A Comparative Analysis of Two Community Stressors' Long-Term Mental Health Effects[1]

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The investigation directly compared the long-term mental health consequences of two community-wide stressors, the Three Mile Island (TMI) nuclear accident and widespread unemployment due to layoff, in demographically comparable samples of women. Results showed a marked degree of similarity in the stressors' effects: Levels of subclinical symptomatology were elevated to similar degrees in each sample during the year following stressor onset, and symptom levels remained elevated in each sample 2 to 3½ years later. Moreover, variables identified as predictors of enduring psychological distress were virtually identical for the two samples. Additional analyses revealed that the mental health status of unemployed husbands mediated the negative psychological effects of layoff on their wives. Implications of these results for understanding the long-term consequences of exposure to community-wide stress are discussed.

Community-wide stressors which expose large numbers of people to an uncontrollable event provide an ideal opportunity for analyzing long-term coping processes. Despite the theoretical and clinical significance of this issue, however, the chronic psychological effects of such exposure have rarely been studied. Furthermore, there has been little concern as to whether these pervasive stressors produce uniform or idiosyncratic reactions. The small body of research conducted to date has found varying long-term outcome patterns. For example, some investigations of natural disasters found an initial increase in psychological disturbance that persisted for months and occasionally

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even years (e.g., Moore, 1958; Titchener & Kapp, 1976). In contrast, research on other stressful events affecting large populations, e.g., studies of men who lost their jobs following plant shutdowns (Kasl & Cobb, 1979; Levi et al., 1984), found relatively few negative effects extending beyond an initial acute period.

The inconsistent findings about long-term coping patterns reported in earlier studies of community-wide stress are difficult to interpret. They could have resulted from the unique characteristics of differing stressful events, the distinctive methodologies used to study them, the diverse populations exposed to the event, etc. Clearly, the most straightforward way to determine the long-term effects of community-wide stressful occurrences, and the differences between them, is to compare two or more such events within the same study. However, given the costly nature of this research design and the fortuitous circumstances that it would require, it is not surprising that investigators rarely have the opportunity to conduct such an analysis. Such a situation did arise in the course of the authors' study of the long-term mental health effects of the 1979 accident at the Three Mile Island (TMI) nuclear plant. Approximately 2½ years after the start of longitudinal data collection, the western Pennsylvania area serving as TMI's comparison site experienced massive unemployment in the local steel industry due to a severe economic depression. Thus, the present investigators unexpectedly were able to construct a study directly comparing the long-term mental health effects of markedly different community-wide stressors on demographically similar samples of women.

The first occurrence, the TMI accident, provided an intriguing context for studying the coping process. Like many disasters, TMI was not an acute, time-limited event; rather it entailed a sequence of interrelated stressful events that unfolded over several years. These events included intermittent radiation leaks, persisting difficulties with the clean-up operations, and public controversy surrounding the reopening of the undamaged reactor. Studies of the accident's relatively short-term consequences found increased psychological distress among affected persons (e.g., Baum, Gatchel, & Schaeffer, 1983), particularly in high-risk groups such as mothers of young children (Bromet, Parkinson, Schulberg, Dunn, & Gondek, 1982). A critical question raised in the present study, therefore, is whether the accident had longer-term as well as short-term effects.

The second stressful experience, widespread unemployment, also provided a valuable opportunity to study the coping process. There is growing evidence that unemployment is associated with adverse mental health (see Ferman & Gordus, 1979, for a series of review articles). Unfortunately, however, many of the findings are difficult to interpret because the research samples have included individuals who lost their jobs by being fired or disabl-

ed, as well as being laid off (e.g., Jackson & Warr, 1984; Linn, Sandifer, & Stein, 1985; Pearlin, Menaghan, Lieberman, & Mullan, 1981). The causal direction between unemployment and mental health status, thus, is ambiguous. Despite this uncertainty, there is increasing evidence that unemployment can have deleterious effects on other family members as well (e.g., Cochrane & Stopes-Roe, 1980; Liem & Rayman, 1982). In the present study, therefore, we explored the adjustment of wives of unemployed workers, all of whom were laid off, to further understand the rippling pattern associated with such a community stressor.

