PSYCHOLOGICAL SEQUELA OF HURRICANE HUGO: AN APPLICATION OF THE CONSERVATION OF RESOURCES MODEL OF STRESS

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I. Statement of the Problem to be Studied

On September 21, 1989, hurricane Hugo came ashore at Charleston, South Carolina. A category V hurricane, Hugo ravaged the coastline with sustained winds of 135 mph and tidal surges 15 to 20 feet above high tide. Not only was Hugo one of the most powerful storms to hit the continental U.S., but also one of the largest. Hurricane force winds radiated 100 miles from its center, and tropical force winds extended 200 miles from the eye. Consequently, the damage caused by Hugo was unprecedented: approximately 3 million people were affected; 26 lives were lost; and 343 people were injured. Seventeen thousand people were left jobless; over 5,300 homes were destroyed; and another 18,000 homes were rendered uninhabitable. In the Charleston area alone, property damage estimates were in excess of $4 billion.

Although the estimated losses are impressive, the negative psychological effects of a disaster of this magnitude are more difficult to describe and understand. Some help in this regard is provided by the Diagnostic and Statistical Manual of Mental Disorders - Revised (DSM-III-R) which describes the psychological sequela of trauma and recognizes Post-traumatic Stress Disorder (PTSD) as a diagnostic category. In the DSM-III-R framework, PTSD symptomatology includes: recurrent and intrusive recollections of the traumatic event (e.g., recurrent dreams, flashbacks); avoidance of stimuli associated with the trauma or numbing of responsiveness (e.g., inability/refusal to recall details of the event, diminished interest in significant activities); and increased arousal (e.g., sleep disturbances, irritability, inability to concentrate). Associated complications of PTSD include depression, anxiety, and increased substance use. Hence, following a disaster it seems important to monitor acute PTSD symptoms as well as identify groups of people who are at increased risk for long-term problems stemming from the disaster.

Although the DSM-III-R describes the psychological sequela of disasters, it does little to help us understand these reactions. Indeed, most of the studies investigating psychological reactions to disasters (e.g., Lystad, 1985; Hartsough, 1985) have been hampered by the absence of a conceptual model of how stress reactions occur. Moreover, this lack of an adequate conceptual model represents a serious flaw in the stress literature in that theoretical models provide an important framework to guide research, increase our conceptual understanding of clinical problems, and improve our ability to provide clinical services.

Fortunately, this shortcoming in the stress literature has recently been addressed by Hobfoll (1988) who proposed a theoretical model for conceptualizing stress and stress reactions. The model, called the Model of Conservation of Resources, is based on the supposition that people strive to retain, protect, and build resources. The model identifies four types of resources: object resources (e.g., property, material belongings); conditions (e.g., marriage, job roles); personal characteristics (e.g., self-esteem, sense of control); and energies (e.g., time, money). An event or situation is defined as stressful if these resources

are threatened or lost. According to this model, the impact a stressful event has on an individual is related to the perceived or actual loss of resources, how essential these resources are for the individual's survival, and the individual's coping style.

Because the Conservation of Resources Model proposed by Hobfoll represents an important advance in the stress literature, the proposed study applied this model in order to investigate the psychological sequela of hurricane Hugo. Specifically, the project sought to determine whether hurricane-related losses suffered by the students and faculty of the Medical University of South Carolina affected their reports of PTSD symptomatology, depression, anxiety, alcohol and substance use, and other health-risk behaviors (e.g., diet and exercise) following Hugo.

II. Research Questions to be Answered

The overall goal of this project was to generate empirical data which would allow us to evaluate the applicability of Hobfoll's theoretical model of stress for predicting psychological response to natural disasters. In order to accomplish this goal, the following specific objectives for the project were identified:

A. To describe and quantify the symptoms of psychological distress experienced by our sample following hurricane Hugo.

B. To describe and quantify the types of losses suffered by our sample as a result of Hugo.

C. To determine whether resource loss was correlated with psychological distress and/or coping behavior.

D. To identify variables that were predictive of psychological distress following Hugo and determine which variables among resource loss, personal characteristics, and coping behaviors were most predictive of distress.

E. To determine whether high resource loss compared to low resource loss, was associated with greater prevalence of clinically significant psychological distress following hurricane Hugo.

F. To determine which types of resource loss were most important in explaining psychological distress following hurricane Hugo.

G. To determine the effect of gender on self-reported resource loss following Hugo.

H. To determine whether psychological distress following hurricane Hugo was effected by gender or the extent of loss of resources.

I. To provide normative data about the patterns of alcohol and medication use by our sample after hurricane Hugo.

J. To identify subject variables (e.g., gender and pre-Hugo drinking patterns) that were associated with increased use of alcohol and medications following hurricane Hugo.

K. To collect normative data that documents changes in health habits following hurricane Hugo.

L. To determine whether gender and the extent of loss of resources were associated with disruption in health-related behaviors following Hugo.

III. Methodology of the Study

A. Methods: Approximately eight weeks after hurricane Hugo struck Charleston, South Carolina, 1,200 faculty of the Medical University of South Carolina (MUSC) in Charleston were sent via the campus mail, a packet of assessment instruments. Included in the packet was a cover letter that explained the purpose of the study, insured confidentiality, and provided instructions on completing the questionnaires. Eight weeks after Hugo struck, the same packet of information was distributed to 275 MUSC students during their class time. Individuals who completed the survey were given the opportunity to enter a drawing for two gourmet dinners valued at $120. Return envelopes and an entry form for the drawing were also included in the packet.

B. Assessment instruments (See Appendix I for a copy of each assessment instrument.):

1. Demographic questionnaire. This questionnaire provided basic demographic information about the subjects including their sex, race, marital status, education level, and annual income. It also provided information about previous exposure to other natural disasters, dollar value of property lost as a result of the hurricane, and the respondent's whereabouts when the hurricane actually struck.

2. Resource Loss Questionnaire. Hobfoll's original Resource Loss Questionnaire (RLQ) was modified to obtain a 52-item self-report

inventory on which subjects used a 4-point Likert scale to rate the extent to which Hugo resulted in the loss or threatened loss of 52 resources (e.g., property, money, self-esteem, and leisure time). Although the scale yields a separate score for each type of resource identified by Hobfoll (i.e., Objects, Conditions, Personal Characteristics, and Energies), the total resource loss score (unless specified otherwise) was used in the data analyses.

3. COPE Questionnaire. This 60-item self-report inventory provides 15 4-item scales (Carver, Scheler, and Weintraub, 1989). Subjects used a 4-point Likert scale to indicate the extent to which they had used, after the hurricane, each of the 60 coping behaviors listed. A rating of 0 indicated that they had not used that behavior "at all," and a rating of 3 indicated they had used the behavior "a lot." The subjects' scores for each of the 15 scales were used as raw data for a principle component factor analysis with Varimax rotation to produce the three coping factors used in this study: problem-focused coping, emotion-focused coping, and disengagement copying.

4. Symptom Checklist-90 Revised (SCL-90-R). This 90-item self-report questionnaire devised by Derogatis (1983) was used by subjects to report on a 5-point Likert scale the extent to which they experienced 90 symptoms (e.g., headaches, feelings of guilt, trembling, and feeling blue) following hurricane Hugo. The Global Severity Index score from the SCL-90-R was used in the data analyses as a measure of overall psychological distress following hurricane Hugo.

5. Health Habits Questionnaire. We developed this 52-item questionnaire to evaluate weight changes, food choices, eating patterns, exercise patterns, alcohol use, and prescription medication use following hurricane Hugo.

IV. Sample Characteristics

A. Faculty Sample

1. Size of sample: 525; response rate = 43%.

2. Gender: 51% male; 49% female.

3. Age: mean age = 40.46 years; range = 19 to 77 years.

4. Race: 92% white; 4% black; 4% other.

5. Marital status: 68% married; 21% single; 10% separated or divorced.

6. Education (highest degree earned): 74% graduate; 11% bachelors; 12% technical degree.

7. Annual household income: $10,000-$40,000 - 27%; $40,000-$50,000 - 14%; $50,000 or more - 58%.

B. Student Sample

1. Size of sample: 202; response rate = 73.5%.

2. Gender: 43.1% males; 56.9% females.

3. Age: mean age = 23.95 years; range = 19 to 49 years.

4. Marital status: 77.7% single; 19.8% married; 2.5% separated or divorced.

5. Race: 87.6% white; 7.9% black; 4.5% other.

6. Education (highest degree earned): 8.5% graduate; 57.5% bachelors; 12% associate degree; 17.5% high school; 4.5% other

7. Annual household income: $10,000 or less - 56.2%; $10,000-$20,000 - 13.9%; $20,000-$30,000 - 10.8%; $30,000-$50,000 - 2.6%; $50,000 or more - 7.7%.

V. Results

Because the data for the faculty sample were analyzed separately from the data for the student sample, the results for these samples will be reported separately. The section detailing the data from the student population will include comparisons of the student data with the corresponding data from the faculty sample. The results will be reported in the same order used to list the specific objectives for the project (See pages 2 and 3 of this report.). In addition, for each result reported, the objective it addresses will be noted.

A. Results for the Faculty Sample

1. Objective A: In order to quantify the psychological distress reported by our faculty sample, the mean SCL-90-R profile for men and the mean profile for women were calculated as shown in the graph presented in Appendix II. Inspection of this graph shows that for both the men and women, the mean T-scores on the SCL-90-R clinical scales fell in the range of 50 to 63, with only the mean T-score for women (T-score = 63) on the Obsessive-compulsive scale approaching the range of scores which indicates clinically significant symptoms (T-score $\geq$ 65). Although the mean scores on the SCL-90-R scales were not clinically elevated for males or females, 9.9% of females and 6.3% of males fell above a T-score of 65 on the SCL-90-R Global Severity Index (GSI) for nonpatient norms. This finding indicates a sizable proportion of the faculty sample suffered from clinically relevant psychological distress following hurricane Hugo.

2. Objective A: The five SCL-90-R items which were most frequently endorsed by the faculty sample are listed below in Table 1 with the percentage of the total group endorsing each item noted. For more detailed information regarding the 10 SCL-90-R items most frequently endorsed by the sample and the percentage of males and females endorsing each of these items, please see Appendix II. Examination of the data in Appendix II indicates that the symptoms of distress most frequently reported on the SCL-90-R were very similar for males and females.

Table 1

	SCL-90-R Item	Percentage of Total Group Endorsing Item
1.	Feeling easily annoyed or irritated	41%
2.	Feeling low in energy or slowed down	35%
3.	Feeling critical of others	33%
4.	Worrying too much about things	32%
5.	Feeling blocked in getting things done	30%

3. Objective B: The five resource loss (RLQ) items most frequently endorsed by our faculty sample are listed below in Table 2 with the percentage of the total sample endorsing each item noted. For more detailed information about the 10 resource loss items most frequently endorsed by the males and females in this sample, please see Appendix II. Examination of the data in Appendix II indicates that males' and females' reports of resources lost were very similar.

