

Social Capital and the Repopulation of New Orleans after Hurricane Katrina

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Abstract

Repopulation, one of the central elements of disaster recovery, generally rests on three legs: the amount of damage, individual resources, and collective resources or social capital. Most demographic research on repopulation after Hurricane Katrina (2005) has focused mainly on the first two factors and has not assessed social capital well, probably because government agencies, which provide most data, tend not to measure it. We conducted a large (N=7,000) survey in New Orleans after Hurricane Katrina that contains extensive measures of social capital. Our analyses show that storm damage is the largest determinant of neighborhood recovery, across census tracts. While individual resources matter, their impact becomes much reduced when damage and collective resources are controlled for. By contrast, collective resources or social capital have a strong independent effect: neighborhoods with stronger civic engagement recover more quickly, even when damage and individual resources are taken into account. And notably, while civic engagement has a large impact on repopulation, social networks have no significant impact.

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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, 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 mechanisms by which social capital affects 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 stronger 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

Probably the dominant paradigm today for explaining disaster recovery stresses inequality and vulnerability.¹ This approach focusses on the presence or absence of individual resources. Socially and economically weaker members of society suffer the worst outcomes from disasters, especially lower income or less educated people, disadvantaged racial and ethnic minorities, women, younger children and elderly people, and people with disabilities (Bolin 2007) (Phillips, Thomas, Fothergill, and Blinn-Pike 2010) (Peacock, Morrow, and Gladwin 1997) (Brunsma, Overfelt, and Picou 2010) (Norris, Friedman, and Watson 2002; Norris, Friedman, Watson, Byrne, Diaz, and Kaniasty 2002) (Fothergill, Maestas, and Darlington 1999) (Enarson, Fothergill, and Peek 2007) (Fothergill and Peek 2004). Furthermore, less powerful people are often forced into more hazardous locations before or after disasters, and may receive less favorable

¹ An earlier generation of disaster recovery research aimed to “debunk” conventional wisdom that disasters would produce conflict and chaos. Quarantelli and colleagues argued that antisocial behavior and panic are rare, and that cooperative behavior and altruism are more common, with “emergent” grassroots organizations helping recovery more effectively than command-driven efforts from centralized institutions do. Observers suggested that cooperative or altruistic social ties which remain latent in ordinary times may become activated in response to a disaster. See Quarantelli, E. and R. Dynes. 1977. “Response to social crisis and disaster.” *Annual Review of Sociology* 3(1):23-49. Quarantelli, Enrico L. 2008. “Conventional Beliefs and Counterintuitive Realities.” *Social Research* 75(3):873-904. Rodriguez, Havidan, Joseph Trainor, and Enrico L. Quarantelli. 2006. “Rising to the Challenges of a Catastrophe: The Emergent and Prosocial Behavior Following Hurricane Katrina.” *Annals of the American Academy of Political and Social Science* 604:82-101. Solnit, Rebecca. 2009. *A paradise built in hell : the extraordinary communities that arise in disasters*. New York: Viking.

assistance after disasters, as when homeowners are helped, but renters are not (Pais and Elliott 2008) (Elliott and Pais 2010) (Schultz and Elliott 2013).² Some of these vulnerabilities can be mitigated to a extent by different forms of assistance, though they, too, tend to be spread unevenly. Researchers show that private insurance can offset losses, typically among the more affluent (Von Peter, Von Dahlen, and Saxena 2012) (Neumayer, Plümper, and Barthel 2014), while government transfer payments can mitigate negative economic impacts, especially of lower income people (Deryugina 2013) (Coffman and Noy 2012).

An alternative and growing research perspective describes social capital's positive contribution to disaster outcomes. This approach focusses on the presence or absence of collective resources. People and communities with stronger social capital are better able to avoid or withstand a disaster's impact and are better able to recover from its damage (Dynes 2006) (Hurlbert, Beggs, and Haines 2001) (Nakagawa and Shaw 2004) (Chamlee-Wright and Storr 2009). These abilities are often grouped under the rubric of "resilience." In a major theoretical review, Norris (Norris, Stevens,

² The particular settlement patterns of New Orleans complicate environmental justice theories there. Early settlement indeed put advantaged groups onto the higher (and safer) natural levees along the Mississippi River, and disadvantaged groups into lower (and more hazardous) "back o' town" areas bordering the swamplands that were prone to flooding. However, beginning around the turn of the twentieth century, civil engineers began to drain the swamps between the river and Lake Pontchartrain, and those areas were mostly reserved for middle-class whites, and disadvantaged groups were often excluded. Those are the areas that experienced the worst flooding after Hurricane Katrina. Campanella, Richard. 2006. *Geographies of New Orleans: Urban Fabrics Before the Storm*: Center for Louisiana Studies/University of Louisiana at Lafayette. Colten, Craig E. 2002. "Basin Street blues: drainage and environmental equity in New Orleans, 1890–1930." *Journal of Historical Geography* 28:237-257.

Pfefferbaum, Wyche, and Pfefferbaum 2008) identifies four contributing causes to disaster resilience – economic development, information and communication, social capital, and community competence. These are umbrella categories containing sub-parts, and the latter two are forms of social capital, which together contain twelve sub-parts, including social support, social networks, social organizations, civic action, collective efficacy, and political partnerships.³ Daniel Aldrich (Aldrich 2012), in a major book analyzing four historical disaster recoveries, builds on the classic distinction among three types of social capital: bonding, bridging, and linking (Woolcock 1998). Bonding social capital draws similar people together in community; bridging social capital pulls together disparate communities; and linking social capital attaches communities to external resources, often from agencies or institutions “above” them. Aldrich’s empirical analyses indicate that social capital is a more powerful predictor of disaster recovery than socio-economic factors. Yet he also notes that social capital is “Janus-faced:” there are negative or unsolidaristic elements, as when some social groups absorb resources while excluding other groups, or when some communities organize to avoid shared burdens.

If we take repopulation as a central indicator of disaster recovery, then the relevance of migration, or return migration, theory in demographic research is clear;

³ The full list includes, under “social capital:” received (enacted) social support, perceived (expected) social support, social embeddedness (informal ties), organizational linkages and cooperation, citizen participation leadership and roles (formal ties), attachment to place, and sense of community. And “community competence” includes: community action, critical reflection and problem solving skills, flexibility and creativity, collective efficacy and empowerment, and political partnerships.

and notably, migration theory has clear parallels to disaster recovery theory. In an influential article, Massey and colleagues (Massey, Arango, Hugo, Kouaouci, Pellegrino, and Taylor 1993) review four “cumulative” elements of migration theory: the neoclassical economic approach, the “new economics” approach, the world-system perspective, and the social networks approach. The first two approaches, which focus on individual or family resources, parallel the inequality or vulnerability approach in disaster recovery research, while the fourth approach, social networks, is a form of social capital theory, which stresses collective resources.⁴

However, even though migration theory takes social networks into account, most demographic treatments of social capital or collective resources are somewhat narrower than we want to consider here. Most migration (and immigration) studies regard social networks as a resource of individuals, even if that resource is embedded in a collectivity (Portes 1998). Individual outcomes may be aggregated to a group of migrants, but it is less common for migration researchers to consider collective action or civic engagement. This is not entirely surprising, because most migrants by definition are newcomers, often without citizenship rights, and generally without deep roots in their place of destination. Even return migrants are often the victims of persecution who may be disadvantaged or endangered if they seek to return (Hall 2015). By contrast, returning evacuees after a disaster are generally full citizens, often with deep

⁴ World systems theory is, of course, a macro theory, which does not have a clear parallel in the disaster recovery theories we are considering here. To the extent that resiliency theory is viewed as an ecological systems theory, then disaster recovery theory does have a macro approach. We do not pursue this direction here.

roots and organizational resources in their place of return. They may exert a degree of influence or control of their social and political environment that most migrants lack. Thus, we turn to political sociology to augment our view of the social capital or civic engagement of disaster survivors.

