September 2015

Polling in Impossible Conditions: Pre-election Polling in New Orleans after Hurricane Katrina

Brian J. Brox
Tulane University

J Celeste Lay
Tulane University

Follow this and additional works at: http://digitalscholarship.tsu.edu/jpmsp

Part of the Political Science Commons, Public Affairs, Public Policy and Public Administration Commons, and the Urban Studies and Planning Commons

Polling in Impossible Conditions:
Pre-election Polling in New Orleans after Hurricane Katrina

Brian J. Brox
Tulane University

J. Celeste Lay
Tulane University

Just months after Hurricane Katrina made landfall, New Orleans held a mayoral election. With so many displaced residents, it was difficult to gauge attitudes, but there are perhaps few more important situations in which the public's attitudes need to be examined. This paper examines the methodological challenges with survey research in the aftermath of a natural disaster. We conducted a traditional survey just days before the election and attempted to correct for our inability to reach particular segments of the population through post-stratification weights. The results of our poll were relatively accurate for all of the candidates but one – the winner. We recommend in the aftermath of a disaster that researchers provide not only a range of possible outcomes, but also that they should consider other methods, such as focus groups, and alter the usual questions to account for the post-disaster context. Given that the opinion environment after a major disaster is marked by indecision and confusion, it is not surprising that respondents were unsure of their vote choice and/or changed their mind just before the election. Our experience should provide some caution to researchers seeking to measure opinion in these circumstances.

In 2005, Hurricane Katrina caused extensive damage in New Orleans and led nearly everyone in the city to evacuate for periods lasting from weeks to months. Six months after the disaster, with still thousands of residents living in temporary locations both inside and outside the city, New Orleans held a mayoral election. Since preexisting estimates of the city's population size and demographics were rendered unreliable, it was extremely difficult to   accurately measure public opinion about the election, including voters' preferences about the candidates and the important issues related to recovery. Into this uncertain situation we saw the opportunity not only to try to assess public opinion about a mayoral election, but also to analyze the methodological obstacles to collecting data in situations in which the sample is hard to reach and the population is in a state of rapid flux.

From a methodological standpoint, one of the challenges is that disasters can disrupt the population so much that pre-disaster estimates are no longer useful. When a substantial   proportion of the population loses their homes and is displaced, how do candidates, pollsters, and elected officials gauge their attitudes? This question is not only relevant to pre-election polls, but   also in measuring survivors' attitudes about recovery policies and their individual coping strategies. Furthermore, it is often difficult to reach the sample with traditional phone or internet surveys due to utility outages and population displacement.

These issues are not unique to this case. Natural disasters of various types are ubiquitous, and elections often take place as communities recover from floods, blizzards, tornadoes, wildfires, or hurricanes. For example, voters in Chicago had to go to the polls in late February 1979 to cast ballots in a primary election for mayor mere weeks after a massive winter storm blanketed Chicago with record low temperatures and over two feet of snow. Hurricane Andrew in 1992 and four major hurricanes in 2004 pounded Florida's coast in the months preceding presidential elections. In 2012, voters along the Atlantic Coast had to participate in federal elections just two weeks after Hurricane Sandy caused serious damage throughout the region. Indeed, given the United States' large number of elections and its wide susceptibility to natural disasters, there are many examples. And, if climate scientists are correct about the increasing number and severity of disasters, the cases are likely to increase.

This paper describes our efforts to conduct polling in New Orleans in the aftermath of Hurricane Katrina as the city prepared for municipal elections. We hope our findings shed light not only on issues of post-Katrina New

Orleans recovery, but also more broadly on useful lessons for those who hope to assess public opinion as part of a recovery effort following future natural disasters. To those ends, we begin by reviewing the scholarly literature on how natural disasters influence voting behavior. We continue by describing the efforts by numerous researchers to measure public opinion in the aftermath of Katrina, paying particular attention to their estimates of the racial composition of New Orleans. Using these estimates as a guide, we describe the methodology we employed to survey New Orleans voters in advance of the April 2006 mayoral primary. We then compare the results of our survey to the election results. We conclude with guidance for others working in situations similar to ours.

Political Behavior and Disasters

Most of the social science and public policy work on disasters examines individuals' psychological responses and coping mechanisms, societal responses such as acts of altruism and solidarity, policies on mitigation and recovery, and issues of inequality and injustice. However, there are important reasons to analyze the effect that disasters have on politics, including political behavior. Disasters can affect voting behavior in elections that immediately follow the event, but only to the extent that voters hold elected officials responsible for preparation and response to these events. Voters often utilize retrospective evaluations to reward or punish candidates and are capable of holding elected officials accountable based on their performance in office (Key 1966; Kramer 1971; Fiorina 1981; Malhotra and Kuo 2008). Attributions of responsibility vary by the incumbent's level of office, partisanship, and voters' levels of political sophistication (Gomez and Wilson 2008) as well as by the accessibility of information about the issue on which voters are asked to assess blame (Bartels 2008; Healy and Lenz 2014). For example, Maestas et al. show that people who were more attentive to news coverage about Hurricane Katrina, especially Republicans, were more likely to believe that the state's failure to call the federal government for help was instrumental in the time it took to get aid to New Orleans (2008). This literature, however, has not taken on the fact that there are significant methodological hurdles to assessing public opinion in the aftermath of a major disaster.