Table 2

	RLQ Item	Percent of Total Sample Endorsing Item
1.	Vegetation on your property	83%
2.	Free time	65%
3.	Daily routine	54%
4.	Feeling that I am accomplishing my goals	50%
5.	Feeling that my life is peaceful	47%

4. Objective C: Bivariate correlations indicated that high psychological distress as indicated by the SCL-90-R GSI scores was associated with: high resource loss ($r = .64$, $p < .01$), high scores on disengagement coping ($r = .60$, $p < .01$), and high scores on emotion-focused coping ($r = .24$, $p < .01$). Gender ($r = .29$, $p < .01$) and marital status ($r = .20$, $p < .01$) were also significantly correlated with distress, with females and single people reporting greater distress. Higher income was associated with lower distress ($r = .15$, $p < .01$). Correlations also revealed that high resource loss was associated with being female ($r = .24$, $p < .01$) and higher coping scores, especially higher rates of disengagement coping ($r = .57$, $p < .01$). A table detailing the correlations among resource loss, psychological distress, and coping variables is shown in Appendix III.

5. Objective D: A step-wise regression was used to determine the degree to which psychological distress, as measured by the SCL-90-R GSI scores, could be predicted based upon demographic variables, scores on the COPE, and resource loss. Approximately half ($r^2 = 50.1\%$) of the total variance of psychological distress could be accounted for in this manner, with resource loss making the greatest contribution ($r^2 = 38.8\%$). Other variables which entered into the regression equation at a statistically significant level were disengagement coping ($r^2 = 7.8\%$), marital status ($r^2 = 1.5\%$), problem-focused coping ($r^2 = .9\%$), distance from Charleston during Hugo ($r^2 = .6\%$), and extent to which personal decisions placed others at risk ($r^2 = 1.0\%$). Hence, resource loss, compared to demographic or coping variables, served as the best predictor of distress. Table 3 below provides the beta weights for this step-wise regression.

Table 3

Prediction of General Severity Index Scores for the Faculty Sample by Personal Characteristics, Resource Loss, and Coping Behavior

Predictor Variable	beta	R	R^2	F	df	p
Block 1: Personal Characteristics						
Gender	.035					
Marital Status	.076*					
Household Income	-.041					
Prior Disaster Exposure	.027					
After Block 1		.315	.099	10.57	4,385	.001
Block 2: Resource Loss						
Aggregate Resource Loss	.450**					
After Block 2		.661	.437	230.51	5,384	.001
Block 3: Coping Behavior						
Problem Focused	-.122***					
Emotion Focused	.044					
Disengagement Focused	.333****					
After All Three Blocks		.718	.516	20.66	8,381	.001

* Being single was associated with greater distress.
** Higher loss was associated with greater distress.
*** Less problem focused coping was associated with higher distress.
**** More disengagement coping was associated with higher distress.

6. Objective E: Table 4 below presents the percent of males and females in the high and low resource loss categories (upper most quartile v. lowest quartile) who demonstrated scores on the General Severity Index (GSI) above the clinical cut off score (T-score $\geq$ 63) using nonpatient norms. As predicted, the prevalence of clinically meaningful distress levels was significantly greater among people experiencing high resource loss compared to people experiencing low resource loss. These significant differences held for both males and females.

Table 4

Prevalence of clinically significant psychological distress among high and low loss males and females.

Males		Females	
High Loss (n=51)	Low Loss (n=155)	High Loss (n=52)	Low Loss (n=160)
34.4%	4.5%	44.2%	10.6%
[t(204) = 8.05, p <.001]		[t(210) = 8.19, p <.001]	

7. Objective F: In order to determine which types of resource loss best explained psychological distress following Hugo, a two-step hierarchical multiple regression was performed (See Table 5 below.). The first step entered demographic variables that accounted for 9.5% of psychological distress variance. The second step entered the four resource loss variables that accounted for an additional 39.3% of the psychological distress variance. Examination of significant beta weights indicated that, in order of variance explained, these variables predicted high psychological distress: personal characteristic loss (b =.41, f(7,402) = 52.36, p<.001), social condition loss (b = .30, f(7,402) = 35.81, p < .001), and lower annual household income (b = -.09, F(7,402) = 4.64, p < .03). Hence, the loss of psychological and social resources (personal characteristics and social conditions) were most important in explaining psychological distress in our sample following hurricane Hugo.

Table 5

Hierarchical Multiple Regression Predicting Psychological Distress

Predictor Variable	beta	R	R^2	F	df	p
Step 1: Demographic Variables						
Gender	.04					
Marital Status	.05					
Household Income	.09*					
After Step 1		.308	.095	14.20	3,406	.001
Step 2: Resource Loss Variables						
Personal Characteristics	.41**					
Objects	.03					
Social Conditions	.30**					
Energies	.03					
After Step 2		.699	.488	77.12	7,402	.001

* $p < .03$
** $p < .001$

8. Objective G: In order to determine the effect of gender on self-reported resource loss following Hugo, a t-test was conducted upon the total loss scores for the male and female groups. This t-test revealed that female faculty members reported significantly higher loss compared to their male counterparts ($t(478) = 537$, $p < .001$). A graph depicting this difference can be seen in Appendix II. The mean total loss score for males was 32 compared to a mean total loss score of 45 for females.

9. Objective H: In order to determine whether psychological distress following hurricane Hugo was effected by gender, a t-test was applied to the Global Severity Index (GSI) scores for the male and female faculty groups. The mean GSI T-score for the males was 49 whereas the mean GSI T-score for the females was 53. The t-test applied to these data revealed that females reported significantly more psychological distress following hurricane Hugo than males ($t(514) = 3.81$, $p < .0001$). A graphic depiction of these results is presented in Appendix II.

10. Objective H: To determine whether psychological distress following hurricane Hugo was effected by the extent of loss of resources, a median split was performed on the Resource Loss Questionnaire total scores to define a high loss and low loss group. The mean GSI T-score for the low loss group was 45 whereas the mean GSI T-score for the high loss group was 57. A t-test applied to these data indicated that significantly more distress on the SCL-90-R was reported by the high loss group compared to the low loss group ($t(472) = 14.03$, $p < .0001$). A graph depicting this difference is shown in Appendix II.

11. Objective I: Normative data summarizing the alcohol and medication use changes made by our sample following Hugo are presented in Appendix IV. Of the total faculty sample, 20.4% reported increases in alcohol intake following hurricane Hugo. As shown in Table 1 of Appendix IV, approximately the same proportion of the faculty sample was abstinent from alcohol both pre- and post-Hugo (23% to 25%). The percentage of faculty who drank 1 to 7 drinks per week declined from its pre-Hugo level (67%) to a post-Hugo level of 59%. In contrast to these findings, whereas only 10% of the faculty sample drank 8 or more drinks per week prior to Hugo, a full 16% drank at that rate following Hugo. This increase in the proportion of the sample who drank 8 or more drinks per week following Hugo held up across gender and loss group (See Table 1, Appendix IV.).

    Of the total sample, 12% reported starting a prescription medication following hurricane Hugo, and 10.6% of the total sample reported increases in the use of prescription medication following Hugo. Increased use of over-the-counter pain medication was reported by 27.4% of the total faculty sample, and increased use of an over-the-counter cold medication was reported by 12%. Increased use following hurricane Hugo of over-the-counter antihistamines was reported by 16.3% of the total faculty sample.

12. Objective J: Figures 1 - 7 shown in Appendix IV provide information about subject variables (e.g., gender and pre-Hugo drinking patterns) that are associated with increased use of alcohol and medication following hurricane Hugo. For the analyses that examined the effect of resource loss on alcohol and medication use, a median split was performed on the Resource Loss Questionnaire scores to define a high loss and low loss group. The highlights from these figures include the following findings:

    a) Changes in alcohol intake after the hurricane were similar for males and females.
    b) A significantly greater percentage of the high loss group reported increases in their alcohol intake compared to the low loss group.

c) Males who drank more than 8 drinks per week prior to the hurricane reported a higher rate of increased intake of alcohol (47%) than any other group.

d) A higher percentage of females compared to males reported starting a prescription medication following hurricane Hugo.

e) A higher proportion of high loss females compared to other groups reported an increase in prescription medication use following Hugo.

f) A higher proportion of high loss females compared to other groups reported an increase in over-the-counter pain medication and antihistamine use following the hurricane.

g) Gender or loss group did not appear to affect increases in over-the-counter cold medication use.

13. Objective K: Normative data which describe the health-related characteristics of our faculty sample and the changes in health habits our sample made following hurricane Hugo are reported in Tables 1 - 5 in Appendix V. Perusal of the data shown in these tables indicates that the entire sample displayed, on average, increases from pre- to post-hurricane in snacking ($t(520) = 7.4$, $p < .0001$), fast food consumption ($t(515) = 12.1$, $p < .0001$), and skipping meals ($t(516) = 2.5$, $p < .05$). A significant decrease in exercise frequency was also noted ($t(513) = 12.8$, $p < .0001$).

Of the total sample, 15.4% reported weight gains compared to 12.8% that reported weight loss. Over half of the entire sample reported a disruption in exercise routine, and the most commonly cited obstacle to regular exercise was lack of time, followed by lack of energy and indisposed exercise facilities.

14. Objective L: In order to determine whether the extent of loss of resources was associated with disruption in health related behaviors following Hugo, a median split was performed on the total scores from the Resource Loss Questionnaire to create a high and a low loss group. Tables 2 - 5 shown in Appendix V summarize the effects of gender and loss of resources upon health related behaviors following Hugo. Perusal of these tables reveals several highlights of the data:

a) A series of two-way ANOVA's revealed that the high loss group reported significantly greater changes than the low loss group on snacking ($F(1,452) = 15.7$, $p < .0001$), fast food consumption $F(1,452) = 32.9$, $p < .001$), and exercise frequency ($F(1,452) = 21.5$, $p < .0001$). There were no significant gender effects or gender by loss interactions on these variables.

b) Females reported greater weight changes than males ($F(1,452) = 20.9$, $p < .0001$) and the high loss group reported greater changes than the low loss group ($F(1,452) = 11.2$, $p < .001$) (See table 4.0, Appendix V.). No gender by loss interaction was found on these variables. In addition, 50% of the high loss females reported "moderate" weight changes of 5 or more pounds, compared to 28% of the high loss males and 37% of the low loss females.

c) High loss individuals showed a significantly greater decline in exercise than low loss persons ($F(1,465) = 22.5$, $p < 0001$). No gender or gender by loss interaction was found on the variable of exercise frequency (See Table 5.0, Appendix I).