Perhaps the most prominent contemporary research on civic engagement are Robert Putnam's version of social capital theory and Robert Sampson's theory of collective efficacy. Putnam suggested that civic orientations can improve democratic governance and the economy (Putnam 1993) (Putnam 2000). In a study of Italy, he argued that regions with a richer history of associational life and interpersonal trust that extends beyond the family enjoy better economic and government performance. And he subsequently extended this argument to the United States and other countries. Similarly, Sampson and colleagues (Sampson 2012) developed a model of collective efficacy, built of willingness to enforce social norms in a neighborhood and mutual trust among residents, as well as a picture of civic engagement characterized especially by participation in neighborhood affairs. Both Putnam and Sampson initially stressed collective, more than individual, benefits of their versions of civic engagement. For Putnam, it was a stronger democracy and economy, and for Sampson, safer and healthier neighborhoods. Indeed, Putnam developed his version of social capital theory out of the "civic culture" tradition of political culture and political participation research (Almond and Verba 1963), (Verba, Schlozman, and Brady 1995); while Sampson grounded his work in the Chicago School's theory of social control. Yet these perspectives are more similar than they might seem at first, for as Janowitz (Janowitz

1978) has argued, they are both forms of democratic theory. Perhaps the most important common theoretical base is Tocqueville's (Tocqueville 2000) theory of liberty, in which citizens bring their "self interest rightly understood" to town meetings, where they discuss the issues and hammer out a sense of a common good.

Sidney Verba's work on political participation may supply the key element here. Verba and colleagues (Verba, Schlozman, and Brady 1995) characterize the underpinnings of participation in terms of individual and collective resources. In their earlier work (Verba and Nie 1972; Verba, Nie, and Kim 1978), they found that Americans participated more, the higher their social status (measured by education and income), an individual resource. They called this the base model, as shown in Figure 1. However, in their initial survey from the early 1960s, they found that African Americans participated at fairly high levels, across status lines. They hypothesized that this occurred because the civil rights movement mobilized African Americans across status lines. Verba and colleagues expanded their research to seven countries on different continents and found, similarly, that in countries with strong labor or ethnic organizations that mobilized lower-status people, participation rates rose and flattened across status lines, while in countries that lacked these organizations, the base model prevailed, and status remained the major determinant. In a replication of Verba's survey in the 1980s, Lawrence Bobo (Bobo and Gilliam 1990) found that African American participation had reverted to the base model and argued that this occurred because the civil rights movement had waned and no longer mobilized lower-status adherents. Taken together, these findings suggest that collective resources can act as a

countervailing or compensatory force among people who lack individual resources – but only when lower status people are mobilized by some organization or some event. The “compensating” model is shown in Figure 2. Verba’s model remains central to current research on civic engagement and social capital (Prewitt, Mackie, and Habermann 2014).

Two examples of lower-income New Orleans communities that used collective resources to help recover from Hurricane Katrina are the Vietnamese community and the Social Aid and Pleasure Clubs (SAPCs, long-established organizations of working class African Americans). These groups follow Verba’s compensating model in Figure 2: they are low income, but have strong community solidarity. For instance, in our interviews with Fr. Nguyen The Vien, pastor of the Mary Queen of Vietnam Catholic Church in New Orleans East, he insisted that while most areas were mere neighborhoods, his was a real community. The Vietnamese community’s repopulation was quite strong. And when we asked Tamara Jackson, president of the SACP Task Force, how the recovery was going, she began listing general neighborhood problems, but when we asked her how club members were doing, she said, “Us? We’re fine. We help each other.” The Social Aid and Pleasure Clubs’ repopulation was also quite strong. For further discussion of these groups, see (Weil 2011).

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. Almost the entire population of Greater New Orleans evacuated

due to the storm, at least for a time, though most returned relatively quickly. Those who did not, or could not, return in the first year were substantially worse off than returnees. These evacuees were more likely to be lower-income, African American, and unmarried; they suffered greater housing damage; they had higher levels of unemployment, lower wages, and higher dependence on government assistance. And these same factors affected evacuees' ability to return, as did lack of homeownership and residential stability. 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). A few good non-governmental data sources paint a similar picture, 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 data have not been able to shed much light on the extent to which social capital or collective resources may have aided recovery and repopulation.

Three recent, still unpublished, studies, based on restricted-use government or "big" consumer data that track individuals over a decade-long period, from before to after the storm wherever they moved in the U.S., present an even more detailed picture of repopulation and recovery. Using individual tax returns from 1999 to 2010,

Deryugina and colleagues (Deryugina, Kawano, and Levitt 2013) construct a twelve-year panel dataset; Groen and colleagues (Groen, Kutzbach, and Polivka 2014) employ restricted-use individual records from the 2000 Census, the 2003-05 ACS, and the Longitudinal Employer-Household Dynamics program to construct a nine-year panel from 2003 to 2012; and Gallagher and Hartley (Gallagher and Hartley 2014) use individual-level credit and debt information from the Federal Reserve Bank of New York and Equifax's Consumer Credit Panel to construct a panel of quarterly data since 1999. Their results are surprising. Deryugina and colleagues find only "small and transitory impacts of the disaster on wages, employment, and total income, even among the worst affected" (1), and within a few years, Katrina survivors' incomes actually exceeded those of control populations. People who sustained more storm damage and older survivors indeed had worse outcomes, but long-term evacuees did better after an initial decline. The authors speculate that this may be due to survivors relocating from a depressed local economy (New Orleans) to more vibrant economies elsewhere. Groen and colleagues also find that, while storm survivors suffered sizable short-term earnings losses, they experienced earnings recoveries after the second post-storm year. Storm damage was a major cause of losses, sometimes because evacuees were unable to return, while employment in the construction industry was a source of advantage, especially short-term. African Americans, women, evacuees, and those with higher education suffered greater losses and had fewer gains. And Gallagher and Hartley show that Katrina did not greatly increase consumer debt. On the contrary, and paradoxically, the greater the flood damage, the more debt declined, mainly because homeowners

used insurance payments to pay down mortgages, while there was little effect on credit card debt. Again, however, these studies have not generally been able to go very far – for lack of appropriate variables – in assessing 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;⁵ and eighteen percent of our sample consists of evacuees.⁶ 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.⁷ Our initial goal had been to sample a number of contrast groups, but as we proceeded, we became convinced that we could sample the

⁵ 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.