In an early and groundbreaking study, Abney and Hill demonstrated that voters did not believe the incumbent mayor of New Orleans was responsible for the flooding after Hurricane Betsy in 1965. The mayor was reelected by a thin margin just months after the storm (1966). The researchers had "neither the time nor the money to sample the entire city" and limited their interviews to five precincts comparable across racial and socioeconomic conditions (Abney and Hill 1966, 975). Three of the precincts had no flooding and two of them had significant flooding. They conducted their surveys in person by going door-to-door, thereby avoiding problems with phone service and power outages, however they did not address the likelihood that response rates were undoubtedly lower in the "wet" precincts.

A more recent study examines voters' attitudes in Houston after Tropical Storm Allison flooded parts of the city in 2001. Voters who believed the city was responsible for flood protection were willing to punish the incumbent mayor (Arceneaux and Stein 2006). Though this study was conducted within three months of a severe storm that caused $5 billion in damage, the destruction paled compared to Katrina. Approximately 30,000 people became homeless as a result of Allison, or about 1.5 percent of the Houston's population, compared to nearly 80 percent in New Orleans following Katrina. Researchers did not take extraordinary efforts to deal with sampling problems primarily because such a small portion of the population was displaced.

Other analyses avoid the difficulty of in-person interviews and ensure universal coverage of precincts by analyzing aggregate data. Aggregate analyses tend to show that events as wide ranging as droughts, floods, tornadoes, and shark attacks are associated with declines in vote share for incumbent parties (Achen and Bartels 2004; Healy and Malhotra 2009, 2010; Gasper and Reeves 2011). Looking at turnout rather than vote returns, Sinclair et al. (2011) demonstrate that Hurricane Katrina had a depressing effect on turnout in the 2006 election, but that those who lived in the most heavily damaged areas were actually the most motivated to vote because of the dynamics of the campaign.

In the aftermath of other natural disasters, polling firms and university polling centers have mostly chosen not to change their sampling methodology. The University of Iowa Hawkeye Poll did not change its methodology after the flooding in 2008, even though thousands of residents were displaced from their homes for months. Although there was some discussion at Gallup and other polling firms about discontinuing national polling operations after Hurricane Sandy destroyed homes along the New Jersey coast and Staten Island in 2012, ultimately pollsters forged ahead. Most polls of local residents utilized post-stratification weights to correct for under sampling devastated areas. Online information from the Marist poll, Siena College poll, Rutgers Eagleton poll, and Quinnipiac University poll documents that after Hurricane Sandy, each weighted the data according to 2010 Census figures. In doing so, they did not assume that the underlying population would change significantly, but rather that most of those who left would return or that those who remained were not significantly different from those who were displaced.

In summary, disasters can alter public opinion and voting behavior and as such, when elections take place in the weeks or months after a major natural event, it is necessary for researchers, candidates and the media to try to gauge voters' attitudes. However, there are serious methodological obstacles to collecting these data. Depending on

the scope of the damage, it may not be appropriate to use traditional polling and sampling methods, as they will not allow for accurate estimates of the population's opinions. The 2006 New Orleans mayoral election is a good case study for examining these methodological issues.

Katrina and New Orleans Population Estimates

On August 29, 2005, Hurricane Katrina made landfall just east of New Orleans, causing massive levee breaches around the city. New Orleans flooded nearly completely, as it is a virtual bowl, located largely below sea level and sandwiched between Lake Pontchartrain to the north and the Mississippi River to the south. Although nearly 80 percent of New Orleans' population evacuated before the storm and the majority of the remaining residents were evacuated or forced to leave afterward, the hurricane directly caused the deaths of more than 1,800 residents. Because of the city's geography, nearly every drop of water that came in through levee breaches had to be pumped out, forcing survivors to wait several weeks before they could return. Residents returned in phases, with those who sustained the least damage coming back first.

In spite of the fact that residents were scattered across the region, the city was forced by court order to schedule its regular mayoral primary election for April 22, 2006.[1] In the weeks before the election, the key unknown was the composition of the electorate. Many New Orleans residents lived in temporary homes in or near the city and others lived in Houston, Dallas, Atlanta, Memphis, and Baton Rouge. By the spring of 2006, only about 60 percent of pre-Katrina utility customers had services; only three of nine hospitals were open and only about a quarter of the physicians were practicing; residential mail service was nonexistent; both landline and cellular service was still spotty; and less than a third of the city's public schools had reopened (Rackleff 2007).

As is common after disasters, the City of New Orleans calculated rapid population estimates to get an idea of the new, post-disaster population (Grais et al. 2006). Through a complex process of stratified, geographic sampling and door-to-door surveys, these estimates suggested that in late-January, 2006, about 181,400 people lived in New Orleans (about 37 percent of the pre-Katrina population). Most experts agreed that this estimate was low; it did not include individuals living in non-residential structures nor did it count those living in temporary homes just outside the city.