Given the aim of determining whether community-wide stressors with objectively differing characteristics elicit common or unique reactions, our study design incorporated Brown's (1981) caveat that it is not an event per se but rather its context that determines whether or not it should be classified as stressful. Thus, living closer to TMI was hypothesized to increase the stress level for the following reasons: many of the women residing close by could see the plant's cooling towers and constantly be reminded of the accident; women within 5 miles of the plant were ordered in 1979 temporarily to evacuate if they were pregnant or had small children; and media attention continues to focus on health risks for people living in communities near TMI. With regard to the manner in which context affects the stressful quality of unemployment, its temporal and social characteristics were considered. Thus, whether and for how long a woman's husband was laid off served as the index of the community-wide event's personal stressfulness. It should be noted, however, that almost every woman interviewed also reported that a close friend, neighbor, and/or relative had experienced a layoff in their family.

In addition to the theoretic significance of context, conceptual models describing the psychological effects of stress suggest that symptomatology may be affected by such other factors as preexisting psychological disturbance (Monroe, 1982), perceptions of social support (Turner, 1983), and appraisal of the danger associated with the event (Janis, 1962). Research on acute stressors, such as that analyzing the effects of life events, often includes one more of these explanatory variables (e.g., Dohrenwend & Dohrenwend, 1981). However, studies of community-wide stress and its long-term consequences infrequently consider variables hypothesized to affect the complex coping process. A potential contribution of this study, therefore, is to evaluate the manner whereby psychosocial factors are related to adjustment following two major but markedly different stressful events.

In summary, a central goal of this study was to compare the levels of psychological distress (symptomatology and psychiatric disorder) experienced by women following exposure to differing community-wide stressors. The morbidity patterns associated with each stressor were also examined to determine (a) the effects of severity of the stress on adjustment, (b) the degree

to which preexisting disturbance and social support affect outcome, and (c) the degree to which preexisting disturbance and social support moderate the psychological effects of the stressor's severity. In addition to these analyses which are common to both study samples, the effect of danger appraisals on outcome is evaluated in the TMI sample. Finally, we examine whether the mental health status of unemployed husbands mediates the potentially negative psychological effects of layoff on their wives in our western Pennsylvania sample.

METHOD

Subjects

Panel data were collected from 361 married women who delivered a child in the period between January 1978 and March 1979 (the month of the TMI accident). Of these, 257 women lived within 10 miles of the TMI facility in Middletown, PA, and 104 women lived near the Beaver Valley–Shippingport (BV-S) nuclear plants in western Pennsylvania. Since Pennsylvania law prohibited access to vital statistics records, subjects were drawn from birth announcements appearing in area newspapers. Hospitals in the area routinely reported birth delivery data to the local newspapers and virtually all local women delivered in a hospital, thus minimizing sample bias. The refusal rate at initial interview was 21% and the rate of attrition over the 3½-year period was 19%.

The two samples were demographically similar. Indeed, the BV-S site was originally chosen because its population characteristics and area density levels resembled those of the TMI site. When initially interviewed, the women's median age was 28 (range = 18 to 44), they were predominantly Caucasian, had grown up in the locale where currently living, had at least a high school education, and had one to two children. The BV-S sample was more heavily blue-collar (62%) than the TMI sample (36%) (defined in terms of the spouse's occupation; see Bromet et al., 1982). No systematic differences were found between women with complete and incomplete follow-up data with respect to demographic, psychosocial, or symptom variables.

Procedure

All subjects were interviewed in their homes 9, 12, 30, and 42 months after the TMI accident. (The 30-month interview occurred immediately prior to the onset of layoffs in the BV-S area.) In addition, the BV-S women were interviewed a fifth time by telephone 54 months after the accident. Each in-

terview lasted approximately 1½ hours. Subjects were interviewed by staff trained in the administration of the instruments described below (see Bromet et al., 1982, for a complete account of the training program).

Instruments

Symptomatology. The Symptom Checklist-90 (SCL-90) was administered at each interview to assess subclinical levels of psychological disturbance. This checklist inquires about 90 symptoms during the 2 weeks preceding the interview and they are rated on a 5-point scale (0 = not at all, 4 = extremely distressed). The SCL-90 produces an overall measure, the Global Severity Index (GSI), which represents the average score for the 90 items (Derogatis, 1977).

