

## The Location of Displaced New Orleans Residents in the Year After Hurricane Katrina

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**Abstract** Using individual data from the restricted version of the American Community Survey, we examined the displacement locations of pre-Hurricane Katrina adult residents of New Orleans in the year after the hurricane. More than one-half (53 %) of adults had returned to—or remained in—the New Orleans metropolitan area, with just under one-third of the total returning to the dwelling in which they resided prior to Hurricane Katrina. Among the remainder, Texas was the leading location of displaced residents, with almost 40 % of those living away from the metropolitan area (18 % of the total), followed by other locations in Louisiana (12 %), the South region of the United States other than Louisiana and Texas (12 %), and elsewhere in the United States (5 %). Black adults were considerably more likely than nonblack adults to be living elsewhere in Louisiana, in Texas, and elsewhere in the South. The observed race disparity was not accounted for by any of the demographic or socioeconomic covariates in the multinomial logistic regression models. Consistent with hypothesized effects, we found that following Hurricane Katrina, young adults (aged 25–39) were more likely to move further away from New Orleans and that adults born outside Louisiana were substantially more likely to have relocated away from the state.

**Keywords** Hurricane Katrina · New Orleans population · Migration · Displacement · Disaster

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## Introduction

On the morning of August 29, 2005, Hurricane Katrina made landfall on the coast of Louisiana. The threat of the hurricane led to an evacuation order for New Orleans, and the subsequent levee failures resulted in virtually all remaining individuals being forced to leave the city. For many, the displacement was temporary; for others, displacement was extended and possibly permanent.

The return to New Orleans among residents of the city displaced by Hurricane Katrina has been described and analyzed in a number of studies (Fussell et al. 2010; Groen and Polivka 2010; Paxson and Rouse 2008; Sastry and Gregory 2012). For example, Sastry and Gregory (2012) found a lower likelihood of return to New Orleans in the year after Hurricane Katrina for blacks, residents of flooded areas, young adults, noncitizens, those born outside Louisiana, and renters. These findings suggest that displaced residents who faced greater costs and fewer benefits from returning were less likely to do so, consistent with general and post-disaster theories about migration decision-making (e.g., Greenwood 1993; Hunter 2005; Morrow-Jones and Morrow-Jones 1991).

Information about the locations of displaced New Orleans residents who did not return to the city and knowledge about the factors that shaped location choices away from New Orleans are, however, almost entirely missing from the literature. Reports from the National Academy of Sciences (2007) and Briggs (2006) noted that little is known regarding the whereabouts of displaced New Orleans residents. Examining the location of displaced residents—and the demographic and socioeconomic factors associated with moves to particular types of displacement locations—addresses a number of important gaps in knowledge that are the consequence of displacement on this scale being a relatively rare event, particularly in the United States. Although natural disasters occur infrequently, it is crucial to understand whether migration theory in general and the hypothesized relationships between migration and key demographic and socioeconomic factors operate as expected, or whether the theory and hypotheses need to be modified to account for significant differences. Although the analysis presented here is largely descriptive, it does provide a foundation for developing such an understanding in the future when richer data may be available.

Only a handful of studies, most of them preliminary or exclusively descriptive, have investigated where displaced residents from New Orleans resided in the post-Hurricane Katrina period. The earliest of these studies were based on U.S. Postal Service (USPS) change-of-address records in the initial months after the hurricane (e.g., Tizon and Smith 2005) and reports from the Federal Emergency Management Authority (FEMA) and news sources (e.g., Nigg et al. 2006). These studies found that many displaced households remained close to New Orleans. However, residents from poorer and predominately black areas of the city were more likely to have been displaced to more distant locations, with the main destinations outside the New Orleans metropolitan area being Houston, Baton Rouge, Dallas, and Atlanta (Tizon and Smith 2005). The leading initial receiving evacuation site was Houston; from there, evacuees were resettled to other locations in Texas (such as Dallas and San Antonio) as well as to other states (such as Arkansas) (Nigg et al. 2006). Nigg and colleagues determined that by the end of September 2005, evacuees were registered in every state and almost one-half the zip codes of the USPS, although three-quarters were within 250 miles of New Orleans.

Although FEMA records provided timely initial information about the location of displaced individuals immediately after Hurricane Katrina, the agency released tabulated counts of displaced residents only by metropolitan area and did not release counts for finer geographic areas or individual-level data (Plyer et al. 2010).

In a descriptive analysis that drew on public-use data from the American Community Survey (ACS) and migration data from the Internal Revenue Service (IRS), Frey et al. (2007) found that in the 2006 calendar year, black and low-income displaced residents were more likely to be living in distant locations, but whites and higher-income movers were more likely to have been displaced to nearby locations. The primary destinations for blacks and whites were, respectively, the Houston and New Orleans metropolitan areas. Most remaining studies that examined the location of displaced residents were based on samples that were small, lacked pre-Hurricane Katrina comparisons, and were nonrepresentative (e.g., Li et al. 2010), and hence do not provide generalizable results. Other studies (e.g., Hori et al. 2009; Landry et al. 2007; Myers et al. 2008; Weber and Peek 2012) focused on displacement to specific locations or within a circumscribed geographic area—for example, the 18 parishes in Louisiana affected by Hurricane Katrina in the case of Hori et al.'s (2009) analysis—and described only aggregate migration flows. These latter studies have highlighted one of the key limitations associated with studies of the demographic effects of disasters: namely, the lack of representative and detailed individual-level data (Stallings 2006). To the best of our knowledge, no studies have investigated the relationship between the location choices of displaced New Orleans residents and individual characteristics hypothesized to shape these choices.

In the analyses outlined in this article, we used detailed individual data from the restricted version of the U.S. Census Bureau's American Community Survey (ACS) to examine the displacement locations of pre-Hurricane Katrina residents of New Orleans in the year after the hurricane. Although Hurricane Katrina affected other areas along the Gulf Coast, we focus exclusively on New Orleans because it was the location with by far the largest population among these areas, which in turn provided an adequate sample size for a location-specific analysis. We address a number of unanswered research questions about the effects of Hurricane Katrina on the New Orleans population. Where did displaced New Orleanians reside in the year following the hurricane? What factors influenced where people lived; in particular, how did the location of displaced residents vary by demographic and socioeconomic characteristics? The restricted ACS provides a unique opportunity to examine the geographic dispersion of New Orleans residents in the year after Hurricane Katrina: the survey contains a nationally representative sample that includes a large number of individuals who lived in New Orleans prior to Katrina regardless of where in the United States they had relocated.

