Housing loss and recovery after Hurricane Katrina: The effect of housing tenure

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Abstract

Hurricane Katrina and the failure of the levees caused tremendous housing loss for New Orleans residents. Previous research suggests that renters, who are more likely to be socio-economically disadvantaged, have greater difficulty returning to their homes after a disaster. This research focuses on how pre-event housing tenure influences return to a pre-Katrina home among a sample of low-income parents who participated in a study of community college students in New Orleans. I find that pre-Katrina homeowners were 2.5 times as likely to return to their pre-Katrina home as were renters, even after controlling for housing damage, receipt of insurance and disaster assistance, socio-demographic and household composition, pre-event mental health, evacuation timing and trauma exposure. Residents of public housing and Section 8 recipients were significantly less likely than others to return to their pre-Katrina homes. Consistent with prior research, I find renters face greater obstacles to returning to their pre-disaster homes.

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Hurricane Katrina and the flood resulting from the failure of the levees caused tremendous housing loss for residents of the New Orleans area. Housing loss refers to the prolonged loss of access to one's pre-disaster home, either because it was rendered uninhabitable or the non-resident owner of the building prohibited residents from reoccupying their home. Housing loss after a disaster is both sociologically interesting, since it highlights a wealth difference that affects residents' ability to recover, and of concern for policy makers, since it indicates a need for policies that protect renters and address their needs after a disaster. However, both housing loss and recovery are related to pre-disaster vulnerability (Quarentelli 1995). The focus of this paper is on how pre-event housing tenure relates to the re-establishment of permanent housing.

Disaster vulnerability research shows that disadvantaged groups are more vulnerable to housing damage from a disaster than advantaged groups. These disadvantaged groups are characterized as households with low incomes, low levels of education, female-headed households, racial and ethnic minorities (Cutter, Boruff, and Shirley 2003; Laska and Morrow 2006; Myers, Slack, and Singelmann 2008). These social characteristics are correlated with living in rental housing, suggesting that rental housing may be a key mechanism by which vulnerability is produced (Fothergill, Maestas, and Darlington 1999; Fothergill and Peek 2004). In part this may be because landlords are slow to repair disaster-related damages or they may rebuild for a higher-income market, but it may also be due to lower quality of rental housing and the lack of incentive to make improvements that mitigate disaster-related damage (Comerio 1997). Sociologists also find that poorer housing quality, which is often rental housing, is associated with a range of poorer social outcomes such as educational attainment, juvenile delinquency, and occupational mobility (Rosenbaum 1996; Conley 2001), with disaster vulnerability a logical extension of this relationship.

Similarly, disaster recovery research finds that racial and ethnic minorities and lower socio-economic status disaster victims often face more obstacles to recovering their homes or establishing new homes. Those with lower socio-economic status often have less insurance, less savings, fewer personal resources and previous economic problems that impinge on their ability to re-establish permanent housing (Fothergill, Maestas, and Darlington 1999; Fothergill and Peek 2004). These problems make market-based recovery problematic for low-income residents. FEMA also has been slow to provide temporary housing such as trailers to needy disaster victims (Fothergill and Peek 2004). Comerio, Landis, and Rofe (1994) find that in the Loma Prieto earthquake in the San Francisco, three-quarters of the housing units destroyed were rental units and one year later, while all of the single family homes were rebuilt, 90% of the multifamily units were still uninhabitable. Largely this was because these units housed low- and moderate-income renters. They conclude that landlords have few incentives to rebuild low-income

or moderate-income rental housing and may even find it advantageous to rebuild for a higher-income market. This may explain why the recovery of housing is slow and difficult for lower socio-economic status groups.

Why renters and homeowners have different rates of return to their pre-disaster homes and communities has not been thoroughly studied. An obstacle to this type of research is the lack of data on victims' pre- and post-event socio-demographic and housing characteristics as well as the effects of the disaster on the household. A rare study of renters' and homeowners' disaster vulnerability shows that renters are less prepared for disasters than homeowners. This is partly because of their socio-demographic characteristics, but also because they and their landlords are less likely to take disaster mitigation measures and otherwise invest in housing quality (Burby, Steinberg, and Basolo 2003). This provides some evidence of why rental properties are more vulnerable to the physical impacts of disasters. The fact that housing damage in New Orleans after Hurricane Katrina accounts for the difference in the timing of return of black residents and residents with less education provides partial support for this relationship, although it leaves open the question of how much of the housing damage is related to housing tenure (Fussell, Sastry, and VanLandingham 2010). This suggests that much of the disaster vulnerability and difficulty of re-establishing permanent housing experienced by low-income, minority, and female-headed households may be a result of the lower quality of rental housing and the more tenuous relationship of renters to their homes.