Importantly, for the purposes of pre-election polling, the estimates did not break the population down by race (Stone et al. 2006). Racial composition is a key factor for voting in New Orleans (Lay 2009); the city has an extensive history of racially polarized voting and opinion (Liu and Vanderleeuw 2007). There were two main ideas about the composition of the electorate. A Brown University study released in early 2006 predicted that the electorate would be majority White and with significantly higher incomes than before (Logan 2006). By combining 2000 Census data with federal damage assessment maps, the study suggested that if only the undamaged areas of New Orleans were rebuilt, the city could lose as much as 80 percent of its African America population and 50 percent of its White population. A few weeks later, a local consulting group predicted that the electorate would still be majority African American (Thevenot 2006). This study compared voter registration lists with change-of-address filings with the U.S. Postal Service and found that about 80 percent of pre-Katrina registered voters were potentially living in the New Orleans metro area and the racial composition was very similar to its pre-Katrina proportions.

There were few polls taken in New Orleans in the months following Katrina. Loyola University's Institute of Politics conducted two polls in advance of the mayoral primary, one in late January/early February 2006, and the other in late March, about three weeks before Election Day. Each poll reported the results of interviews with 400 registered voters in the City of New Orleans contacted by landline telephone. In both cases, there was difficulty reaching respondents who were roughly 60 percent white and 40 percent African American. They chose to weight the data evenly by race (Ritea and Eggler 2006; Krupa and Donze 2006).

The Gallup Organization (co-sponsored by CNN and *USA Today*) conducted a pilot study on February 4-5, 2006. They saw the lack of landline phone service as the chief obstacle to getting an accurate sample. The state's main phone company, BellSouth, estimated that at that time, there were still 144,000 households in New Orleans without phone service. Gallup believed the appropriate solution was to supplement a landline sample with a cellular phone sample. Most research indicates dual-frame samples are not methodologically problematic and that there are similar population estimates between cell phone and landline samples (Brick et al. 2006; Keeter et al. 2007; Kennedy and Everett 2011), but some have shown significant differences between the populations (Blumberg and Luke 2007; Carley-Baxter et al. 2010).

---

[1] Louisiana has non-partisan primary elections. All candidates are listed on the same ballot. If one candidate receives a majority in the primary, he or she is declared the winner. If no candidate receives a majority, a run-off election is held a month later between the top two vote-getters.

Until very recently, the cell-only group has generally been younger and lower-income than landline users, but as cell phone use grows and landline use declines, this is changing (Peytchev and Neely 2013). There is no research, however, on using a cell phone sample in the period following a natural disaster. One study shows that many New Orleans residents became more reliant on their cell phones after Katrina, largely because it was the only semi-reliable form of communication and even then, primarily only through text message (Shklovski et al. 2010).

In their pilot study, Gallup discovered the working rate for landline telephone numbers in their sample was only 22 percent, about one-third of the working rate in a typical national sample. They were able to get a working rate of 69 percent on cell phones, and the response rates between cell phone respondents and landline respondents were nearly identical (56 and 55 percent, respectively). Gallup's final sample of 804 respondents included 64 percent by cell phone and 36 percent by landline. Landline respondents were slightly more likely to cooperate (59% to 50%). There were few demographic differences and there were no substantive attitudinal differences between the two samples (Jones 2006).

Table 1: Methodologies of Post-Katrina Pre-election Polls

	Dates	Sample Size	Margin of Error	Mode	Post-Stratification Weights
Loyola University Institute of Politics	1/26/06-2/13/06	400	4.7%	Landline	Race (50/50 White/Black)
Gallup	2/18/06-2/26/06	804	4.0%	Landline + Cellphone	Adjusted for prob. of inclusion based on # of telephone #s & # of people
Loyola University Institute of Politics	3/23/06-3/28/06	400	4.7%	Landline	Race (50/50 White/Black)
Our Primary Election Data	4/15/06-4/17/06	571	4.1%	Landline	Multiple weights used

The fact that there was no consensus about the underlying population of New Orleans meant there was enormous uncertainty about the upcoming election. How many and which people would vote? Would the electorate change significantly because so many people were displaced? Would residents travel to the city in order to vote? Moreover, did displaced residents still consider themselves to be New Orleanians, or had they moved not just

physically but psychologically? The uncertainty had serious implications for the campaign, in part because many African American residents feared that they were about to lose power and many Whites believed that for the first time in a generation, they could win back the mayor's office. The uncertainty also, of course, had implications for researchers wishing to analyze public opinion. The sample was going to be difficult to reach because of the lack of utility services. The population was dynamic and yet, if residents were to be involved in the recovery process, officials would have to find a way to understand what the people wanted.

Our Methods

In the weeks before Election Day, the common perception was that the race was a close contest between the African American incumbent, Ray Nagin, and two White candidates: Mitch Landrieu, sitting Lt. Governor; and Ron Forman, a local businessman. The Gallup poll conducted in February showed Landrieu and Nagin were tied with 18 percent each, but the plurality of respondents (40 percent) was undecided. Loyola's March survey showed that Nagin and Landrieu were tied for the lead, each with about a quarter of respondents and about 23 percent of voters were undecided. Forman was third, but people believed his support was growing. With no polls since early March, we believed it was important to collect data because voters' perceptions of the contest influence turnout and vote choice (Blais and Bodet 2006; Gimpel and Harvey 1997). The absence of this information could create incorrect assumptions on the part of voters as well as candidates and policymakers.