## Conceptual Issues and Background

Long-term displacement or resettlement resulting from natural or human-caused disasters has little precedent in the United States and other industrialized countries. Bates (2002:469) is typical in characterizing natural disasters as “acute disruptions” that produce “short-term” displacements of people from a “geographically limited area.” In this sense, the large-scale population displacement resulting from Hurricane Katrina

was largely unimagined. Prior to Hurricane Katrina, Hurricane Andrew of 1992 had been by far the costliest natural disaster in the United States in recent history. It led to the evacuation of 350,000 residents of Dade County, Florida, although only about 40,000 residents were permanently displaced; of these displaced residents, approximately one-half relocated to neighboring Broward County (Smith and McCarty 1996). In contrast, the entire population of New Orleans—comprising 454,000 inhabitants—was displaced by Hurricane Katrina; our results suggest that about one-half of this population was displaced away from the New Orleans metropolitan area in the year after the hurricane.

The two general types of migration following a natural disaster are forced migration (evacuation), which may be mandated and is typically temporary; and voluntary migration resulting from an increase in “push factors” (Hunter 2005). In contrast to the generally positive selection of internal migrants under normal circumstances (Greenwood 1993)—that is, the higher likelihood of moving among those with, for example, higher socioeconomic status (SES) and better health—permanent migrants in response to natural disasters in the United States have typically been negatively selected, especially those who move longer distances. In particular, people who move because of a natural disaster tend to be older, racial or ethnic minorities, socioeconomically disadvantaged, and from female-headed households (Morrow-Jones and Morrow-Jones 1991).

Although a natural disaster may induce people to move, migrants are often still able to choose their destination—if not initially, then usually at a subsequent move. News accounts have suggested, for example, that Hurricane Katrina evacuees in Atlanta may differ from evacuees in Houston because the former comprise more evacuees who chose their destination rather than being sent there by authorities (Ellison 2006). People’s cost-benefit decisions about their migration destinations (Sjaastad 1962; Lee 1966) are likely to be influenced by characteristics such as age, sex, marital status, number of children, employment, occupation, and previous migration experience (Greenwood 1985; Long 1992), as well as by social networks (Stark and Bloom 1985) and contextual factors. Groen and Polivka (2010) and others (e.g., Landry et al. 2007; Sastry and Gregory 2012) have outlined a conceptual framework that has been widely used to analyze post-Hurricane Katrina migration decision-making. This conceptual framework expands and modifies the standard human-capital investment approach to analyzing migration by accounting for the nature of the initial displacement event; location-specific capital, services, and amenities in New Orleans compared with other places; and the costs and uncertainty associated with return and rebuilding. We adopt this conceptual framework and briefly describe the distinct ways in which it applies to analyzing the locations of displaced New Orleans residents. However, we are constrained in our ability to examine many aspects of this framework because of the limited measures available in the ACS; hence, although our analysis is informed by migration theory, it is primarily descriptive.

New Orleans population trends prior to Hurricane Katrina are likely to have played a role in determining post-disaster outcomes. The New Orleans metropolitan area comprises seven parishes, of which Orleans Parish—with 454,863 inhabitants in 2005—had the largest pre-Hurricane Katrina population; the city accounted for about one-third of the total population of 1,338,000 for the metropolitan area (U.S. Census Bureau 2005). The Orleans Parish boundaries correspond precisely with the incorporated limits of the City of New Orleans. In the years prior to Hurricane Katrina, New Orleans was

steadily losing population. Between 1970 and 2000, the city's population declined by 18 %, from 594,000 to 485,000 inhabitants (U.S. Census Bureau 2001), and it decreased by an additional 6 % (down 30,000 residents) from 2000 to 2005 (U.S. Census Bureau 2005). As a result, there were established migration flows to the leading destinations and networks of friends and contacts in those cities. This situation potentially reduced the cost for residents of New Orleans displaced by Hurricane Katrina to resettle in these new sites. Declining population in New Orleans also meant that many people may have been considering leaving the city and, after being forced to evacuate, may have planned not to return. Findings from research on previous natural disasters—such as Hurricane Andrew (Solecki 1999)—suggest that existing demographic trends were accelerated by these events.

The composition and characteristics of the New Orleans population at the time of Hurricane Katrina also shaped the effects of the hurricane on the city's population. According to the 2004 ACS, the majority (69 %) of New Orleans residents were black. Whites accounted for 28 % of the city's population and Asians accounted for 2 %. New Orleans experienced high rates of poverty prior to Hurricane Katrina, with 28 % of the city's residents living in poverty—a rate that was among the highest in the nation (U.S. Census Bureau 2000). As elsewhere, such high rates of poverty were more spatially concentrated over time and were increasingly associated with crime; shortfalls in the provision of basic services, such as health care and education; illiteracy; substandard housing; and lack of opportunity (Fussell et al. 2010). High rates of poverty and disadvantage among the pre-Hurricane Katrina population of New Orleans were likely to have affected evacuation destinations, displacement locations, and the likelihood of return for disadvantaged families differently compared with nondisadvantaged families. The choice of where to evacuate and resettle may have been constrained among poor families because of their limited resources. This may have made it challenging for them to reestablish connections with displaced friends; and because they could not afford the cost of return visits to the city, they may have been constrained in interacting with neighbors who had returned. Another issue concerns the downsides to returning to the concentrated poverty neighborhoods in New Orleans, particularly for many poor people who experienced better neighborhood environments, job opportunities, schools, and amenities in their new locations. A final issue is that low rates of homeownership among the poor placed a significant barrier for returning to the city because of the difficulty of finding rental housing in post-Hurricane Katrina New Orleans; conversely, though, renters did not have to resolve the status of an owned home before deciding to relocate away from the city. Homeowners who were poor had a dwelling to return to in New Orleans but faced considerable challenges in renovating their dwelling or in selling their home if they decided to relocate away from the city.

In summary, the locations in the year after Hurricane Katrina among New Orleans residents displaced by the hurricane are likely to have been strongly related to basic socioeconomic and demographic factors.

## Data and Methods

Data for this study come from the restricted version of the U.S. Census Bureau's ACS, which provides a unique source of information for examining post-Hurricane Katrina

migration location decisions. The ACS includes a large sample of pre-Hurricane Katrina residents of New Orleans whose residential locations throughout the country are observed in the year after the hurricane. We reweighted this sample to more accurately match the pre-Hurricane Katrina population of New Orleans and to overcome a concern that the post-Hurricane Katrina sample may underrepresent certain segments of the population because of differential nonresponse, choices about dwelling type and living arrangements, and other factors.

The ACS, designed to replace the long form of the decennial census, is based on a series of monthly national samples and is fielded continuously (U.S. Census Bureau 2006). The annual sample comprises 2.3 % of households in the United States, for a total of approximately 3 million units. The ACS is primarily a mail survey, although there is a telephone follow-up for nonrespondents to the mailed questionnaire and an in-person follow-up for nonrespondents to the telephone interview. The ACS includes 25 housing and 42 population questions, covering topics such as basic demographic characteristics, schooling, employment, disability, commuting, and dwelling characteristics. An identical set of questions was included in each year of the ACS from 2003 to 2006. The ACS questionnaire is generally completed by one household respondent, who is a member of the household at least 18 years of age. The ACS achieves a 98 % response rate, and data quality and completeness are very high (National Academy of Sciences 2007).