B. Results for the student sample compared to those of the faculty sample.

1. Objective A: In general, the student and faculty groups reported similar levels of loss, distress, and health habit changes. The student and faculty groups were not different on the Global Severity Index of the SCL-90-R. Mean GSI scores for the student and faculty groups were .39 and .37, respectively. Seven of the 10 most frequently endorsed SCL-90-R items were the same for both groups, suggesting similar symptom patterns.

2. Objective B: With regard to scores on the Resource Loss Questionnaire, the student and faculty groups reported comparable levels of aggregate loss. On individual items of the Resource Loss Questionnaire, 8 of the 10 most frequently reported losses were the same for the faculty and student groups. For both groups, higher loss was associated with greater distress.

3. Objectives C,D,F, G, and H: A hierarchical multiple regression analysis was applied to the student data in order to determine which variables among resource loss, personal characteristics, and coping behaviors were most predictive of psychological distress in this sample. Three blocks of variables were entered: demographic/experiential, resource loss, and coping behavior. The demographic/experiential variables were entered first as control variables (sex, marital status, household income, and prior disaster exposure). Aggregate resource loss was entered as the second predictor block. The following coping behaviors were entered as the third predictor block: problem focused coping, emotion focused coping, and disengagement focused coping.

The results of the hierarchical multiple regression are shown in Table 6. Please note that one or more asterisks indicate a significant beta weight. This is important for two reasons: first, significant beta weights indicate which variables within each predictor block are accounting for dependent variable variance; and second, the absolute size of beta weights indicates

which variables are most important in predicting the dependent variable.

Table 6
Prediction of General Severity Index for the Student Sample Using Personal Characteristics, Resource Loss, and Coping Behavior

Predictor Variable	beta	R	R^2	F	df	p
Block 1: Personal Characteristics						
Gender	-.160*					
Marital Status	not sig.					
Household Income	.023					
Prior Disaster Exposure	-.025					
After Block 1		.358	.128	5.78	4,157	.001
Block 2: Resource Loss						
Aggregate Resource Loss	.441**					
After Block 2		.687	.472	27.94	5,156	.001
Block 3: Coping Behavior						
Problem Focused	-088					
Emotion Focused	-038					
Disengagement Focused	-366***					
After All Three Blocks		.749	.562	24.49	8,153	.001

* Females were more distressed than males
** Greater loss was associated with more distress
*** Greater use of disengagement focused coping was associated with greater distress

In order to ease comparison of the results of the multiple regression equations conducted separately on the faculty and student samples, Table 7 is presented below. This table presents the percentage of the GSI variance accounted for by each predictor block when the multiple regression equations were calculated separately for the faculty and student groups.

Table 7

Percent of GSI Variance Accounted for by Each Predictor Block Contained in the Hierarchical Multiple Regression Analyses for the Faculty and Student Data.

Predictor Block	Faculty Group	Student Group
Demographic/Experiential	9.5%	12.8%
Resource Loss	34.1%	34.4%
Coping Behavior	7.9%	8.9%
Total Variance Accounted for	**51.5%**	**56.1%**

Inspection of Table 7 indicates that for both the faculty and student groups, resource loss was the single best predictor of psychological distress. In addition, demographic/experiential variables accounted for approximately the same amount of variance in GSI scores for the faculty and student groups. Moreover, the total amount of GSI variance accounted for in the hierarchical multiple regression was approximately the same for the two groups (faculty and students) under study.

4. Objective E: To assess the role of resource loss as a risk factor for clinically significant psychological distress in the student group, we used level of resource loss (high, low) as a grouping variable and scores on the General Severity Index (GSI) as a dependent variable. Given known gender differences for SCL-90-R scores, separate analyses were conducted for male and female student participants. Specifically, participants were assigned to the high resource loss group for their gender if their resource loss score was in the uppermost 25.0% of the distribution for their gender. Conversely, the low resource loss groups consisted of individuals with resource loss scores falling in the lowest quartile of the distribution for their gender.

   Among male students, the high loss group reported significantly greater levels of psychological distress ($t(68) = 3.24$, $p < .002$). Using non-patient norms for the General Severity Index, 21.1% of high loss student males exceeded a cutoff score indicative of clinical distress (t-score $\geq$ 63). By contrast, only 6.1% of low loss males exceeded the cutoff. Among female students, the high loss group, compared to the low loss group, reported significantly higher

psychological distress ($t(102) = -5.25$, $p < .001$). Using nonpatient norms for the General Severity Index, 50.09% of high loss female students exceeded the T-score cutoff of 63. A more modest 18.4% of low loss females exceeded the clinical cutoff.

Comparison of the student data presented in the preceding paragraph with the corresponding data for the faculty sample (See page 9 of this report.), reveals that for both groups high resource loss is associated with significantly higher levels of clinically relevant psychological distress. Further examination of the percentage of high versus low loss students and faculty who exceed clinical cutoff scores suggests loss has a particularly strong effect within the faculty sample.

5. Objectives I and J: Students and faculty reported similar patterns of change in alcohol and medication usage following Hugo. High loss and high distress were associated with greater increases in alcohol and medication use for both groups ($p < .05$). A higher percentage of the female student group, compared to all other groups, increased their use of medications.

6. Objective K: The students reported health related characteristics (% overweight, smoking status, exercise frequency, etc.) almost identical to the faculty. The only difference being that fewer students regarded themselves as "regular exercisers."

   Students' food consumption patterns after the hurricane were in the same direction as the faculty's reports. Consumption of "healthy" foodstuffs declined, whereas the consumption of those foods considered to be unhealthy in large quantities increased.

7. Objective L: Consistent with the faculty data, female students and students who reported higher levels of loss displayed significantly more change in health behaviors ($p < .05$). These changes generally were in the unhealthy direction.

   As with the faculty, greater change to "unhealthy" food choices was seen in the female and high loss students.

   Snacking behavior did not change for students, whereas it showed a significant increase for high loss faculty ($p < .01$).

   Compared to low loss students, high loss students reported skipping significantly more meals ($p < .05$), whereas this was not different for the faculty.

Both students and faculty with higher losses reported increased consumption of fast food and a decrease in exercise.

Snacking behavior, fast food consumption, skipping meals and changes in exercise were not different between males and females for either the student or the faculty populations.

Small differences in weight change patterns were noted for both the faculty and students. Across all groups (male versus female and low versus high loss), the mean weight change in the student and faculty groups was identical ($\bar{x}$ = 2.3 lbs.). The absolute weight change for male students in the high and low loss groups (2.5 lbs., 2.1 lbs.) was roughly equivalent to high and low loss faculty (2.8 lbs., 1.71 lbs.). However, in the high loss group, a higher percentage of students reported weight losses (23.5%) than gains (11.7%). This trend was reversed in the faculty data with 16% reporting losses and 21.3% reporting gains. Roughly 20% of the low loss males in both populations reported weight gain; 9.1% of low loss males noted a loss, whereas only 2.9% of low loss faculty reported a loss. Thus, it appears that male students are more susceptible to losing weight than their older faculty counterparts who were more likely to gain.

Female students and female faculty in the high loss groups showed nearly identical patterns of weight change. Fifty-one percent in both groups reported weight gains, and 18% reported losses.

Low loss female students showed smaller absolute weight changes (1.8 lbs.) than low loss female faculty (3.2 lbs.). Only 19% of low loss female students reported weight gains compared to 34.8% of the low loss female faculty. The most frequently reported obstacles to an exercise routine for both students and faculty were 1) lack of time and 2) lack of facilities.

Summarizing the comparison of student and faculty data about health related issues, the experience of hurricane Hugo appeared to have affected students and faculty similarly. Unhealthy changes in food consumption, weight, and exercise patterns were noted in both groups. In general, females and high loss persons displayed greater changes. The most notable differences, which could be explained by age, were direction of weight change.

VI. References

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Appendix I

MEDICAL UNIVERSITY OF SOUTH CAROLINA
Student Life Center

Dean of Student Life
(803) 792-4402
Student Support Services
(803) 792-4334
Counseling and Psychological Services
(803) 792-4930
Student/Wellness Center
(803) 792-7080
Human Performance Laboratory
(803) 792-7080
Student Health Service
(803) 792-3664
Student Programs and Activities
(803) 792-2693
Student Financial Aid Services
(803) 792-2536
Student Dormitory
(803) 792-4141

MUSC Medical Center

171 Ashley Avenue
Charleston, South Carolina 29425-0950

November 13, 1989

TO: MUSC Faculty, Staff, and Students

FROM: Darlene L. Shaw, Ph.D.
Director, Counseling & Psychological Services

SUBJECT: Psychological Effects of Hurricane Hugo

Hurricane Hugo has had a major effect on our lives. Help us understand the psychological aftermath of the storm and become eligible to win one of two free dinners for two at Robert's Restaurant by completing the attached survey. The drawing will be held in the Student Wellness Center Classroom at noon on December 15. You need not be present to win.

The National Hazard Center in Boulder, Colorado awarded a grant to Counseling and Psychological Services to study the effects of Hugo on the MUSC community. As part of that grant we are conducting the enclosed survey.

Please be totally honest as you complete the survey. All of the information you provide will be absolutely confidential. To participate and be eligible for one of the free dinners for two, please do the following:

1. Detach the survey from this cover letter. Complete the survey. Do not put your name on the survey! This will ensure your anonymity. Place completed survey in the large pre-addressed envelope provided.

2. Complete this cover letter by filling in your name, department, and phone extension in the spaces provided below. This serves as your entry form for the drawing. Place the letter in the small pre-addressed envelope provided.

3. Drop both envelopes in campus mail.

If you have any questions about the survey, please call 792-4930. Thank you for taking the time to complete the survey. The results of the survey will be published in the Catalyst and professional journals.

Name_____ Department_____

Phone extension_____

General Background Questionnaire

Indicate your responses on this questionnaire. When a question requires a brief answer, do so in the space provided (e.g., age). When a question requires choosing alternatives, circle the answer that most accurately reflects your life.