This research uses a sample of low-income community college students who experienced Hurricane Katrina. The strength of the survey is that it includes pre- and post-event measures of socio-economic status, housing arrangements, and mental and physical health, as well as measures of the disaster impact on individuals and their homes. However, it is not a representative sample of the population affected by Hurricane Katrina. Since the study population is fairly homogeneous and study participants are among those considered most vulnerable – low-income, minority, female headed householders – the results of this research may allow greater insight into the mechanisms that produce slower re-establishment of permanent housing. The next section describes the survey data used in the analysis, followed by a results section and discussion.

Data and sample characteristics

The survey data used for this study comes from a longitudinal study of low-income parents who were enrolled in a study of community college retention and graduation at five community colleges in different states. The community college study in New Orleans enrolled 1,109 students between November 2003 and February 2005. By the time Hurricane Katrina struck on August 29, 2005, 492 students had completed a 12-month follow-up survey. The PIs redesigned the study to focus on recovery from the disaster and 402 (81.7%) of the students were traced and re-interviewed between May 2006 and March 2007, between eight and eighteen months after Hurricane Katrina. Of those, 392 lived in an area that was affected by Hurricane Katrina. This analysis uses the

340 cases with valid responses on the relevant variables.[1] The strength of this survey is that it has both pre- and post-event observations for the participants. It is not, however, representative of a specified population. Results should be interpreted as the effect of the disaster event on those exposed to it.

Using this survey data, I investigate, first, factors influencing whether a participant returned to a pre-Katrina residence, established a new residence, or is living in temporary arrangements, and second, factors influencing whether a participant returned to the New Orleans area. For the first dependent variable, current housing, I use a multinomial logistic regression with three possible outcomes. For the second dependent variable, living in New Orleans, I use a binomial logistic regression.

In the regression analyses I consider three categories of explanatory variables. The first are the demographic characteristics of the study participant and his or her household, including participant's age, gender, race, co-residence with spouse, number and ages of children. The population of the study sample is fairly homogeneous, most are female (97%) with an average age of 26.6 at the time of the hurricane (Table 1). Because of this homogeneity, I do not expect that age and gender will have effects on either outcome. Since all the respondents were community college students, they are relatively homogeneous with respect to education, so educational attainment is not included in the models. As is often the case in surveys, a third of the respondents did not report their monthly household or personal income therefore I exclude this variable from the regression analysis. Race may be an important factor in return to a pre-event home or the New Orleans area because it may be associated with socioeconomic status and because black residents tended to live in more affected neighborhoods. Most respondents are non-Hispanic blacks (84%), followed by non-Hispanic whites (11%), and others, mostly Hispanics (5%). I expect that participants with more children and young children will be less likely to return to either their homes or to New Orleans given the scarcity of childcare and the disorganization in the school system at the time of the survey. The average number of children in the sample was 1.8 with a standard deviation of .9, and ranging from 1 to 7. A co-resident spouse may be a source of assistance, although this assistance may help a respondent to return or relocate. Slightly less than half the sample (45%) lived in a household with their spouse or partner. These household measures were taken at the follow-up survey which occurred just before Hurricane Katrina struck.

[Table 1 about here]

The second set of explanatory variables has to do with housing tenancy, housing damage, and receipt of financial aid. Most participants were mostly renters (70%), and the remainder were equally likely to be homeowners (14%) or to live with family or friends (16%). About 15% of the participants lived in public housing or received Section 8 vouchers and were mostly classified as renters although two claimed to live with family or friends. Housing damage varied across the sample with 45% reporting enormous

[1] Cases missing information included race, insurance receipt, FEMA receipt, other financial assistance receipt, co-residence with spouse, and having children less than 13 years old. There are no large differences between the variable distributions before and after casewise deletion.