Residence rules for the ACS, which determine who is considered a resident at a sampled address, are based on a modified *de facto* rule. Everyone who is currently living or staying at a sampled address is considered a resident, except for people staying there for no more than two months. The two-month rule might have led to displaced New Orleans residents being missed by the ACS except that in the aftermath of Hurricane Katrina, respondents were asked to consider as residents any evacuees who were in the household.

Our analysis is based on ACS restricted data from the 10-month period in the first year after the hurricane, from November 2005 to August 2006. The restricted ACS data include the interview date, allowing us to precisely identify those who lived in New Orleans prior to Hurricane Katrina. Another major advantage of the ACS restricted data is that they provide approximately two-and-one-half times as many cases as the public-use data. Finally, the restricted ACS provides unaltered data, in contrast to the public-use version, which includes recodes and edits to protect respondent confidentiality.

For each person in an ACS household reported to have been living in a different dwelling one year previously, the respondent was asked for the location of that previous residence. The response to this question provided the necessary information for identifying every person in an ACS household, from throughout the entire United States, who was living in Orleans Parish one year previously. To this group, we added people who were currently residing in Orleans Parish and who reported living in the same dwelling one year previously. We thus were able to construct a complete sample of individuals in the ACS from the year after Katrina who were living in New Orleans prior to the hurricane.

The ACS is well suited to our analysis of place of residence in the year after Hurricane Katrina, although it has some limitations. First, households selected for the ACS are interviewed only once in the study period and provide neither retrospective reports on residential locations or residential durations nor information on whether their

current location is temporary or permanent; thus, the pattern of rapid, short-term migration across multiple locations that is likely to have occurred for at least some individuals in the year after Hurricane Katrina is missed by the survey. A second limitation is that our analysis is based on pooled data for the 10-month period between November 2005 and August 2006, and hence it covers initial displacement moves as well as more permanent resettlement. Pooling over the study period provides valuable information about the weighted “average” location of displaced New Orleans residents and is necessary to maximize the sample size for the analysis; stratifying the sample (even into two groups) by date of interview to examine differences in displacement locations over time leads to loss of precision in the estimates.

### Propensity Score Weights

We constructed propensity score weights (DiNardo et al. 1996; Rosenbaum and Rubin 1983) to reweight our analysis sample and address potential concerns about the representativeness of the post-Hurricane Katrina sample of pre-hurricane New Orleans residents. The reweighting approach allowed us to adjust for differences in the distributions of observed individual characteristics between the constructed post-Hurricane Katrina sample and a reference sample comprising all actual residents of New Orleans in the ACS from a 20-month period between January 2004 and the date of Hurricane Katrina in August 2005. The main assumption underlying propensity score reweighting is that there are no unobserved effects (operating to influence the likelihood of an observation appearing in the post-Hurricane Katrina sample compared with the pre-Hurricane Katrina sample) that are correlated with the disturbance terms in the migration model. Through the use of propensity score reweighting, we directly addressed the problem of imbalances between the pre- and post-Hurricane Katrina samples by aligning the two samples based on information from a broad range of observed, time-invariant covariates. The propensity score weights thus served to make the two samples more observationally similar to each other, thereby providing a greater level of confidence that results for the post-Hurricane Katrina period are due to the hurricane rather than to changes in the composition of the sample being examined.

The estimated propensity score is a number in the unit range and represents the probability that an observation is from the post-Hurricane Katrina period, given the observed set of characteristics. The propensity score was obtained by pooling the pre- and post-Hurricane Katrina cross-sectional data and estimating a logistic regression model that incorporated the ACS person-sampling weights. The model included categorical variables that were time-invariant (e.g., sex and race/ethnicity) and unaffected by the hurricane (e.g., age in five-year intervals and educational attainment). Because the representativeness of the post-Hurricane Katrina sample may have varied over time, we estimated a separate propensity score model for each two-month interval in the post-Hurricane Katrina period. Complete details about the construction of the propensity score weights are provided in Online Resource 1. The propensity score was calculated as the predicted probability that an observation came from the post-Hurricane Katrina cross-section, which was then used to construct the associated weight.

The estimated propensity score weights substantially enhanced the observed balance between the pre- and post-Hurricane Katrina samples (see Online Resource 1 for details). The underlying models fit the data well, and the covariates were plausibly

exogenous. If the covariates used in the propensity score model were strongly correlated with whether an observation appeared in the pre- or post-Hurricane Katrina cross-section, then the estimated weights may take on extremely large values for some individuals. Variability in weights is a potential problem because individuals with large weights can dominate the weighted analysis, which can lead to large variances of the estimates. We examined variability in the weights and found this not to be a problem.

For our analyses, we used the product of the estimated propensity score weights,  $w_i$ , and the ACS person sampling weights,  $s_i$ . We normalized these weights so that the mean of the products of the two weights equals 1.

### Preliminary Analysis of ACS Data

Our preliminary analysis of the ACS data focused on several issues. First, we investigated the representativeness of the post-Hurricane Katrina sample through discussions with Census Bureau staff and an analysis of the ACS data. Second, we examined characteristics of the sample and the survey measures in order to determine what types of restrictions to the analysis sample were necessary.

The disruption associated with Hurricane Katrina and its aftermath obviously had a major effect on fieldwork operations for the ACS. We determined that ACS data for September and October 2005 were not reliable. However, by November 2005, ACS operations in the region affected by Hurricane Katrina were back to normal, and the new instructions to include any evacuees because of Hurricane Katrina in the list of household residents were operating effectively.

We restricted both the pre- and post-hurricane Katrina analysis samples to those aged 25 and older as of December 31, 2005. Because most adults have completed their schooling by this age (or have entered the highest education category), this restriction allowed us to consider educational attainment as an age- and time-invariant characteristic and to use it as a proxy for SES. Given the ACS's very high levels of item completeness, almost no observations needed to be dropped because of missing information on key variables.

Our analysis focuses on the place of residence in the year after Hurricane Katrina among the pre-hurricane population of New Orleans, and is based on individuals' reported location at the time of the ACS interview. Individuals outside Louisiana were classified first by state and then, based on a preliminary analysis, into three separate locations—Texas, elsewhere in the South Census Region other than Louisiana and Texas,<sup>1</sup> and elsewhere in the United States outside the South Region. Among individuals within Louisiana, we classified those in the New Orleans metropolitan area separately from those elsewhere in the state. This final set of location categories represents five distinct geographic areas. Although the categories are not strictly ordered by distance from New Orleans, they reflect the predominant locations of displaced residents that balance the size of each category against its geographical distinctiveness.

