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The Association Between Disaster-Related Experiences and Mental Health Outcomes Among Drug Using African American Hurricane Katrina Evacuees

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Abstract

This article provides a detailed examination of the relationship between disaster-related experiences and mental health outcomes among a sample of drug using African American Hurricane Katrina evacuees. Face-to-face structured interviews were administered to Hurricane Katrina evacuees ($n = 350$) residing in voucher assisted apartment complexes in Houston, Texas (2006–2007). We use Ordinary Least Squares and logistic regression models to examine both the relevance of disaster-related experiences and the interactive relationships between disaster-related experiences and post-disaster mental health outcomes including psychological distress, severe depression, somatic symptoms, and posttraumatic stress disorder. Results indicate that disaster-related experiences including negative life changes, disaster exposure, post-disaster stressors, and resource loss, have unique, inverse relationships with mental health. While resource loss has the strongest inverse relationship with mental health, disaster exposure has a negative interactive effect on psychological distress and anxiety. Although highly vulnerable populations report low levels of mental health nearly 2 years following a disaster experience, there is a convergence in mental health outcomes with high levels of disaster experiences and disaster exposure that suggests mental resiliency.

Keywords

Disasters; Post-traumatic stress disorder; Depression; Mental health

Research has consistently documented the adverse effects of disasters on mental health among affected populations (Bourque et al. 2002; David et al. 1996; De la Fuente 1990; Freedy et al. 1994; Norris et al. 1999; Smith et al. 1986). Specifically, disaster victims often experience loss

of life, property damage, financial strain, and forced mobility (Galea et al. 2002; Rubonis and Bickman 1990). Many of these experiences have resulted in feelings of fear, helplessness, and shock (American Psychiatric Association 1994). As a result, individuals exposed to these disaster events have been found to be at risk for adverse health consequences including post-traumatic stress disorder (PTSD), depression, panic disorders, higher prevalence, frequencies, and initiation of substance use, and a host of physical illnesses in both short-term and long-term post-disaster periods (Boscarino 1996; Chae et al. 2005; Galea et al. 2002; Kessler et al. 1995; Vlahov et al. 2006; Yehuda 2002).

Despite this knowledge, there remains a paucity of evidence surrounding the relationship between specific disaster-related experiences and multiple indicators of psychological well-being. In fact, the investigations of these associations with post-disaster mental health outcomes experienced in a situation of long-term evacuation and relocation are even less. More importantly, research does not adequately address how disaster experiences may differentially impact distinct populations. The few studies that exist have found that African Americans exhibit high levels of stress following traumatic events due to factors associated with severe exposure, low economic status and discrimination (Norris 1992). Moreover, African American men have been found to be less traumatized by the disaster exposure, but nevertheless experience delayed-onset of PTSD after the disaster (Gleser et al. 1981). These findings suggest that differential vulnerability may be a more potent explanation for disaster related trauma than differential exposure (Perilla et al. 2002).

The events associated with Hurricane Katrina displaced an estimated 200,000 people throughout the Houston metropolitan area. This population provides an opportunity to investigate how disaster-related experiences are associated with post-disaster mental health outcomes among a highly disadvantaged subpopulation of substance using African Americans from inner-city New Orleans neighborhoods. Using a modified version of the Multivariate Risk Factor (MRF) model, mental health symptoms in this study are conceived as the result of broad domains of risk factors that occur before (pre-disaster), during (within-disaster) and after (post-disaster) the hurricane (Freedy et al. 1992). The MRF model builds on stress process models to suggest that factors existing before, during, and after a natural disaster influence subsequent coping and adjustment. Adjustment is determined by the interactive relationships between individual, environmental, and within-disaster experiences and the disaster experiences and resources of an individual (Freedy et al. 1993). A focus on the relative importance of disaster-related experiences, net of pre-disaster experiences seems to have the most relevance in assessing mental health needs of disadvantaged populations who can be expected to have long histories of trauma and stress.

Given the growing concerns to decrease the physical and emotional effects of disasters, this research examines how disaster-related experiences are associated with mental health disorders among Katrina disaster evacuees 2 years after the event. This research will enable a more refined and differentiated design of public health interventions for this special population of disaster evacuees.