⁶ Our evacuee subsample is not representative geographically, though it is demographically quite diverse.

⁷ 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.

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. Thus, we believe our sample is representative of the post-Katrina population of New Orleans; and while it is not as precise as government data, 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 gives the composition of the scales we use, which were replicated or derived from Robert Putnam's 2000 Social Capital Benchmark Survey.⁸ Our Civic Engagement scale combines Putnam's measure of associational membership with elements of Robert Sampson's "collective efficacy" scale (Sampson 2012). Our Social Embeddedness scale combines Putnam's "informal socializing" scale with a list of in-group social network contacts.

⁸ Our full questionnaire is available at <http://www.lsu.edu/katrinasyurvey/lukatrinasyurvey-nolageneral.pdf>. See <http://www.hks.harvard.edu/saguaro/communitysurvey/index.html> for information about the 2000 Social Capital Benchmark Survey.

To measure repopulation, we use U.S. Postal Service (USPS) data, made available by the Department of Housing and Urban Development on a quarterly basis by census tract.⁹ These data are considered to be somewhat less precise or accurate than census data, but they are available more frequently. Hurricane Katrina occurred exactly between two decennial censuses (in 2005), and the Census's American Community Survey (ACS) must be aggregated into 5-year moving averages for New Orleans census tracts, making it imprecise. Thus, as Allison Plyer¹⁰ and colleagues (Plyer, Bonaguro, and Hodges 2010) argue, USPS data may be the most appropriate to measure population change after a disaster, at least until Census data become available. However, they also note that USPS data may not be reliable immediately after the disaster, if the Postal Service's operations themselves have been disrupted, as occurred after Katrina. We follow Plyer's practice of beginning our post-Katrina USPS time series with the March, 2008, data point. The first available USPS data point is late 2005, which is after the storm. However, both Plyer and a HUD data manager (personal communication) note that this 2005 data point for New Orleans is actually from July, 2005, before the storm, because the USPS did not recover sufficiently to update its estimates following the storm, and is thus a reasonable measure of the pre-storm population.

⁹ See <http://www.huduser.org/portal/datasets/usps.html>.

¹⁰ Allison Plyer is Executive Director and Chief Demographer of the Data Center (TDS), formerly the Greater New Orleans Community Data Center. TDS publishes frequent demographic analyses and, since Hurricane Katrina, has collaborated with the Metropolitan Policy program at the Brookings Institution to produce the annual demographic and economic New Orleans Index. See <http://www.datacenterresearch.org/>.

Finally, we use our ethnographic research to flesh out some of our quantitative findings on the contribution of social capital to repopulation. In the course of collecting our survey data, we worked with over 200 community organizations and conducted many informal discussions with members of neighborhood associations, faith leaders, ethnic group leaders, and leaders of other non profits and service delivery organizations. In addition, we conducted 125 videotaped semi-structured, in depth interviews with community leaders and community members as well as community events, each usually 2-3 hours in length, totaling 400-500 hours of footage, with thousands of pages of transcripts. We were especially interested in leaders' strategies for recovery. From our qualitative data, we develop a couple more specific hypotheses to explain how collective action was used to promote repopulation; and we provide several suggestive quantitative evaluations.

Methods/Analysis

Pre-Katrina population levels are used to compute the percent of repopulation in each tract in New Orleans after Katrina. Thus, OLS regression is used to predict the percentage of repopulation compared to the pre-Katrina population over time. The percentage increase/decrease of the pre-Katrina population is predicted every three months from March 2008 until March 2012. Therefore, there are 18 observations per track (pre-Katrina, March, June, September, and December of 2008-2011, and our final observation in March 2012). We use indicator variables to control for time and cluster standard errors to take into account multiple observations for each tract.

In the following, we first present bivariate analysis comparing tracts that repopulated at a high level (i.e., greater than or equal to the 75th percentile of repopulation for all tracts in the final observation) and those that repopulated at a low level (i.e., less than or equal to the 25th percentile of repopulation for all tracts in the final observation). Next, using OLS regression, we predict repopulation over time using indicators of time period and individual resources while clustering standard errors by tract to account for multiple observations per tract. In subsequent models, other variables such as damage, social embeddedness, and civic engagement are taken into account to understand how these factors are related to repopulation. In all analysis, except for the bivariate analysis, indicator variables representing time period are controlled for and standard errors are clustered to account for multiple observations of tracts. Additionally, tracts exclusively representing project housing are excluded because these tracts are subject to political, rather than market forces, as are tracts without data on all covariates (6.5% or 13 tracts in total are excluded).

Results

Table 1 shows descriptive statistics for all tracts and for those that had the lowest repopulation (i.e., the 25th percentile or lower or 67% or less of their pre-Katrina population) by March 2012 (the last observation) and those that had the highest repopulation (i.e., the 75th percentile or higher or 90% or more of their pre-Katrina population) and we show significant differences between tracts with the highest and lowest repopulation. In this bivariate analysis we find that individual resources, damage,

and civic engagement generally have the expected effect on repopulation. Tracts that had the highest repopulation were more advantaged than tracts with the lowest repopulation; with the tracts with the highest repopulation having higher incomes (about \$53,160 per year versus \$31,970), marginally fewer Blacks (43% versus 58%, $p=.057$), more young people (32% versus 28%), less damage (-.63 versus .63), and were less likely to have the lowest civic engagement (11% versus 43%), while being more likely to have the highest civic engagement (47% versus 7%). While interesting, we next turn to our regression analysis to have a greater understanding of how these factors are associated with repopulation after controlling on other factors.

Model 1 in Table 2 includes individual resources as well as indicator variables for time. In general, these associations are in the expected direction. First, communities repopulated over time, but in the last time period were still not fully repopulated and prior to Katrina their populations were 23.82% higher than in the last observed time period (March 2012). Second, communities with higher income also repopulated at a more rapid pace; indeed, each \$1,000 increase in yearly income is associated with a .29 increase in repopulation. Third, communities with more young people repopulate more quickly. For every one percent increase in residents aged 15-34 was associated with a .73 percent greater repopulation. Contrary to expectations, the percent of Blacks in census tracts did not significantly influence repopulation over time after controlling on income and young people in each tract. Subsequent analysis (available upon request) showed that the percentage of Blacks was related to repopulation, but was explained by including income.

In Model 2 in Table 2 we include damage, and because damage may be less important over time, we included an interaction between damage and time. This model shows that, as expected, damage is quite important for repopulation. Figure 3 highlights the importance of damage over time. In Figure 3 it is clear that the first observation after Katrina (i.e., March 2008) there are vast differences between highly damaged and less damaged communities and there is a 28 percentage point gap between the two; for communities that are minimally damaged (i.e., at the first quartile of damage—25th percentile) predicted repopulation is 79% compared to 51% for those that are highly damaged (at the 75th percentile of damage). Nevertheless, this gap closes, albeit not completely, over time and by the last observation in March of 2012, the difference between less damaged communities and more damaged communities is reduced to 15 percentage points with less damaged communities at 84% of their pre-Katrina size and more damaged communities at 69% of their pre-Katrina size.