<sup>1</sup> Oklahoma, Arkansas, Tennessee, Mississippi, Kentucky, Alabama, West Virginia, Virginia, South Carolina, North Carolina, Maryland, Georgia, Florida, the District of Columbia, and Delaware.



## Variables

Independent variables for our analysis include basic demographic characteristics, such as each individual's age, race, and sex; background variables, such as place of birth, veteran status, and citizenship; and SES, measured by educational attainment. These variables represent the basic underlying factors that shape migration decision-making and reflect the limits to the types of measures collected in the ACS. However, certain of these variables provide insights into other processes hypothesized to affect choices regarding place of residence: for example, the place-of-birth variable that identifies Louisiana-born adults indicates the likelihood of having stronger local family and friendship ties. Veterans, noncitizens, and those born outside Louisiana are all more likely to have lived outside the state and to have social or family ties elsewhere that make the likelihood of relocating away from New Orleans following Hurricane Katrina substantially greater.

Summary statistics for the independent variables are presented in Table 1. The two columns in this table both show estimates for the same population—namely, the pre-Hurricane Katrina adult population of New Orleans aged 25 and older—based on two independent samples. The first column shows estimates for the period prior to the hurricane (based on a total of 3,525 observations), and the second column shows estimates for the post-hurricane period (2,784 separate observations). The pre-Hurricane Katrina estimates are weighted using the ACS person sampling weights; the post-Hurricane Katrina estimates are weighted using the ACS person sampling weights and the propensity score weights. The first result to note is the similarity between the estimates in these two columns. Although there are a few minor differences, the sampling weights and the propensity score weights generally yield close estimates of characteristics for the same population at two points in time.

The estimates themselves show that almost two-thirds of the pre-Hurricane Katrina adult population of New Orleans was black. Just under one-half of adults had a high school diploma or less education, about 20 % had some college, and the remaining 30 % had a bachelor's or graduate degree. Thirty percent of the adult population were young adults aged 25–39, 45 % were middle-aged adults (aged 40–59), and the remaining one-quarter were aged 60 or older. The population had more females (55 %) than males (45 %). About three-quarters of pre-Hurricane Katrina adult residents of New Orleans were born in the state, and well over 90 % were U.S. citizens.

## Statistical Models

We estimated weighted multinomial regression models to examine the location of displaced New Orleans residents in the year after Hurricane Katrina based on the five location categories. We report robust standard error estimates, which adjust for the clustering of individuals by household.

## Results

We present results of a descriptive analysis first, before turning to the results of our regression analysis.

**Table 1** Descriptive statistics for pre-Katrina adult residents of New Orleans in 2004–2005 (pre-Katrina) and in 2005–2006 (post-Katrina)

Variable	2004–2005 ACS (%)		2005–2006 ACS (%)	
<b>Race</b>				
Black	62.7	(1.5)	61.6	(1.5)
Nonblack	37.3	(1.5)	38.4	(1.5)
<b>Education</b>				
High school dropout	17.5	(1.0)	17.2	(1.0)
High school	29.8	(1.3)	29.1	(1.2)
Some college	22.2	(1.0)	22.6	(1.1)
Bachelor's degree	19.2	(1.1)	19.8	(1.1)
Graduate degree	11.3	(0.7)	11.3	(0.7)
<b>Age</b>				
25–39	30.6	(1.3)	30.3	(1.3)
40–59	44.3	(1.3)	44.6	(1.3)
60+	25.0	(1.1)	25.1	(1.1)
<b>Sex</b>				
Female	55.6	(0.9)	54.9	(1.0)
Male	44.4	(0.9)	45.1	(1.0)
<b>Place of Birth</b>				
Louisiana	73.1	(1.2)	73.1	(1.2)
Elsewhere	26.9	(1.2)	26.9	(1.2)
<b>Marital Status</b>				
Ever married	70.7	(1.2)	70.1	(1.3)
Never married	29.3	(1.2)	29.9	(1.3)
<b>Citizenship</b>				
U.S.	92.9	(0.8)	93.2	(0.8)
Non-U.S.	7.1	(0.8)	6.8	(0.8)
<b>Veteran</b>				
Yes	89.8	(0.6)	87.3	(0.8)
No	10.2	(0.6)	12.7	(0.8)
Observations	3,525		2,784	

*Notes:* Standard errors are in parentheses. The 2004–2005 ACS estimates are based on individuals residing at the time in the City of New Orleans and are weighted using the ACS weights; the 2005–2006 ACS estimates are based on individuals throughout the United States who reported living in the City of New Orleans one year previously and are weighted using the product of the ACS weights and the propensity score weights.

## Descriptive Results

Table 2 shows that more than one-half (53 %) of pre-Hurricane Katrina adult residents of New Orleans had returned to—or remained in—the New Orleans metropolitan area in the year after the hurricane, with just under one-third of the total returning to the dwelling in which they resided prior to Hurricane Katrina. One-quarter of those who returned to Orleans Parish (13 % of the total) did so to a different dwelling, and the

**Table 2** Residential location after Katrina of pre-Katrina adult residents of New Orleans

Location	All	Race	
		Black	Nonblack
New Orleans Metropolitan Area	52.5	43.6	66.8
Pre-Hurricane Katrina dwelling	31.4	22.3	46.0
Different dwelling in City of New Orleans	13.2	14.8	10.6
Metropolitan New Orleans, outside City of New Orleans	7.9	6.5	10.3
Elsewhere in Louisiana	12.3	14.6	8.7
Texas	18.3	25.5	6.8
South Region outside Louisiana and Texas	11.7	12.8	10.0
Georgia	3.4		
Alabama	1.8		
Mississippi	1.7		
Florida	1.7		
Maryland	0.7		
Arkansas	0.7		
Tennessee	0.6		
South Carolina	0.4		
Other state in South <sup>a</sup>	0.9		
U.S. Outside South	5.2	3.5	7.7
California	1.1		
New York	0.5		
Ohio	0.4		
Other U.S. state	3.1		
Total	100.0	100.0	100.0
Observations	2,784	1,434	1,350

*Notes:* Estimates based on 2005–2006 ACS respondents from throughout the United States who reported living in the City of New Orleans one year previously.

<sup>a</sup> Oklahoma, Kentucky, North Carolina, West Virginia, Virginia, Delaware, and the District of Columbia.

remainder (15 % of the returned; 8 % of the total) resided in a different dwelling in the metropolitan area outside Orleans Parish.

There were major disparities in return rates by race, with blacks substantially less likely to return to the New Orleans metropolitan area than nonblacks (44 % vs. 67 %). Differences by race were larger in returning to the same dwelling (22 % for blacks vs. 46 % for nonblacks) than in returning to a different dwelling in the city or in the metropolitan area outside Orleans Parish.