1. Sex: M F

2. Age (today):

3. Race:

   a. asian
   b. black
   c. hispanic
   d. native american
   e. white
   f. other _____

4. Marital Status:

   a. single
   b. married
   c. separated
   d. divorced
   e. widowed

5. Highest Education:

   a. High school graduate
   b. Associates degree
   c. Bachelors degree
   d. Graduate degree
   e. other _____

6. Affiliation at MUSC:

   a. student
   b. faculty/administration
   c. house staff
   d. professional staff (nurses, social workers, etc.)
   e. support staff (clerical, etc.)
   f. other _____

7. Annual personal income

   a. $0 to 10,000
   b. $10,001 to 20,000
   c. $20,001 to 30,000
   d. $30,001 to 40,000
   e. $40,001 to 50,000
   f. over $50,001

8. Annual household income

   a. $0 to 10,000
   b. $10,001 to 20,000
   c. $20,001 to 30,000
   d. $30,001 to 40,000
   e. $40,001 to 50,000
   f. over $50,001

9. Living arrangements prior to Hugo:

   a. owned residence
   b. rented residence
   c. lived with parents
   d. other _____

10. Number of people living in household prior to Hugo (include self):

    1 2 3 4 5 6 7 8 or more

11. Number of <u>dependents</u> living in household prior to Hugo (include self, children, older relatives):

    1 2 3 4 5 6 7 8 or more

12. Where did you stay during hurricane Hugo?

    a. own residence
    b. residence of a family member or friend
    c. a shelter
    d. a hotel/motel
    e. at work
    f. other _____

13. Who was with you during hurricane Hugo? (circle only one)

    a. no one, I was alone
    b. family members or close friends
    c. acquaintances or co-workers
    d. other _____

14. How far from Charleston (the peninsula) was your place of refuge?

    a. less than 25 miles
    b. 26 to 100 miles
    c. 101 to 150 miles
    d. over 151 miles

15. To what extent did you fear for your safety during hurricane Hugo?

1	2	3	4	5
not at all		moderately		extremely

16. To what extent did you sustain physical harm or injury due to Hugo?

1	2	3	4	5
not at all		moderately		extremely

17. To what extent did your decisions regarding hurricane Hugo place you at risk for harm? (e.g., where to stay, when or if to leave, etc.)

1	2	3	4	5
not at all		moderately		extremely

18. To what extent did your decisions regarding hurricane Hugo place other people at risk for harm?

1	2	3	4	5
not at all		moderately		extremely

19. To what extent did other people make decisions regarding Hugo that placed you at risk for harm? (e.g., job/partner required you to stay)

1	2	3	4	5
not at all		moderately		extremely

20. How soon after Hugo did you see your residence?

    a. immediately
    b. 1 to 3 days
    c. 4 to 6 days
    d. greater than 6 days

21. Estimate the financial cost of repairing damage to your primary residence? (includes structure and contents)

    a. no cost
    b. less than $5,000
    c. $5,001 to $20,000
    d. $20,001 to $50,000
    e. $50,001 to $100,000
    f. over $100,000

22. How long were you displaced from your primary residence due to Hugo?

    a. I was not displaced at all
    b. less than 3 days
    c. 3 to 7 days
    d. 8 to 14 days
    e. 15 to 30 days
    f. 31 days or more, but I am back in my primary residence
    g. 31 days or more and I am not back in my primary residence

23. How soon after the storm did you return to your place of employment? (school for students)

    a. 1 to 3 days
    b. 4 to 7 days
    c. greater than 7 days

24. Have you ever personally experienced a natural disaster prior to Hugo? (hurricane, tornado, flood, earthquake, etc.)

    Yes____ No____

25. Are you a native of the Charleston area?

    Yes____ No____

26. How long have you lived in the Charleston area?

    a. less than 1 year
    b. 1 to 5 years
    c. 6 to 15 years
    d. over 15 years

RESOURCES QUESTIONNAIRE

Instructions: Listed below are a number of things which make life easier and/or enjoyable. Since hurricane Hugo you may have experienced a loss of many of these resources. Carefully consider each resource and rate the extent to which you have experienced a loss of that resource since Hugo. Rate the extent of loss for each resource on the following scale:

0 = no loss
1 = a little bit of loss
2 = a moderate amount of loss
3 = quite a bit of loss
4 = extreme amount of loss

1. Personal transportation _____
2. Home contents _____
3. Time for adequate sleep _____
4. Sentimental possessions (photo albums, etc.) _____
5. Clothing _____
6. Feeling valuable to others _____
7. Family stability _____
8. "Free time" _____
9. Pets _____
10. Vegetation on your property (trees, shrubs, etc.) _____
11. Intimacy with one or more family members _____
12. Time for work _____
13. Feeling that I am accomplishing my goals _____
14. A good relationship with my children _____
15. Time with loved ones _____
16. Necessary tools for work _____
17. Stamina/endurance _____
18. Adequate food _____
19. A daily routine _____
20. Personal health _____
21. Sense of optimism _____
22. Necessary appliances for home _____

0 = no loss
1 = a little bit of loss
2 = a moderate amount of loss
3 = quite a bit of loss
4 = extreme amount of loss

23. Personal residence _____
24. Sense of humor _____
25. Stable employment _____
26. Furnishings for residence _____
27. Feeling that I have control over my life _____
28. Essentials for children _____
29. Feeling that my life is peaceful _____
30. Ability to organize tasks _____
31. Intimacy with at least one friend _____
32. Money for "extras" _____
33. Understanding from my employer/boss _____
34. Savings or emergency money _____
35. Motivation to get things done _____
36. Support from co-workers _____
37. Adequate income _____
38. Advancement in my education or training _____
39. Adequate credit (financial) _____
40. Feeling independent _____
41. Companionship _____
42. Financial assets (stocks, property, etc.) _____
43. Affection from others _____
44. Feeling that my life has meaning/purpose _____
45. Involvement with church, synagogue, etc. _____
46. Retirement security (financial) _____
47. Help with tasks at home _____
48. Loyalty of friends _____
49. Help with childcare _____
50. Involvement in organizations with others who have similar interests _____
51. Financial help if needed _____
52. Health of family/close friends _____

HEALTH HABITS

1. Height: ____ft. ____in. 2. Weight: _____

3. How much has your weight changed since Hugo? (circle one & indicate amount)
no change gained/lost____lbs.

4. Which statement best describes your weight loss efforts BEFORE the hurricane: (choose one)

a. trying to eat fewer calories
b. trying to exercise more
c. both a and b
d. attending a formal weight loss program
e. not trying to lose weight

5. Which describes your CURRENT weight loss efforts (choose one)

a. trying to eat fewer calories
b. trying to exercise more
c. both a and b
d. attending a formal weight loss program
e. I am not trying to lose weight

How many times per week did/do you eat fast foods

6. BEFORE the hurricane:

0 1 2 3 4 5 6 7
8 9 10 or more

7. SINCE the hurricane:

0 1 2 3 4 5 6 7
8 9 10 or more

How many meals per week did/do you skip (breakfast included)

8. BEFORE the hurricane

0 1 2 3 4 5 6 7
8 9 10 or more

9. SINCE the hurricane

0 1 2 3 4 5 6 7
8 9 10 or more

How many snacks did/do you eat per day

10. BEFORE the hurricane

0 1 2 3 4 or more

11. SINCE the hurricane

0 1 2 3 4 or more

Using the following scale, describe your intake of each of the following foods SINCE the hurricane:

1 2 3 4 5
much less no change much more

12. ___red meat
13. ___poultry/fish
14. ___vegetables
15. ___breads/starches
16. ___fruit
17. ___milk/yogurt
18. ___cheese
19. ___chips/crackers/pretzels
20. ___ desserts (ice cream, cookies, cake, etc.)
21. ___ chocolates/candies
22. ___ fast foods (burgers, chicken, french fries)
23. ___ pizza
24. ___ fried foods
25. ___ beverages with caffeine (coffee, soda)

26. Do you consider yourself a regular exerciser?

1 2 3 4 5
not at all somewhat very much so

27. If you exercise regularly, what type of exercise do you engage in most often: (circle one)

not a regular exerciser walking running swimming aerobic dance cycling
weight training other (please specify) _____

About how many times per week did/do you exercise

28. BEFORE the hurricane

0 1 2 3 4 5 6 7
8 9 10 or more

29. SINCE the hurricane

0 1 2 3 4 5 6 7
8 9 10 or more

30. Which of the following has contributed the most to changes in your exercise SINCE the hurricane: (pick one)

a. my exercise has not changed
b. not enough time to exercise
c. not enough energy to exercise
d. exercise is not as important to me
e. lack of exercise facility
f. lack of exercise partner
g. other _____

The next several questions ask about alcohol consumption. "A drink" refers to a beer, wine cooler, 4 oz. of wine, or drink containing 1 oz. of liquor.

31. Using the following scale, describe your intake of alcohol SINCE the hurricane. Have you had alcohol:

1 2 3 4 5
much less no change much more

How many drinks of alcohol did/do you usually have per week

32. BEFORE the hurricane

a. 0
b. 1-3
c. 4-7
d. 8-12
e. 13-16
f. 17 or more

33. SINCE the hurricane

a. 0
b. 1-3
c. 4-7
d. 8-12
e. 13-16
f. 17 or more

During the last two weeks, how many times have you had

34. 1 or 2 drinks on one occasion (but no more)

a. none
b. once
c. twice
d. 3-5 times
e. 6 or more

35. 3 or 4 drinks on one occasion (but no more)

a. none
b. once
c. twice
d. 3-5 times
e. 6 or more

36. 5 or more on one occasion

a. none
b. once
c. twice
d. 3-5 times
e. 6 or more

37. Describe your cigarette smoking SINCE the hurricane.

1	2	3	4	5
much less		no change		much more

38. Which describes your cigarette smoking in the past 30 days?

a. have not smoked
b. 1-5 cigarettes per day
c. about one half pack a day
d. about a pack a day
e. about 1 1/2 packs a day
f. 2 or more packs a day

39. Which describes your cigarette smoking BEFORE the hurricane?

a. did not smoke
b. 1-5 cigarettes per day
c. about one half pack a day
d. about a pack a day
e. about 1 1/2 packs a day
f. 2 or more packs a day

40. Using the following scale, describe your use of prescription medications SINCE hurricane Hugo?

1	2	3	4	5
much less		no change		much more

Using the following scale, describe your intake of each of the following medications SINCE the hurricane:

1	2	3	4	5
much less		no change		much more

41. ___ pain relievers (aspirin, Tylenol, Nuprin, etc.)
42. ___ cold medications (Nyquil, Contac, etc.)
43. ___ antihistamines (Dimetapp, Sudafed, Actifed, etc.)
44. ___ anti-acids (Tums, Maalox, etc.)
45. ___ laxatives (Ex-lax, Correctol, etc.)
46. ___ diuretics (Aquaban, Pamprim, etc.)
47. ___ diet pills (Dexatrim, Control, etc.)
48. ___ stimulants (No-doz, Vivarin, etc.)
49. ___ nose sprays (Afrin, Neo-synephrine, etc.)
50. ___ other _____

51. Please list any prescription medications that you have started taking SINCE the hurricane:

_____

_____

52. Using the following scale, describe your seat belt use SINCE the hurricane.

1	2	3	4	5
much less		no change		much more

COPE

Hurricane Hugo produced challenges for each of us. We are interested in what you have done to cope with the challenges created by Hugo. Your responses should reflect your efforts to cope from immediately after the hurricane until today.