Methods

Sample

Data are collected from 350 African American Hurricane Katrina evacuees who had used illicit substances prior to relocating in Houston, Texas in the period from July, 2006 until May, 2007. We used an adaptive sampling methodology combining several techniques employed in prior studies of community samples of substance users (Heckathorn 1997; Heckathorn et al. 2001; Yin et al. 1996). Respondents were drawn from twenty-six Houston apartment complexes participating in the Housing Voucher Program that were randomly selected from 171

complexes located within two geographic regions determined to have the highest concentration of evacuees. The number of respondents recruited from each complex was weighted based on the proportion of eligible respondents. Participants eligible for the study were those living in one of the Katrina affected areas, reporting substance use 6 months prior to and/or post Katrina, and/or in drug treatment 6 months prior to Katrina, over 18 years but not older than 65 and currently living in the Houston metropolitan area.

Measurements

The hour and a half semi-structured interview was administered face-to-face to the participants in the field and included open-ended questions, demographic information, single question items and established scales used in disaster research. The primary measures utilized in our analysis consist of three analytical domains: (1) pre- and post-disaster characteristics; (2) disaster-related experiences and (3) current mental health outcomes.

The *pre-disaster characteristics* occurring before Katrina and *post-disaster characteristics* related to the time of the interview include:

Socio-demographic—Gender, age, education, number of children and marital status at time of interview, income before Katrina, and lifetime parole/probation were recorded in the interview. Age is included as a continuous variable. Education was collapsed into a binary categorization of “less than a high school education” (referent) or a “high school education or higher” due to few respondents in other educational statuses. Marital status categorizes individuals as either married or not/never married. Income includes a categorical representation (0: less than \$500; 1: \$500–\$999; 2: \$1,000–\$1,999; 3: \$2,000–\$3,999; 4: \$4,000–\$5,999, and 5: \$6,000 or more) indicating the amount of income a respondent received in the last 30 days from all sources of income, both legal and illegal.

Process of Katrina Evacuation—A single item was used to assess the respondent's evacuation process. Respondents were asked if they left the city before Katrina and the responses were coded as no = 0 or yes = 1. Of note, the majority (93.3 percent) of those that evacuated post-hurricane indicated that they were “forced to evacuate” their homes.

Lifetime Traumatic Event Exposure—The Traumatic Stress Schedule (TSS) was used to assess exposure to other potentially traumatic life events (Norris et al. 1999). The TSS assesses exposure to nine traumatic events including robbery, physical assault, sexual assault, tragic death, motor vehicle accident, fire, other disaster and other hazard. Dichotomous responses were scored 0 = unexposed and 1 = exposed and summed into a total composite score.

Self-rated Health—This one item question measured the overall health status as rated by the participant at the time of the interview. The participant was asked to make a rating based on four point scale ranging from poor to excellent.

The following *disaster-related experience* measures were used in this analysis:

Disaster Related Exposure—Respondents were asked the degree of exposure to the disaster using three modified measures of severity of exposure identified by previous research (Freedy et al. 1992, 1993; Norris et al. 1999). Threat to life was assessed (0 = no, 1 = yes) by asking respondents “Did you ever feel like your life was in danger during the hurricane?” Injury (0 = no, 1 = yes) was measured by asking respondents if they or any member of their household were injured as a direct result of the hurricane. Finally, property damage was measured using

a six point scale from 0 = no damage to 6 = demolished. An overall composite score variable was created that ranged from 0 to 8.

Resource Loss—Resource loss was assessed using a 19 item Resources Questionnaire adapted from a 52 item scale designed to measure resource loss following a natural disaster (Freedy et al. 1992). The scale measures both internal and external resources by asking respondents to rate the extent of loss of each resource since the hurricane (0 = no loss to 3 = quite a bit of loss). Resource loss includes such items as: feeling that you have control over your life, a sense of optimism, feeling independent, a daily routine, time with loved ones, and time for adequate sleep. An overall composite variable was created which is a cumulative count of these 19 individual items (range 0–57).