In the year after the hurricane, just under one-half (47 %) of pre-Hurricane Katrina adults from New Orleans were displaced, which we define as residing away from the metropolitan area. Texas was the leading location of displaced residents, with almost 40 % of those who were living away from the metropolitan area (18 % of the total). The numbers in Texas exceeded those who had relocated to another place in Louisiana (about one-quarter of those away from the New Orleans metropolitan area; 12 % of the total).

The South region of the United States (other than Louisiana and Texas) was the location of about one-quarter of the displaced population (12 % of the total), with the leading locations being Georgia (3.4 % of the total), Alabama (1.8 %), Mississippi (1.7 %), and Florida (1.7 %). Of note is the small percentage of displaced adult residents in neighboring states other than Texas: only 2 % of adults from New Orleans were in Arkansas or Mississippi in the year after Hurricane Katrina. In contrast, more than four of five (83 %) adults from New Orleans were in either Louisiana or Texas in the year following the hurricane. Finally, states outside the South were the location of just 5 % of pre-Hurricane Katrina adult residents of New Orleans, with California (1.1 % of the total), New York (0.5 %), and Ohio (0.4 %) being the three leading destinations.

Blacks were moderately more likely than nonblacks to be living elsewhere in Louisiana in the year after Hurricane Katrina (15 % vs. 9 %) but were substantially more likely than nonblacks to be residing in Texas (25 % vs. 7 %). A higher percentage of nonblacks than blacks were residing outside the South in the study period (8 % vs. 4 %).

### Regression Results

Our multinomial regression results are presented in Tables 3 and 4. Table 3 contains four panels, corresponding to each of the comparisons between the baseline (omitted) outcome of staying or returning to the New Orleans metropolitan area with the four other outcomes: residing elsewhere in Louisiana, in Texas, elsewhere in the South (other than Louisiana or Texas), or elsewhere in the United States. Each panel shows the results for race and education from six model specifications. The models examine the effects of race alone (Model 1), education alone (Model 2), race and education (Model 3), the full set of individual covariates (Model 4), race-education interactions alone (Model 5), and the full set of individual covariates with interactions between race and all covariates except citizenship and veteran status (Model 6). In Table 4, we present the full set of estimated results for all the covariates in Model 4.

The entries in Tables 3 and 4 show the exponentiated parameter estimates, along with robust standard errors (in parentheses) and an indicator of the statistical significance of each parameter estimate. The exponentiated parameters are interpreted as ratios of relative risks. Thus, the first entry in Table 3 shows that, compared with blacks (the omitted category), nonblacks had a relative risk of residing elsewhere in Louisiana compared with residing in the New Orleans metropolitan area that was lower by 0.387 times, or by 61 %. The three asterisks indicate that this coefficient is statistically significant at the .001 level. For models with interactions, we present parallel parameter estimates for blacks and nonblacks and discuss the estimated interaction effects (and statistical tests of these effects) in the text.

We begin by examining differences by race in the post-Hurricane Katrina location of adult New Orleanians from Model 1 in Table 3. Compared with blacks, nonblacks were substantially less likely to be residing elsewhere in Louisiana, in Texas, or elsewhere in the South relative to residing in the New Orleans metropolitan area; however, there were no statistically significant differences by race in the likelihood of residing elsewhere in the United States relative to living in the New Orleans metropolitan area. In other words, nonblacks were much more likely than blacks to have returned to (or remained in) the New Orleans metropolitan area in the year after

**Table 3** Multinomial logistic regression models of residential location among pre-Katrina adult residents of New Orleans

Variable	Model 5			Model 6				
	Model 1	Model 2	Model 3	Model 4	Black	Nonblack	Black	Nonblack
<b>A. Elsewhere in Louisiana vs. New Orleans Metro</b>								
Race (ref. = black)								
Nonblack	0.387*** (0.087)		0.437*** (0.108)	0.446*** (0.107)	0.136*** (0.062)	0.129*** (0.067)		
Education (ref. = high school)								
High school dropout		1.034 (0.271)	1.037 (0.280)	1.106 (0.294)	0.707 (0.193)	6.703** (4.567)	0.793 (0.221)	6.354** (4.094)
Some college		1.108 (0.269)	1.224 (0.300)	1.198 (0.299)	0.997 (0.300)	3.893** (1.821)	0.973 (0.297)	3.908** (1.867)
Bachelor's degree		0.544* (0.155)	0.770 (0.228)	0.740 (0.215)	0.717 (0.349)	2.135 (1.030)	0.713 (0.338)	2.009 (0.955)
Graduate degree		0.460** (0.133)	0.689 (0.199)	0.704 (0.207)	0.626 (0.289)	1.991 (0.968)	0.713 (0.335)	1.879 (0.919)
Total effect (ref. = black)								
Nonblack						0.387*** (0.097)		0.402*** (0.102)
<b>B. Texas vs. New Orleans Metro</b>								
Race (ref. = black)								
Nonblack	0.175*** (0.037)		0.190*** (0.046)	0.142*** (0.035)	0.256** (0.115)	0.166*** (0.085)		
Education (ref. = high school)								
High school dropout		1.161 (0.236)	1.167 (0.252)	1.245 (0.266)	0.920 (0.208)	2.920* (1.543)	1.026 (0.232)	2.494† (1.325)
Some college		1.021 (0.201)	1.199 (0.251)	1.151 (0.247)	1.223 (0.280)	0.603 (0.326)	1.180 (0.275)	0.511 (0.260)
Bachelor's degree		0.442*** (0.115)	0.823 (0.235)	0.801 (0.232)	1.159 (0.384)	0.295* (0.151)	1.177 (0.395)	0.226** (0.111)
Graduate degree		0.429*** (0.110)	0.901 (0.254)	0.869 (0.256)	1.131 (0.427)	0.617 (0.310)	1.262 (0.501)	0.407† (0.203)

Table 3 (continued)