damage, 20% reporting substantial damage, 19% reporting moderate damage, and 16% reporting minimal damage. I expect that the more housing damage a respondent suffered, the less likely he or she will return to their pre-Katrina home or to currently live in New Orleans. The survey measured receipt of financial assistance from three sources: personal insurance coverage (homeowners or renters), the Federal Emergency Management Agency, and other charitable organizations. Most respondents received FEMA assistance (84%) and other forms of charity (82%), but relatively few received insurance payments (30%). I expect that respondents who received payments from personal insurance coverage will be more likely to return to their pre-Katrina home. FEMA assistance and other charitable assistance is less likely to predict return to their pre-Katrina home or to New Orleans since this assistance was often used to cover expenses incurred during the evacuation and may not be of use in returning. Participants were not asked to differentiate the different types of FEMA or charitable assistance they received, just to indicate whether they received any.

The final category measures respondent's exposure to hurricane Katrina and their pre-Katrina psychological health with four indicators: whether they evacuated before or after Hurricane Katrina struck; whether they experienced any injuries or traumas, how many injuries or traumas they experienced, and a K6 measure of mental health from the baseline, pre-Katrina survey. Most respondents had evacuated before the hurricane (86%), while the remainder left during (5%) or in the week after Hurricane Katrina (10%). A scale was constructed from 8 questions which assessed stressors experienced in the aftermath of the Hurricanes Katrina, duplicating those questions used in a larger survey of the evacuation and hurricane experiences of Hurricane Katrina evacuees (Brodie et al., 2006), as well as a question about whether any family members or friends had died as a result of the hurricane and its aftermath. Respondents were asked to indicate whether they had experienced any of the following conditions: (a) no fresh water to drink; (b) no food to eat; (c) felt their life was in danger, (d) lacked necessary medicine, (e) lacked necessary medical care, (g) lacked knowledge of safety of their children, and (h) lacked knowledge of safety of their other family members. I expect that those who left after the hurricane struck and those who experienced any traumas or multiple traumas are less likely to return to their pre-Katrina home or the community. These respondents may be less able to cope with being in their pre-event home and community, or they may face additional, unmeasured obstacles to return. The baseline survey included a mental health measure which serves as a control for participants' psychological capacity for coping with the hurricane and the recovery. About 7.2% of the participants had a K6 scale measure over 12, which is considered severe mental illness, before Hurricane Katrina. These participants are expected to be less able to recover from the trauma and therefore less likely to return to their pre-Katrina home or New Orleans.

Students were re-interviewed as they were relocated over a 10 month period while the survey was in the field. Students who were relocated earlier in the fieldwork may differ from those relocated later, either because of pre-event differences in self-efficacy or socio-economic status or in the extent to which they were affected by the event itself. To test this design effect timing of interview is included as a control variable. The average time to re-interview was slightly less than a year after Hurricane Katrina (357 days), with a standard deviation of 75 days (Table 1).

Post-Katrina housing

The research question investigated here is whether tenancy of a study participants' pre-Katrina home affected their odds of establishing a permanent home between eight and eighteen months after Hurricane Katrina. The bi-variate relationship between pre-Katrina housing tenancy and post-Katrina housing suggests that homeowners were much more likely than renters to return: 46% of homeowners had returned versus only 16.1% of renters. Of the participants who lived with family or friends 34.5% had returned, suggesting they were more like homeowners than renters. Pre-Katrina renters were more than twice as likely as pre-Katrina homeowners and 45% more likely than those living with family and friends before Katrina to be living in a new home after Katrina. Differences by pre-Katrina housing tenancy in returning to the New Orleans MSA are not as large: 68.0% of homeowners and 67.3% of those living with family and friends had returned to New Orleans whereas only 45.5% of renters had returned (Table 2). The pattern in these bi-variate results shows that pre-Katrina renters are much less likely to return to their pre-Katrina home and somewhat less likely to return to New Orleans generally.

[Table 2 about here]

Overall, only 23.3% of the study participants had returned to their pre-Katrina homes. Most (59.9%) had established new homes in Louisiana or other nearby states. A smaller percentage (16.7%) were still living in temporary circumstances, these were mostly FEMA trailers (6.1%), friend's or relative's homes (7.8%), or some other circumstances (2.8%). The multinomial logistic regression models these outcomes jointly. While each set of factors – socio-demographic, housing, and evacuation timing and trauma – explains a portion of participants' housing outcomes, these factors are also correlated. Therefore I present four models: one for each set of factors and a fourth that includes all three groups of factors.