Negative Life Event Changes—This scale includes yes or no answers to 20 questions concerning negative changes that occurred in participant's life between the period of the hurricane and today (Norris and Kaniasty 1996). Questions include life events pertaining to marital status, family status and health, and social networks.

Post Katrina Stressors—The extent of personal stressors experienced by the participant since the hurricane is measured by the summing of eight post-Katrina questions including the occurrence of: death of a spouse, divorce, death of family member, serious injury, marriage, family problems, work problems, and mental/emotional problems (Freedy et al. 1993).

The *mental health outcome* measures that indicate complaints and symptoms experienced at the time of the interview include the following:

Psychological Distress—This continuous measure was derived from the sum total of the eight item Center for Epidemiological studies Depression Scale (CES-D). The CES-D is a highly reliable and valid study that ranges from 0 to 24 and indicates clinically significant levels of depressive symptoms with a score of seven or higher (Melchior and Huba 1993; Norris et al. 2002; Radloff 1977).

Post-Traumatic Stress Disorder (PTSD)—The PTSD symptoms are measured using the NWS PTSD Module, a modified version of the Diagnostic Interview Schedule (Galea et al. 2002). PTSD is determined by the presence of at least one recurrent symptom, three avoidance symptoms and hyperarousal symptoms. These symptoms have persisted 2 weeks or longer, have been present within the previous 30 days and related to Hurricane Katrina.

Anxiety, Severe Depression, and Somatic—These specific symptoms are derived from the respective subscales of the General Health Questionnaire-28 (GHQ-28) and range from 0 to 20 (Goldberg and Gaeter 1997; Makowska et al. 2002; Swallow et al. 2003).

Statistical Analysis

The analysis includes a descriptive univariate analysis of sociodemographic factors, pre and post-disaster factors, disaster-related experiences and current mental health outcomes. Pairwise Pearson correlation coefficients were calculated to examine the correlations between the mental health outcome scores and the disaster-related experience variables. Our multivariate analysis employed logistic and Ordinary Least Squares (OLS) procedures depending on the nature of the mental health outcome variable. Along with the inclusion of sociodemographic variables, self-rated health, lifetime traumatic event exposure, and process of Katrina evacuation, the disaster-related experiences variables were included in the model to check for the associations between disaster-related experiences and mental health. In the next step, we followed the MRF assumption that disaster exposure should interact with other individual resources (Freedy et

al. 1993) and tested for interactive effects of each of the disaster-related experiences with one another on the specific mental health outcomes. All analyses were conducted using STATA 9.0 (StataCorp 2005).

Results

Table 1 presents the descriptive percentages and the mean scores and standard deviations for the total sample of 350 Hurricane Katrina evacuees residing in Houston about 18 months after Katrina. The majority of the sample are African-American (98%) and male (63%) with a mean age of 33.9. In addition to being high-risk drug users and evacuees, the sample has a high proportion of individuals who are unmarried (93.6%), unemployed (77%), have little to no income, and have one or more children (72.6%). Respondents indicate a number of disaster-related experiences, including approximately five negative life changes. The mean disaster exposure score for the sample was extremely high at 7.18 ($SD = 1.12$), with only 30 percent of the sample reporting a score of less than or equal to five, indicating that the majority of respondents had experienced the full brunt of the storm. Resource loss was more moderate at 30.32. The number of personal stressors since Katrina was 2.41. Mean mental health scores indicate a high level of post-Katrina distress, with an average distress score of 14, with approximately 81 percent of the sample scoring above seven as clinically depressed. These results are similar to those reported for residents exposed to Hurricane Andrew where over 35 percent of the sample scored 16 or above on psychological distress (Norris et al. 1999). Approximately 14 percent of the Katrina sample report symptoms that meet clinical levels of PTSD. This is in comparison to 23 and 38 percent for Blacks and Hispanics exposed to Hurricane Andrew, respectively (Norris et al. 1999; Perilla et al. 2002). The GHQ-28 subscale scores indicated higher mean values for anxiety (13.67) and somatic symptoms (9.24) than for severe depression (5.92).

