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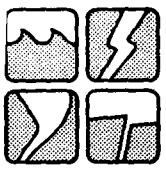

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Psychological Responses to the Mexico City Earthquake

Abigail J. Stewart

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The broad goal of this study was to assess the emotional, cognitive, psychosocial, and behavioral consequences of disasters (in this case, an earthquake) for victims, less directly affected neighbors, and disaster relief workers. Specifically, the present study was designed to examine the process of adaptation to disasters within a larger framework for studying individuals' responses to traumatic life changes. This model begins with the assumption that while there may be short-term psychological risks following dramatic life changes (typically manifest in mood disturbance, increased symptomatology, and psychiatric disorders), there is also potential for emotional and cognitive growth as a result of successful emotional adaptation. To date, studies of individuals adapting to a variety of major life changes (e.g., marital separation, school and job changes, first parenthood) have provided empirical support for a recursive sequence of emotional stances that individuals experience after any drastic, relatively permanent life change. (This sequence involves four stances: a passive-receptive stance adopted in the immediate post-change period, followed in turn by a posture of limited initiative and autonomy; greater assertiveness and hostility; and finally a neutral, integrated stance. See Stewart, 1982; Stewart et al., 1982, 1986 for full accounts of the theoretical model, as well as empirical support for it.)

Thus, in addition to creating trauma for anyone directly exposed to them, disaster experiences stimulate a process of adaptation at least in those whose subsequent lives are significantly changed by them. This process of emotional adaptation creates, in turn, an opportunity for emotional and cognitive growth. The first goal of the proposed research was, then, to examine the process of

emotional adaptation and psychosocial adjustment in earthquake victims, less-affected neighbors and relief workers.

In addition, while disasters may have direct effects on cognition and behavior, recent evidence suggests that the process of emotional adaptation itself influences complex cognitive processing abilities as well as behavior in the immediate post-disaster period. Previous research (see Stewart and Healy, 1985) has shown that the first stance adopted in the course of emotional adaptation (Receptivity) interferes both with complex problem-solving skills and with taking initiative (e.g., help-seeking) in the early post-change period. However, retention of the Receptive stance in the early post-transition period seems to facilitate the growth of cognitive information- structuring capabilities over time. Thus, in addition to examining the effects of the earthquake on emotional adaptation and psychosocial adjustment, we proposed to assess the effects of the process of emotional adaptation on cognitive problem-solving skills and help-seeking behavior.

Finally, we selected several variables likely to predict individuals' immediate responses to disasters, as well as to the longer-term process of emotional adaptation: aspects of the disaster experience itself (reflected in the subjects' group: victim, neighbor, relief worker); other sources of stress (e.g., life changes); and resources for coping (e.g, social support). Thus, we will examine predictors of the process of emotional adaptation and psychosocial adjustment in victims, neighbors, and relief workers.

Conceptual Framework

The study began with the notion that while exposure to major stressful events such as disasters may lead to at least temporary psychological disturbance, it may not be best understood as producing widespread extreme mental health problems (see, e.g., Quarantelli, 1985). It may instead be fruitful to explore the links between the psychological sequelae of more

normative life changes (e.g., parenthood, bereavement, etc.) and disasters. Thus, (1) like other dramatic life changes (that challenge an individual's cognitive schemas and demand new adaptive responses), disasters may stimulate a process of emotional adaptation which involves four successive emotional stances toward the environment: Receptivity, Autonomy, Assertiveness, and Integration; (2) the process of emotional adaptation may have both short and long-term consequences that can lead to emotional growth (Stewart and Healy, 1984, 1985; Healy, 1985); and (3) the course of psychosocial adjustment, and of emotional adaptation, may be affected by environmental and individual characteristics (e.g., life stress and social support).

Method

Sample. In the early fall of 1985, a severe earthquake struck Mexico City and the surrounding region. With the aid of financial support from the Quick Response Research Program administered by the Natural Hazards Research and Applications Information Center, and in collaboration with Dora Schael of the Instituto Tecnologico Autonomo de Mexico (ITAM), we were able to collect interview and questionnaire data within a few weeks of the earthquake from three groups of adults directly or indirectly affected by it: 1) 21 residents of Tlaltelolco, a housing project seriously damaged by the earthquake, whose homes had been completely destroyed; 2) 21 neighbors who lived in undamaged apartments in the same housing project; and 3) 17 community workers who assisted victims in the immediate post-disaster period. (In the fall and winter of 1986, approximately one year after the earthquake and the initial data collection, with the help of a small grant from the McBer Foundation, these groups were followed up with almost identical questionnaires and interviews.)