Psychiatric Disorder. Lifetime episodes of major depression and generalized anxiety as well as episodes occurring during the periods between interviews were determined from subjects' responses at each interview to relevant sections of the SADS-L (Endicott & Spitzer, 1978). Research Diagnostic Criteria (RDC) were used to categorize presence or absence of these disorders (Spitzer, Endicott, & Robins, 1978). Other diagnostic categories were not assessed during the follow-up period because of their low prevalence in the type of population studied.

In addition to mental health history and demographic information, the following other classes of variables hypothesized to affect the event–psychological distress relationship were assessed:

Severity of the Stressor. Distance of residence from the TMI plant at the time of the accident (reported at the initial interview) served as the index of the accident's stressfulness for the TMI sample. Data regarding husband's employment history during the interval between each interview were used to create an index of the personal stressfulness of unemployment for BV-S women. At each interview, subjects reported whether or not their husband had been unemployed since the previous interview.[3] In addition, at the fourth and fifth interviews (which occurred after the onset of layoffs in the western Pennsylvania area), the women gave (a) the reason for each period of unemployment (e.g.; layoff, dismissal, etc.; all cases of unemployment in the BV-S sample were due to layoff), and (b) the number of weeks unemployed during each such period. Since 26% of the BV-S sample reported uncertainty about the precise lengths of husband's unemployment, a

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[3]Rates prior to the first two interviews are likely to underestimate the extent of unemployment; women were not questioned directly about husband's employment status at these interviews but were asked to describe any major life events occurring in the past year (Guy, 1976).

trichotomous variable was created (1 = employed during entire interval, 2 = laid off for 6 months or less, 3 = laid off for more than 6 months) to reflect husband's employment status during the intervals between the third and fourth and fourth and fifth interviews.

Perceptions of Social Support. An item concerning perception of the availability of emotional support and an item concerning perception of the availability of instrumental support from close friends and relatives were included in the first and third interviews. Since these items were correlated at both interviews (r = .86 and .52, respectively), a composite general social support variable was created by averaging responses at each interview (larger value = greater support).

Appraisal of Danger Associated with TMI. Women from the TMI area indicated at the first interview (a) whether they perceived TMI to be currently dangerous (3 = yes, 2 = maybe, 1 = no), and (b) whether they believed it was safe to live near a nuclear facility (3 = no, 2 = maybe, 1 = yes). Since these items were correlated (r = .56), a composite variable was created by averaging subjects' responses to them.

Husband's Symptomatology. A husband's distress level following his own unemployment might influence his wife's adjustment to this stressor. To study this relationship, husbands were asked to complete a brief form of the SCL-90 at the fourth interview. An averaged symptomatology score, similar to the Global Severity Index, was then created for the 62 of 104 eligible husbands providing this information. Wives of these 62 respondents did not differ from wives of the 42 nonrespondents on any demographic, psychosocial, or mental health variables.

Analyses

The analyses focus on the prospective associations of event occurrence with subsequent symptomatology and psychiatric disorder. To evaluate these relationships, analyses of covariance were first performed to compare distress levels between the samples. Hierarchical linear regression analyses were then performed within each sample to examine the adjustment patterns associated with each stressor. Prior to these analyses, distributions of all variables were evaluated. The symptomatology measures from each interview were logarithmically transformed to reduce skewness in their distributions in order to meet an assumption of ANCOVA and regression analysis.

In order directly to compare the unique effects of the two types of events, it is methodologically important that unemployment be prevalent in the BV-S sample but not in the TMI sample. Data demonstrating this fact are presented in Table I, which displays the percentages of each sample whose husbands became unemployed during the 12 months preceding each inter-

Table I. TMI and Beaver Valley-Shippingport (BV-S) Rates of Unemployment and Comparison of Risk During the Year Prior to Each Interview[a]

Period of unemployment	TMI (n = 257)		BV-S (n = 104)		Relative risk (BV-S/TMI)	Z	p
	%	n	%	n			
Prior to first interview	1.2	3	1.0	1	0.82	-0.16	.44
Prior to second interview	1.9	5	1.0	1	0.49	-0.61	.28
Prior to third interview	7.0	18	9.6	10	1.37	0.84	.21
Prior to fourth interview	12.4	32	46.2	48[b]	3.71	6.98	<.001
Prior to fifth interview	—	—	47.1	49[c]	—	—	—

[a]Rates reflect the proportion of each sample who stated that their husband had been unemployed at any time during the previous year.
[b]Of these 48, 33 were unemployed for 6 months or less and 15 were unemployed for more than 6 months.
[c]Of these 49, 17 were unemployed for 6 months or less and 32 were unemployed for more than 6 months.

view. It should also be noted that by the fifth interview, 54% of the BV-S women had reported that their husband had experienced some period of layoff during the period in which they participated in the study; of these layoffs, 52% reported periods totaling more than 1 year.