Variable	Model 2		Model 3		Model 4		Model 5		Model 6	
Total effect (ref. = black)										
Nonblack							0.190***	(0.042)		0.134*** (0.033)
C. Elsewhere in South vs. New Orleans Metro										
Race (ref. = black)										
Nonblack	0.506***	(0.106)	0.478***	(0.111)	0.302***	(0.081)	0.364*	(0.150)		0.218*** (0.123)
Education (ref. = high school)										
High school dropout	0.928	(0.256)	0.931	(0.260)	0.950	(0.270)	0.613	(0.202)	3.418**	(1.567) 0.639 (0.215) 3.320** (1.476)
Some college	1.348	(0.321)	1.475	(0.355)	1.364	(0.346)	1.334	(0.384)	1.953 <sup>†</sup>	(0.789) 1.263 (0.379) 1.590 (0.658)
Bachelor's degree	0.964	(0.279)	1.319	(0.392)	1.226	(0.383)	1.394	(0.631)	1.567	(0.598) 1.422 (0.649) 1.126 (0.464)
Graduate degree	0.734	(0.212)	1.054	(0.323)	0.865	(0.273)	1.925 <sup>†</sup>	(0.766)	0.831	(0.366) 1.955 <sup>†</sup> (0.772) 0.484 (0.231)
Total effect (ref. = black)										
Nonblack									0.496***	(0.110) 0.293*** (0.080)
D. Elsewhere in United States vs. New Orleans Metro										
Race (ref. = black)										
Nonblack	1.426	(0.346)	1.395	(0.357)	0.730	(0.233)			0.740	(0.361) 0.486 (0.338)
Education (ref. = high school)										
High school dropout	1.002	(0.323)	1.000	(0.322)	0.927	(0.299)	0.841	(0.317)	1.663	(1.036) 0.833 (0.296) 1.365 (0.878)
Some college	1.401	(0.446)	1.335	(0.407)	1.249	(0.398)	0.547	(0.253)	3.135*	(1.478) 0.557 (0.267) 2.595 <sup>†</sup> (1.288)

**Table 3** (continued)

Variable	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6			
Bachelor's degree	1.244	(0.378)	1.078	(0.326)	0.992	(0.319)	1.022	(0.548)	1.594	(0.717)	1.035	(0.533)	1.140	(0.552)
Graduate degree	1.331	(0.476)	1.133	(0.408)	0.905	(0.348)	1.811	(1.055)	1.482	(0.755)	1.803	(1.055)	0.876	(0.462)
Total effect (ref. = black)														
Nonblack									1.318	(0.350)			0.735	(0.249)
Joint <i>F</i> Tests														
Education	2.463**		0.706		0.685		1.137		3.024***		0.925		3.614***	

*Notes:* Standard errors with household-level clustering are in parentheses; *N* = 2,784. Effects are estimated using restricted data from American Community Survey for November 2005 through the one-year anniversary of Hurricane Katrina and using ACS weights and estimated propensity score weights (see the text for details). Not shown for Models 4 and 6 are estimated parameters for age, sex, place of birth, marital status, citizenship, and veteran status; also not shown for Model 6 are interactions between race and each of these covariates except for citizenship and veteran status.

\**p* < .10; \*\**p* < .05; \*\*\**p* < .001

**Table 4** Multinomial logistic regression model of residential location after Katrina among pre-Katrina adult residents of New Orleans

Variable	A. Elsewhere in Louisiana vs. New Orleans Metro	B. Texas vs. New Orleans Metro	C. Elsewhere in South vs. New Orleans Metro	D. Elsewhere in U.S. vs. New Orleans Metro
Race (ref. = black)				
Nonblack	0.446*** (0.107)	0.142*** (0.035)	0.302*** (0.081)	0.730 (0.233)
Education (ref. = high school)				
High school dropout	1.106 (0.294)	1.245 (0.266)	0.950 (0.270)	0.927 (0.299)
Some college	1.198 (0.299)	1.151 (0.247)	1.364 (0.346)	1.249 (0.398)
Bachelor's degree	0.740 (0.215)	0.801 (0.232)	1.226 (0.383)	0.992 (0.319)
Graduate degree	0.704 (0.207)	0.869 (0.256)	0.865 (0.273)	0.905 (0.348)
Age (ref. = 40–59)				
25–39	1.602* (0.332)	1.796** (0.361)	1.746** (0.350)	2.647*** (0.730)
60+	0.706 (0.165)	0.698 <sup>†</sup> (0.141)	0.713 (0.168)	1.140 (0.325)
Sex (ref. = female)				
Male	1.126 (0.150)	0.963 (0.141)	0.951 (0.139)	1.128 (0.216)
Place of birth (ref. = Louisiana)				
Elsewhere	0.639 <sup>†</sup> (0.156)	1.386 (0.284)	3.141*** (0.665)	3.285*** (0.918)
Marital status (ref. = ever married)				
Never married	0.724 (0.161)	1.137 (0.221)	1.180 (0.230)	1.166 (0.298)
Citizenship (ref. = U.S.)				
Non-U.S.	2.669 <sup>†</sup> (1.339)	2.758* (1.109)	1.258 (0.486)	1.923 <sup>†</sup> (0.720)
Veteran (ref. = no)				
Yes	1.128 (0.262)	1.201 (0.291)	1.274 (0.337)	1.226 (0.412)

*Notes:* Standard errors with household-level clustering are in parentheses;  $N = 2,784$ . Effects are estimated using restricted data from American Community Survey for November 2005 through the one-year anniversary of Hurricane Katrina and using ACS weights and estimated propensity score weights (see the text for details).

<sup>†</sup> $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Hurricane Katrina, but conditional on not having returned, nonblacks were more likely to have relocated outside the South.

Model 2, which examines differences in post-Hurricane Katrina locations by educational attainment, shows that there were statistically significant differences in locations across education groups. The most striking contrasts involve the likelihood of residing “elsewhere in Louisiana” (away from the New Orleans metropolitan area) or in Texas relative to the likelihood of residing in the New Orleans metropolitan area. Adults with greater educational attainment were substantially less likely to be residing in either of these two areas than in metropolitan New Orleans. Specifically, adults who completed a bachelor’s or graduate degree were about one-half as likely as those with just a high school diploma to be residing elsewhere in Louisiana or in Texas compared with residing in the New Orleans metropolitan area. There were no differences by educational attainment in the likelihood of residing elsewhere in the South or elsewhere in the United States relative to living in the New Orleans metropolitan area.



When we controlled for both race and education in Model 3, there was essentially no change in the estimated location differences by race; however, the effects by education disappeared. In particular, not only was the joint effect of education in Model 3 statistically insignificant, but there were no individually significant parameter estimates, either. Thus, the observed differences in post-Hurricane Katrina locations by education are explained entirely by differences by race rather than by education itself.

Model 4, which adds all remaining covariates to the previous model, yielded the same pattern of results for the effects of race and education on the post-Hurricane Katrina locations of adults from New Orleans. Although there were minor changes in the effects of some parameters, race differences continued to be statistically significant, but education differences were insignificant.

Interactions between race and education are featured in Model 5, with a parallel set of estimates for blacks and nonblacks displayed. The nonblack effects shown are the sums of the main effects (for blacks) and the interaction effect (representing the differential effect for nonblacks compared with blacks). At the bottom of each panel, we also present the total effect of race, which allows direct comparisons to be made with the race results from Models 1, 3, and 4. The total effect of race summarizes differences between blacks and nonblacks by calculating a weighted average across each of the education categories (with the weights based on the distribution of the population by category) and factoring in the main effect of race.