Additionally, as hypothesized, civic engagement is more influential than social embeddedness for repopulation, see Table 2 Model 3 and 4. 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, while social embeddedness is never significantly related to repopulation, even in bivariate analysis, as Figures 4 and 5 show.

Again, consistent with expectations, communities with the highest civic engagement repopulate more rapidly, while areas with lower civic engagement recover

more slowly. Figure 5 shows that while communities with both the highest and lowest civic engagement experience precipitous declines in population two years after Katrina, by the first observation after Katrina, March of 2008, communities with the highest civic engagement are closer to their pre-Katrina population size, 78%, compared to communities with the lowest civic engagement, 53% (a difference of 25 percentage points, $p=.000$). Indeed, these differences persist and by the final observation (March 2012) communities with the highest civic engagement have an 18 percentage point higher repopulation, with 86% repopulation, than communities with the lowest civic engagement, at 69% repopulation. Importantly, only communities with the highest civic engagement repopulated at a more rapid pace than communities with lower levels of engagement and there was no significant difference in repopulation between communities with lower levels of civic engagement (medium-high, medium-low, and lower levels of civic engagement).

Additionally, as a disadvantaged group, blacks had lower repopulation in bivariate models, but after controlling on other factors (income, percent young, and damage) black communities with higher civic engagement actually experience higher repopulation. In bivariate models only including percent black and time, communities with higher percentages of blacks had greater predicted declines in repopulation ($b=-.10$; $p=.020$). Nevertheless, after controlling on other variables and an interaction effect of percent black with civic engagement, the percent black in communities either had no effect on repopulation for communities with lower civic engagement and a positive effect for communities with higher levels of civic engagement. In Model 5, black

communities with the highest levels of civic engagement actually had higher repopulation as shown by the main effect of percent black ($b=.13$; $p=.038$); subsequent analysis shows that this association was also apparent in communities with medium-high civic engagement ($b=.17$; $p=.000$), but for communities with lower levels of civic engagement the percent black in a community was not related to repopulation (for medium-low civic engagement $b=.07$; $p=.247$ and for low civic engagement $b=-.12$; $p=.191$). Figure 6 also illustrates this relationship and we see that in communities with the lowest levels of civic engagement there is a non-significant decline as the percentage of blacks increases (from 81% repopulation for communities with no blacks to 71% for communities that are completely black, $p=.191$) as opposed to a significant increase in repopulation as the percent of blacks increases for communities with the highest level of civic engagement (from 71% for communities with no blacks to 85% for communities that are completely black, $p=.038$). Against this interpretation, it might be suggested that the true interaction is with race and income, not race and civic engagement, that is, that repopulation is higher among higher-income blacks than lower-income blacks. However, the race-income interaction effect is statistically insignificant (table available on request). Thus, we find evidence, as Verba posited, that collective resources, when present, can compensate for a lack of individual resources.

Thus, as hypothesized, neighborhoods with the highest levels of civic engagement recovered, perhaps because they gave residents confidence that they would have a viable neighborhood to return to, while less engaged neighborhoods had a lower level of recovery, perhaps because residents were less attached to their

communities and 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 the effect of income was reduced by 62% $((.29-.11)/.29)$, and the effect of percent of young people was reduced by 52% $((.73-.35)/.73)$. Nevertheless, the effect of the percentage of Blacks reached significance only in the final model, and subsequent analysis (available upon request) indicates that only after taking income, the percent young, and civic engagement into account that communities with greater percentages of Blacks were more likely to repopulate. In addition, damage had large effects across the study period. Civic engagement had an important effect, with communities with the highest levels of civic engagement also having the highest levels of repopulation. And in at least in the case of African Americans, we found a compensating effect with civic engagement. Blacks, as members of a vulnerable group (an individual resource), can compensate for this disadvantage by participating in civic engagement (a collective resource). This collective resource contributed to African Americans' recovery from disaster, even in the face of individual vulnerability.

Neighborhood Recovery Strategies

In our qualitative research on Katrina recovery in New Orleans, we spoke and worked with a great many community leaders and members, especially in neighborhood associations, faith organizations, ethnic organizations, mutual aid associations, as well as nonprofits and service providers. We were especially interested in the different forms

of community organization and collective action, as strategies for community recovery. While much scholarly literature on collective action focusses on social movements and protest, we did not find these forms to be the most common or most effective. Rather, the growing civic engagement was more likely to involve (a) increasing organizational capacity and autonomy, (b) greater strategic sophistication, (c) increasing citizen participation, (d) a new cooperative orientation and the emergence of new umbrella groups, and (e) new recovery resources from “outside-inside” the community (Weil 2011). Our research parallels that of several other important studies that examine community recovery strategies and community planning efforts, including (Olshansky and Johnson 2010) (Wooten 2012) (Chamlee-Wright and Storr 2009) (Seidman 2013); and we spoke and worked with many of the same leaders.

Among the most sophisticated recovery strategies we encountered was the attempt to organize a kind of positive “tipping” effect.¹¹ Community leaders realized that if residents thought no one else was going to come back and rebuild, they would be discouraged, resulting in a self-fulfilling prophecy. If, conversely, residents thought others were returning and rebuilding, this would give them confidence to do the same.

The question was how to manage impressions and create a critical mass or tipping

¹¹ A large literature exists on tipping, critical mass, and bandwagon effects. See, for instance, Schelling, Thomas C. 2006. *Micromotives and macrobehavior*: WW Norton & Company. Marwell, Gerald and Pamela Oliver. 2007. *The Critical Mass in Collective Action (Studies in Rationality and Social Change)*: Cambridge University Press. Noelle-Neumann, Elisabeth. 1984. *The Spiral of Silence. Public Opinion - Our Social Skin*. Chicago: University of Chicago Press. Granovetter, Mark and Roland Soong. 1988. “Threshold Models of Diversity: Chinese Restaurants, Residential Segregation, and the Spiral of Silence.” pp. 69. Gladwell, Malcolm. 2000. *The Tipping Point: How Little Things Can Make a Big Difference*. Boston: Little, Brown.

point. Broadmoor put up banners and yard signs throughout the neighborhood that said, “Broadmoor Lives,” and people in New Orleans East put signs in their window and their yards that said “We’re Coming Back,” well before they were able to return. These communities took a page from the playbook of Madison Avenue and created neighborhood “brands” to encourage other residents to join in. This signaling helped create a critical mass or tipping point to forge solidarity in the service of recovery.