RESULTS

Psychological Distress Levels

Subclinical symptomatology (GSI scores) and SADS-diagnosable depression and/or anxiety in the samples were examined as dependent variables in two separate analyses of covariance. Each analysis included site (TMI vs. BV-S) and history of any psychiatric disorder prior to the TMI accident (present vs. absent) as the between-subjects factors, time of interview as the within-subjects factor (9, 12, 30, and 42 months), and a measure of socioeconomic status (SES) as the covariate.[4]

Figure 1 presents covariate-adjusted mean GSI scores (logarithmically transformed) at each interview for four groups of women: TMI women with and without a history of psychiatric disorder, and BV-S women with and without such history. TMI women averaged higher symptom levels than BV-S women across all four interviews, $F(1, 356) = 4.58$, $p < .04$, effect size $\eta = .11$. Women from either site with a prior history of psychiatric disorder had substantially higher symptom levels than those without such a history, $F(1, 356) = 17.43$, $p < .001$, $\eta = .22$. The relatively lower symptom levels observed for all groups at the second interview most likely reflect seasonal variations in mental health; this interview was conducted in the spring whereas all others were conducted in the fall.

A planned contrast was performed on the Site × Time interaction to evaluate directly the relative effects of the two stressors. This contrast tested the hypothesis that the TMI accident intensified TMI women's symptom levels during the two initial interviews relative to BV-S women, whereas unemployment (anticipated at the third interview and occurring thereafter) intensified the BV-S women's symptoms relative to the TMI sample at the two later interviews. This contrast was indeed found significant, $F(1, 1071) = 8.44$, $p < .01$, $\eta = .09$.[5]

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[4]Subjects' education and their husband's occupation were both correlated with the dependent variables, necessitating their inclusion as covariates. Because they were also correlated with each other ($r = .38$), they were combined as a 5-point socioeconomic status scale (1 = higher, 5 = lower SES; Hollingshead & Redlich, 1958), and this new variable served as the covariate.

[5]Note that this contrast for the interaction involves a relative comparison of how the groups change over time and is not incompatible with the main effect that TMI women had higher distress scores on the average across time. Contrast weights were + 1 and − 1 for the TMI and BV-S samples, respectively, at the first two interviews, and − 1 and + 1 for the TMI and BV-S samples, respectively, at the last two interviews.
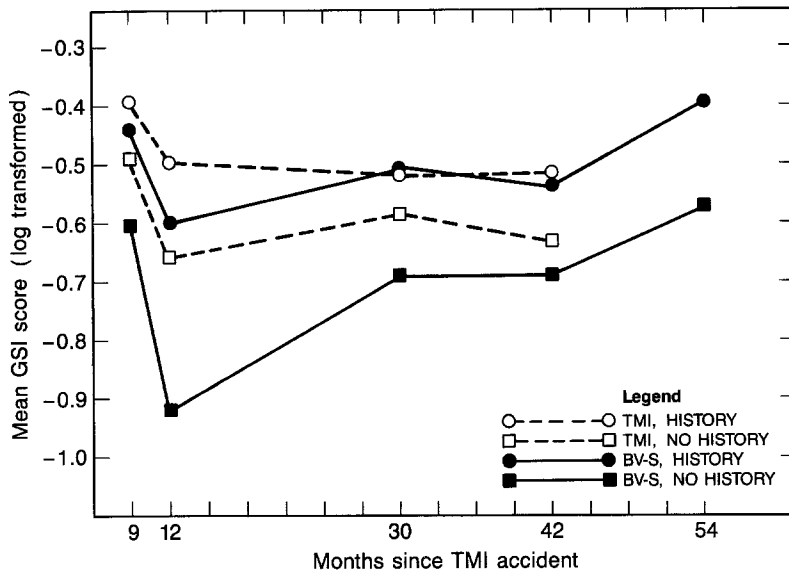
Fig. 1. Mean GSI scores at each interview for the TMI and BV-S samples (adjusted for socioeconomic status; see text for description of variables).