Table 2 presents the pairwise correlations and the statistical significance level of each of the mental health variables and each of the disaster-related experiences. The results show high statistically significant relationships between disaster-related factors and mental health outcomes. Specifically, each of the mental health disorders have positive relationships with negative life events, post-Katrina stressors, and resource loss ranging from a low of 0.15 (negative life events with PTSD) to a high of 0.57 (resource loss and anxiety). However, disaster exposure which was notably high in the sample has only a moderate relationship with psychological distress (0.13, $P < 0.05$), which is potentially due to little variance in the disaster exposure variable. Also, anxiety (0.14, $P < 0.01$) was not significantly associated with PTSD, severe depression or somatic complaints. The disaster-related experience inter-correlations were for the most part statistically significant, ranging from a low of resource loss with disaster exposure (0.12, $P < 0.05$) to a high of post-Katrina stressors and negative life events (0.44, $P < 0.001$). The correlation of disaster exposure with negative life events was not statistically significant and weaker than the other correlations between the disaster-related experiences.

Building on the results in table two, we present Table 3 as the multivariate results of psychological distress, PTSD, anxiety, severe depression, and somatic symptoms regressed on the disaster-related experiences to understand the relative importance of the predictor variables with mental health outcomes while including relevant control variables. We present a full model including all of the predictor and control variables for each mental health outcome and we include an additional model with the interaction effects for those models that show statistically significant interactive relationships for specific mental health outcomes. Model 1 indicates that negative life events, and resource loss are associated with higher levels of psychological distress. The inclusion of the interactive term of disaster exposure and negative life events in Model 2 is statistically significant and negative. The inclusion of this interactive term also notably increased the main effects of both negative life events and disaster exposure.

Models 1 and 2 each accounted for a large amount of the variance in psychological distress ($R^2 = 0.45$).

The moderating effect of disaster exposure is expressed through the reduction of the relative association between negative life events and psychological distress by increases of disaster exposure. At low disaster exposure levels, low levels of negative life events have low predicted values of psychological distress and high levels of negative life events have high predicted values of psychological distress. But at higher exposure levels, the predicted values for both low and high negative life events lead to a near convergence approximating a psychological distress score of 13. For example, at a disaster exposure level of two, the average respondent¹ in the 25th percentile of negative life changes (three negative life changes) would have a predicted psychological distress score of 10.0 compared to a score of 17.5 of a respective respondent in the 90th percentile (eight negative life changes). However, at the relatively higher disaster exposure rate of seven, the difference between the 25th (predicted distress = 13.0) and 90th percentile (predicted distress = 15.0) is reduced to a 2.0 unit difference. Clearly, under the condition of high disaster exposure, the influence of negative life events on psychological distress diminishes.

Model 3 uses a logistic regression to examine the relationship between disaster-related experiences and PTSD. We find that resource loss and post-Katrina stressors have statistically significant association with PTSD as indicated by the coefficients of 0.05 (OR 1.05, $P < 0.001$) and 0.30 (OR 1.34, $P < 0.10$), respectively. Models 4, 5, and 6 focus on the continuous measure of anxiety and indicate that negative life events, post-Katrina stressors, and resource loss all have a positive relationship with higher levels of anxiety. The interaction term in Model 5 shows a negative, statistically significant relationship between disaster exposure and resource loss on anxiety. The inclusion of the interaction term also raises the main effect of disaster exposure considerably from 0.23 to 1.47 and makes this effect statistically significant ($P < 0.05$). Resource loss also increases the magnitude of its highly significant ($P < 0.001$) main effect with the inclusion of the interaction term from 0.20 to 0.50. Specifically, we find that an increase in disaster exposure has a dampening effect on the relative importance of resource loss on anxiety. At the highest level of disaster exposure, which includes over 50 percent of our sample, there is a near convergence in anxiety scores with an average difference in the resource quartiles (12.0, 13.7, and 15.5, respectively) of 1.6. Model 6 examines the interaction between disaster exposure and negative life events. The pattern of disaster exposure's moderating effect on the relationship of negative life events and anxiety is notably similar to that found in both Model 3 and Model 5. Similar to the previous interaction models, the results indicate a converging relationship, with higher levels of disaster exposure associated with a dampening effect on negative life events. For example, at the lowest level of distress, there is a difference in anxiety scores of 11.0 (8.04 and 19.04) for an individual with three negative life events compared to an anxiety score difference of 0.60 (13.72 and 14.32) at the highest level of disaster loss with eight negative life events. Additionally, Models 4, 5, and 6 explain a considerable amount of the variance in anxiety ($R^2 = 0.44, 0.45$, and 0.45 , respectively).

