News, Social Capital and
Health in the Context of Katrina

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Abstract: This study assesses the public health functions played by news information and social capital in the context of Hurricane Katrina. In-depth interviews were conducted with 57 hurricane shelter residents between 4 and 6 weeks after the hurricane. Depression was more common for participants who relied more on news information than for other participants after the hurricane (adjusted odds ratio [AOR], 5.49; 95% CI, 1.29 to 23.35; p=.021). Depression was more common for participants with relatively low levels of pre-hurricane positive social interactions (AOR, .16; 95% CI, .02 to 1.83; p=.046) and post-hurricane positive social interactions (AOR, .02; 95% CI, .00 to .74; p=.033) and high levels of post-hurricane negative social interactions (AOR, 17.05; 95% CI, .92 to 315.64; p=.047). Illness and injury were more common for participants who had relied more on news information than for other participants after the hurricane (AOR, 1.13; 95% CI, 1.02 to 2.77; p=.046).

Key words: Social capital, news, mass media, depression, natural disasters.

Natural disasters place a great burden on an affected region and its population, fracturing social, informational, and physical infrastructure[1–4] and causing death and injury,[2] as well as stress, depression, and vulnerability.[1,5–9] Because disasters exacerbate preexisting social inequalities,[10] these negative outcomes are worse among poor and underserved groups, often best characterized in terms of class, income, race, ethnicity, gender, and age.[11]

By many standards, Hurricane Katrina was the worst natural disaster in U.S. history. The storm surge breached several New Orleans levees, leading to the greatest displacement of a U.S. population ever, the flooding of 80% of the city, the deaths of more than a thousand people in New Orleans alone, and an estimated $100 billion in damages.[12,13] Although a mandatory evacuation was ordered, 120,000 residents remained in New Orleans during the hurricane, in homes, hotels, and several "shelters of last resort."[14] An estimated 27,000 people stayed at the Superdome, with another 20,000 at the New Orleans Convention Center.[14] In the days and weeks that followed, New Orleans residents moved across the country, with many staying in hurricane shelters in other cities and states.

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With local, state, and federal governments providing little assistance, the New Orleans public was left, in many ways, to fend for itself. In such an environment, people had to create and adapt to makeshift social and informational resources. As a consequence, Hurricane Katrina affords a unique opportunity to study the public health functions of news information and social capital in the context of a natural catastrophe.

News information and social capital are critical to how people adapt to new situations; construct, manage, and resolve uncertainty; and confront adversity, including threats to physical and mental health. To deal with such challenges, many people rely on the news media.[15,16] News information has been shown to be important in various disaster settings, including reports of a disaster in the aftermath and recommendations related to public safety.[17,18] Conversely, exposure to graphic television depictions of disasters has been associated with the development of psychological illness.[19,20] Concerning Hurricane Katrina, it would be expected that news coverage and its effects would vary according to time period. For example, prior to the hurricane, news information would be critical to survival and safety, in the form of weather predictions and suggested evacuation routes and other safety strategies. Following a hurricane, news information is also important, taking the form of updates on hurricane-damaged regions, recommendations related to living accommodations and planned returns to damaged regions, and safety tips for reentering such areas. News following a hurricane, however, could well also include graphic and disturbing images.

Also critical to a public's disaster response is *social capital*, which can be defined as resources embedded in social networks that can be accessed and mobilized in purposive action.[21] These social resources result from the social connections and interactions of people.[22] Social capital is defined in terms of its function,[23] with social connections necessary for the achievement of various outcomes. Previous research has considered social capital to be a resource of groups of people and/or of individual people.[24] The current study takes the view that, while social capital exists in links between people, it is individuals who have actual access to the social resources. It should be noted that, with information channels as an integral component,[23] social capital is consistent with the flow of news information during disasters.

Social capital is important because of its connection to positive public health outcomes.[25,26] This carries over to disaster settings, where disaster preparedness and recovery are better for people and groups who have high levels of trust, community participation, and social networking.[4,27–29] Similarly, social support is linked to improved post-disaster health and development,[30,31] including decreased stress and depression.[1,2,5–7] Conversely, social capital can have adverse public health outcomes,[32] such as that evidenced by the link between organization membership and HIV infection in South Africa.[33] In disaster settings, social capital, as measured in terms of social connections and informal groupings, is consistent with illegal activities such as raiding of relief supplies and looting.[34,35]

The current study assesses the public health functions of news information and social capital in a vulnerable population before, during, and after Hurricane Katrina. The current study aims to address two related questions. First, what types of news information and social capital do people rely on before, during, and after a catastrophic

natural disaster? Second, what are the relationships between health outcomes and the reliance on news information and social capital?