The key question was how to build the momentum. For instance, leaders of the Beacon of Hope Resource Center in Lakeview knew that neighbors were more likely to return and rebuild if retail stores were available, while retail merchants were more likely to reopen if residents returned. Thus, Beacon leaders instituted a strategy of jawboning each side, telling residents that if they would return, Beacon would see to it that retail merchants reopened, and telling merchants along the retail corridors of Robert E. Lee Boulevard and Harrison Avenue that if they would reopen, Beacon would provide them with customers. Likewise, leaders of the Broadmoor Improvement Association (BIA) knew that residents were more likely to return and rebuild if neighborhood schools were open, while schools were reluctant to reopen if students did not return. Thus, BIA developed a strategy of building an “education corridor,” working to assure that the neighborhood Wilson School reopened and that the neighborhood library reopened as a community center, complete with a café. None of these efforts was guaranteed success, and much depended on leaders’ ability to persuade both sides. For instance, neighborhood leaders in Gentilly, just across City Park from Lakeview, also described to

us their efforts to persuade retail merchants to reopen, but they had much less success in doing so.

It is difficult to directly test the efficacy of these sophisticated strategies, but we can get some sense of “tipping” effects from our individual-level survey data, combined with the repopulation data from the USPS. Anticipating that tipping might be an important issue, we asked respondents if they thought most of their neighbors were going to come back and rebuild, and we asked if they thought their neighborhood would recover. In Table 3, we see that in census tracts where residents were optimistic, repopulation did in fact occur in subsequent years. This predictive effect (in the table rows) held good for the first couple years – 2006 and 2007 – and then faded by 2008, as a preponderance of those who were going to return did so.

This is an impressive result, especially since impressions and actual repopulation data were measured independently of each other. Still, a few provisos must be noted. First, since we were measuring impressions at different points of time, we had far fewer respondents to aggregate in each census tract. (Our full sample was collected over a period of several years, but it is not a set of full cross-sections over time, since we went neighborhood by neighborhood for the face-to-face component of our interviewing.) Thus, the number of census tracts for each predictive year (the rows of Table 3) are reduced. Furthermore, the tracts in each predictive year (row) are not necessarily the same as in other predictive years (rows). Also, we make no attempt in Table 3 to control for other variables or to classify the tracts by their leaders’ recovery strategies. Thus,

the results in Table 3 are suggestive and support our hypothesis about strategies for impression management to produce positive tipping, but they are not conclusive. Still, they support our primary models in this paper that show that civic engagement helped encourage repopulation in New Orleans after Hurricane Katrina, and they help flesh out some of the mechanisms by which this occurred.

Tables

Table 1. Descriptive Statistics.

	All		Lowest Repopulation ^a		Highest Repopulation ^b		Sig. Diff. ^c
	Mean or %	SD	Mean or %	SD	Mean or %	SD	
<u>Median Income (1000s)</u>	40.07	(24.07)	31.97	(13.41)	53.16	(30.92)	***
<u>% Black</u>	56%		58%		43%		+
<u>% Young (15-34)</u>	30%		28%		32%		**
<u>Damage</u>	-0.01	(0.72)	0.63	(0.58)	-0.63	(0.50)	***
<u>Social Embeddedness</u>	0.00	(0.98)	0.00	(1.13)	0.13	(0.87)	
<u>Civic Engagement</u>							
Lowest	24%		43%		11%		***
Med-Low	25%		24%		21%		
Med-High	25%		26%		21%		
Highest	26%		7%		47%		***
N	183		46		47		

Note: ^a Less than or equal to the 25th percentile in repopulation by the final observation (March 2012);
^b Greater than or equal to the the 75th percentile by the final observation (March 2012); ^c significant
difference between the lowest repopulation and highest repopulation. +p<.10; *p<.05; **p<.01; ***p<.001.
Standard errors in parentheses.

Table 2. Regression Predicting Percent Change in Population After Katrina

	Model 1: Demographics	Model 2: +Damage	Model 3: +Social Embeddedness	Model 4: +Civic Engagement	Model 5: +Civ*%Black
<u>Median Income (1000s)</u>	0.29*** (0.07)	0.17** (0.05)	0.16** (0.05)	0.11* (0.05)	0.13* (0.06)
<u>%Young (15-34)</u>	0.73** (0.23)	0.34+ (0.19)	0.32 (0.19)	0.35+ (0.19)	0.34* (0.17)
<u>%Black</u>	0.04 (0.05)	0.06+ (0.04)	0.06+ (0.04)	0.08* (0.04)	0.13* (0.06)
<u>Civic Engagement (vs. Highest)</u>					
Lowest				-7.92** (2.96)	9.94 (7.23)
Med-Low				-5.86* (2.59)	-3.36 (5.00)
Med-High				-6.87** (2.29)	-8.90* (3.82)
<u>Civic Engagement*%Black</u>					
Lowest*%Black					-0.25* (0.10)
Med-Low*%Black					-0.06 (0.08)
Med-High*%Black					0.03 (0.07)
<u>Damage</u>		1.69* (0.71)	1.30 (0.79)	2.00* (0.84)	2.26** (0.86)
<u>Damage*Time</u>					
		-			
Dam*Mar-08		27.13*** (1.54)	-27.13*** (1.54)	-27.13*** (1.54)	-27.13*** (1.54)
		-			
Dam*Jun-08		26.13*** (1.49)	-26.13*** (1.49)	-26.13*** (1.49)	-26.13*** (1.49)
		-			
Dam*Sep-08		25.28*** (1.46)	-25.28*** (1.46)	-25.28*** (1.46)	-25.28*** (1.46)
		-			
Dam*Dec-08		23.49*** (1.45)	-23.49*** (1.46)	-23.49*** (1.46)	-23.49*** (1.46)
		-			
Dam*Mar-09		22.68*** (1.47)	-22.68*** (1.47)	-22.68*** (1.47)	-22.68*** (1.47)
		-			
Dam*Jun-09		21.35***	-21.35***	-21.35***	-21.35***

			(1.46)	(1.46)	(1.46)	(1.46)
			-			
	Dam*Sep-09	20.85***	-20.85***	-20.85***	-20.85***	-20.85***
			(1.45)	(1.45)	(1.45)	(1.45)
			-			
	Dam*Dec-09	20.00***	-20.00***	-20.00***	-20.00***	-20.00***
			(1.46)	(1.46)	(1.46)	(1.46)
			-			
	Dam*Mar-10	19.31***	-19.31***	-19.31***	-19.31***	-19.31***
			(1.53)	(1.53)	(1.53)	(1.53)
			-			
	Dam*Jun-10	18.58***	-18.58***	-18.58***	-18.58***	-18.58***
			(1.54)	(1.54)	(1.54)	(1.54)
			-			
	Dam*Sep-10	18.16***	-18.16***	-18.16***	-18.16***	-18.16***
			(1.53)	(1.53)	(1.54)	(1.54)
			-			
	Dam*Dec-10	17.84***	-17.84***	-17.84***	-17.84***	-17.84***
			(1.57)	(1.57)	(1.57)	(1.57)
			-			
	Dam*Mar-11	17.16***	-17.16***	-17.16***	-17.16***	-17.16***
			(1.60)	(1.60)	(1.60)	(1.60)
			-			
	Dam*Jun-11	16.67***	-16.67***	-16.67***	-16.67***	-16.67***
			(1.59)	(1.59)	(1.59)	(1.59)
			-			
	Dam*Sep-11	16.44***	-16.44***	-16.44***	-16.44***	-16.44***
			(1.58)	(1.58)	(1.58)	(1.58)
			-			
	Dam*Dec-11	16.14***	-16.14***	-16.14***	-16.14***	-16.14***
			(1.59)	(1.59)	(1.59)	(1.59)
			-			
	Dam*Mar-12	15.92***	-15.92***	-15.92***	-15.92***	-15.92***
			(1.58)	(1.58)	(1.58)	(1.59)
	<u>Social Embeddedness</u>			1.78	1.42	1.54
				(1.13)	(1.12)	(1.05)
	<u>Time (vs. Pre-Katrina)</u>					
			-			
	Mar-08	-35.08***	35.39***	-35.39***	-35.39***	-35.39***
			(1.82)	(1.13)	(1.13)	(1.13)
			-			
	Jun-08	-35.15***	35.45***	-35.45***	-35.45***	-35.45***
			(1.76)	(1.10)	(1.10)	(1.10)
			-			
	Sep-08	-34.68***	34.97***	-34.97***	-34.97***	-34.97***
			(1.70)	(1.06)	(1.06)	(1.06)
			-			
	Dec-08	-34.16***	34.43***	-34.43***	-34.43***	-34.43***