Questionnaire Measures: Coding and Analysis

In addition to a basic demographic questionnaire, participants completed several standard questionnaire measures designed to tap dimensions of adjustment

(including measures of mood disturbance, symptoms, and life satisfaction). In addition to the solid empirical support for these measures, they were chosen because they are relatively widely-used and, thus, would permit cross-cultural comparisons to other samples affected by major traumas or to samples undergoing less drastic changes. All measures were translated into Spanish by a bilingual psychologist. Because analysis of these questionnaire measures did not depend on transcription, translation or coding of interviews, we have completed analyses of the first year data at this time.

For an indication of mood disturbance, each adult in the study completed the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971). McNair and his colleagues present impressive evidence for the internal consistency and test-retest reliability of the scales comprising the total mood disturbance score. The six scales contributing to overall mood disturbance are tension-anxiety, depression-dejection, confusion-bewilderment, anger-hostility, fatigue-inertia, and vigor-activity.

Each adult in the study completed a questionnaire on stress symptoms adapted from Gurin, Veroff, and Feld's (1960) and Veroff, Kulka, and Douvan's (1981) national study of mental health in American adults. This measure has been well established as a reliable and valid indicator of behavioral and psychological symptoms in these nation-wide studies of mental health in american adults.

Finally, a single item assessing overall life satisfaction was included. It has been frequently used in national studies of subjective mental health and well-being (Bradburn & Caplovitz,1965; Gurin, Veroff & Feld, 1960; Veroff, Douvan & Kulka, 1981).

Results of Questionnaire Analyses

Results of sex by group analyses of variance on these indicators, comparing direct victims and neighbors (see Tables 1 and 2), suggest that direct victims

were significantly lower than neighbors in reported life satisfaction, and significantly higher in overall mood disturbance (specifically, they were higher in anger and depression; see Table 2). There was also a trend ($p<.10$) suggesting that victims were higher in confusion. Male victims were lower in self-esteem than male neighbors (though there was no difference for females).

Victims and neighbors did not differ in self-reported fatigue, anxiety, or psychosomatic symptoms. At least in the case of anxiety, though (for which, along with fatigue and the other POMS scales there are some U.S. normative and other comparative data), it appears that this may be due to the fact that anxiety is high in both victims and neighbors. While it is possible to compare the scores of these three groups with various U.S. samples, it is, of course, unknown whether there are base-rate differences in the way Mexicans would score on these measures. However, the pattern of similarities and differences in scores may help us understand the particular scores of the two groups.

First, it is worth noting that the Mexican earthquake groups do not differ from "normal" U.S. samples (college students, divorcing mothers) in vigor, confusion or fatigue (see Table 3). They generally score much higher, though, on anger, depression, and tension-anxiety. In fact, on these three scales the Mexican earthquake groups score as high as (in the case of anxiety and depression) or higher than (in the case of anger) U.S. psychiatric patients.

Comparison of the earthquake groups with various samples given the life satisfaction item (see Table 4) suggests that the earthquake groups are generally less satisfied than any U.S. samples; the direct victims are especially low on this measure (over half reporting that they are not satisfied compared with about 10% of most U.S. samples and only 27% of recently-separated, divorcing mothers of school-age children). However, comparison of the earthquake samples with a national U.S. sample in terms of the three stress symptom subscales suggests no large differences (see Table 5).

Comparison of the victim and neighbor groups with the relief workers was problematic. First, there were only three female relief workers; sex by sample analyses were therefore impossible. Second, although the direct victims and neighbors were quite comparable demographically, the relief workers were somewhat different: they tended to be younger and better educated, especially than the neighbor sample. However, in comparisons of men only that controlled for age and education (see Tables 6 and 7), there were no differences between relief workers and victims in psychological state. Relief workers were characterized, then, by high scores on anger, anxiety and depression, like the victims. The only differences found suggested that neighbors were higher in life satisfaction and lower in depression than either of the other two groups.