Our survey used Interactive Voice Response (IVR) to call landlines in New Orleans. In contrast to the more expensive Computer-Assisted Telephone Interviewing (CATI), IVR significantly reduces costs because no call center is necessary. There are several other benefits of using IVR. First, it reduces social desirability bias (Turner et al. 1998; Newman et al. 2002; Kreuter et al. 2008). Lind et al. (2013) suggest that respondents are more likely to report true opinions rather than socially desirable ones when "questioned by computers (rather) than by interviewers" (889) because they "wish to avoid embarrassing interviewer reactions and other potentially harmful consequences…" (908). Further, because IVR is cheaper, it allows for the collection of larger sample sizes; in our case, this was an important advantage because we needed a larger sample so that we could rely on weighting techniques to correct for sample biases resulting from the lack of landline phone service in New Orleans. Fortunately, comparisons of IVR to CATI show few significant differences (Midanik and Greenfield 2010). One drawback to IVR, as compared to CATI, is an increase in nonresponse error; it is easier for respondents to drop out (Tourangeau et al. 2002; Sakshaug et al. 2010). However recent analyses of the accuracy of CATI and IVR polling reveal that both methods are acceptable (AAPOR 2009).

We used a generic vote choice question and a screen for whether respondents planned to vote in the mayoral election.[2] Surveys were administered to randomly-selected residential landlines in Orleans Parish on April 15-17, 2006. Despite drop-off throughout the survey, we obtained 966 responses to at least one question in the survey (65 percent response rate) and 333 responses that fully completed the one-minute telephone survey (22 percent). As we expected, the sample was not an accurate representation of the racial composition of the population. Seventy-five percent of our sample was White, 18 percent was African American and 7 percent was another race.

O'Neill et al. argue that it is acceptable to use post-stratification weights based on a characteristic that is correlated to the vote and is available for both the population and the sample (2002). Post-stratification weights adjust for nonresponse or noncoverage in order that the weighted survey more accurately represents the population of inference. Their use assumes that those included in the survey with a particular characteristic – in this case, racial identity – have similar attitudes as those excluded from the survey. They are commonly used in surveys conducted over the phone or Internet to adjust for the population that does not have access to these devices (Dever et al. 2008). In most cases, the adjustments are minimal, but "when there is sizeable noncoverage and/or nonresponse involved, the adjustments can be substantial; in this case the adjustments are used to reduce the bias of the survey estimates, but standard errors for estimates unrelated to the adjustment variables may be increased" (Kalton and Flores-Cervantes 2003, 82).

Although methodologists caution against significantly altering the sample after the fact through the use of weights, obtaining a less biased sample would have required extraordinary efforts. One could have, for example, gone door-to-door to get around the problems of a lack of utility services. However, in March and April, 2006, most of the flooded neighborhoods were still largely abandoned. A door-to-door search would have found many empty, moldy homes and in some cases, no doors on which to knock. A cell phone sample would have helped to reach some displaced

---

[2] Our question: "If the New Orleans mayoral election were held today, would you vote for…?" Several candidates names were then listed one at a time and respondents stated "no" or "yes." Gallup's question: "For each of the following candidates for mayor, please tell me whether you will definitely vote for that person. How about…?"

voters, but it would have been prohibitively expensive.

The major problem with weighting the data, however, was that it requires that population totals for the explanatory variables be known from an external source. As stated, no one was sure what the racial composition of the city or the electorate would be in this first election after Katrina. Thus, traditional survey methods resulted in biased samples, and a common method of correcting the bias was compromised because we lacked solid figures on the current racial composition of the population. Our solution to this problem was to create multiple weights based on the two population estimates reported at that time, including the Brown University report and the local consultant's estimate. This way, we did not assume we understood more about the underlying population than we actually did. Results would be reported along a range and contingent upon the weights used.

The Brown study estimated the city could have lost 80 percent of the Black population and 50 percent of the White population. It did not estimate an effect on the other racial groups; to account for voters of other races, we estimated that population lost 65 percent of its pre-Katrina population. A large portion of New Orleanians who are neither Black nor White are Vietnamese-American, and though this population suffered substantial flooding and displacement, they also returned in more significant numbers than many poor Blacks. Thus, we estimated that their return rate would have been between that of the White and African American population. This results in an electorate 46 percent Black, 48 percent white, and 6 percent other races. This was very similar to the 50/50 distribution used by Loyola University's Institute of Politics. The other weighting technique was that of the local consultant, who estimated that the population after the storm would be similar to the pre-Katrina population. As such, the racial composition of the last mayoral election in 2002 was 62 percent Black, 35 percent White, and 3 percent other races.

Results

Table 2 presents the results of our poll based on different weighting scenarios as well as the election results. The raw data were within the margin of error for a two of the minor candidates: Rob Couhig and Tom Watson. Couhig was the only Republican in the race and garnered most of his support from fellow residents of Lakeview, a mostly White upper- and middle-class community that suffered severe flooding. Of those whose homes were most heavily damaged, these residents were some of the first to return and begin rebuilding. As such, they were easier to reach than others who suffered similar or worse levels of flooding. Watson is an African American minister, but was not seen as a viable alternative to Nagin.