	(1.61)	(1.04)	(1.04)	(1.04)	(1.04)
Mar-09	-33.25*** (1.59)	33.51*** (1.05)	-33.51*** (1.05)	-33.51*** (1.05)	-33.51*** (1.05)
Jun-09	-31.77*** (1.53)	32.02*** (1.03)	-32.02*** (1.03)	-32.02*** (1.03)	-32.02*** (1.03)
Sep-09	-30.79*** (1.51)	31.03*** (1.04)	-31.03*** (1.04)	-31.03*** (1.04)	-31.03*** (1.04)
Dec-09	-29.82*** (1.48)	30.05*** (1.04)	-30.05*** (1.04)	-30.05*** (1.04)	-30.05*** (1.04)
Mar-10	-28.65*** (1.48)	28.87*** (1.08)	-28.87*** (1.08)	-28.87*** (1.08)	-28.87*** (1.08)
Jun-10	-28.58*** (1.50)	28.80*** (1.14)	-28.80*** (1.14)	-28.80*** (1.15)	-28.80*** (1.15)
Sep-10	-28.10*** (1.49)	28.31*** (1.15)	-28.31*** (1.15)	-28.31*** (1.15)	-28.31*** (1.15)
Dec-10	-26.12*** (1.51)	26.32*** (1.18)	-26.32*** (1.18)	-26.32*** (1.18)	-26.32*** (1.18)
Mar-11	-25.44*** (1.49)	25.64*** (1.19)	-25.64*** (1.19)	-25.64*** (1.19)	-25.64*** (1.19)
Jun-11	-25.21*** (1.47)	25.40*** (1.19)	-25.40*** (1.19)	-25.40*** (1.19)	-25.40*** (1.19)
Sep-11	-24.66*** (1.47)	24.85*** (1.19)	-24.85*** (1.19)	-24.85*** (1.19)	-24.85*** (1.19)
Dec-11	-24.26*** (1.46)	24.44*** (1.19)	-24.44*** (1.19)	-24.44*** (1.19)	-24.44*** (1.19)
Mar-12	-23.82*** (1.45)	24.00*** (1.19)	-24.00*** (1.19)	-24.00*** (1.19)	-24.00*** (1.19)
Constant	63.78*** (9.94)	79.35*** (7.85)	80.52*** (7.50)	85.80*** (7.54)	83.13*** (7.75)
R ²	0.26	0.58	0.58	0.60	0.62
Observations	3348	3348	3348	3348	3348
Tracts	186	186	186	186	186

Note: Standard errors in parentheses. +p<.10; *p<.05; **p<.01; ***p<.001

Table 3.
The Effect of Expectations on Repopulation in Greater New Orleans, 2006-2010
Survey Data (N=ca. 7,000) & USPS Data at Tract Level (N as shown)
Bivariate Correlations

Cumulative Rate of Repopulation to:

<i>Expectations</i>	N ^a	2006	2007	2008	2009	2010
Most NBH evacuees will return 2007	33	-	.212	.312+	.317+	.322+
Most NBH evacuees will return 2008	37	-	-	.165	.128	.091
Neighborhood will Recover 2006	23	.584**	.602**	.708**	.716**	.742**
Neighborhood will Recover 2007	33	-	.596**	.609**	.628**	.604**
Neighborhood will Recover 2008	37	-	-	.082	.153	.142

^aNote: Tracts are different in different years.

Figures

Figure 1: Verba-Nie-Kim's Base Model: Individual Resources and Outcomes

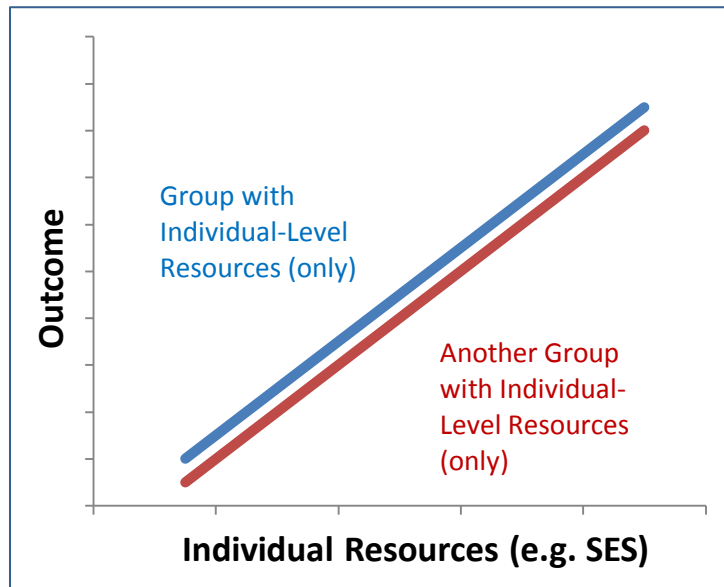


Figure 2: Verba-Nie-Kim's Model of Compensating Effects: Individual Resources, Collective Resources, and Outcomes

