Social Capital and the Repopulation of New Orleans after Hurricane Katrina
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Introduction: Repopulation, one of the central elements of disaster recovery, generally rests on three legs: the amount of damage, individual resources, and collective resources. Damage, of course, is a negative factor: the greater the damage, the more difficult the recovery. Individual resources are chiefly financial, but can also include other individual attributes like level of education, age, racial/ethnic/religious identity, disabilities, etc. Collective resources are people's ability to work together and are usually characterized in terms of social capital: social networks, trust, reciprocity, civic engagement, etc. Most demographic research on disaster recovery tends to focus on individual resources, against the backdrop of damages, and gives little attention to collective resources or social capital. This focus is perhaps due less to a lack of interest than to data limitations. Demographers generally want to use the most precise data available, and these are usually collected by government agencies. Yet those agencies rarely measure social capital. Many times, however, researchers strive to use proxies for social capital, such as length of residency or home ownership as indicators of people's commitment to an area, charitable giving as an indicator of altruism, or voting turnout as an indicator of civic engagement. Yet such indicators are, at best, only rough measures of social capital, and are often better indicators of individual economic resources.

Here we assess how damage, individual resources, and, most importantly, collective resources were associated with repopulation in New Orleans after an extensive disaster, Hurricane Katrina. Using several data sources, including the LSU Disaster Recovery Survey, the ACS, the government's Road Home rebuilding assistance program, and data on population from the US postal service, we were able to assess the relative impacts of storm damage, individual resources, and social capital, to better understand how *all* of these factors contributed to repopulation in New Orleans. With this approach, we are able to augment traditional demographic models and show that collective resources may even outweigh individual resources in disaster recovery.

We developed several hypotheses regarding the factors associated with repopulation from prior research regarding damage and individual level resources. And, given our ethnographic fieldwork, we developed hypotheses about the effects of social capital on repopulation. In several neighborhoods, leaders and active community members worked to encourage amenities like retail stores, schools, libraries, and playgrounds to open, in order to encourage neighborhood members to return. In other cases, neighborhood leaders were able to allocate the labor of visiting volunteers in such a way as to encourage resident cooperation in rebuilding efforts. Weil (Weil 2011) expands on these and other examples. Most of these activities stressed civic participation, especially to get residents to come back as early as possible, in order to encourage other residents to join a "bandwagon" of repopulation. Thus, we can hypothesize that civic engagement – probably more than other forms of social capital – encourages early repopulation in neighborhoods. We also expect that damage will discourage repopulation, and that the standard individual resources (money, lack of social vulnerability) will encourage repopulation.

Background: Prior demographic studies of recovery from Hurricane Katrina after 2005 mostly stress the importance of individual resources and damage, and do not examine collective resources. The best studies utilized data that tracked storm survivors wherever they migrated in the U.S. over various periods of time, and measured their ability to return to their pre-storm location as well as their economic recovery. Studies have been based on the Census Bureau's Current Population Survey (CPS) and American Community Survey

(ACS) (Cahoon, Ning, Reed, Weyland, Herz, Polivka, and Robison 2006) (Brown, Mason, and Tiller 2006) (Vigdor 2008) (Groen and Polivka 2008) (Groen and Polivka 2010) (Zissimopoulos and Karoly 2010) (Sastry and Gregory 2014); restricted-use individual tax returns (Deryugina, Kawano, and Levitt 2013); restricted-use individual records from the 2000 Census, the 2003-05 ACS, and the Longitudinal Employer-Household Dynamics program (Groen, Kutzbach, and Polivka 2014); as well as a few good non-governmental data sources including RAND's Displaced New Orleans Residents Survey (Sastry 2009) (Sastry 2013) (Fussell, Sastry, and VanLandingham 2010); and an early Gallup survey of evacuees (Elliott and Pais 2006). However, these methods have not been able to assess the importance of social capital in repopulation.

Data: We take a complementary approach, which aims to augment previous findings, based on a large (N=7,000) survey of Katrina survivors in Greater New Orleans, the LSU Disaster Recovery Survey, that was conducted from mid-2006 till spring 2011 and measured social capital in depth. As a small research team with limited resources, we were not able to sample the pre-storm population or track evacuees wherever they went, but our sample is well representative of the post-Katrina population demographically;[1] and eighteen percent of our sample consists of evacuees.[2] We conducted the survey by paper and pencil and on the internet; and to correct for under-representation of lower-status respondents, we conducted much of it by face-to-face interviews, going door to door.[3] Our initial goal had been to sample a number of contrast groups, but as we proceeded, we became convinced that we could sample the whole of Orleans and St. Bernard parishes (counties), the hardest-hit areas, and we went neighborhood by neighborhood to obtain a sample that was geographically, as well as demographically representative. In the end, our study design and sampling procedure allowed us to aggregate respondents by census tract (mean=21 per tract), so that we could use social capital as a predictor of neighborhood repopulation and assess its impact as compared to damage and individual resources. As noted, our sample is not as precise as government data, but since our questionnaire is richer, we think our sample can complement what we can learn from government data alone.

In developing indicators of social capital, we were guided by the literature, as well as by our extensive ethnographic fieldwork. In this paper, we test two elements of social capital as factors in repopulation: civic engagement and social embeddedness. Appendix A (upon request) gives the composition of the scales we use, which were replicated or derived from Robert Putnam's 2000 Social Capital Benchmark Survey.[4] Our Civic Engagement scale combines Putnam's measure of associational membership with elements of Robert Sampson's "collective efficacy" scale (Sampson 2011). Our Social Embeddedness scale combines Putnam's "informal socializing" scale with a list of in-group social network contacts.

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[1] Weighting by the joint age-gender-race/ethnic distributions for each parish (county), according to Census population estimates for the year of the interview, did not change percentages of population subgroups drastically.