Model 7 indicates that resource loss and negative life event changes have statistically significant associations with severe depression. However, this model explains 31 percent of the variance in severe depression. Finally, Model 8 shows that post-Katrina stressors and resource loss are significantly associated with a higher number of somatic symptoms and explains 43 percent of the variance, while controlling for self-rated health.

¹Male, less than H.S. education, unemployed, left city before Katrina, with other variables set at means.

Discussion

Natural disasters often abruptly uproot populations from their communities resulting in socio-psychological and economic difficulties. However, natural disasters may be more deleterious for US populations characterized by poverty, racial minority status and substance use. Fewer social and material resources place these disadvantaged populations at a high risk for negative health outcomes and other detrimental consequences as our results suggest. As expected, among our sample of low income urban African American Hurricane Katrina evacuees, we found high levels of psychological co-morbidity. Specifically, 13 percent of the respondents reported symptoms that are consistent with a diagnosis of PTSD and the results reveal high mean values on scale measures of psychological distress, anxiety, and somatic symptoms. Also, our sample shows high levels of disaster-related experiences, particularly in regards to levels of disaster exposure and resource loss as compared to other disaster populations (Freedy et al. 1994). This in part is explained by the fact that most of the study respondents were from New Orleans' neighborhoods that were the poorest and experienced the worst flooding and forcible evacuations.

Our results point to several key disaster-related mental health findings. First, we find that there are high correlations between mental health outcomes within our sample. A focus on individual mental health outcomes, while fruitful, may overlook the extent and severity of mental dysfunction. These findings highlight the extent of symptomology, the expression of interrelated mental health outcomes, and the need for a wide-lens approach to understanding mental health among vulnerable populations.

Second, disaster related experiences are not likely to take place in isolation, but rather are highly correlated with one another as our results suggest. Our most consistent and robust findings concern resource loss. Resource loss is highly correlated with life event changes and stressors and is linked to lower levels of psychological well-being in each of our outcome measures. This suggests the complicated social, individual, and financial components of disasters and underscores the necessity of conceptualizing disasters outcomes as multi-faceted factors that may be expressed in numerous forms as suggested by a MRF framework. Disaster research should not be limited to disaster exposure and financial loss, but should explore important nuanced interpretations of resource loss, stressors, and life changes. This highlights the importance of potential intervention strategies aimed at providing both preventive and immediate resource support to disaster victims.

In contrast to previous research, our findings indicate that disaster exposure does not have a clear and consistent relationship with mental health outcomes. That is, while other studies have contended that PTSD and depression are linked to disaster exposure (Galea et al. 2002; Goenjian et al. 2001; Nolen-Hoeksema and Morrow 1991), our study did not find such a direct and singular link. But, our lack of findings in the results may be due in part to our unique sample of a highly disadvantaged population and the lack of variance in the disaster resource variables, as our sample was characterized by very high disaster exposure. Nonetheless, we find that disaster exposure had a moderating influence in this population's overall psychological distress and anxiety. Specifically, exposure has a dampened importance at higher levels of either negative life changes or resource loss. Our results suggest a surprising convergence in mental health outcomes with increasing levels of exposure. The disaster exposure interaction effects provide insight into the pathways of mental illness in disasters and may point to a certain degree of resiliency stimulated by the disaster itself that warrants future research.