The data thus suggest that both stressors had the common effect of increasing subclinical symptomatology in the exposed cohort relative to the comparison group during the year after the stressor's occurrence. Our finding that BV-S subjects maintained elevated levels of symptomatology at the fifth interview (see Figure 1) suggests that spouse's unemployment produced an extended effect similar to that experienced by women living near the TMI plant.

Similar analyses were performed on the dependent variable of SADS-diagnosable depression and/or anxiety during the year preceding the 12-, 30-, and 42-month interviews. Although women with a history of psychiatric disorder were more likely to experience one or more episodes during the study period compared to women without a history (46% vs. 19% of the respective sampes; $F(1, 356) = 21.95, p < .001, \eta = 24$), all other effects were small.[6] Since there was little evidence of extended effects for these disorders, we did not include them as dependent variables in further analyses of predictors of adjustment to stress.

[6]The rate of disorder was higher for the TMI than the BV-S sample during the year after the accident, as discussed in Bromet et al. (1982). See also Snedecor and Cochran (1967) and D'Agostino (1971) for discussion of the appropriateness of analysis of variance with dichotomous dependent variables.

Predictors of Extended Psychological Distress

We focus now on variables that could account for the observed effects on subclinical symptomatology in each of the two samples. To facilitate this presentation, we distinguish the relatively short-term and longer-term distress following stressor onset in each sample. An index of short-term distress following the TMI accident was created by averaging TMI subjects' 9- and 12-month GSI scores with the rationale that the two measures were obtained within a relatively brief time frame and they were indeed highly correlated ($r = .63$). Similarly, the 30- and 42-month symptom scores were highly correlated ($r = .70$) and they too were averaged to reflect longer-term distress for the TMI sample. For BV-S women, who were subjected to the stressor of unemployment following the third wave of interviews, GSI scores at the 42-month interview and at the 54-month interview constituted the symptom measures used to reflect relatively short- and long-term distress, respectively.[7]

The three questions guiding our analyses of outcome predictors concern whether (a) higher levels of stressor severity directly affected symptom levels over time, (b) preexisting disturbance and social support affected symptom levels, and (c) these two variables moderated the psychological effects of the stressor's severity. A hierarchical regression approach was used to address these questions (J. Cohen & Cohen, 1975). Thus, main effects of all predictors were initially entered simultaneously. In addition to the three major predictors, SES and, for the TMI sample, appraisal of the danger of TMI were also included as predictors.[8] Interactions of the severity index with preexisting disturbance and social support were added subsequently to the regression equation to test for moderating effects. For the TMI sample, all predictors were assessed at the initial interview conducted 9 months after the accident. For the BV-S sample, all predictors except the employment status variable were assessed at the third (30-month) interview conducted immediately prior to the onset of layoffs in the area.

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[7]Although the short- and long-term symptom outcome measures were averaged scores over two time points for the TMI sample but only single-interview scores for the BV-S sample, it is unlikely that this difference affected our results. We performed analyses separately for each of the TMI sample's four single-interview GSI scores and obtained results virtually identical to those presented for the two averaged measures. In addition, correlations between short- and long-term distress measures within the TMI and BV-S samples were quite similar ($r = .69$ and .66, respectively).

[8]For the TMI sample, we continued to use the composite measure of SES that we constructed earlier as a covariate for the ANCOVA. However, our SES measure for the BV-S sample regression analyses included only education. Husband's occupation could not be included as a socioeconomic status measure because it was highly correlated with the employment status index (the lower the status of his occupation, the more likely he was to be laid off). Occupation was therefore eliminated from the BV-S sample regressions in order to reduce multicollinearity among the predictor variables.

Table II presents the results of these analyses for the two samples. (Correlation coefficients between all variables are presented in Table III.) With respect to the impact of stressor severity on adjustment, our findings indicate that this factor was a relatively unimportant predictor of each sample's short-term symptomatology. However, severity became a somewhat stronger predictor of distress as time progressed. Thus, for the TMI sample, the closer a woman lived to the plant when the acccident occurred, the more symptoms she was likely to report in the long term. Severity of unemployment during a 2-year period was also mildly (though not significantly) associated with higher levels of symptomatology over time.