Some socio-demographic factors strongly shape the type of housing participants were living in when they were re-interviewed. Race and the age and number of children are most important, and, as expected, participants' age and gender and co-residence with a spouse do not differentiate this homogeneous population. White and "other race" participants' odds of returning to their pre-Katrina homes rather then establishing a new home were 5.0 and 3.9 times greater than those of black participants. Similarly, "other race" participants' odds of being in temporary housing were 3.9 times those of black participants. Participants with children between the ages of 13 and 18 had odds of returning to their pre-Katrina home that were twice those of participants who did not have children this age and their odds of living in temporary housing were nearly twice those of those without children this age compared to similar renters. However, the more children participants had, the less likely they were to reside in temporary circumstances over living in a new rental home. Participants with fewer children and those with older children may experience fewer demands on their time, which may make living in a damaged home or temporary arrangement more manageable. Participants with many children and small children may find being back in their old homes or in temporary arrangements too difficult to manage. The model with only socio-demographic factors fits the data well and explains about 7 percent of the variation in the dependent variable.

Participants' pre-Katrina housing tenure, residence in public or private housing, whether they had insurance, and the extent of damage to their home are all strongly related to their post-Katrina living arrangement. Pre-Katrina homeowners' odds of living in their pre-Katrina home or a temporary living situation are 3.1 and 2.4 times those of pre-Katrina renters. While renters are less likely to be living in their pre-Katrina homes, those who lived in public housing or used Section 8 vouchers, both of which are rental arrangements, had 80% lower odds of living in their pre-Katrina homes or other temporary arrangements. Those who had lived in one of the "Big Four" housing projects were unable to return to these buildings and may have been eligible for different kinds of housing assistance in other regions. Clearly, pre-Katrina housing tenure makes a big difference in establishing post-Katrina housing.

Damage to participants' homes makes an important difference as well. Those with substantial or enormous damage have odds of living in their pre-Katrina home versus a new home that are 82% and 96% less, respectively, than those with only minimal damage to their pre-Katrina home. Having received homeowner's insurance payments more than doubles participants' odds of living in their pre-Katrina home, although no other form of assistance helps. In contrast, housing damage and insurance or other assistance does not affect the odds of living in temporary circumstances versus living in a new home. Pre-Katrina homeowners may stay in temporary arrangements, such as FEMA trailers, longer because they are rebuilding their pre-Katrina home. Public housing residents may stay in temporary circumstances longer because of the difficulty of navigating the subsidized housing market, either in New Orleans or elsewhere. This model (model 2) fits the data better than the other partial models (models 1 & 3), explaining about 19 percent of the variation in the dependent variable.

Participants' exposure to Katrina and their pre-Katrina mental health influenced current housing arrangements as well. Participants who evacuated before Hurricane Katrina struck had odds of living in their pre-Katrina home that were nearly five times greater than those who left later. This effect is independent of exposure to and amount of hurricane-related traumas. Those who had experienced any injuries or traumas, controlling for evacuation timing and the number traumas, had odds of returning to their pre-Katrina home that were more than twice that of those who had not experienced any. This unexpected finding may be because 77% of participants experienced the trauma of not knowing where a family member was, but many fewer experienced the other types of traumas. For each additional trauma, after controlling for having any trauma, participants' odds of returning to a pre-Katrina home decreased by 18%. Pre-Katrina mental health was not a significant factor influencing participants' return to their pre-Katrina home. In contrast, pre-Katrina mental is the only one of these factors that is associated with living in temporary housing arrangements. Particpants with severe mental illness before the hurricane were 3.8 times more likely to be living in temporary housing arrangements versus living in a new home. These trauma and mental health variables fit the data well and but explain only about 6 percent of the variation in the dependent variable.

In the combined model pre-Katrina homeowners have odds of returning to their pre-Katrina home that are 2.5 times those of pre-Katrina renters even with controls for housing damage and all the other variables in the model. This robust relationship provides evidence that housing tenure strongly influences the options for post-Katrina housing. Pre-Katrina public housing residents have lower odds of living in their pre-

Katrina home (.18) or in other temporary housing arrangements (.23) than those who lived in private housing before Katrina, providing evidence that those with the fewest housing options prior to Katrina also had more constrained options afterwards. Housing damage and insurance payments are still significant predictors of returning to a pre-Katrina home.