Table 2: Weighting Scenarios Based on Multiple Post-Katrina Population Estimates of Racial Composition

Candidates	Our Raw Data	Brown Weights	'02 Election Weights	'06 Election Weights	2006 Primary Results
		45/48/6[1]	62/35/3[1]	53/42/5[1]	
Couhig	14.5%	13.3%	12.3%	12.8%	10%
	(83)				
Forman	24.7%	18.4%	14.8%	16.7%	17%

	(141)				
Landrieu	24.0%	25.7%	26.8%	26.2%	29%
	(137)				
Nagin	11.7%	20.8%	25.9%	23.1%	38%
	(67)				
Watson	0.4%	1.0%	1.2%	1.1%	1%
	(2)				
Other	4.0%	3.6%	3.4%	3.5%	5%
	(23)				
Undecided	20.7%	17.2%	15.6%	16.5%	--
	(118)				

Total N=571

[1] Weights presented in order of %Black, %White, and %Other Races

The unweighted results were only slightly outside the margin of error for Ron Forman and Mitch Landrieu, the two White candidates believed to be the incumbent's major competition. Forman was most heavily supported by White residents living in Uptown, an area of the city that did not suffer significant flooding and consists primarily of middle- and upper-income residents. Landrieu's support was more widespread and he ultimately came in second to Nagin. Our unweighted results were most inaccurate with regard to Nagin's support. His support came mostly from Black voters. Because the African American community suffered disproportionately in the flood and were so much more difficult to reach with traditional survey methods, they were under-represented in the poll.

In weighting the data according to racial composition, weighting techniques that assume higher White populations produce higher levels of support for Couhig and Forman and lower support for Nagin. If the actual racial composition in the election had been closer to 46/48/6, Forman would have been a stronger contender. Landrieu's support was much less contingent on the weighting scenario than any of the others. The poll shows him leading Nagin under all scenarios, including the one based on the 2002 electorate's composition in which African Americans were a significant majority.

Ultimately, the racial composition of the 2006 primary electorate was 53 percent Black, 42 percent White, and 5 percent other races. Had we had a crystal ball to foresee this, the poll would have produced results within the margin of error for all candidates except Nagin, the eventual first place finisher. Under this weighting scenario Landrieu was still predicted to finish first, followed closely by Nagin and Forman. Furthermore, nearly seventeen percent of the population would have been categorized as undecided using these weights.

Why did the poll so substantially under-estimate Nagin's support? He came in first in the primary, garnering 38 percent of the vote, but none of the weighting scenarios show him in the lead. One problem is that the African Americans who were surveyed were not entirely representative of those who actually voted. Blacks who were surveyed had landline phone service and thus, were not as poor as those who could not be included in the sample. Indeed, 42 percent of African Americans in the sample reported no flooding at their home, a figure much lower than the 80 percent of Black residents in the population that experienced some flooding. Even allowing that a significant portion of these residents did not vote in the 2006 election because of disinterest or displacement, it is likely the case that the African Americans in our sample were systematically different from primary voters. Given that we now know Nagin received most of his support from predominantly-Black precincts, this helps explain why the poll underestimated his level of

support.

Another reason the poll miscalculated Nagin's support was that nearly 20 percent of respondents said they were undecided about whom to support. This portion undoubtedly included some respondents who were not interested in or closely following the elections as well as some who had a preference but did not wish to reveal it in the survey; it also likely included some voters who were genuinely stumped. African American voters had not supported Nagin in 2002 and before Katrina, they did not generally approve of his job performance. However, the 2006 campaign became viewed through the lens of a potential White "power grab," when Blacks feared Whites were going to take advantage of the fact that so many African Americans were displaced and could not vote. In fact, Sinclair et al. (2011) show this belief helped to mobilize the Black community. Thus, there were likely many African American voters who held their noses and voted for Nagin, but did not decide to do so until the last minute, or who were unwilling to reveal this choice in a survey. For their part, the White community was split primarily between Forman and Landrieu, so it is possible that some of the undecided voters were Whites who had not made up their minds about which candidate to support.

We present our results in Table 3 with the exclusion of the undecided voters. The presence of a "don't know" or "undecided" option does not influence the substantive distribution when the "don't knows" are excluded (Presser and Schuman 1980). Mitofsky (1998) offers alternatives for allocating the "undecideds," including excluding them altogether. He also argues one could allocate the "undecided" evenly between the two parties or allocate them all to the challenger, but because this was a multi-candidate race where partisanship had little influence, neither of these were viable options. We chose not to allocate the "undecided" proportionally because it seemed clear to us that voters were not equally undecided between all the candidates, but rather had narrowed their choices down to two – either Forman or Landrieu, or Nagin or Landrieu, dependent largely on the respondent's race.