The general findings from Model 5 are the presence of some statistically significant educational differences in post-Hurricane Katrina locations for nonblacks but essentially no effects of education for blacks. A consistent result is the higher likelihood of displacement among the least educated nonblacks (i.e., those who are high school dropouts): they were 6.7 times more likely than those with a high school diploma to be living elsewhere in Louisiana relative to living in the New Orleans metropolitan area; 2.9 times more likely to be living in Texas; and 3.5 times more likely to be living elsewhere in the South. There is also evidence that nonblack adults with some college education were more likely to have relocated away from the New Orleans metropolitan area than nonblack adults with a high school diploma. Finally, nonblack adults with a college education were less likely to reside in Texas than in any other location, although the effect was statistically significant only for those with a bachelor's degree. The total effects for nonblacks in Model 5 reveal a set of findings very similar to those from the previous models—particularly the results from Model 3, which controlled for education but without an interaction by race.

Model 6 includes the full set of covariates as well as race interactions for all variables except citizenship and veteran's status (because of small cell sizes with race interactions for these two variables). The findings from the previous models generally hold, with one difference being the appearance of stronger covariate effects for nonblacks than for blacks. This was the case for education in the previous model, but even this effect is strengthened: nonblacks with the highest educational attainment (i.e., with a bachelor's or graduate degree) were even less likely (than in the previous model) to be living in Texas relative to living in New Orleans compared with nonblacks with a high school diploma. No similar pattern emerged for blacks.

Finally, the total disparity by race in the likelihood of living in any of the three out-of-state locations (Texas, elsewhere in the South, or elsewhere in the United States) relative to living in New Orleans was higher in Model 6 than in any of the earlier

models. For example, the likelihood of living elsewhere in the South rather than in the New Orleans metropolitan area was 70 % lower for nonblacks than for blacks in Model 6; in contrast, the observed difference by race (from Model 1) indicated that nonblacks had only a 49 % lower observed likelihood of this outcome. This finding suggests that among the covariates in Model 6—age, sex, place of birth, marital status, citizenship, and veteran status—the covariate values that occur more frequently among blacks are together associated with a higher likelihood of remaining in New Orleans compared with relocating to these other locations; thus, after we control for these covariates, the observed disparities by race become larger.

We next turn to the results in Table 4, which show the estimated effects for all covariates in the Model 4 specification from Table 3. We focus here on the effects of the remaining model covariates. Several of these remaining covariates had statistically significant associations with post-Hurricane Katrina locations. There were significant effects of age, with young adults substantially more likely than middle-aged adults to be in each location away from the New Orleans metropolitan area. Compared with the reference category of middle-aged adults (aged 40–59), young adults aged 25–39 were 60 % more likely to be living elsewhere in Louisiana relative to living in metropolitan New Orleans, between 75 % and 80 % more likely to be living in Texas or elsewhere in the South, and almost three times more likely to be elsewhere in the United States. Compared with middle-aged adults, there were no statistically significant differences in the residential locations of older adults aged 60 or older. The association of younger adult ages with a higher propensity to move a greater distance away from New Orleans is consistent with the life-course patterns of migration, described in a large body of previous research, and results from the greater opportunities and lower costs for younger adults to migrate and to make longer-distance moves (Geist and McManus 2008).

Adults born outside Louisiana were three times more likely than those born in Louisiana to have relocated away from Louisiana and Texas, relative to remaining in metropolitan New Orleans, with similar likelihoods of being elsewhere in the South or elsewhere in the United States. Adults born in Louisiana were no more likely to be elsewhere in Louisiana or in Texas, compared with being in metropolitan New Orleans, than adults born outside Louisiana. The migration literature has documented an association between place of birth and return migration (Rogers and Belanger 1990): people are drawn back toward their birthplace, especially following major life-course events, such as retirement or divorce, which are likely to have similar disruptive effects on peoples' lives as experiencing a disaster like Hurricane Katrina.

Finally, noncitizens were substantially more likely than U.S. citizens to be living in Texas relative to living in the New Orleans metropolitan area; they were also more likely to be living elsewhere in Louisiana or elsewhere in the United States relative to living in metropolitan New Orleans, although these effects were statistically significant only at the .10 level. Based on previous research, the low concentration of immigrants in New Orleans and the disruption associated with Hurricane Katrina may have led noncitizens to move to areas, such as Texas, with a higher concentration of immigrants, favorable economic conditions, and the presence of social ties (e.g., Gurak and Kritz 2000; Kritz and Nogle 1994).

## Conclusions

We used data from the restricted version of the U.S. Census Bureau's ACS to examine the post-Hurricane Katrina locations of adults aged 25 and older who lived in New Orleans before the hurricane. Our analysis focused on outcomes during a 10-month period in the first year after the hurricane, from November 2005 to August 2006, among all individuals throughout the country who reported living in New Orleans one year previously. We generated a set of modified weights, based on a propensity score analysis, that balanced the post-Hurricane Katrina population against a pooled sample of pre-Hurricane Katrina residents who lived in the city and were interviewed for the ACS between January 2004 and August 2005. Although the pre- and post-Hurricane Katrina samples were quite similar, the propensity score weighting procedure further enhanced the comparability between the two samples.

Our analysis addressed a number of unanswered research questions regarding the effects of Hurricane Katrina on the New Orleans population. First, we described the locations where displaced adult New Orleanians resided in the year after the hurricane. Although just over one-half (53 %) had returned to (or stayed in) metropolitan New Orleans, two-thirds of those who were displaced were living elsewhere in Louisiana or in Texas. Thus, the majority of adult residents of New Orleans at the time of Hurricane Katrina remained relatively close to the city; however, most of the displaced adults likely faced considerable economic and institutional barriers in being able to move back to the city, such as the lack of affordable rental housing (Kamel 2012). Just under one-fifth (17 %) of adults were outside these two states; and among that group, 70 % were elsewhere in the South in states such as Georgia, Alabama, Mississippi, and Florida. This result has implications for policies and programs to encourage displaced residents to return to the city; for example, the relatively close proximity to New Orleans suggests the potential feasibility of relocating back to the city for many displaced residents—provided that they can overcome the substantial financial and nonpecuniary costs of doing so. The high fraction of displaced blacks who were in Texas suggests that policies to ensure a racial balance in return rates might have targeted this state in order to increase the number of blacks who returned to New Orleans; it also suggests that policies intended to reduce disparities in return migration following future disaster-related population dislocations might target areas that similarly receive a large share of evacuees whose location choices were strongly influenced by government-coordinated evacuation efforts.

Second, we investigated the demographic and socioeconomic factors influencing where pre-Hurricane Katrina residents lived in the year after the hurricane, using a sequence of multinomial regression models. Although our main goal was to conduct a descriptive analysis, our findings were consistent with migration theory in general. We observed the expected relationships between migration and key demographic and socioeconomic factors. A major focus was on differences between blacks and non-blacks, based on previous research that found major race disparities (favoring non-blacks) in the likelihood of returning to New Orleans in the year after the hurricane (Fussell et al. 2010; Groen and Polivka 2010; Paxson and Rouse 2008; Sastry and Gregory 2012).