The association of socio-demographic characteristics with housing variables and disaster exposure is evident from the fact that many of the socio-demographic and disaster exposure variables become insignificant in the combined model. Notably, participants who evacuated before Katrina are 3.6 times more likely than those who waited to be living in their pre-Katrina home versus a new home. This is consistent with the idea that these participants may have taken additional precautions that mitigated the impact of the disaster on their home, although this can not be shown. Similarly, the odds of participants who were mentally ill before Katrina have odds of living in temporary arrangements that are 4.5 times those of others. These participants may have been particularly ill equipped to handle the disaster and recovery process. The combined model fits the data well and explains 25% of the variation in the outcomes. It also articulates well with prior research suggesting that homeowners and those who take precautions against disasters – by having insurance coverage and evacuating prior to the hurricane – were better able to return to their pre-Katrina homes than others, even after controlling for damage to their homes.

Post-Katrina location

A logical next question is whether the same variables that account for returning to one's pre-Katrina home also account for returning to the New Orleans metropolitan area. Participants who were able to return to their pre-Katrina home also, by definition, returned to the New Orleans MSA since all of them had resided there prior to Katrina. But do the same factors that influence return to one's pre-Katrina home also influence return to New Orleans? Following the strategy used in the analysis of return to a pre-Katrina home, I present four models: one for each set of independent variables and the combined model.

The same socio-demographic characteristics that influence returning to a pre-Katrina home -- race and age of children -- also influence returning to New Orleans (model 1). However, these variables only explain about 4 percent of the variation in the dependent variable and fit the data poorly. Similarly, housing characteristics explain less about returning to New Orleans than returning to one's home. Pre-Katrina housing tenure and public housing residence operate in the predicted directions, but fall below statistical significance in predicting return migration. Receipt of insurance payments is also insignificant in the return migration model. Only housing damage, as expected, is influential in explaining return to New Orleans. Those who suffered substantial and enormous damage have odds of returning that are 57% and 91%, respectively, of those who suffered only minimal damage (model 2). Still, housing variables explain 12% of the variation in the dependent variable, more than the other two partial models. Only two of the measures of hurricane exposure and mental health are significant in the return migration model. Those who evacuated prior to Katrina have odds of return migration that are 3 times those of those who waited. However, for each additional trauma a

participant experienced their odds of returning to New Orleans diminished by 6%. These variables do a poor job of explaining variation in the dependent variable.

In the combined model many of these variables are no longer significant, presumably because of their correlation with housing damage and evacuation timing which are the only variables that remain statistically significant. Housing damage is an obvious deterrent to return to New Orleans, because dwellings were made uninhabitable, but also because of the shortage of temporary or permanent rental housing in the area. This model suggests that factors operating at the community level – such as the housing market and the provision of emergency and temporary housing – were more influential than individual-level characteristics in shaping return migration to New Orleans.

Discussion

To be written…

References

Brodie, M., E. Weltzien, D. Altman, R.J. Blendon, J.M. and Benson. 2006. “Experiences of Hurricane Katrina evacuees in Houston shelters: Implications for future planning. American Journal of Public Health, 96: 1402-1408.

Burby, Raymond J., Laura J. Steinberg, and Victoria Basolo. 2003. “The Tenure Trap: The Vulnerability of Renters to Joint Natural and Technological Disasters.” Urban Affairs Review, 39(1): 32-058.

Comerio, Mary C. 1997. “Housing Issues after Disasters.” Journal of Contingencies and Crisis Management, 5(3): 166-178.

Conley, Dalton. 2001. “A Room with a View or a Room of One’s Own: Housing and Social Stratification.” Sociological Forum 16(2): 263-280.

Cutter, Susan L., Bryan J. Boruff, and W. Lynn Shirley. 2003. “Social Vulnerability to Environmental Hazards.” Social Science Quarterly, 84(2): 242-261.

Fothergill, Alice, Enrique G.M. Maestas, and JoAnne DeRouen Darlington. 1999. Disasters, 23(2): 156-173.

Elizabeth Fussell, Narayan Sastry, Mark VanLandingham. 2010. “Race, Socio-economic Status, and Return Migration to New Orleans after Hurricane Katrina.” Population and Environment. 31: 20-42.

Laska, Shirley, and Betty Hearn Morrow. 2006. “Social Vulnerabilities and Hurricane Katrina: An Unnatural Disaster in New Orleans.” Marine Technology Society Journal, 40(4): 16-26.