Excluding the undecided voters, Nagin's proportion comes closest to his actual total in the election when we assume the racial composition of the electorate will match the previous electorate – when African Americans make up a substantial majority. Even these results under- estimate his eventual levels of support. If we had weighted the data according to the actual racial composition of the 2006 electorate, we would have predicted Nagin's total portion would have been even less. We cannot be sure how much of the poll's under-representation of Nagin's support is due to issues with the representativeness of African Americans in the sample, or whether a significant portion of New Orleans voters decided in the final days to vote for the incumbent.

Table 3: Weighting Scenarios Based on Multiple Post-Katrina Population Estimates of Racial Composition – Excluding Undecided Voters

Candidates	Our Raw Data	Brown Weights	'02 Election Weights	'06 Election Weights	2006 Primary Results
		45/48/6[1]	62/35/3[1]	53/42/5[1]	
Couhig	14.5%	16.1%	14.6%	15.4%	10%
	(83)				
Forman	24.7%	22.3%	17.5%	20.1%	17%
	(141)				
Landrieu	24.0%	31.1%	31.8%	31.4%	29%
	(137)				
Nagin	11.7%	25.1%	30.7%	27.7%	38%
	(67)				
Watson	0.4%	1.2%	1.5%	1.3%	1%
	(2)				
Other	4.0%	4.3%	4.0%	4.2%	5%
	(23)				
	Total N=571				

[1] Weights presented in order of %Black, %White, and %Other Races

We should also note that because we sampled landlines, we were unable to interview any residents who were living outside New Orleans but voted by absentee ballot. City and state officials made significant efforts to allow New Orleans voters to cast their ballots from outside the city. Satellite polling centers were located near cities with large numbers of evacuees, and ballots were allowed to be submitted by mail and fax. Had we been able to include a sample of this population in the poll, it is possible Nagin's support would have been higher, however the election results do not indicate it would have made a significant difference. Nagin won a plurality of the absentee votes (38 percent), but Landrieu came in not far behind with 35.5 percent; even Forman earned a significant portion of displaced voters (16.5 percent).

Conclusions and Recommendations

The results of our poll, conducted just a few days before the election, did not accurately predict the outcome that Nagin would win. Even with a variety of weighting scenarios, mathematical correction cannot overcome a sample in which a demographic group   known to have an important impact on local politics is distinct from its underlying population. However, the relative accuracy of the weighted predictions for the remaining candidates was remarkable

given the uncertainty that surrounded efforts to estimate the racial makeup of New Orleans in early 2006. It is these two results – the accuracy of the predictions for most of the candidates and the inaccuracy of the prediction for the eventual winner – that lead us to a few important recommendations for researchers measuring public opinion following disasters.

First, when a disaster displaces a significant portion of the population, especially when the effects are not equally distributed across important demographic groups, we believe researchers should develop multiple weighting techniques and report results along a range of opinion. One option would be to use pre-disaster estimates as a guide; this can serve as a good starting point and is obviously most appropriate when all relevant demographic groups are equally displaced by the natural disaster. Additional options may present themselves as other researchers – commercial, political, and academic – also attempt to describe the population in the wake of a natural disaster. Thus, it is best to present multiple sets of results based on the different techniques, and researchers should emphasize the higher level of trust they place in findings that are consistent across the different weighting schemes. In our case, however, multiple weighting scenarios would not have completely solved the problems associated with the biased sample.

As such, it may not be possible with a widespread disaster to use traditional polling techniques and obtain accurate results. When so many people are displaced; when they do not have access to utility services; when they do not know where "home" really is, it may be better and more accurate to use other forms of data collection than to rely on phone surveys. Focus groups, panel studies, face-to-face interviews are all potential options that could have helped us get a closer approximation of actual opinion in the population. These methods are, of course, more time-consuming and expensive than a traditional phone survey, but if we had chosen to supplement our survey will ongoing focus groups, we might have better understood how the attitudes of the poorer, displaced African American population were so significantly different from the less poor African American population we were able to survey. Future research should consider multiple methods of data collection that includes, but is not limited to, traditional survey research.

Finally, the results here also suggest that the post-Katrina situation led to a more dynamic opinion environment. There were high numbers of undecided voters because people were generally struggling with significant choices on a regular basis, only one of which was their vote for mayor. Where would I live? Was my old job still available? Where will my friends and family live? Will I be able to send my children to school, and where? Is it safe to stay in the city? Katrina and other major disasters lead to a high level of confusion and indecision, along with resulting anxiety and psychological distress. Polling is, after all, only a snapshot of attitudes at a given time. In an environment where people regularly change their minds, either because of their own confusion or because the situation demands it, the usefulness of polling may be limited. Researchers should attempt to gauge how confident respondents are about their answers so that they can judge how confident they should be in their results. If we had followed our sample across several weeks of the campaign, we might have seen how and when undecided voters ultimately came to their decision.

In conclusion, it is important to try to understand public opinion after a disaster. Elected officials need to know where the public stands on the myriad issues surrounding recovery. But, researchers should be aware of the potential pitfalls and try to adapt their methods to account for the changes in the population resulting from the disaster. More than any other recommendation we can offer is that researchers should not be overly confident that they have accurately captured the population's views in an environment where not only are people changing their mind more often than usual, but the population itself changes rapidly as people come and go in the wake of a major disaster.