Finally, since individuals were interviewed between 6 and 12 weeks after the earthquake, we correlated scores on all measures with length of time between the earthquake and the interview. For the sample as a whole (N=59), there was no significant correlation. However, among victims (N=21), there was a significant positive correlation between time and the somatic complaints subscale of the stress symptoms measure and the fatigue scale of the POMS. For neighbors (N=21), there was only a significant positive correlation between time and the confusion scale of the POMS. For relief workers (N=17), there were significant negative correlations of time with the anxiety subscale of the stress symptoms measure, and the confusion scale of the POMS, but a significant positive correlation with the tension-anxiety scale. These results suggest that the over-time analyses are very important, and will help clarify whether the victims (and perhaps the relief workers) were more likely to develop the post-traumatic stress syndrome (which was directly assessed at Time 2) than the neighbors (as these results seem to suggest).

In any case, these data taken together suggest that the different experiences of the earthquake assessed in terms of group membership did indeed

have different psychological consequences. The three groups, therefore, very likely experienced different needs, in terms of intervention and support. Only the analyses not yet completed (of interview material) will allow us to address these issues more adequately.

Translation of Interview Measures

In some ways, the heart of the overall research project depends on the coding of the interview material. Since translation of all interviews at both times is very costly, we have adopted an alternative coding strategy. We will use bilingual coders, who can be trained in English using training materials designed in English. Initial reliability can be established on translated materials, but eventually existing expert coders can code interviews in English that bilingual coders code directly in Spanish. Once reliability has been established in this way, bilingual coders can code the remaining interviews in Spanish, obviating the need for translation of all interviews. Because over-time change is an important part of the research question animating this study, it is important that coding of open-ended material be carried out blind to time (as well as group). Thus, this coding can only be performed after all data has been collected and transcribed. At this time, the second-year data is collected, and transcription of it in Spanish is in process.

With help from the Boston University Psychology Department, and our original Quick Response grant, we were able to have 18 of the original interviews translated (drawn from all three groups). However, none of the followup interviews has been translated. We recently secured funds for the translation of nine followup interviews (three from each of the three groups) from the Society for the Psychological Study of Social Issues, as well as for training of coders and establishment of reliability.

The three measures which will eventually be coded from the interviews are emotional adaptation, structured problem-solving, and help-seeking behavior.

Each of these measures has been used in previous studies of individuals coping with stressful life events; our primary purpose in selecting them was to maintain comparability to previous studies we and others have done while applying our model to a new cultural context and a new form of traumatic life change.

Emotional adaptation to the environment will be assessed using Stewart's measure of affective development (Stewart, 1979, 1982). This measure is usually based on the analysis of projective stories told by subjects in response to ambiguous picture cues. An individual's score on this measure indicates the nature of his/her emotional orientation toward the environment. For the purposes of this project, we will use the adaptation of the Stewart coding system used in several previous studies to code subjects' open-ended responses to questions in the course of an interview. In the adapted coding system, the coding category definitions remain the same as in the traditional coding procedures. However, rather than coding a category present or absent in the response to a particular picture cue, the actual number of images fitting each category is counted from all of the available text material. Specific category totals are represented as proportions of the total amount of coded imagery. Winter (1983) has demonstrated the viability of adapting coding systems originally designed for coding projective material for use with free response text material. Sokol (1983) first modified the emotional adaptation coding system for use in coding patients' utterances in therapy sessions. Our own secondary analyses of Parkes and Weiss' (1983) interviews with recently bereaved widows and widowers suggest that our adaptation of the coding system can be profitably used to assess emotional adaptation in free response interview material.

The level of active help-seeking by the earthquake victims, neighbors and relief workers will also be assessed. The quality or type of need felt by the participant may affect how the need is, or is not, met. For example, Veroff,

Kulka, & Douvan (1981) found in their study of help-seeking that people are more likely to pursue help for interpersonal and emotional problems rather than financial or material needs. In addition, they found that individual social characteristics may mediate a person's help-seeking activity; women, young people, and those with more education are, on the whole, most likely to pursue help for themselves. Questions concerning help-seeking behavior, adapted from Veroff, Kulka and Douvan (1981) for current problems, were incorporated into the interview discussion of help and resources. We asked questions to identify who initiated the help, and how it was initiated. Responses for each of four areas (private feelings, material aid, advice, and physical assistance) will be coded according to four-point scales (from no help needed, to active help-seeking).