Quarentelli, E.L. 1995. “Patterns of shelter and housing in U.S. disasters.” Disaster Prevention and Management 4(3): 43-53.

Rosenbaum, Emily. 1996. “Racial/Ethnic Differences in Home Ownership and Housing Quality, 1991.” Social Problems, 43(4): 403-426.

Table 1. Variables used in the analysis

Variables	Mean or %	s.d.	Min.	Max.
Dependent variables				
Current type of residence				
Pre-Katrina home	23.3		0=no	1=yes
A new home	59.9		0=no	1=yes
A temporary home	16.7		0=no	1=yes
Current place of residence				
In New Orleans MSA	52.2		0=no	1=yes
Independent variables				
Days since Katrina	356.9	74.6	256	560
Gender	96.5		0=M	1=F
Age at Katrina	26.6	4.4	19	35
Number of children	1.8	0.9	1	7
Lives with spouse/partner	44.7		0=no	1=yes
Lives with child less than age13	28.5		0=no	1=yes
Lives with child age 13 to 18	93.1		0=no	1=yes
Non-Hispanic white	11.2		0=no	1=yes
Non-Hispanic black	83.6		0=no	1=yes
Other race / ethnicity	5.2		0=no	1=yes
Pre-Katrina public housing / Section 8	15.3		0=no	1=yes
Pre-Katrina homeowner	14.4		0=no	1=yes
Pre-Katrina renter	69.7		0=no	1=yes
Pre-Katrina lived with family/friends	15.9		0=no	1=yes
Minimal damage to pre-Katrina house	15.9		0=no	1=yes
Moderate damage to pre-Katrina house	19.0		0=no	1=yes
Substantial damage to pre-Katrina house	19.9		0=no	1=yes
Enormous damage to pre-Katrina house	44.7		0=no	1=yes
Received insurance payment for damage	29.7		0=no	1=yes
Received payments from FEMA	83.9		0=no	1=yes
Received payments from other organization	81.8		0=no	1=yes
Evacuated before Katrina struck	85.6		0=no	1=yes
Experienced any injuries or traumas	87.0		0=no	1=yes
Number of injuries or traumas (listed below):	3.6	2.5	0	9
Lacked fresh water	24.5		0=no	1=yes
Lacked food	33.1		0=no	1=yes
Felt life was in danger	29.5		0=no	1=yes
Lacked necessary medication	31.1		0=no	1=yes
Lacked necessary medical care	28.0		0=no	1=yes
Family member lacked medical care	30.7		0=no	1=yes
Didn’t know if child was safe	22.8		0=no	1=yes
Didn’t know if other family was safe	77.2		0=no	1=yes
Family or friend died as a result of disaster	28.9		0=no	1=yes
Pre-Katrina K6 score above 12	7.2		0=no	1=yes
N	347			

Table 2. Bi-variate relationship between prek-Katrina tenancy relationship, current housing, and return to New Orleans MSA.

	% in pre-K home	% in new home	% in temporary housing	% in NOLA MSA
Owned pre-K home	46.0	32.0	22.0	68.0
Rented pre-K home	16.1	68.6	15.3	45.5
Lived with family, friends, or another situation	34.5	47.3	18.2	67.3
Pearson chi2		31.6		14.4
Degrees of freedom		4		2
Probability		0.0001		0.001

Table 3. Multinomial logit models predicting return to pre-Katrina home or temporary living conditions versus living in new home