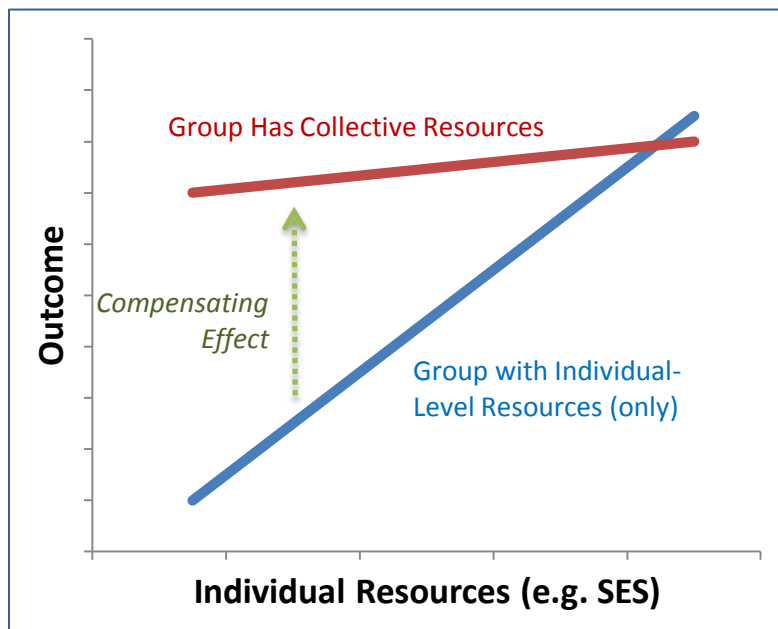


Figure 3

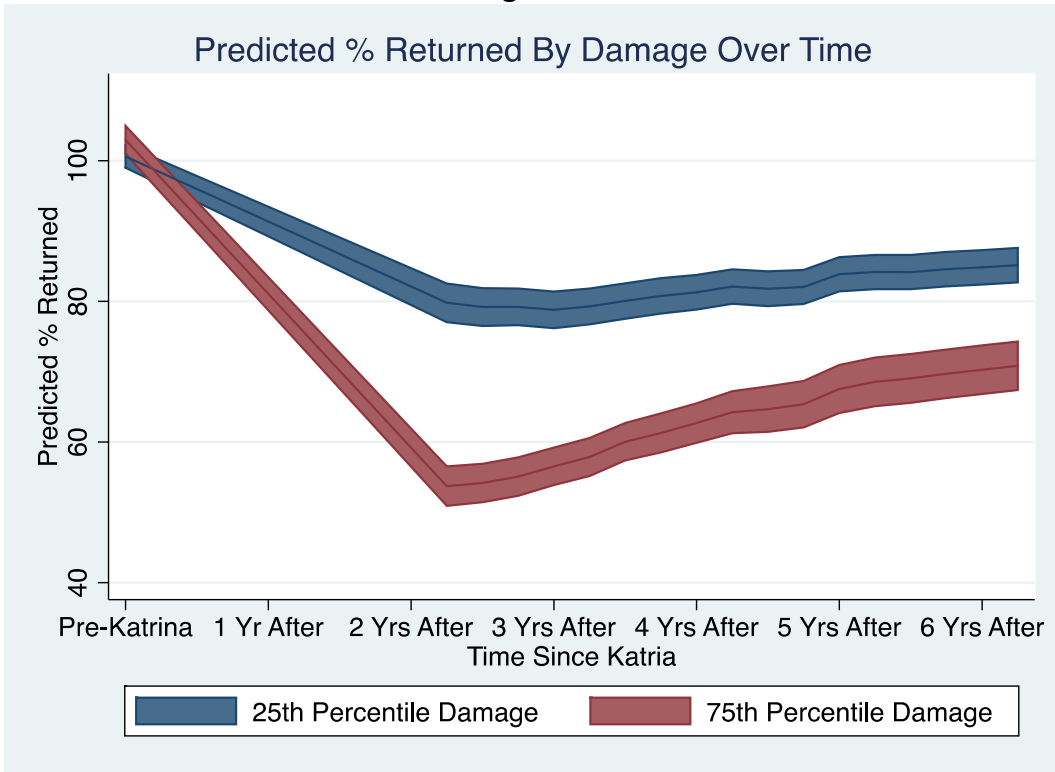


Figure 4

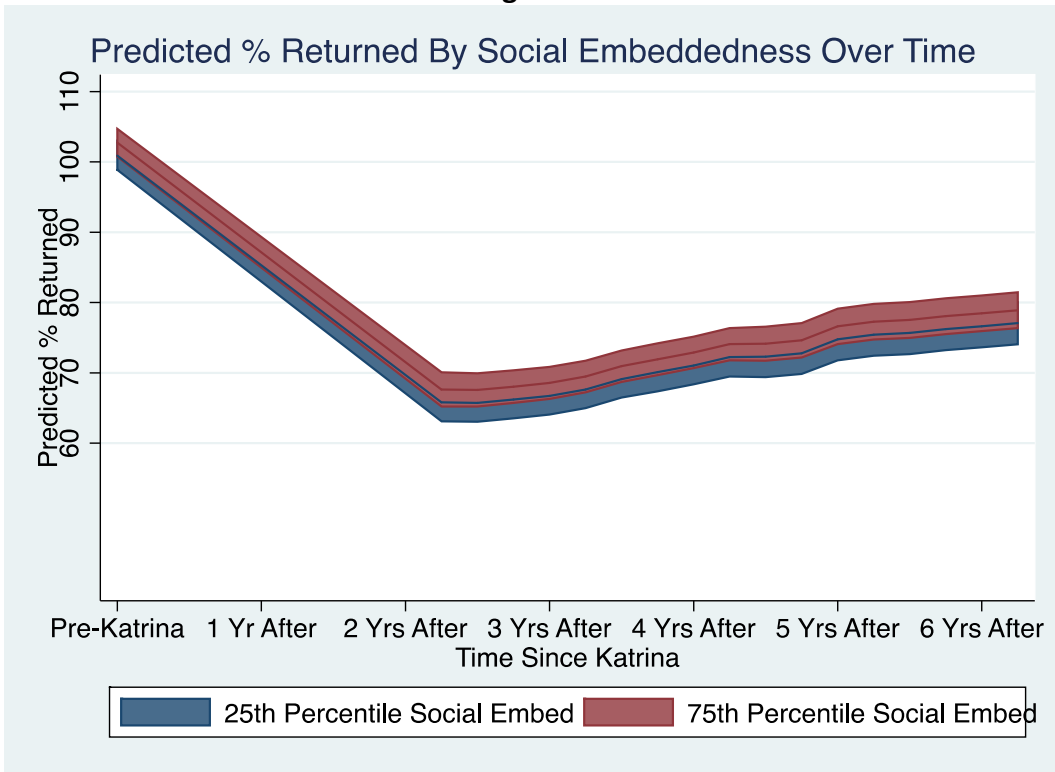


Figure 5

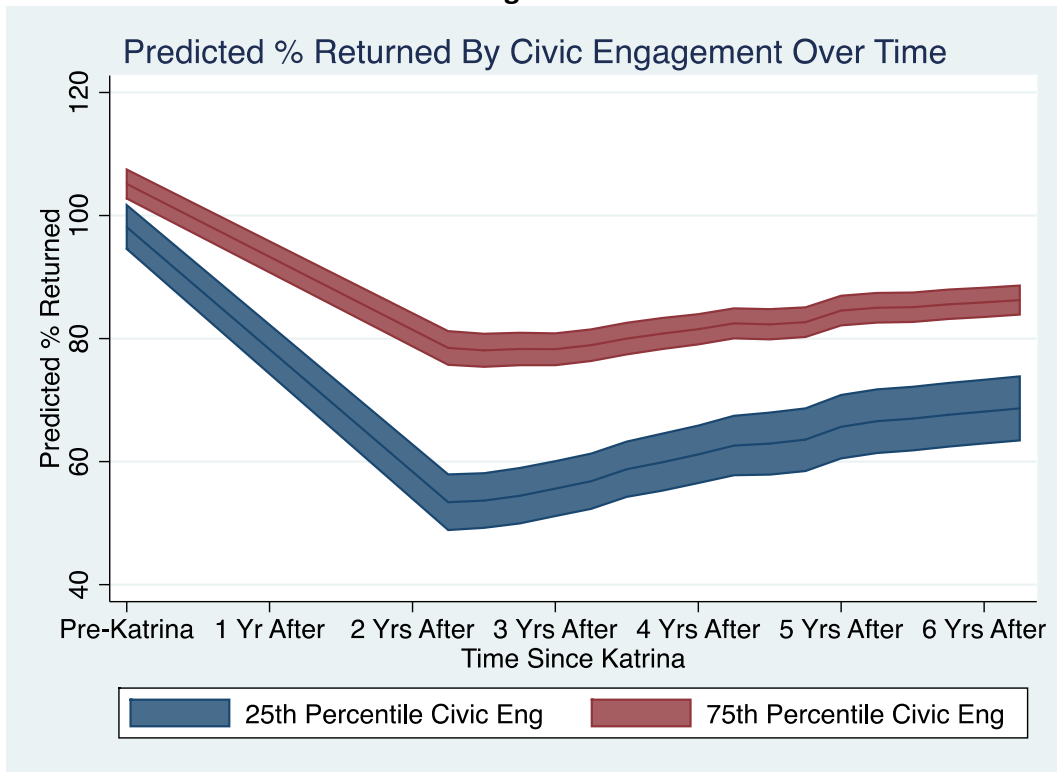
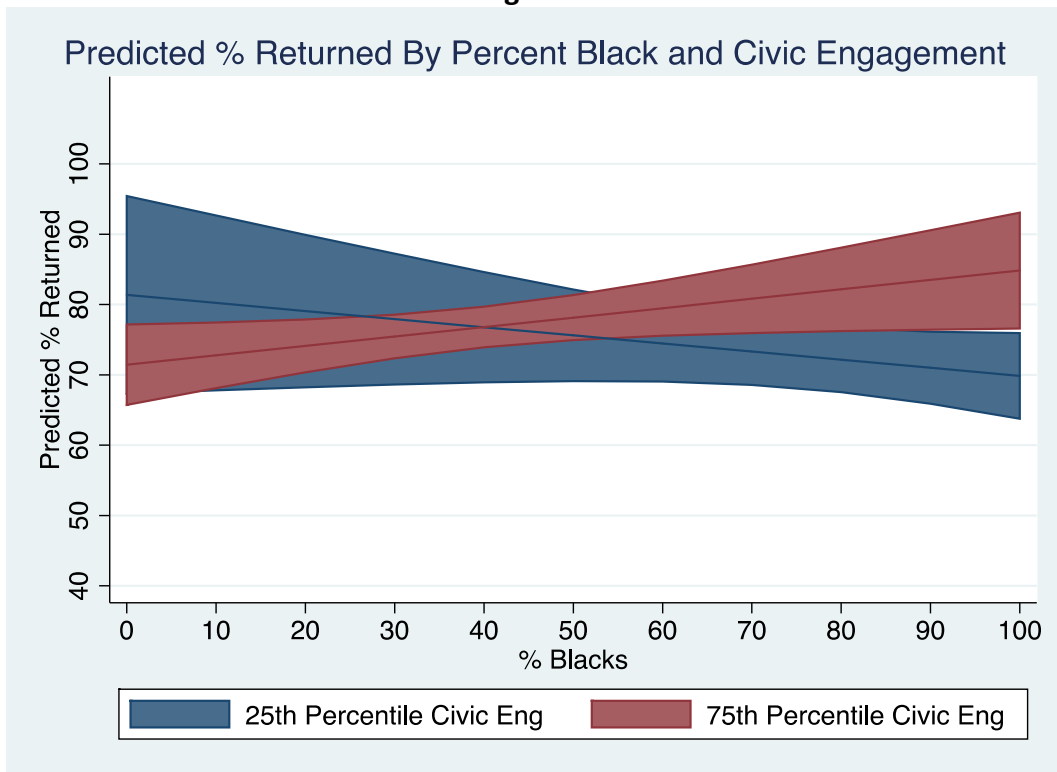


Figure 6



Appendix A. Data Sources and Survey Questions used in Variable Creation.

Income, Race, and Age. These are taken from the census tract data from the American Community Survey (ACS) for 2005-09.

Storm damage. Principle components of: “How much physical damage did your residence suffer as a result of hurricane Katrina and the subsequent flooding? [If apartment or condo: your own unit.] None or almost none, Some physical damage, Major physical damage, Complete destruction, unsalvageable;” “About how deep were any flood waters in your residence? No flood damage, Less than 2 feet, 2-4 feet, 4-8 feet, 8-12 feet, Over 12 feet;” and “[If still working] How much physical damage did your/your employer’s business suffer as a result of hurricane Katrina and the subsequent flooding? None or almost none, Some physical damage, Major physical damage, Complete destruction, unsalvageable.” The first two questions yield a scale of residential damage, which we use here, and the third question a scale of business or employer damage, which we do not use here. When we aggregate our survey measure of residential storm damage by census tract, it correlates at .854** with a house-by-house damage survey conducted by the city of New Orleans shortly after the storm. However, since the latter was conducted only in Orleans Parish, but not in St. Bernard Parish, we used our survey measure to assess residential damage in both parishes.