Respond to each item according to the scale below. Your response for each item should be written in the space corresponding to the item.

1= I have not done this at all
2= I have done this a little bit
3= I have done this a medium amount
4= I have done this a lot

_____ 1. I have tried to grow as a person as a result of the experience.
_____ 2. I have turned to my work or other substitute activities to take my mind off things.
_____ 3. I have gotten upset and let my emotions out.
_____ 4. I have tried to get advice from someone about what to do.
_____ 5. I have concentrated my efforts on doing something about the challenges.
_____ 6. I have said to myself "this isn't real."
_____ 7. I have put my trust in God.
_____ 8. I have laughed about the situation.
_____ 9. I have admitted to myself that I can't deal with the challenges and quit trying.
_____ 10. I have restrained myself from doing anything too quickly.
_____ 11. I have discussed my feelings with someone.
_____ 12. I have used alcohol or drugs to make myself feel better.

_____ 13. I have gotten used to the idea that the hurricane happened.
_____ 14. I have talked to someone to find out more about the situation.
_____ 15. I have kept myself from getting distracted by other thoughts or activities.
_____ 16. I have daydreamed about things other than this.
_____ 17. I have gotten upset, and am really aware of my feelings.
_____ 18. I have sought God's help.
_____ 19. I have made a plan of action.
_____ 20. I have made jokes about the situation.
_____ 21. I have accepted that the hurricane has happened and that it can't be changed.
_____ 22. I have held off doing anything about the challenges until the situation permits.
_____ 23. I have tried to get emotional support from friends or relatives.
_____ 24. I have just given up trying to reach my goals.

_____ 25. I have taken additional action to try to get rid of the problems.
_____ 26. I have tried to lose myself for a while by drinking alcohol or taking drugs.
_____ 27. I have refused to believe that Hugo has happened.
_____ 28. I have let my feelings out.
_____ 29. I have tried to see Hugo in a different light, to make it seem more positive.
_____ 30. I have talked to someone who could do something concrete about the challenges.
_____ 31. I have slept more than usual.
_____ 32. I have tried to come up with a strategy about what to do.
_____ 33. I have focused on dealing with the challenges, and if necessary let other things slide a little.
_____ 34. I have gotten sympathy and understanding from someone.
_____ 35. I have drank alcohol or taken drugs, in order to think about the situation less.
_____ 36. I have kidded around about Hugo.

Continue to answer each item with these response choices:

1= I have not done this at all
2= I have done this a little bit
3= I have done this a medium amount
4= I have done this a lot

_____ 37. I have given up the attempt to get what I want.
_____ 38. I have looked for something good in what is happening.
_____ 39. I have thought about how I might best handle the challenges.
_____ 40. I have pretended that the hurricane hasn't really happened.
_____ 41. I have made sure not to make matters worse by acting too soon.
_____ 42. I have tried hard to prevent other things from interfering with my efforts at dealing with this.
_____ 43. I have gone to movies or watched TV, to think about the situation less.
_____ 44. I have accepted the reality of the fact that Hugo happened.
_____ 45. I have asked people who have had similar experiences what they did.
_____ 46. I have felt a lot of emotional distress and I found myself expressing those feelings a lot.
_____ 47. I have taken direct action to get around the challenges.
_____ 48. I have tried to find comfort in my religion.

_____ 49. I have forced myself to wait for the right time to do something.
_____ 50. I have made fun of the situation.
_____ 51. I have reduced the amount of effort I'm putting into solving the challenges.
_____ 52. I have talked to someone about how I feel.
_____ 53. I have used alcohol or drugs to help me get through the challenges.
_____ 54. I have learned to live with the hurricane.
_____ 55. I have put aside other activities to concentrate on this.
_____ 56. I have thought hard about what steps to take.
_____ 57. I have acted as though it hasn't even happened.
_____ 58. I have done what has to be done, one step at a time.
_____ 59. I have learned something from the experience.
_____ 60. I have prayed more than usual.

INSTRUCTIONS:

Below is a list of problems people sometimes have. Please read each one carefully, and circle the number to the right that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Circle only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example below before beginning, and if you have any questions please ask about them.

SEX

MALE ○

FEMALE ○

NAME: _____

LOCATION: _____

EDUCATION: _____

MARITAL STATUS: MAR.__ SEP.__ DIV.__ WID.__ SING.__

DATE			ID. NUMBER	AGE
MO	DAY	YEAR		

VISIT NUMBER: _____

EXAMPLE HOW MUCH WERE YOU DISTRESSED BY:	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
1. Bodyaches	0	1	2	(3)	4

HOW MUCH WERE YOU DISTRESSED BY:		NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
1. Headaches	1	0	1	2	3	4
2. Nervousness or shakiness inside	2	0	1	2	3	4
3. Repeated unpleasant thoughts that won't leave your mind	3	0	1	2	3	4
4. Faintness or dizziness	4	0	1	2	3	4
5. Loss of sexual interest or pleasure	5	0	1	2	3	4
6. Feeling critical of others	6	0	1	2	3	4
7. The idea that someone else can control your thoughts	7	0	1	2	3	4
8. Feeling others are to blame for most of your troubles	8	0	1	2	3	4
9. Trouble remembering things	9	0	1	2	3	4
10. Worried about sloppiness or carelessness	10	0	1	2	3	4
11. Feeling easily annoyed or irritated	11	0	1	2	3	4
12. Pains in heart or chest	12	0	1	2	3	4
13. Feeling afraid in open spaces or on the streets	13	0	1	2	3	4
14. Feeling low in energy or slowed down	14	0	1	2	3	4
15. Thoughts of ending your life	15	0	1	2	3	4
16. Hearing voices that other people do not hear	16	0	1	2	3	4
17. Trembling	17	0	1	2	3	4
18. Feeling that most people cannot be trusted	18	0	1	2	3	4
19. Poor appetite	19	0	1	2	3	4
20. Crying easily	20	0	1	2	3	4
21. Feeling shy or uneasy with the opposite sex	21	0	1	2	3	4
22. Feelings of being trapped or caught	22	0	1	2	3	4
23. Suddenly scared for no reason	23	0	1	2	3	4
24. Temper outbursts that you could not control	24	0	1	2	3	4
25. Feeling afraid to go out of your house alone	25	0	1	2	3	4
26. Blaming yourself for things	26	0	1	2	3	4
27. Pains in lower back	27	0	1	2	3	4
28. Feeling blocked in getting things done	28	0	1	2	3	4
29. Feeling lonely	29	0	1	2	3	4
30. Feeling blue	30	0	1	2	3	4
31. Worrying too much about things	31	0	1	2	3	4
32. Feeling no interest in things	32	0	1	2	3	4
33. Feeling fearful	33	0	1	2	3	4
34. Your feelings being easily hurt	34	0	1	2	3	4
35. Other people being aware of your private thoughts	35	0	1	2	3	4

Please continue on the following page ▶

36.	Feeling others do not understand you or are unsympathetic	36	0	1	2	3	4
37.	Feeling that people are unfriendly or dislike you	37	0	1	2	3	4
38.	Having to do things very slowly to insure correctness	38	0	1	2	3	4
39.	Heart pounding or racing	39	0	1	2	3	4
40.	Nausea or upset stomach	40	0	1	2	3	4
41.	Feeling inferior to others	41	0	1	2	3	4
42.	Soreness of your muscles	42	0	1	2	3	4
43.	Feeling that you are watched or talked about by others	43	0	1	2	3	4
44.	Trouble falling asleep	44	0	1	2	3	4
45.	Having to check and double-check what you do	45	0	1	2	3	4
46.	Difficulty making decisions	46	0	1	2	3	4
47.	Feeling afraid to travel on buses, subways, or trains	47	0	1	2	3	4
48.	Trouble getting your breath	48	0	1	2	3	4
49.	Hot or cold spells	49	0	1	2	3	4
50.	Having to avoid certain things, places, or activities because they frighten you	50	0	1	2	3	4
51.	Your mind going blank	51	0	1	2	3	4
52.	Numbness or tingling in parts of your body	52	0	1	2	3	4
53.	A lump in your throat	53	0	1	2	3	4
54.	Feeling hopeless about the future	54	0	1	2	3	4
55.	Trouble concentrating	55	0	1	2	3	4
56.	Feeling weak in parts of your body	56	0	1	2	3	4
57.	Feeling tense or keyed up	57	0	1	2	3	4
58.	Heavy feelings in your arms or legs	58	0	1	2	3	4
59.	Thoughts of death or dying	59	0	1	2	3	4
60.	Overeating	60	0	1	2	3	4
61.	Feeling uneasy when people are watching or talking about you	61	0	1	2	3	4
62.	Having thoughts that are not your own	62	0	1	2	3	4
63.	Having urges to beat, injure, or harm someone	63	0	1	2	3	4
64.	Awakening in the early morning	64	0	1	2	3	4
65.	Having to repeat the same actions such as touching, counting, or washing	65	0	1	2	3	4
66.	Sleep that is restless or disturbed	66	0	1	2	3	4
67.	Having urges to break or smash things	67	0	1	2	3	4
68.	Having ideas or beliefs that others do not share	68	0	1	2	3	4
69.	Feeling very self-conscious with others	69	0	1	2	3	4
70.	Feeling uneasy in crowds, such as shopping or at a movie	70	0	1	2	3	4
71.	Feeling everything is an effort	71	0	1	2	3	4
72.	Spells of terror or panic	72	0	1	2	3	4
73.	Feeling uncomfortable about eating or drinking in public	73	0	1	2	3	4
74.	Getting into frequent arguments	74	0	1	2	3	4
75.	Feeling nervous when you are left alone	75	0	1	2	3	4
76.	Others not giving you proper credit for your achievements	76	0	1	2	3	4
77.	Feeling lonely even when you are with people	77	0	1	2	3	4
78.	Feeling so restless you couldn't sit still	78	0	1	2	3	4
79.	Feelings of worthlessness	79	0	1	2	3	4
80.	The feeling that something bad is going to happen to you	80	0	1	2	3	4
81.	Shouting or throwing things	81	0	1	2	3	4
82.	Feeling afraid you will faint in public	82	0	1	2	3	4
83.	Feeling that people will take advantage of you if you let them	83	0	1	2	3	4
84.	Having thoughts about sex that bother you a lot	84	0	1	2	3	4
85.	The idea that you should be punished for your sins	85	0	1	2	3	4
86.	Thoughts and images of a frightening nature	86	0	1	2	3	4
87.	The idea that something serious is wrong with your body	87	0	1	2	3	4
88.	Never feeling close to another person	88	0	1	2	3	4
89.	Feelings of guilt	89	0	1	2	3	4
90.	The idea that something is wrong with your mind	90	0	1	2	3	4

The Relationship Between Loss of Resources and Clinical Symptomatology Among Survivors of a Natural Disaster: A Clinical Application of the Conservation of Resources Model

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Purpose

On September 21, 1989, hurricane Hugo came ashore at Charleston, South Carolina. As one of the largest and most powerful storms ever to hit the United States, Hugo caused unprecedented property damage and effected the lives of virtually everyone in his path. The purposes of this study were to:

1) Describe and quantify the symptoms of psychological distress experienced by Hugo's survivors.