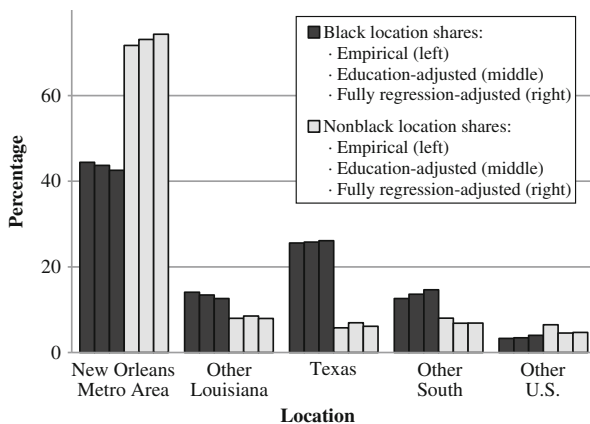
We found that in the year after Hurricane Katrina, blacks were considerably more likely than nonblacks to be living elsewhere in Louisiana, in Texas, and elsewhere in

the South than to be living in New Orleans. This finding can be observed clearly in Fig. 1, which shows the distribution of blacks and whites across the five location categories that we considered in our analysis. The observed race disparity was not accounted for by any of the demographic or socioeconomic covariates in the models, as shown in Fig. 1 by the small changes in the distribution of individuals by location (for blacks and nonblacks separately) when we controlled for a progressively larger set of covariates. Factors other than the measured characteristics from the ACS apparently account for differences by race in post-Hurricane Katrina location decisions. Based on previous research, barriers to returning to New Orleans—such as a flood-damaged dwelling—were likely to have been among the key unmeasured factors.

Young adults (aged 25–39) were more likely to have moved farther from New Orleans. This finding is consistent with the expected age effect, which suggests that young adults will invest in such moves because they have a longer period over which to accrue returns. Younger nonblacks were more likely to move farther from New Orleans than were younger blacks.

Consistent with anticipated effects of social and family networks on migration patterns, we found that adults born outside Louisiana were substantially more likely to have relocated away from the state. This effect was stronger for nonblacks than for blacks. Although this is an important effect, its impact for New Orleans is balanced by the fact that the city had among the highest proportion of the population born in-state of any major U.S. city (based on our analysis of data from the 2000 census).

The main indicator of SES—namely, educational attainment—had no effect on the post-Hurricane Katrina locations of blacks. This result is based on statistically insignificant and substantively small effects of educational attainment on blacks' location in the year after the hurricane. However, for nonblacks, we consistently found that the least-advantaged socioeconomic group (high school dropouts) was more likely to be displaced to any location outside New Orleans. Only the latter finding matches results from previous disaster research (Morrow-Jones and Morrow-Jones 1991); in contrast, the absence of negative selection for black migrants suggests that this established characterization of movers following a natural disaster may need



**Fig. 1** Summary of residential locations after Hurricane Katrina among pre-Hurricane Katrina adult residents of New Orleans: Blacks vs. nonblacks

to be revised so that it appropriately reflects differences in the post-disaster migration patterns of distinct groups.

When looking at the characteristics of displaced New Orleans residents by location, we found that the groups most likely to be residing in Texas or elsewhere in Louisiana were, respectively, blacks and the least-educated nonblacks. Texas was the prime destination for black adults—and, in particular, for young black adults. Texas was notably not a destination for nonblacks of higher SES. Locations in Louisiana outside the New Orleans metropolitan area were where a disproportionately large fraction of the least-educated nonblacks were living in the year after Hurricane Katrina. Displaced New Orleans residents found in locations outside these two states were considerably more likely to be younger adults (aged 25–39) and to have been born outside Louisiana. The higher likelihood of residing away from Texas and Louisiana for individuals born outside Louisiana suggests a potential for family and friendship ties in these locations to have influenced migration decisions. Taken together, these findings describe a relatively clear set of location preferences among displaced New Orleans residents, which follow the pre–Hurricane Katrina migration streams from the city (see Frey et al. 2007). Our conclusion that pre-disaster migration patterns shaped individuals' post-disaster moves is consistent with the presence of important social network effects in determining movers' destination choices and provides useful information for predicting likely migration patterns following future disasters.

Our results substantially strengthen and extend the preliminary set of descriptive findings Frey and colleagues (2007) provided by capitalizing on the strengths of the ACS (i.e., by using restricted information on the date of interview to precisely identify displaced New Orleans residents in the one-year period following the hurricane), by incorporating a propensity reweighting procedure, and by using regression modeling to examine factors associated with displacement locations.

Our analysis has several limitations. First, the ACS is a cross-sectional survey, and households are interviewed only once and not tracked from before the hurricane or over time. Second, we aggregated migration outcomes over the first year following Hurricane Katrina, which provides information on the average location during the study period but provides neither insights into how locations changed within this period nor information about displacement locations after the first anniversary of the hurricane. Third, although the propensity score weights are effective in controlling for differences in observed characteristics between the pre- and post–Hurricane Katrina samples, the results may be susceptible to the effects of unobserved factors. Finally, the ACS includes only a limited set of covariates for examining various explanations for the observed findings that are suggested by the modified human-capital investment approach to analyzing migration; hence, the results are primarily descriptive. The limited set of covariates and the design of the ACS also mean that we were unable to examine the association between displacement locations and well-being outcomes.

This article provides the first set of detailed analytical results regarding the location of displaced New Orleans residents in the year after Hurricane Katrina. The results have a number of implications for studying the effects of future large-scale human-caused and natural disasters. First, displaced residents tend to stay close to home, with few moving to distant locations. However, those who do move to different locations tend to have distinct demographic and socioeconomic characteristics. This finding makes very clear the lack of representative population segments at specific displacement locations

and thus highlights the need to have representative samples of the *origin* population in order to correctly study the effects of disasters. Second, this study uncovers significant demographic and socioeconomic differences in displacement locations following Hurricane Katrina and thereby highlights the importance of examining disparities in disaster research. Third, the analysis shows the value of the ACS for future studies of the demographic effects of large-scale human-caused and natural disasters. The ACS, which has replaced the long form of the decennial census in the United States, generally provides excellent opportunities for studying demographic outcomes. In particular, the status of the ACS as a large, continuous, ongoing national survey makes it uniquely positioned for examining outcomes following a large-scale disaster. Although it is straightforward to create comparable ACS samples of the same population from before and after an event, the use of enhancements such as propensity score reweighting lead to more accurate and reliable assessments of post-disaster outcomes.

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