In the proposed research structured problem-solving was assessed by asking participants how they would handle various problems which arose in the course of the earthquake (e.g., location and care of lost pets, coordination of relief efforts, etc.). Previous research suggests that structured problem-solving ability is impaired in individuals coping with a traumatic life change (see Healy, 1985). Moreover, in laboratory studies of problem-solving under stressful conditions there is consistent evidence that the amount of information attended to and used in problem-solving becomes limited (see Hockey, 1979, for a review of these studies). Thus, problems that require organizing and structuring a range of information to form a coordinated solution should prove difficult for many of the participants in the proposed project.

Participants' responses to the problem-solving tasks will be coded for the ability to create an organizing structure for solving the problem under which specific tasks are organized. Specifically, we will use three categories from the Test of Thematic Analysis (Winter and McClelland, 1978), which measures the ability to analyze and restructure the information in a complex problem in order to arrive at an organized solution. These three categories assess the degree to

which an individual actively engages in simultaneously processing and restructuring the problem with the goal of arriving at an organized solution: (1) Analytic hierarchy assesses the ability to create an overarching framework or central organizing principle to guide the solution; (2) Redefinition involves redefining or reconceptualizing the problem in order to bring it into line with the framework guiding the solution; (3) Subsuming alternatives involves the creation of integrative solutions for seemingly disparate facets of the problem.

To date, the measure of structured problem-solving that we have chosen has been validated in several samples of college students using problems based on real-life content (Winter, McClelland, and Stewart, 1981). The coding system is designed for free-response content and, therefore, is ideal for use with the kind of data we intend to collect. Moreover, this conceptual skill has been shown to develop as a result of exposure to a wide variety of experiences (Winter, McClelland, and Stewart, 1981), suggesting that it does assess a dimension of cognitive processing abilities likely to be affected by novel experiences. Finally, our own research has shown that structured problem-solving abilities are impaired in the early period of emotional adaptation (Healy, 1985) and that maintenance of the Receptive stance in the post-transitional period facilitates development in structured problem-solving (Stewart and Healy, 1985).

Analyses of these variables--in terms of group differences and correlations, as well as change over time--will be completed when all second year interviews have been transcribed, and enough have been translated to permit acceptable interrater reliability to be established.

References

Barrera, M.J. (1981). Social support in adjustment of pregnant adaloscents: Assessment issues. In B.H. Gottlieb (Ed.) Social networks and social support. Beverly Hills, CA: Sage.

Bradburn, N. & Caplovitz, D. (1965). Reports on happiness. Chicago: Aldine.

Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-314.

Gurin, G., Veroff, J., & Feld, S. (1960). Americans view their mental health. New York: Basic Books.

Healy, J.M., Jr. (1985). Emotional adaptation to life transitions and cognitive performance. Unpublished Doctoral Dissertation, Boston University.

Hockey, R. (1979). Stress and the cognitive components of skilled performance. In V. Hamilton & D.M. Warburton (Eds.) Human stress and cognition, New York: Wiley.

Janoff-Bulman, R. (in press). Understanding people in terms of their assumptive worlds. In D. Ozer, A.J. Stewart, & J.M. Healy, Jr. (Eds.) Perspectives on personality: Theory, measurement, and interpersonal dynamics, Vol. III, Greenwich, CT: JAI Press.

Janoff-Bulman, R. (1985). The aftermath of victimization: Rebuilding shattered assumptions. In C.R. Figley (Ed.) Trauma and its wake. New York: Brunner/Mazel.

Janoff-Bulman, R., & Frieze, I.F. (1983). A theoretical perspective for understanding reactions to victimization. Journal of Social Issues, 39(2), 1-17.

McNair, D., Lorr, M., & Droppleman, L. (1971). Profile of mood states. San Diego, CA: Educational and Industrial Testing Service.

Melick, M.E., Logue, J.N., & Frederick, C.J. (1982). Stress and disaster. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects. New York: Free Press.

Parkes, C.M., & Weiss, R.S. (1983). Recovery from bereavement. New York: Basic Books.

Quarantelli, E.L. (1985). An assessment of conflicting views on mental health: The consequences of traumatic events. In C.R. Figley (Ed.), Trauma and its wake. New York: Brunner/Mazel.