The second question concerns the effects of preexisting disturbance and social support on symptomatology. As might be expected, preexisting disturbance exerted important effects on both short- and long-term symptomatology for these two samples. The data indicate that women who had a history of psychiatric disorder prior to onset of the stressor were especially likely to experience relatively high levels of distress during the year after stressor onset. In addition, prior level of symptomatology was a strong predictor of subsequent symptomatology for both samples. Perceptions of social support, however, exerted minimal effects on the outcome variables in each sample.

We should also note that women of lower SES showed elevated symptomatology levels relatively soon after onset of the stressor, but in neither sample was SES an important predictor of longer-term distress. In addition, for the TMI sample, appraisals of the dangerousness of the plant poorly predicted postaccident distress.

Our third question concerns interaction effects. Regression coefficients for the interactions of preexisting disturbance and social support with stressor severity were uniformly small and nonsignificant for both samples. Thus, although these variables have been hypothesized to moderate the impact of stressful events, no such effects were found in the present study.

Mediation of the Effects of Unemployment

Given that SCL-90 data were available for 62 BV-S husbands as well as for their wives, we had the unusual opportunity to examine whether a husband's employment status affected his wife's symptom levels through a process of mediation. Specifically, we hypothesized that unemployment elevated symptomatology in the husbands which then caused the wives' symptom levels to rise (see Figure 2). If such a mediation process were operating, then the indirect path from employment status to wife's symptomatology (through husband's symptomatology) would have large coefficients relative to the size of the coefficient for the direct path between employment status and wife's symptomatology.

Table II. Effects of Predictors on Symptomatology Following Stressor Onset[a]

Predictors	M	SD	Standardized regression coefficients for symptomatology	
			Earlier interviews	Later interviews
TMI sample (n = 255)				
Index of stressor severity				
Distance from TMI (0-10 miles)	6.38	2.92	-.07	-.12[c]
Preexisting disturbance				
Disorder prior to TMI (1 = yes, 0 = no)	0.36	0.48	.17[c]	-.01
Symptomatology at earlier interview (log of 0-4 scale)	-0.54	0.34	—	.68[d]
Social support (1 = low, 4 = high)	1.94	0.64	-.01	-.03
Socioeconomic status (1 = high, 5 = low)	3.36	0.99	.13[b]	.00
Appraisal of danger (3 = dangerous, 1 = not)	2.37	0.77	.07	.03
Multiple R (main effects)			.26[c]	.70[d]
BV-S sample (n = 90)				
Index of stressor severity				
Employment status (1 = employed, 2 = laid off ≤ 6 months, 3 = laid off > 6 mos.)				
Between 30-42 month, interviews	1.59	0.73	.06	—
Between 30-54 month interviews	1.90	0.91	—	.13
Preexisting disturbance				
Disorder prior to community stress	0.39	0.49	.17[b]	.17
Symptomatology prior to community stress (log of 0-4 scale)	-0.63	0.40	.68[d]	.54[d]
Social support (1 = low, 4 = high)	1.80	0.55	-.07	-.03
Socioeconomic status (1 = high, 7 = low)	3.78	0.97	.11	.03
Multiple R (main effects)			.75[d]	.61[d]

[a]See text for definition of variables. Regressions were based on subjects with complete data for all variables.
[b]$p < .05$.
[c]$p < .01$.
[d]$p < .001$.

Table III. Correlations Between Major Predictor and Outcome Variables for the TMI Sample (Below Diagonal) and for the BV-S Sample (Above Diagonal)[a]

Variables	Earlier symptoms	Later symptoms	Distance from TMI	Employment status 30-42 mos.	Employment status 30-54 mos.	Prior disorder	Prior symptoms	Social support	SES
Poststressor outcomes									
Symptomatology (log of 0-4 scale)									
Earlier interviews		.66	—	.04	-.02	.28	.71	-.01	-.24
Later interviews	.69		—	.14	.13	.25	.57	.03	-.14
Predictors									
Distance from TMI (0-10 miles)	-.09	-.18		—	—	—	—	—	—
Employment status (1 = employed, 2 = laid off ≤ 6 months, 3 = laid off > 6 months)									
Between 30-42 month interviews	—	—	—		.84	-.11	.00	.12	.05
Between 30-54 month interviews	—	—	—			-.01	.00	.15	-.06
Prior psychiatric disorder (1 = yes, 0 = no)	.19	.13	-.06	—	—		.16	-.02	-.08
Prior symptomatology (log of 0-4 scale)	1.00[b]	.69	-.09	—	—	.19		.10	-.16
Social support (1 = low, 4 = high)	-.01	-.05	.07	—	—	-.02	-.01		.11
Socioeconomic status (larger value = lower status)	.15	.12	-.18	—	—	.02	.15	-.04	
Appraisal of danger (3 = dangerous, 1 = not)	.10	.08	.11	—	—	.13	.10	.10	.05

[a]See text for definition of variables. Correlations were based on subjects with complete data for all variables (n's of 255 and 90 for TMI and BV-S samples, respectively).