Authors' Biographies

Brian J. Brox is an associate professor of political science at Tulane University. He is the author of *Back in the Game: Political Party Campaigning in an Era of Reform*, published by SUNY Press in 2013. His research interests include political parties, voting behavior, and campaigns and elections.

J. Celeste Lay is an associate professor of political science at Tulane University. She is the author of *A Midwestern Mosaic: Immigration and Political Socialization in Rural America*, published by Temple University Press in 2012. Her research interests include political socialization, voting behavior, public opinion, and education policy.

References

American Association for Public Opinion Research. 2009. An evaluation of the methodology of the 2008 pre-election primary polls. Report of the AAPOR Ad Hoc Committee on the 2008 Presidential Primary Polling. http://www.aapor.org/AAPORKentico/AAPOR_Main/media/MainSiteFiles/AAPOR_Rept_FINAL-Rev-4-13-09.pdf [Accessed to May 26, 2015].

Abney, F. Glenn, and Larry B. Hill. 1966. Natural disasters as a political variable: The effect of a hurricane on an urban election. *American Political Science Review* 60:974-981.

Achen, Christopher H., and Larry M. Bartels. 2004. Blind retrospection: Electoral responses to drought, flu, and shark attacks. Princeton University. Working Paper.

Arceneaux, Kevin, and Robert Stein. 2006. Who is held responsible when disaster strikes? The attribution of responsibility for a natural disaster in an urban election. *Journal of Urban Affairs* 28:43–53.

Bartels, Larry M. 2008. *Unequal democracy: The political economy of the New Gilded Age*. Princeton, NJ: Princeton University Press.

Blais, André, and Marc André Bodet. 2006. How do voters form expectations about the parties' chances of winning the election? *Social Science Quarterly* 87:477-493.

Blumberg, Stephen J., and Julian V. Luke. 2007. Coverage bias in traditional telephone surveys of low-income and young adults. *Public Opinion Quarterly* 71:734-749.

Brick, Michael J., Sarah Dipko, Stanley Presser, Clyde Tucker, and Yangyang Yuan. 2006. Nonresponse bias in a dual frame sample of cell and landline numbers. *Public Opinion Quarterly* 70:780-793.

Carley-Baxter, Lisa R., Andy Peytchev, and Michele C. Black. 2010. Comparison of cell phone and landline surveys: A design perspective. *Field Methods* 22:3-15.

Dever, Jill A., Ann Rafferty, and Richard Valliant. 2008. Internet surveys: Can statistical adjustments eliminate coverage bias? *Survey Research Methods* 2:47-62.

Fiorina, Morris P. 1981. *Retrospective voting in American national elections.* New Haven: Yale University Press.

Gasper, John T., and Andrew Reeves. 2011. Make it rain? Retrospection and the attentive electorate in the context of natural disasters. *American Journal of Political Science* 55:340-355.

Gimpel, James G., and Diane Hollern Harvey. 1997. Forecasts and preferences in the 1992 general election. *Political Behavior* 19:157-175.

Gomez, Brad T., and J. Matthew Wilson. 2008. Political Sophistication and Attributions of Blame in the Wake of Hurricane Katrina. *Publius* 38:633-650.

Grais, Rebecca F., Denis Coulombier, Julia Ampuero, Macelino E.S. Lucas, Avertino T. Barretto, Guy Jacquier, Francisco Diaz, Serge Balandine, Claude Mahoudeau, and Vincent Brown. 2006. Are rapid population estimates accurate? A field trial of two different assessment methods. *Disasters* 30:364-376.

Healy, Andrew, and Gabriel S. Lenz. 2014. Substituting the end for the whole: Why voters respond primarily to the election-year economy. *American Journal of Political Science* 58:31-47.

Healy, Andrew, and Neil Malhotra. 2009. Myopic voters and natural disaster policy. *American Political Science Review* 103:387-406.

---. 2010. Random events, economic losses, and retrospective voting: Implications for democratic competence. *Quarterly Journal of Political Science* 5:193-208.

Jones, Jeffrey M. 2006. New Orleans poll methodology. http://www.galluppoll.com/BLOG/default.aspx?a=03012006 [Blog post that was available at URL as of March 8, 2013. Copy of post can be obtained by contacting the authors].

Kalton, Graham, and Ismael Flores-Cervantes. 2003. Weighting methods. *Journal of Official Statistics* 19:81-91.

Keeter, Scott, Courtney Kennedy, April Clark, Trevor Tompson, and Mike Mokrzycki. 2007. What's missing from national landline RDD surveys? The impact of the growing cell-only population. *Public Opinion Quarterly* 71:772-792.

Kennedy, Courtney, and Stephen E. Everett. 2011. Use of cognitive shortcuts in landline and cell phone surveys. *Public Opinion Quarterly* 75: 336-348.

Key, Valdimer O. 1966. *The responsible electorate: Rationality in presidential voting, 1936-1960.* Cambridge, MA: Harvard University Press.

Kramer, Gerald. 1971. Short-term fluctuations in US voting behavior, 1896-1964. *American Political Science Review* 65:131-143.