2) Describe and quantify the types of losses suffered by our sample as a result of Hugo.

3) Determine the effect of gender on self-reported losses following Hugo.

4) Determine whether psychological distress following Hugo was effected by gender or the extent of loss of resources.

Method

Subjects

Eight weeks after the hurricane, 1200 surveys were sent via campus mail to the faculty/professional staff at the Medical University of South Carolina at Charleston, South Carolina. A cover letter explained the purpose of the study, insured confidentiality, and gave instructions on completing the questionnaires. Individuals completing the survey were given the opportunity to enter a drawing for two gourmet dinners valued at $120.00. Return envelopes and an entry form for the drawing were included.

Survey Questionnaires

Demographic Questionnaire

Resource Loss Questionnaire (Hobfoll): a self-report inventory on which subjects used a 4-point Likert scale to rate the extent to which Hugo resulted in the loss or threatened loss of 52 resources (e.g., property, money, self-esteem, and leisure time).

Symptom Checklist - 90 Revised (SCL-90-R; Derogatis, 1983): a self-report questionnaire on which respondents used a 5-point Likert scale to rate the extent which they experienced 90 symptoms (e.g., headaches, feelings of guilt, trembling, and feeling lonely) following Hugo.

Data Analysis

Because the four subscale scores from the Resource Loss Questionnaire were highly intercorrelated, the total score from this questionnaire was used to reflect loss of resources in the data analyses. Similary, because the nine clinical scales on the SCL-90-R were highly intercorrelated, the Global Severity Index (GSI) score from this questionnaire was used in the data analyses to represent overall psychological distress.

The SCL-90-R and the Resource Loss data were analyzed for the total sample and by gender. A t-test was used to determine the effect of gender on the extent of self-reported loss incurred due to the hurricane. A median split was performed on the Resource Loss Questionnaire scores to define a high loss and a low loss group. The effects of gender and high versus low loss on psychological distress (GSI scores) were analyzed using t-tests.

Sample

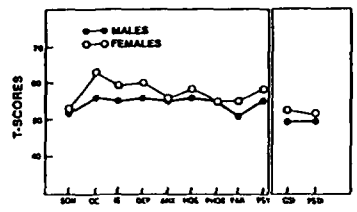
N = 523
Response rate = 43%

SEX		AGE	
51%	Male	X =	40.46
49%	Female	S.D. =	10.67
		Range =	19-77

RACE		MARITAL STATUS	
92%	White	21%	Single
4%	Black	68%	Married
4%	Other	10%	Separated/Divorced

EDUCATION (Highest Degree)		ANNUAL HOUSEHOLD INCOME	
74%	Graduate	58%	Over 30,000
11%	Bachelors	14%	40,000-50,000
12%	Technical degree	27%	30,000-40,000

MEAN SCORES FOR MALES AND FEMALES ON THE SCL-90-R SCALES (USING NON-PATIENT NORMS)



Ten SCL-90-R Items Most Frequently Endorsed

Item #	Item	Percent of Total Group Endorsing Item	Percent of Males Endorsing Item	Percent of Females Endorsing Item
11	Feeling easily annoyed or irritated	41	33	48
14	Feeling low in energy or slowed down	35	23	46
6	Feeling criticial of others	33	26	40
31	Worrying too much about things	32	25	40
28	Feeling blocked in getting things done	30	22	38
30	Feeling blue	27	17	37
57	Feeling tense or keyed up	26	18	35
9	Trouble remembering things	25	17	33
55	Trouble concentrating	23	19	27
66	Sleep that is restless or disturbed	23	16	30

"Endorsed" items were defined as those which respondents rated as "moderately" (2) or higher on a Likert scale ranging from 0 to 4.

Among males, 23% endorsed "soreness of your muscles" and 17% endorsed "awakening in the early morning," making these items respectively the fifth and tenth most frequently endorsed by men.

Among females, 34% endorsed "headaches" making it the eighth most frequently reported item for women.

Ten Resource Loss Items Most Frequently Endorsed

Item #	Item	Percent of Total Sample Endorsing Item	Percent of Males Endorsing Item	Percent of Females Endorsing Item
10	Vegetation on your property	83	85	82
8	Free time	65	63	67
19	A daily routine	54	49	61
13	Feeling that I am accomplishing my goals	50	40	59
29	Feeling that my life is peaceful	47	36	58
17	Stamina/Endurance	39	28	51
3	Time for adequate sleep	39	31	47
34	Savings or emergency money	38	34	42
21	Sense of optimism	33	29	46

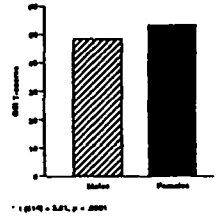
"Endorsed" items were those which respondents rated as a 1 or higher on a Likert scale ranging form 0 to 4.

For males, the sixth ranked item was "personal residence" with 35% endorsing it.

For males, the eighth ranked item was "time for work" with 32% endorsing it.

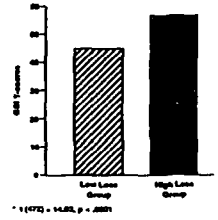
For females, the eighth ranked item was "motivation to get things done" with 48% endorsing it.

Mean T-scores on the Global Severity Index (GSI) of the SCL-90-R for the Male and Female Groups*



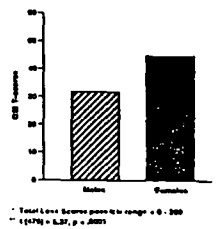
* t (514) = 3.85, p = .0001

Mean T-scores on the Global Severity Index (GSI) of the SCL-90-R for the Low and High Loss Groups*



* t (472) = 14.83, p = .0001

Mean Total Loss Scores* for the Male and Female Groups**



* Total Loss Scores possible range = 0 - 208
** t (479) = 8.37, p = .0001

Summary

1. The symptom profiles formed by the mean scores on SCL-90-R scales were very similar for males and females.
2. Mean scores for males and females on the SCL-90-R fell below the clinical cutoff.
3. Females scored significantly higher than males on the t-scores of the Global Index Scale (GSI) of the SCL-90-R.
4. The symptoms of distress most frequently reported on the SCL-90-R were very similar for males and females.
5. A higher proportion of the female group, compared to the males, endorsed clinical symptoms.
6. The type of resources lost were very similar for males and females.
7. Females reported significantly more loss than males.
8. Significantly more distress on the SCL-90-R was reported by females (vs. males) and the high loss group (vs. the low loss group).

Presented at the 24th Annual Convention for the Association for the Advancement of Behavior Therapy, November 1-4, 1990 in San Francisco, California.

RESOURCE LOSS, COPING AND PSYCHOLOGICAL DISTRESS: AN EMPIRICAL TEST OF A THEORETICAL MODEL [1, 2]

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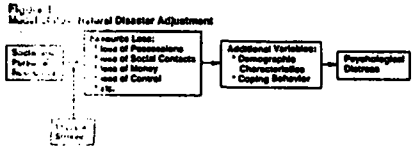
INTRODUCTION

It is important to understand individual adjustment following natural disasters. Literature review indicates that exposure to natural disaster is alarmingly common (Baum, 1987; Gibbs, 1989). Most important to mental health professionals, disaster exposure can produce both acute and prolonged psychological distress (Green, Lindy, Grace, Gleser, Leonard, Korol, Winget, 1990; Madakasira & O'Brien, 1987). Ambiguity exists in definitions of disaster exposure, with most definitions emphasizing a mix of acute (e.g., threat) and ongoing (e.g., adversities in the post disaster period) events (Madakasira & O'Brien, 1987). This study clarifies ambiguities by proposing and empirically testing a model of individual adjustment following natural disaster.

The Conservation of Resources (COR) stress model provides a useful framework for understanding individual adjustment following disaster (Hobfoll, 1988; 1989). Figure 1 presents the COR model applied to post disaster adjustment. The model focuses on the extent to which individuals

Figure 1
Model of Post Natural Disaster Adjustment



maintain social (e.g., family roles, work roles) and personal (e.g., possessions, sense of control) resources to meet personal needs. Subsequent to disaster, people experience a range of losses requiring ongoing efforts to adjust, such as: loss of possessions, loss of social contacts, loss of routines, and the like. The COR model proposes that resource loss will be the primary cause of post disaster psychological distress. This model proposes that additional variables, such as demographic characteristics and coping behavior, will be of secondary importance in predicting psychological distress.

HYPOTHESES

These statements represent the hypotheses in this study:

1. Resource loss will be positively related to psychological distress and coping behavior.
2. Resource loss will account for more psychological distress variance than demographic variables or coping behavior.
3. Resource loss will be a risk factor for psychological distress. High resource loss will be associated with a greater prevalence of clinically significant psychological distress compared to low resource loss.

METHOD

Approximately 8 weeks after Hurricane Hugo devastated Charleston, South Carolina, questionnaire sets were mailed to 1,200 employees of the Medical University of South Carolina in Charleston. The questionnaire sets included the following:

*Demographic Questionnaire

*Resources Questionnaire - 52 items; 5 point Likert scale ranging from 0 =no loss to 4 =extreme amount of loss; modified from Hobfoll; measure of aggregate resource loss (mean of 52 items) used in data analysis.

*COPE Questionnaire - 60 item inventory that provides 15, 4 item scales (Carver, Scheier, & Weintraub, 1989); 4 point Likert scale from 0 =I have not done this at all to 3 =I have done this a lot; 15, 4 item scales were used as raw data for a principle components factor analysis with varimax rotation to produce the 3 coping factors used in this study: *problem focused coping, emotion focused coping, and disengagement coping.*

*SCL-90-R - Global Severity Index; Derogatis, 1983

Table 1 summarizes characteristics of participants:

Table 1
Sample Characteristics

N=418; 34.8% usable return rate

Gender:	50.7% female; 49.3% male	
Age:	mean =40.2 years; s.d.=10.4; range =19-68	
Race:	93.6% white; 6.3% African/Asian/Hispanic/ Native American	
Marital:	69.4% married 19.9% single, never married 10.1% single, previously married	
Highest Education:	75.4% graduate degree 11.7% bachelors degree	
Annual Household Income:	>$50,000 $30,000 - $50,000 <$30,000	59.3% 28.0% 1.5%

FINDINGS

Table 2 presents bivariate correlations, relevant to the first hypothesis. As predicted, resource loss is positively correlated with psychological distress and each of the three coping styles.