Our findings challenge the view that disaster related experiences have simple inverse relationships with mental health. Rather, these findings suggest that disaster-related experiences are *uniquely* linked to various mental health outcomes. These disaster related

experiences include a number of factors such as life changes, exposure, stressors, and resource loss, which are not likely to take place in isolation and are highly correlated with one another. This complexity underscores the necessity of conceptualizing disaster-related experiences as inter-related phenomena that may be internalized or externalized in multiple ways (Vlahov and Galea 2004; Vlahov et al. 2002). As such, disaster research should not be limited to disaster exposure and financial loss, but should explore the importance of internalized and externalized variations of resource loss, stressors, and life changes. Furthermore, our findings suggest the potential benefits of intervention strategies based primarily on the provision of immediate resource support for highly vulnerable populations.

In conclusion, our results suggest a heightened psychological vulnerability among those without suitable resources. While it is certainly possible that low levels of SES and high drug use are partially due to previous mental health problems, we demonstrate that even when controls for pre-disaster trauma and disaster-related factors and their interactions are considered, psychological well-being in its multiple variations will be detrimentally affected by the direct and indirect consequences of the natural disaster itself.

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Table 1Descriptive statistics for Katrina evacuees, ($n = 350$)

	Percentages and means
Gender	
Male	63.01
Female	36.99
Race/ethnicity	
N.H. Black	98.57
N.H. White or Hispanic/Latino	1.43
Education	
Less than high school	45.20
High school degree or higher	54.72
Mean age	33.88 (11.68)
Marital status	
Never/not married	93.62
Married	6.38
Number of children	
None	27.38
One or more	72.62
Employment status	
Employed	23.01
Not employed/not in labor force	76.99
Current income [post Katrina, \$]	
0	4.06
Less than 500	61.16
500–999	21.45
1,000–1,999	11.30
2,000–3,999	1.45
4,000–5,999	0.29
6,000 or more	0.29
Evacuation process	
Before Katrina	32.29
After Katrina	67.71
Mean self-rated health [0–3]	1.50 (1.50)
Mean lifetime trauma [0–8]	3.84 (1.86)
Disaster-related experiences	
Mean number of negative life events	4.67 (2.45)
Mean resource loss [0–57]	30.32 (12.53)
Mean disaster exposure [0–8]	7.18 (1.12)

Percentages and means	
Mean number of post-Katrina stressors [0–6]	2.41 (1.39)
Mean mental health scores	
Psychological distress [0–24]	14.01 (7.11)
PTSD [0–1]	0.13 (0.34)
Anxiety [0–21]	13.67 (6.04)
Severe depression [0–21]	5.92 (5.94)
Somatic symptoms [0–20]	9.24 (5.12)

Data from Houston, TX in years 2006–2007

Standard deviation in parentheses

Table 2
Pairwise correlations of mental health outcomes and hurricane Katrina related disaster experiences ($n = 350$)

	1	2	3	4	5	6	7	8
Mental health outcomes								
1. Psychological distress								
2. PTSD	0.20***							
3. Anxiety	0.76***	0.27***						
4. Severe depression	0.63***	0.24***	0.57***					
5. Somatic	0.62***	0.26***	0.65***	0.53***				
Disaster-related factors								
6. Negative life event	0.34***	0.15**	0.36***	0.29***	0.23***			
7. Disaster exposure	0.13†	0.06	0.14**	0.08	0.06	0.09†		
8. Post-Katrina stressors	0.38***	0.28***	0.44***	0.27***	0.42***	0.44***	0.16***	
9. Resource loss	0.56***	0.24***	0.57***	0.47***	0.46***	0.35***	0.12*	0.35***

*** $P < 0.001$,

** $P < 0.01$,

* $P < 0.05$,

† $P < 0.10$

Table 3
Full regression models (OLS and Logistic) of mental health outcomes on hurricane Katrina disaster experiences, (*n* = 350)