Rahe, R.H. (1972). Subjects' recent life changes and their near-future illness susceptibility. Advances in Psychosomatic Medicine, 8,2-19.

Robins, L.N. (1984). Evolution of the DIS. DIS Newsletter, 1(1), 1-2.

Robins, L.N., Helzer, J.E., Croughan, J., & Ratcliff, K.S. (1981). The NIMH Diagnostic Interview Schedule: Its history, characteristics and validity.

Archives of General Psychiatry, 38, 381-389.

Robins, L.N., & Smith, E.M. (1984). Impact of disaster on previously assessed mental health. St. Louis, MO: Washington University School of Medicine.

Sokol, M. (1983). A content analysis of time-limited psychotherapy: Measuring emotional perspectives. Unpublished Doctoral Dissertation, Boston University.

Stewart, A.J. (1979). Measuring affective development in adults. Paper presented at the American Psychological Association Conference, New York.

Stewart, A.J. (1982). The course of individual adaptation. Journal of Personality and Social Psychology, 42, 1100-1113.

Stewart, A.J., & Healy, J.M., Jr. (1984). Processing affective responses to life experiences: The development of the adult self. In C. Malatesta & C. Izard (Eds.), Emotion in adult development. Beverly Hills, CA: Sage Publications.

Stewart, A.J., & Healy, J.M., Jr. (1985). Personality and adaptation to change. In R. Hogan & W. Jones (Eds.), Perspectives on personality: Theory, measurement and interpersonal dynamics. Greenwich, CT: JAI Press.

Veroff, J., Douvan, E. & Kulka, R.(1981). The Inner American. New York: Basic.

Veroff, J., Kulka, R.A., & Douvan, E. (1981). Mental health in America: Patterns of help-seeking from 1957 to 1976. New York: Basic Books.

Winter, D.G. (1983). Development of an integrated system for scoring motive imagery in verbal running text. Unpublished manuscript, Wesleyan University, Middletown, CT.

Winter, D.G., & McClelland, D.C. (1978). Thematic analysis: An empirically derived measure of the effects of liberal arts education. Journal of Educational Psychology, 70, 8-16.

Winter, D.G., McClelland, D.C., & Stewart, A.J. (1981). A new case for the liberal arts. San Francisco: Jossey-Bass.

Table 1

Comparisons of Direct Victims and Neighbors

	MEANS MEN	MEANS WOMEN	SIGNIFICANT F-TESTS a
Life-Satisfaction			
Direct Victims (N=21)	2.60b	2.82	F group = 4.11*
Neighbors (N=21)	3.57b	2.93	
Self-Esteem			
Direct Victims	3.11	3.22	F interaction = 4.88*
Neighbors	3.50b	2.89b	
Total Stress Symptoms			
Direct Victims	1.72	1.95	
Neighbors	1.79	1.94	
Overall Mood Disturbance			
Direct Victims	59.53	68.69	F group = 6.87*
Neighbors	41.29	53.18	

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a Based on sex by group analyses of variance, covarying age and education. Only significant effects ($p<.05$) or trends ($p<.10$) are listed.

b Means sharing this subscript, within an analysis, are significantly different from each other.

t $p<.10$

* $p<.05$

** $p<.01$

Table 2

Comparisons of Direct Victims and Neighbors

	MEANS		SIGNIFICANT F-TESTS a
	MEN	WOMEN	
Anger			
Direct Victims	20.00	21.91	F group = 6.60*
Neighbors	17.14	17.78	
Confusion			
Direct Victims	9.60	11.18	F group = 3.33t
Neighbors	6.00	9.24	
Tension			
Direct Victims	16.50	17.18	
Neighbors	15.86	16.96	
Depression			
Direct Victims	22.04	24.39	F group = 9.57**
Neighbors	15.29	18.94	
Fatigue			
Direct Victims	9.30	11.55	
Neighbors	8.00	10.06	
Vigor			
Direct Victims	17.91	17.52	
Neighbors	21.00	19.10	

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a Based on sex by group analyses of variance, covarying age and education. Only significant effects ($p<.05$) or trends ($p<.10$) are listed.