Table 2
Correlations Among Resource Loss, Psychological Distress, and Coping Variables

Variable	1	2	3	4	5
1. Resource Loss	—				
2. General Severity Index	.54*	—			
3. Problem Focused Coping	.23*	.11#	—		
4. Emotion Focused Coping	.34*	.34*	.46*	—	
5. Disengagement Coping	.57*	.60*	.25*	.36*	—

N=418; * p <.01, # p <.05

Figure 2 summarizes data concerning the relative importance of each resource loss, demographic characteristics, and coping behaviors in accounting for variance in psychological distress (hypothesis 2). The figure is based upon a hierarchical multiple regression equation. Variable blocks were entered in the following order, according to notions regarding likely causal sequencing: demographic block (gender, marital status, household income), resource loss block, and coping behavior block. In total, the proposed model accounted for 51.5% of psychological distress variance. As predicted, resource loss accounted for more psychological distress variance (34.1%) than either demographic variables (9.5%) or coping behavior (7.9%).

Figure 2
Prediction of Psychological Distress Variance Based on the Model of Post Natural Disaster Adjustment

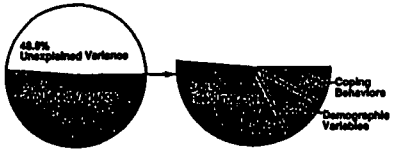


Table 3 presents data addressing the third hypothesis concerning resource loss as a risk factor for psychological distress. The percent of males and females in high and low resource loss categories (upper quartile v. lower quartiles) who demonstrated scores on the general severity index above the clinical cut off score (t=63) are displayed. As predicted, the prevalence of clinically meaningful distress levels was significantly greater among people experiencing high resource loss compared to people experiencing low resource loss. These significant differences held for both males and females.

Table 3
Prevalence of clinically significant psychological distress among high and low loss males and females.

Males		Females	
High Loss (n=51)	Low Loss (n=155)	High Loss (n=52)	Low Loss (n=160)
34.4%	4.5%	44.2%	10.6%
[t(204)=6.05, p <.001]		[t(210)=6.19, p <.001]	

SUMMARY OF KEY FINDINGS

1. Subsequent to natural disaster, increased levels of resource loss are positively associated with increases in both psychological distress and coping behavior.
2. Post natural disaster adjustment can be viewed as a process in which environmental factors (e.g., resource loss) are more important than personal factors (e.g., demographic characteristics and coping behavior) in determining psychological distress.
3. High levels of resource loss are associated with the increased prevalence of clinically significant levels of psychological distress.

Clinical Implications of Key Findings

1. Intervention efforts should target individuals experiencing high levels of resource loss as these individuals are most vulnerable to psychological distress.
2. The types of resource loss reported can guide the planning of intervention efforts. When basic resources are effected (e.g., shelter, food), the meeting of these needs should reduce psychological distress. When higher level resources are effected (e.g., sense of control) the meeting of these needs may require a different approach to reduce psychological distress (e.g., providing normative information concerning psychological reactions, reassurance).
3. Coping behavior, whether focused on problems, emotions, or disengagement, should reduce psychological distress to the extent that the coping behavior serves to replenish depleted resources (e.g. finding shelter, re-establishing social ties). Clinical workers may be most helpful by encouraging coping that addresses the resource needs of the natural disaster victim.

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1. This research was supported by a grant from the National Hazards Research and Applications Center, Boulder, Colorado

2. Association for the Advancement of Behavior Therapy 24th Annual Convention, November 1-4, 1990, San Francisco, California

NORMATIVE ALCOHOL AND MEDICATION USE FOLLOWING A NATURAL DISASTER

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INTRODUCTION

It is generally agreed that traumatic stress, such as natural disasters, significantly affects the psychological functioning and behavior of its victims. While information concerning the reactions to natural disasters has occurred in recent years, relatively little is known about the patterns of alcohol and medication use following disasters. Normative information of this type is critical in order to understand the responses and meet the needs of natural disaster victims. Further, if variables could be indentified that predict groups at high risk for increases in alcohol and medication use, interventions could be delivered more efficiently to these target groups.

On September 21, 1989, hurricane Hugo came ashore at Charleston, South Carolina. A category 5 hurricane, Hugo ravaged the coastline with sustained winds of 135 mph and tidal surges 15 to 29 feet above high tide. Not only was hurricane Hugo one of the most powerful storms to hit the continental U.S., but also one of the largest. Hurricane force winds radiated 100 miles from the eye of the storm. Consequently, the damage caused by the storm was unprecedented: approximately 3 million people were affected; 26 lives were lost; and hundreds of people were seriously injured. Seventeen thousand people were left jobless; over 5,300 homes were destroyed; and another 198,000 homes were rendered uninhabitable. In the Charleston area alone, property damage estimates were in excess of 4 billion dollars.

METHOD

8 weeks after the hurricane, 1200 surveys were sent via campus mail to the faculty and professional staff at the Medical University of South Carolina at Charleston, South Carolina.

Survey materials included
Demographic Questionnaire
Health Habits Questionnaire
Resource Loss Questionnaire (Hobfoll)

A cover letter explained the purpose of the study, ensured confidentiality, and gave instructions on completing the questionnaires.

Individuals completing the survey were given the opportunity to enter a drawing for 2 gourmet dinners valued at $120.00. Return envelopes and an entry form for the drawing were included.

A median split was performed on the Loss Questionnaire scores to define a high loss and low loss group. Data are presented by gender and loss group.

Sample Characteristics

N=525 (267 males; 258 female) 43% response rate

Race	Marital Status
92% white	68% married
4% black	21% single
4% other	10% divorced/separated

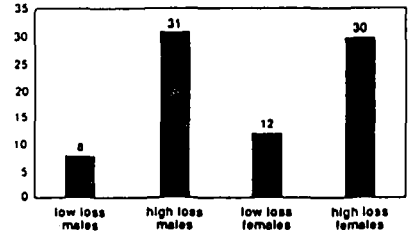
Education level	Household income
74% graduate degrees	59% $50,000+
12% bachelor degrees	14% $40-50,000
12% technical degrees	14% $30-40,000
2% high school	11% $0-30,000

TABLE I

PERCENT OF GENDER AND LOSS GROUPS REPORTING 0, 1-7, OR 8+DRINKS PER WEEK PRE AND POST-HURRICANE

	0 Drinks/wk		1-7 Drinks/wk		8+ Drinks/wk	
Sample	Pre	Post	Pre	Post	Pre	Post
Total	23.3	24.7	67.2	59.3	9.6	16.1
Male	19.2	19.2	66.6	59.3	14.3	21.6
Female	27.3	30.3	67.9	59.5	4.7	10.3
HI Loss	19.9	21.1	70.1	62.5	10.0	16.4
Lo Loss	27.2	29.0	63.1	56.7	9.6	14.3

Figure 1
Percent of loss/gender groups reporting increases in alcohol intake



Note: 20.4% of the total sample reported increases in alcohol intake

Figure 2
Percent of loss/gender groups reporting increases in alcohol intake by pre-hurricane drinking behavior

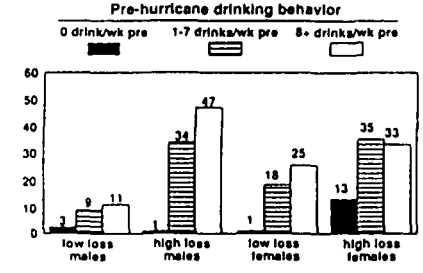
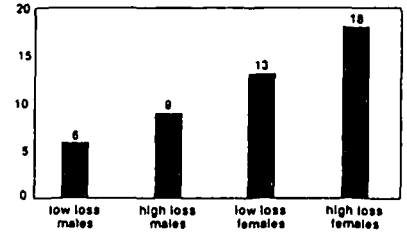
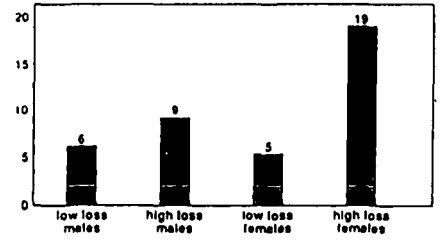


Figure 3
Percent of loss/gender groups starting prescription medications



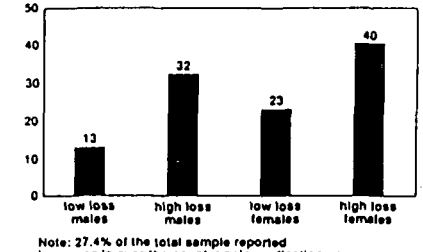
Note: 12% of the total sample reported starting prescription medications

Figure 4
Percent of loss/gender groups reporting increases in prescription medication use



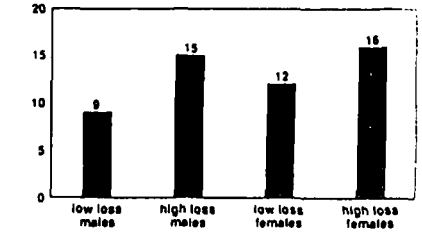
Note: 10.6% of the total sample reported increases in prescription medication use

Figure 5
Percent of loss/gender groups reporting increases in over-the-counter pain medication



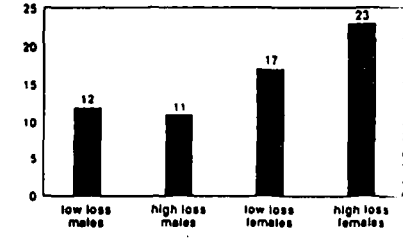
Note: 27.4% of the total sample reported increases in over-the-counter pain medication use

Figure 6
Percent of loss/gender groups reporting increases in over-the-counter cold medication use



Note: 12% of the total sample reported increases in over-the-counter cold medication use

Figure 7
Percent loss/gender groups reporting increases in over-the-counter antihistamine use



Note: 16.3% of the total sample reported increases in over-the-counter antihistamine use

SUMMARY

20.4% of the sample reported increases in alcohol intake after the hurricane.

Changes in alcohol intake after the hurricane were similar for males and females.

Males drinking more than 8 drinks per week before the hurricane reported increases at a higher rate (47%) than any other group.