	Psychological distress			PTSD ^a			Anxiety			Severe depression ^a			Somatic symptoms ^a		
	1	2	3	4	5	6	7	8							
Disaster-related experiences															
Negative life event changes [0–13]	0.36* (0.15)	1.94* (0.89)	–0.06 (0.09)	0.30* (0.13)	0.29* (0.13)	2.20** (0.77)	0.24 [†] (0.14)	0.07 (0.11)							
Disaster exposure [0–8]	0.20 (0.29)	1.26 [†] (0.65)	0.05 (0.19)	0.23 (0.25)	1.47* (0.66)	1.49** (0.56)	0.07 (0.28)	–0.16 (0.22)							
Post-Katrina stressors [0–6]	0.42 (0.26)	0.41 (0.26)	0.30 [†] (0.16)	0.75** (0.23)	0.76*** (0.23)	0.73** (0.23)	0.21 (0.25)	0.72*** (0.19)							
Resource loss [0–57]	0.23*** (0.03)	0.23*** (0.03)	0.05*** (0.02)	0.20*** (0.02)	0.50*** (0.15)	0.20*** (0.02)	0.18*** (0.03)	0.12*** (0.02)							
Disaster-related experiences interactions															
Disaster exposure * negative life event change		–0.22 [†] (0.12)				–0.26* (0.10)									
Disaster exposure * resource loss					–0.04* (0.02)										
Controls															
Sex [Female]															
Male	–2.68*** (0.68)	–2.66*** (0.67)	0.03 (0.41)	–0.90 (0.59)	–0.91 (0.58)	–0.87 (0.58)	–1.26* (0.64)	–1.50** (0.50)							
Age [18–65]	0.04 (0.03)	0.04 (0.03)	0.03 [†] (0.02)	0.00 (0.03)	0.00 (0.03)	–0.00 (0.03)	–0.02 (0.03)	0.05* (0.02)							
Education [less than high school]															
High school degree or higher	–0.28 (0.64)	–0.19 (0.64)	–0.12 (0.39)	–0.34 (0.56)	–0.29 (0.55)	–0.23 (0.55)	–1.13 [†] (0.61)	–0.87 [†] (0.47)							
Marital status [never/not married]															
Married	1.46 (1.23)	1.59 (1.23)	–0.34 (0.83)	1.70 (1.07)	1.68 (1.06)	1.85 [†] (1.06)	–1.21 (1.17)	–0.72 (0.91)							
Current income [\$1,000 increments, 0–7]	0.01 (0.41)	–0.04 (0.40)	0.38 (0.24)	–0.10 (0.35)	–0.14 (0.35)	–0.15 (0.35)	–0.35 (0.39)	0.23 (0.30)							
Employment status [not employed]															
Employed	–1.25 (0.76)	–1.17 (0.76)	0.36 (0.44)	–0.30 (0.66)	–0.32 (0.66)	–0.21 (0.66)	–0.91 (0.73)	–0.47 (0.56)							

	Psychological distress			PTSD ^a	Anxiety		Severe depression ^a		Somatic symptoms ^a
	1	2	3		4	5	6	7	
Evacuation process [did not leave before Katrina]									
Left city before Katrina	-1.21 [†] (0.67)	-1.19 [†] (0.67)	-0.26 (0.42)	-0.32 (0.58)	-0.34 (0.58)	-0.29 (0.57)	-0.78 (0.64)	-0.71 (0.49)	
Self rated health [0-3]	-1.22 ^{**} (0.37)	-1.26 ^{***} (0.37)	-0.12 (0.22)	-0.75 [*] (0.32)	-0.78 [*] (0.32)	-0.81 [*] (0.32)	-1.03 ^{**} (0.35)	-1.23 ^{***} (0.27)	
Lifetime Trauma [0-8]	0.37 [*] (0.18)	0.36 [†] (0.18)	0.04 (0.11)	0.33 [*] (0.16)	0.30 [†] (0.16)	0.31 [†] (0.16)	0.14 (0.17)	0.36 ^{**} (0.14)	
Constant	4.22 [†] (2.51)	-3.16 (4.79)	-5.61 ^{***} (1.70)	3.44 (2.17)	-5.25 (4.75)	-5.41 (4.12)	2.20 (2.39)	5.00 ^{**} (1.84)	
R-squared	0.45	0.46		0.44	0.45	0.45	0.31	0.43	

Standard errors in parentheses

^aNo significant interaction effects

 $P < 0.001$,

**
 $P < 0.01$,

*
 $P < 0.05$,

[†]
 $P < 0.10$