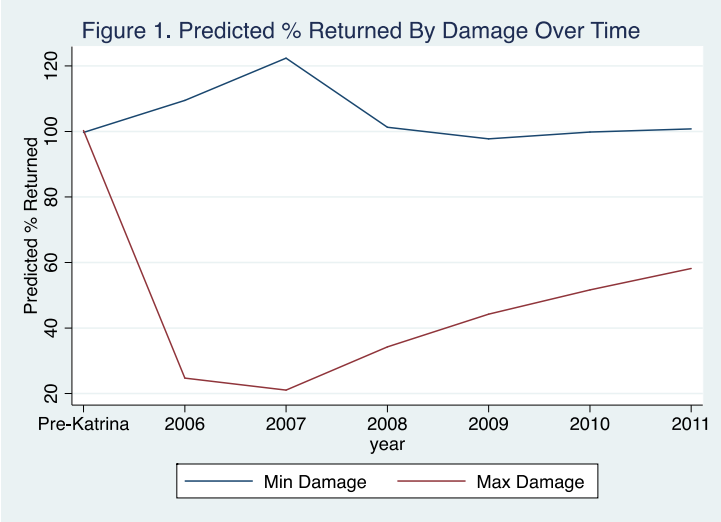
[2] Our evacuee subsample is not representative geographically, though it is demographically quite diverse.

3 Our door-to-door sampling accounts for the long time period of data collection. Because landline telephones were inoperative and unreliable for an extended period of time, and because cell phone plans still charged by the minute, we did not do telephone interviewing.

[4] Our full questionnaire is available at http://www.lsu.edu/katrinasurvey/lsukatrinasurvey-nolageneral.pdf. See http://www.hks.harvard.edu/saguaro/communitysurvey/index.html for information about the 2000 Social Capital Benchmark Survey.

Results: In bivariate analysis we find that individual resources have the expected effect on repopulation. Higher levels of income and a larger percentage of individuals age 15-34 encourage repopulation, while higher percentages of Blacks and the percent of individuals receiving the government's Road Home Option 1 grants to repair homes discourages repopulation. Nevertheless, after including damage to residences and social capital factors, all of the effects of individual resources are explained to insignificance, except that the percent of younger individuals retained marginal significance (p=.07).

As expected, damage has an exceptionally large effect on repopulation. This effect is quite pronounced in the years after Katrina (2006 and 2007) and later declines, but even by 2011 the gap between profoundly and minutely damaged communities is still large and significant. Figure 1 and Table 1 show that communities with high levels of damage only retain about 25% of their population in 2006 and 21% in 2007, while communities with minimal damage grow during these years to 109% in 2006 and 122% in 2007 (likely due to migration from damaged areas). This gap, however, declines in subsequent years because communities with minimal damage stabilize at their pre-Katrina size and highly damaged communities rebound, albeit to much smaller sizes than Pre-Katrina, and by 2011 extremely damaged communities are at about 58% of their pre-Katrina size whereas minimally damaged communities were nearly at pre-Katrina sizes (100.8%).



Additionally, as hypothesized, civic engagement is more influential than social embeddedness for repopulation, see Table 1. Social embeddedness is not significantly related to repopulation (either as a main effect or in interactive models). Consistent with expectations, civic engagement is significantly associated with repopulation 3-4 years after Katrina (2008 and 2009), while social embeddedness is never significantly related to repopulation.

Again, consistent with expectations, communities with high civic engagement repopulate more rapidly, while areas with low civic engagement recover more slowly, but eventually catch up. Table 1 shows that while communities with both high and low civic engagement experience precipitous declines in population in the year following Katrina and in 2006 and 2007 there are no differences in repopulation by civic engagement. By 2008 and 2009, however, an increase in civic engagement is significantly associated with an increase in population. By 2010 civic engagement was not significantly related to repopulation.

Thus, as hypothesized, neighborhoods with greater civic engagement recovered more quickly, perhaps because they gave residents confidence that they would have a viable neighborhood to return to, while less engaged neighborhoods recovered more slowly,

perhaps because residents felt they could depend only on their own individual resources to overcome their damage. In fact, while individual factors were important, after controlling for damage and civic engagement these had no effect. Damage had large effects across the study period. Civic engagement had a large effect and followed the trajectory we predicted. In the paper following we intend to specifically examine if/how other collective resources matter for repopulation (e.g., social trust) and further explore the associations found here.

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Table 1. Regression Predicting Percent Change in Population After Katrina

	Coef.	Std. Error
Year(vs. Pre-Katrina)		
2006	-37.03***	(1.046)
2007	-33.19***	(1.317)
2008	-35.57***	(1.225)
2009	-31.69***	(1.342)
2010	-26.64***	(1.829)
2011	-22.60***	(2.050)
Civic Eng	-0.57	(0.927)
CivicXYear		
CivicX2006	1.54	(0.980)
CivicX2007	1.02	(1.378)
CivicX2008	3.85**	(1.454)
CivicX2009	3.67*	(1.799)
CivicX2010	1.65	(2.863)
CivicX2011	0.48	(3.047)
Damage	0.21	(1.419)
DamXYear		
DamX2006	-31.72***	(1.501)
DamX2007	-37.87***	(1.944)
DamX2008	-25.11***	(2.049)
DamX2009	-20.10***	(2.618)
DamX2010	-18.12***	(4.334)
DamX2011	-16.05***	(4.651)
Social Embed	0.58	(1.438)
Median Income	0.08	(0.049)
Option1	0.92	(21.570)
%Black	3.08	(4.518)
% Young	23.55+	(12.903)
Constant	87.92***	(6.242)
R^2	0.52	
N	1246	
Tracts	178	