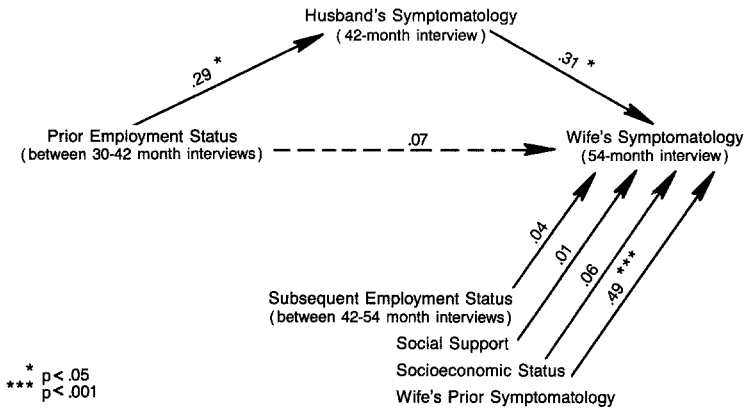[b]These two variables were identical for the TMI sample.

Fig. 2. A model of mediation with estimated standardized regression coefficients.

This model was evaluated in several steps. First, husband's symptomatology level was regressed on his prior employment status during the year between the 30- and 42-month interviews. Next, wife's symptomatology at the 54-month interview was regressed on both the husband's symptomatology at the 42-month interview and his employment status between the 30- and 42-month interviews. Additional variables included in this equation to control for their effects were wife's prior symptom level, perceptions of social support, and SES as measured at the 30-month interview, plus husband's subsequent employment status between the 42- and 54-month interviews.

The results shown in Figure 2 suggest that a process of mediation was operating. Thus, prior employment status affected husband's symptomatology ($\beta = .29$) which, in turn, affected wife's symptomatology ($\beta = .31$). In contrast, the direct effect of husband's prior employment status on wife's symptoms was relatively small ($\beta = .07$). When these analyses are repeated under the assumption that husband's prior employment status has *no* direct effect on wife's symptoms (i.e., wife's symptom level is regressed on all variables *except* husband's prior employment status), the multiple correlation coefficient is almost identical to that obtained when the prior employment status variable is included as a predictor (R of .632 and .636, respectively). This further substantiates the conclusion that, although husband's layoff has limited direct causal impact on wife's symptomatology, its mediated effects warrant further consideration.

DISCUSSION

Previous studies have found community-wide stressors to have varying degrees of impact on residents' mental health. The reports range from

those demonstrating devastating and persistent psychological consequences to those that obtained few negative effects extending beyond an initial period of acute distress. Given these discrepancies, we took advantage of a fortuitous opportunity to compare directly the long-term mental health effects of two community-wide stressful occurrences — the TMI accident and widespread unemployment due to layoff — in demographically comparable samples of subjects. Our results, therefore, provide unique evidence of qualitative similarities and differences between these stressors' effects which are relatively unconfounded by methodological differences in their evaluation.

We found a remarkable similarity in the long-term mental health impact of these stressors. First, subclinical symptomatology levels were elevated to similar degrees during the year after stressor onset in each sample; these levels remained elevated in each sample during the follow-up period. Second, comparable patterns of effects were found to explain the enduring distress levels for persons exposed to each stressor. This is demonstrated most clearly in Table II which shows predictor variables' effects on symptomatology following stressor onset. Focusing on the size of the coefficients rather than on their significance alone (since statistical significance is affected by sample size, and the BV-S sample was considerably smaller than the TMI sample), the degree of correspondence between predictors' effects across the two samples is noteworthy. Thus, although our index of each community-wide event's personal stressfulness did not predict short-term symptomatology, each contributed at least mildly to the prediction of distress at later time points. This suggests the presence of a cumulative or latent component in each stressor's effects, as we discuss in more detail below. Results for both samples also showed that psychological distress prior to an event's onset was the best predictor of subsequent distress levels, a finding consistent with other research on reactions to stressful life events (e.g., Monroe, 1982). In contrast to other work (e.g., Turner, 1983), however, we found perceptions of social support from friends and relatives to exert minimal effects on symptomatology in both samples. Furthermore, neither preexisting disturbance nor social support interacted with, or moderated, the impact of either stressor's severity on mental health.