	RRR	P>z	RRR	P>z	RRR	P>z	RRR	P>z	RRR	P>z	RRR	P>z	RRR	P>z	RRR	P>z
Days since Katrina	**0.99**	0.02	1.00	0.80	**0.99**	0.00	1.00	0.75	**0.99**	0.02	1.00	0.86	**0.99**	0.01	1.00	0.38
Gender (female=ref.)	1.61	0.54	1.09	0.92									1.38	0.74	1.24	0.81
Age at Katrina	1.04	0.29	1.05	0.23									1.00	0.93	1.04	0.42
Number of children	0.84	0.30	**0.59**	0.01									0.97	0.86	**0.59**	0.02
Non-Hispanic white	**5.00**	0.00	1.36	0.58									0.90	0.76	1.16	0.66
Other race / ethnicity	**3.93**	0.02	**3.91**	0.04									**2.32**	0.04	**2.15**	0.06
Lives with spouse/partner	1.06	0.84	1.26	0.46									2.01	0.33	0.68	0.52
Lives with child age 13 to 18	**2.12**	0.03	**1.88**	0.09									1.19	0.72	0.78	0.67
Lives with child less than age 13	1.72	0.40	0.74	0.59									1.14	0.87	3.19	0.11
Pre-K lived in public housing					**0.22**	0.01	**0.21**	0.01					**0.18**	0.01	**0.23**	0.03
Pre-K homeowner					**3.14**	0.03	**2.36**	0.10					**2.52**	0.10	1.66	0.41
Pre-K lived with family/friends					1.75	0.21	1.53	0.34					1.40	0.47	1.62	0.31
Moderate damage to pre-K house					0.62	0.27	0.83	0.75					0.65	0.36	1.12	0.85
Substantial damage to pre-K house					**0.18**	0.00	0.74	0.58					**0.16**	0.00	0.96	0.95
Enormous damage to pre-K house					**0.04**	0.00	0.62	0.34					**0.05**	0.00	0.84	0.75
Insurance payment for damage					**2.20**	0.06	1.16	0.72					**2.39**	0.05	1.39	0.46
Payments from FEMA					1.02	0.97	1.57	0.36					0.89	0.80	1.79	0.26
Payments from other organization					1.12	0.78	1.27	0.58					1.13	0.79	1.31	0.56
Evacuated before Katrina struck									**4.60**	0.02	1.64	0.31	**3.56**	0.09	1.61	0.38
Experienced any injuries or traumas									**2.39**	0.09	0.74	0.55	2.45	0.17	0.63	0.41
Number of injuries or traumas									**0.82**	0.01	0.90	0.18	0.91	0.31	0.90	0.26
Pre-Katrina K6 score over 12									1.95	0.23	**3.84**	0.01	2.68	0.15	**4.54**	0.01
Number of obs	347				347				347				347			
Degrees of freedom	18				20				10				44			
LR chi2(38)	46.16				122.79				40.23				161.97			
Prob > chi2	0.00				0.00				0.00				0.00			
Pseudo R2	0.07				0.19				0.06				0.25			
Log likelihood =	-305.0				-266.7				-307.9				-247.1			

Table 4. Logistic regression predicting current residence in New Orleans MSA

	Odds	P>z	Odds	P>z	Odds	P>z	Odds	P>z
Days since Katrina	1.00	0.56	1.00	0.52	1.00	0.57	1.00	0.53
Gender (female=ref.)	2.01	0.27					1.68	0.46
Age at Katrina	0.99	0.80					0.97	0.35
Number of children	0.83	0.15					0.86	0.28
Non-Hispanic white	**2.92**	0.01					1.07	0.87
Other race / ethnicity	**3.82**	0.02					2.30	0.20
Lives with spouse/partner	1.32	0.23					1.35	0.24
Lives with child age 13 to 18	**1.58**	0.10					1.54	0.16
Lives with child less than age 13	1.40	0.47					1.60	0.34
Pre-K lived in public housing			0.59	0.12			0.64	0.21
Pre-K homeowner			1.56	0.29			1.46	0.40
Pre-K lived with family/friends			1.78	0.11			1.58	0.23
Moderate damage to pre-K house			0.95	0.90			1.01	0.98
Substantial damage to pre-K house			**0.43**	0.03			**0.41**	0.04
Enormous damage to pre-K house			**0.19**	0.00			**0.21**	0.00
Insurance payment for damage			1.44	0.25			1.43	0.28
Payments from FEMA			1.28	0.48			1.18	0.65
Payments from other organization			1.19	0.59			1.37	0.34
Evacuated before Katrina struck					**2.98**	0.00	**2.48**	0.02
Experienced any injuries or traumas					1.07	0.86	1.01	0.98
Number of injuries or traumas					**0.94**	0.10	0.96	0.51
Pre-Katrina K6 score over 12					0.96	0.92	1.04	0.93
Number of obs	347		347		347		347	
Degrees of freedom	9		10		5		22	
LR chi2	20.85		57.99		17.63		74.54	
Prob > chi2	0.01		0		0.0035		0	
Pseudo R2	0.04		0.1207		0.0367		0.1552	
Log likelihood =	-230		-211.2		-231		-202.9	