t $p<.10$

* $p<.05$

** $p<.01$

Table 3

Comparisons of Earthquake Groups with Other Samples on POMS Scales

Group	Mean score on POMS scale for: Tension-Anxiety	Anger	Depression	Confusion	Fatigue	Vigor
Earthquake Groups	16.57	19.13	20.25	9.16	9.80	18.88
Victims	16.86	21.00	23.27	10.43	10.48	17.71
Neighbors	16.60	17.57	17.72	8.16	9.34	19.73
Relief workers	16.18	18.77	19.65	8.82	9.51	19.29
Normative Samples of Psychiatric Patients with Various Diagnoses						
Males	18.40	13.50	22.30	12.40	10.10	11.30
Females	20.70	14.90	28.00	13.30	13.00	9.30
Normative Sample of U.S. College Students						
Males	12.90	10.10	10.50	10.20	10.40	15.60
Females	13.90	9.30	13.10	11.70	10.70	15.60
U.S. Sample of Divorcing Mothers of School-age Children						
About six months after physical separation	13.53	15.05	13.73	9.03	9.85	15.92
About eighteen months after physical separation	10.53	9.69	9.80	6.32	8.22	16.08

Table 4

Comparison of Earthquake Groups with Other Samples on Life Satisfaction *

Group	Very Satisfied	Pretty Satisfied	Not Very Satisfied
Earthquake Groups			
Victims	24	24	52
Neighbors	43	29	29
Relief workers	24	47	29
Normative Sample of U.S. Adults in a National Mental Health Survey **	17	73	10
National Survey of Adults on the Use of Time in American Society ***	24	65	11
National Sample of Post-Election Political Behavior ***	24	66	10
U.S. Sample of Divorcing Mothers of School-age Children			
About six months after physical separation	16	57	27
About eighteen months after physical separation	28	54	18

* All figures in the table are percentages.

** Veroff, J., Douvan, E., & Kulka, R. A. (1981). The inner American. New York: Basic Books.

*** Unpublished data from Survey Research Center surveys, described in Robinson, J. P., & Shaver, P. R. (1973). Measures of social psychological attitudes. Ann Arbor MI: Institute for Social Research.

Table 5

Comparison of Earthquake Groups with a National Sample on Symptoms Subscales *

Group	Anxiety		Somatic Complaints		Immobilization	
	low	high	low	high	low	high
Earthquake Sample						
Male victims	30	70	40	60	40	60
Female victims	36	63	18	81	45	55
Male neighbors	28	71	29	71	28	72
Female neighbors	7	93	64	36	28	71
Male relief workers	28	70	36	64	50	50
National Sample of Adult Americans' Mental Health **						
Males	42	58	49	51	42	57
Females	28	72	42	58	44	57

* All figures in the table are percentages.

** Veroff, J., Douvan, E., & Kulka, R. A. (1981). The inner American. New York: Basic Books.

Table 6

Comparison of Male Direct Victims, Neighbors and Relief Workers

	MEANS	SIGNIFICANT F-TESTS a
Life-Satisfaction		
Direct Victims (N=10)	2.60	F group = 3.95*
Neighbors (N=7)	3.57	
Relief Workers (N=14)	3.00	
Self-Esteem		
Direct Victims	3.11	
Neighbors	3.50	
Relief Workers	3.32	
Total Stress Symptoms		
Direct Victims	1.72	
Neighbors	1.79	
Relief Workers	1.66	
Overall Mood Disturbance		
Direct Victims	59.53	
Neighbors	41.29	
Relief Workers	55.83	

a Based on one-way analyses of variance, covarying age and education

* $p<.05$

Table 7

Comparisons of Male Direct Victims, Neighbors and Relief Workers

	MEANS	SIGNIFICANT F-TESTS a
Anger		
Direct Victims	20.00	
Neighbors	17.14	
Relief Workers	19.00	
Confusion		
Direct Victims	9.60	
Neighbors	6.00	
Relief Workers	9.43	
Tension		
Direct Victims	16.50	
Neighbors	15.86	
Relief Workers	16.57	
Depression		
Direct Victims	22.04	F group = 3.59*
Neighbors	15.29	
Relief Workers	20.29	
Fatigue		
Direct Victims	9.30	
Neighbors	8.00	
Relief Workers	10.41	
Vigor		
Direct Victims	17.91	
Neighbors	21.00	
Relief Workers	19.86	

a Based on one-way analyses of variance, covarying age and education

* $p<.05$