Kreuter, Frauke, Stanley Presser, and Roger Tourangeau. 2008. Social desirability bias in CATI, IVR, and web surveys. *Public Opinion Quarterly* 72:847-865.

Krupa, Michelle, and Frank Donze. 2006. New poll in mayor's race shows top 3 candidates running close. *New*

Orleans Times-Picayune, April 8, 1.

Lay, J. Celeste. 2009. Race, retrospective voting, and disasters: The reelection of C. Ray Nagin after Hurricane Katrina. *Urban Affairs Review* 44:645-662.

Lind, Laura H., Michael F. Schober, Frederick G. Conrad, and Heidi Reichert. 2013. Why do survey respondents disclose more when computers ask the questions? *Public Opinion Quarterly* 77:888-935.

Liu, Baodong, and James M. Vanderleeuw. 2007. *Race rules: Electoral politics in New Orleans, 1965-2006*. Lanham: Lexington Books.

Logan, John R. 2006. The impact of Katrina: Race and class in storm-damaged neighborhoods. Report of the initiative in spatial structures in the social sciences, Brown University. http://www.s4.brown.edu/katrina/report.pdf [Accessed May 26, 2015].

Maestas, Cherie D., Lonna Rae Atkeson, Thomas Croom, and Lisa A. Bryant. 2008. Shifting the blame: Federalism, media, and public assignment of blame following Hurricane Katrina. *Publius* 38:609-632.

Malhotra, Neil, and Alexander G. Kuo. 2008. Attributing blame: The public's response to Hurricane Katrina. *Journal of Politics* 70:120-135.

Midanik, Lorraine T., and Thomas K. Greenfield. 2010. Reports of alcohol-related problems and alcohol dependence for demographic subgroups using interactive voice response versus telephone surveys: The 2005 US National Alcohol Survey. *Drug & Alcohol Review* 29:392-398.

Mitofsky, Warren. 1998. The polls – review: Was 1996 a worse year for polls than 1948? *Public Opinion Quarterly* 62:230-249.

Newman, Jessica Clark, Don C. Des Jarlais, Charles F. Turner, James Gribble, D. Phillip Cooley, and Denise Paone. 2002. The differential effects of face-to-face and computer interview modes. *American Journal of Public Health* 92:294–297.

O'Neill, Harry, Warren Mitofsky, and Humphrey Taylor. 2002. The good and bad of weighting data. Statement by the national council on public polls polling review board. http://www.ncpp.org/?q=node/39 [Accessed May 26, 2015].

Peytchev, Andy, and Benjamin Neely. 2013. RDD telephone surveys: Toward a single-frame cell-phone design. *Public Opinion Quarterly* 77:283-304.

Presser, Stanley, and Howard Schuman. 1980. The measurement of a middle position in attitude surveys. *Public Opinion Quarterly* 44:70-85.

Rackleff, Robert. 2007. The lost (and found) voters of Hurricane Katrina. *Carnegie Reporter* 4(2). http://carnegie.org/publications/carnegie-reporter/single/view/article/item/175/ [Accessed May 26, 2015].

Ritea, Steve, and Bruce Eggler. 2006. Mayoral poll can't snag many evacuees; but those in city favor Landrieu, Nagin. *New Orleans Times-Picayune*, February 24, 13.

Sakshaug, Joseph W., Ting Yan, and Roger Tourangeau. 2010. Nonresponse error, measurement error, and mode of data collection: Tradeoffs in a multi-mode survey of sensitive and non-sensitive items. *Public Opinion Quarterly* 74: 907-933.

Sinclair, Betsy, Thad E. Hall, and R. Michael Alvarez. 2011. Flooding the vote: Hurricane Katrina and voter participation in New Orleans. *American Politics Research* 39: 921-957.

Shklovski, Irina, Moira Burke, Sara Kiesler, and Robert Kraut. 2010. Technology adoption and use in the aftermath of Hurricane Katrina in New Orleans. *American Behavioral Scientist* 53: 1228-1246.

Stone, Greg, Tim Grant, and Nathaniel Weaver. 2006. Rapid population estimate project. Report of the Emergency Operations Center, City of New Orleans. http://www.columbia.edu/itc/journalism/cases/katrina/City%20of%20New%20Orleans/Emergency%20Operations%20Center/Rapid%20Population%20Estimate.pdf [Accessed May 26, 2015].

Thevenot, Brian. 2006. N.O. voters still here, latest study shows. *New Orleans Times- Picayune*, March 29.

Tourangeau, Roger, Darby Miller Steiger, and David Wilson. 2002. Self-administered questions by telephone: Evaluating interactive voice response. *Public Opinion Quarterly* 66:265-278.

Turner, Charles F., Barbara H. Forsyth, James M. O'Reilly, Phillip C. Cooley, Timothy K. Smith, Susan M. Rogers, and Heather G. Miller. 1998. Automated self-interviewing and the survey measurement of sensitive behaviors. In Mick P. Couper, Reginald P. Baker, Jelke Bethlehem, Cynthia Z. F. Clark, Jean Martin, William L. Nichols II, and James M. O'Reilly, eds., *Computer assisted survey information collection*. New York: Wiley.