A greater percentage of the high loss group (93%) reported increases in their alcohol intake compared to the low loss group (99.6%).

43.5% of the high loss group who reported having more than 8 drinks per week before the hurricane reported post-hurricane increases in their alchohol intake.

More females than males started prescription medications after the hurricane.

Compared to males, more females reported increases in prescription medication use.

These data suggest main effects for gender and loss with regard to post-hurricane increases in medication use.

Presented at the 24th Annual Convention of the Association for the Advancement of Behavior Therapy, Nov. 1-4, 1990 in San Francisco, CA

The Disruption of Health Maintenance Behaviors Following Traumatic Stress: Implications for Clinical Intervention

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Introduction

Stress has been noted to have both acute and long term behavioral effects. It is not uncommon for individuals to revert to unhealthy habits during periods of stress, as a reaction to the distress or as a means of coping. With hurricane Hugo causing a community-wide disaster, it was hypothesized that such a trauma would be associated with a decline in health-related behaviors. If prolonged, these unhealthy habits could develop into a lifestyle that puts one at significant health risk. Further, individuals experiencing greater deleterious changes in their health behaviors may be likely to have more difficulty reinstating their previous health habits. Hence, we identified persons who increased their health risks by continuing to engage in less healthy habits and those who may have difficulty returning to their original health routines.

Purpose:

1. Examine normative changes in health habits following a natural disaster.
2. Explore the pattern of health habit changes in males and females separately.
3. Determine if individuals perceiving greater losses display a greater disruption of health behaviors than low loss individuals.

Method

Eight weeks after hurricane Hugo, 1200 faculty and staff of the Medical University of South Carolina were asked to complete a packet of self-report questionnaires assessing the after-effects of the hurricane.

Assessment Instruments:
- Demographic Questionnaire
- Health Habits Questionnaire
- Resources Loss Questionnaire (Hobfoll)
- Symptom Checklist - 90 Revised (Derogatis, 1983)

The Health Habits Questionnaire is a 52 item questionnaire that was developed to evaluate weight changes, food choices, smoking and exercise patterns following the hurricane.

The Resources Loss Questionnaire is a 52-item questionnaire that measures an individual's perceived losses of possessions, employment, social contacts, sense of mobility, etc. A median split was performed on the Resources Loss Questionnaire to create high and low loss groups.

Results

125 surveys were completed and returned yielding a 31.4% response rate. Demographic information (see Table 1.0) revealed that the sample was a relatively healthy population with access to many resources such as, education, finances, professional status, etc.

Total perceived loss, as measured by the Resources Loss Questionnaire, and distress, as reflected by the General Severity Index of the SCL-90, were found to be significantly correlated with gender ($r=.23$, $p<.001$; $r=.36$, $p<.001$). Females reported more loss ($F(1,478)=38.8$, $p<.000$) and more distress ($F(1,514)=6.0$, $p<.000$).

Contingency tables (see Table 2.0; Table 2.1) were created for males and females, and for high and low loss groups to show the percentage of persons reporting increases or decreases in their consumption of certain types of foods.

Paired t-tests suggest that the entire sample displayed increases, from pre to post hurricane, in snacking ($t(320)=7.4$, $p<.000$), fast food consumption ($t(315)=12.1$, $p<.000$), and skipping meals ($t(316)=2.5$, $p<.05$) and decreases in exercise frequency ($t(313)=12.8$, $p<.000$).

A series of 2-way ANOVA's revealed that the high loss group reported significantly greater changes than the low loss group on snacking ($F(1,452)=13.7$, $p<.000$), fast food consumption ($F(1,452)=32.9$, $p<.000$), and exercise frequency ($F(1,452)=21.5$, $p<.000$) (See Table 3.0). There were no significant gender effects (See Table 3.1) or gender by loss interactions.

Of the total sample, 13.4% reported weight gains compared to 12.8% reporting weight losses. Females reported greater weight changes than males ($F(1,452)=20.9$, $p<.000$) and the high loss group reported greater changes than the low loss group ($F(1,452)=11.2$, $p<.001$) (See Table 4.0). No gender by loss interaction was found. Additionally, as many as 60% of the high loss females reported "moderate" weight changes of 5 or more pounds, compared to 28% of the high loss males and 37% of the low loss females.

High loss individuals showed a significantly greater decline in exercise than low loss persons ($F(1,463)=22.5$, $p<.000$). No gender or gender by loss interaction was found(see Table 5.0). The most commonly reported obstacle to exercise was lack of time (see Table 5.1).

Table 1.0

Sample Characteristics

Total N:	525	Mean Age:	39.8 yrs
Sex:	51% males 49% females	Education:	74%-graduate degree 11% - bachelors degree 12% - technical degree
Race:	92% white 4% black	Annual income:	58% - $50,000+ 14% - $40,000-50,000 14% - $30-40,000 11% - $20-30,000 <2% - $10-20,000
Marital status:	68% married 21% single 11% divlsep/widow		

Health Related Characteristics

Smoking Status:		Males:	
Smokers:	11%	Mean Ht:	70.6 ins.
Non-smokers:	81%	Mean Wt:	173.6 lbs.
		%IBW:	96.1%
Regular Exercisers:		Females:	
Not regular :	19%	Mean Ht:	65.1 ins.
Somewhat reg:	67%	Mean Wt:	139.9 lbs.
Very regular:	14%	%IBW:	100.4%
Most Frequent Type of Exercise:		Mean Number of Exercise Sessions Per Week: 2.99	
Walking:	34%		
Running:	17%		

Table 2.0

Percentage of Respondents Reporting Change in the Consumption of the Following Foods by Loss

FOODS	LOSS	DIRECTION OF CHANGE: Decrease	Increase
MEATS	Hi	19.8	16.3
	Lo	7.9	6.3
FRUITS & VEGETABLES	Hi	32.5	12.7
	Lo	11.5	4.6
MILK PRODUCTS	Hi	16.6	9.1
	Lo	6.3	3.6
BREADS & STARCHES	Hi	6.6	37.6
	Lo	3.5	10.0
JUNK FOODS	Hi	14.8	38.8
	Lo	7.7	14.5
FRIED FOODS	Hi	17.9	25.1
	Lo	6.9	7.3
SWEETS	Hi	23.6	36.8
	Lo	8.2	16.6
CAFFEINATED BEVERAGES	Hi	7.0	41.5
	Lo	4.3	15.1

Table 2.1

Percentage of Respondents Reporting Change in the Consumption of the Following Foods by Gender

FOODS	GENDER	DIRECTION OF CHANGE: Decrease	Increase
MEATS	M	10.7	9.8
	F	17.6	12.1
FRUITS & VEGETABLES	M	16.2	6.8
	F	28.8	9.8
MILK PRODUCTS	M	7.3	4.7
	F	16.6	9.0
BREADS & STARCHES	M	3.4	17.7
	F	7.3	29.7
JUNK FOODS	M	8.3	17.7
	F	14.5	36.0
FRIED FOODS	M	10.9	13.6
	F	14.0	18.4
SWEETS	M	11.1	18.6
	F	15.9	36.3
CAFFEINATED BEVERAGES	M	4.9	21.4
	F	6.2	35.2

Table 3.0

Change in Frequency of Health Related Behaviors by Loss (mean number of occurrences per week)

BEHAVIOR	LOSS	MEASUREMENT: Pre	Post
*Snacking	Hi	1.31	1.79
	Lo	1.29	1.38
*Fast food	Hi	1.93	3.17
	Lo	1.75	2.11
Skip meals	Hi	2.65	2.96
	Lo	2.30	2.36
*Exercise	Hi	3.25	1.64
	Lo	2.76	2.15

Note: Pre and post means are presented above for ease of presentation; however, the analyses were conducted on pre to post change scores.

*$p<.000$

Table 3.1

Change in Frequency of Health Related Behaviors by Gender (mean number of occurrences per week)

BEHAVIOR	GENDER	MEASUREMENT: Pre	Post
Snacking	M	1.19	1.58
	F	1.40	1.81
Fast food	M	1.80	2.53
	F	1.89	2.88
Skip meals	M	2.59	2.73
	F	2.47	2.64
Exercise	M	3.24	2.29
	F	2.71	1.56

Note: Pre and post means are presented above for ease of presentation; however, the analyses were conducted on pre to post change scores.

All tests were non-significant ($p>.05$).

Table 4.0

Percentage of Participants Showing Weight Changes Following the Hurricane by Gender and by Loss

Groups		Mean Weight Change	Direction of Change: Loss	Gain
Males	Hi Loss	2.8 lbs.	16.0%	21.3%
	Lo Loss	1.7 lbs.	3.9%	20.1%
Females	Hi Loss	4.3 lbs.	17.3	51.1%
	Lo Loss	3.2 lbs.	12.1%	34.6%

Table 5.0

Percentage of Respondents Reporting Change in the Frequency of Exercise Sessions Following the Hurricane by Loss and Gender

GROUPS	Direction of Change: DECREASE	INCREASE
Hi Loss ***	59.2	7.6
Lo Loss	36.2	10.3
Males	43.9	8.0
Females	52.8	9.2

***$p<.000$

Table 5.1

Reported Reasons for Change in Exercise Routine (Percentage of Respondents per Group)

Most Commonly Reported Obstacles to Regular Exercise Routine		Groups: Hi Loss	Lo Loss	Males	Females
1.	Lack of time	31.1	19.9	25.7	26.2
2.	Lack of energy	13.8	8.1	9.8	13.5
3.	Lack of facility	11.6	10.9	14.3	8.0
4.	Other	9.8	13.1	9.0	13.9

Summary of Findings

- Health habits are vulnerable to change in the wake of a natural disaster, even in a relatively healthy population with many resources.
- Overall, females and individuals reporting higher losses displayed a greater magnitude of change on most health related behaviors Compared to men and those reporting fewer losses. Change was generally in the unhealthy direction.
- Following the hurricane, food consumption patterns followed the same trend for males, females, high and low loss groups. The consumption of "healthy" foods declined, whereas, the consumption of foods generally considered "unhealthy in large quantities" increased.
- A higher percentage of females and high loss persons reported changes in food choices compared to males and low loss individuals.
- The total sample showed increases in snacking behavior, fast food consumption, and skipping meals following the hurricane. High loss persons displayed greater negative changes than low loss persons on all these behaviors. No gender differences were evident.
- Significant weight changes occurred for the entire sample, with more individuals reporting weight gains than weight losses. Females and high loss persons reported greater weight changes than males and the low loss group.
- Over half of the sample reported a disruption in their exercise routine.
- The most commonly cited obstacle to regular exercise was lack of time, followed by lack of energy and indisposed exercise facilities.

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