Perhaps our most conceptually intriguing finding is that the effects of unemployment appear to be primarily indirect, or mediated, by the distress of the person actually experiencing job loss; the husband's level of psychological distress better predicted his wife's symptoms than did his employment status per se. Although few studies have investigated longitudinal effects of unemployment on family members, some preliminary reports suggest a pattern of indirect effects similar to ours for wives of the unemployed (Liem, 1983; Liem & Rayman, 1982).

The lack of direct or moderating effects of social support in both our comparative analyses (Table II) and our analyses of mediation of unemployment effects (Figure 2) is surprising. One possibility is that the items we com-

bined to create an index of social support — one assessing emotional and the other instrumental aspects of this construct — are intercorrelated but not equally good predictors of subsequent mental health status. Thus, the lack of effects for social support might be a methodological artifact. However, the zero-order correlations of each item with the mental health measures were very similar, making such an explanation unlikely. A second explanation lies in the manner in which we measured social support. The two items reflect subjects' perceptions of availability of support rather than quality of support received. Recent evidence suggests that quality of support may be the relatively more important correlate of psychological well-being (see Turner, 1983, for a review).

Although our data clearly suggest that two widely differing community-wide stressors are equally associated with chronically elevated levels of psychological distress, it must be noted that the quasi-experimental nature of our data precludes conclusive statements that either stressor caused higher symptom scores. This caution especially pertains to the TMI stressor since data were collected only after the accident occurred, although careful matching of the comparison sample allows for relatively stronger conclusions to be drawn. The data for unemployment effects are prospective, however, strengthening our ability to draw causal inferences. Additionally, while long-term mental health effects have rarely been obtained for community crises such as unemployment through layoff, we believe that we observed such effects because our design was more truly prospective than preceding ones (e.g., Kasl & Cobb, 1979). Changes from baseline levels of psychological functioning could thus be more readily detected.

It should be noted that the magnitude of the stress effects in both samples of women was for the most part mild. However, this magnitude is consistent with theoretical expectations as well as with other empirical evidence on long-term effects of chronic stress (e.g., Baum et al., 1983). The chronic stress situation has been conceptualized as one in which individuals are affected by "continuous and manifold changes, demands, threats, or deprivations" (Fried, 1982, p. 5). Although each component of the stressor may be small in scale, collectively they summate over months and years to produce measurable increases in psychosocial strain. This conceptualization certainly applies to the stressors investigated in this study. As was noted earlier, persisting elements of the crisis keep the TMI situation in nearby residents' awareness. Similarly, as unemployment extends over time, such daily problems as altered family routines, strained household budgets, etc., emphasize the dilemma facing members of the unemployed person's family.

The fact that symptomatology did not reach the level of diagnosable illness in most cases does not imply that the level of distress experienced by

the women in this study is clinically unimportant. On the contrary, remaining for extended time periods in such stressful situations can have secondary effects, including apathy and the use of relatively passive and resigned coping methods (e.g., Earls, 1976; Fried, 1982; Popkin, Stillner, Osborn, Pierce, & Shurley, 1974). One consequence of this defensive posture is a reduced ability to cope with additional acute stressors superimposed on the existing chronic ones (Baum, Singer, & Baum, 1981; S. Cohen, 1978). Thus, low-level chronic stress such as that observed in the present study may ultimately play a critical role in furthering the illness process, even though alone it may produce only mild subclinical manifestations.

In conclusion, both of the community-wide stressors examined in this study exerted extended effects on mental health, up to 42 months after onset. These effects are manifested primarily in symptomatology rather than in diagnosable episodes of clinical disorder. Since we investigated only two pervasive stressors, continued comparisons are necessary to determine whether certain types of such stressors exert more persistent and deleterious effects than others. Furthermore, understanding of the process by which these stressors operate requires an examination of additional variables which potentially moderate and/or mediate stressor effects.

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