Civic Engagement. Principle components factor from: “Have you taken part in activities with the following groups and organizations in the past 12 months? Yes, No. ‘A neighborhood association, like a block association, a homeowner or tenant association, or a crime watch group;’ ‘A charity or social welfare organization that provides services in such fields as health or service to the needy;’ ‘A professional, trade, farm, or business association;” “How good a job do you think the following have done in the recovery from Hurricane Katrina and subsequent flooding? Great, Good, Neither Good Nor Bad, Bad, Terrible: ‘Your New Orleans neighborhood’s representatives in city government;’ ‘The leadership of your New Orleans neighborhood association.” Cronbach’s Alpha = .520.

Social Embeddedness. Principle components factor from: “About how often have you done the following? Every week (or more often), Almost every week, Once or twice a month, A few times per year, Less often than that, Never: ‘Had friends over to your home,’ ‘Visited relatives in person or had them visit you,’ ‘Socialized with co-workers outside of work,’ ‘Played cards or board games with others,’ ‘Hung out with friends at a

park, shopping mall, or other public place.” Plus, “About how many family and close friends do you have in each of these groups? (People you’re close enough to, that you’d visit each other at home.) About 0-5, About 5-15, About 15-50, About 50-100, About 100 or more. ‘Family and friends who live in your New Orleans neighborhood,’ ‘Family and friends of your faith who live in Greater New Orleans,’ ‘Family and friends of your race who live in Greater New Orleans.’” Cronbach’s Alpha = .753.

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