Methods

In-depth interviews were conducted with 57 adults who were hurricane shelter residents in the state of Louisiana. The randomly selected participants were residents of New Orleans who had left the city as a result of Hurricane Katrina. The in-depth interviews were completed during the first two weeks of October 2005, between 4 and 6 weeks after the hurricane. Each interview lasted between 20 and 60 minutes. The interviews were conducted inside the four most-populated Red Cross shelters in the state: Alexandria, Baton Rouge, Lafayette, and Monroe. Institutional Review Board approval for this study was provided by Tulane University. Participants signed a related consent form prior to the interviews.

Participants were randomly selected, with every 10th shelter resident approached for this study. The study was explained individually to 75 such residents. Among the 75 individuals, 11 expressed a lack of interest during the explanation of the study. The remaining 64 people were asked to participate in the study. Of these, 89% (n=57) agreed and were subsequently interviewed, resulting in an overall cooperation rate of 76%.

The interviews were semi-structured, allowing participants to answer specific questions, as well as provide anecdotal information and tangential ideas. There were both quantitative and qualitative questions. Topics were addressed in chronological order, beginning with the days before the hurricane, moving on to the hurricane itself, and then to the weeks that followed. Each place a participant had stayed was assessed. Questions related to demographics were asked at the end of the interviews.

The aim of the qualitative interview component was to draw comparisons and contrasts with the findings of the quantitative interview component and to provide examples of experiences reported during the interviews. The interviews were audio recorded and then transcribed and entered, in quantitative and qualitative forms, into Microsoft Excel. Excel was used as a step toward further quantitative analysis with Stata 9 (StataCorp, College Station, Texas, USA); its use made the qualitative data more manageable in terms of both categorization and presentation. The qualitative data analysis focused on the content of participant statements. Because of the broad nature of the qualitative data, a sorting process followed, with segments of each interview placed in various content categories. This involved categorization according to grounded theory, including open and selective coding, comparison and categorization, and re-reading and modification.[36]

Quantitative measurement included psychological and physical health problems, news reliance, positive social capital, negative social capital, and demographics. Psychological problems were assessed in terms of depression. The six items involved restless sleeping, sadness, enjoyment of life, crying, feeling disliked by others, and feeling depressed.[37] The timeframe for the questions was the previous week. This specific subscale,[9] as well as other similar subscales,[38,39] have been validated by previous research. Responses to each item were yes (1) and no (0). Responses were added to create a seven-point index of depression (K-R 20=.85; range=0–6; M=2.97; SD=1.81). The index was

split to distinguish between participants who met the criteria for depression (4 to 6 symptoms) and those who did not (0 to 3 symptoms). Those respondents with the criteria for depression were scored 1, while those without the criteria were scored 0. By having four, five, or six of the symptoms, 46% of the participants screened positively for depression. Physical health problems were assessed specific to illness and injury. There were two items: 1) one specific to physical illness, including diarrhea, colds, and respiratory problems; and 2) one specific to physical injury, including cuts, bruises, staph infection, and rashes. The timeframe for these measures was from the point of the hurricane making landfall until the time of the interview. Thirteen percent reported physical illness, while 6% reported physical injury. Subsequently, an overall index was created for illness and injury ($M=.16$, $SD=.37$).

Use of news information was assessed in terms of news reliance before and after the hurricane. This measure indexed participant reliance on different media (radio, television, newspaper, and Internet) for news information about the hurricane. Participants were asked if they had relied on each of these media for news about the hurricane.[40] For example, for television news reliance after the hurricane, the following item was used: "Did you rely on television news to stay informed about the hurricane and its aftermath?" For hurricane-related information leading up to the hurricane, 54% of the participants relied on television, followed by radio (25%) and newspapers (2%). After the hurricane, television was the most widely relied upon source of news information in the shelters (49%), compared with radio (21%), the Internet (7%), and newspapers (5%). Responses to the four medium-specific items were added to create news reliance indices for before the hurricane ($M=.81$, $SD=.69$) and after the hurricane ($M=.83$, $SD=.81$). Thus, participants, on average, relied on .81 media outlets before the hurricane and .83 media outlets after the hurricane. As for plans for future news information related to the hurricane, 60% said they expected to rely on radio, followed by television (46%) and newspapers (2%).

Social capital was measured in terms of social interactions before and after the hurricane. The assessment at both time periods had two steps. First, for each place the participants stayed, they were asked how often they interacted with neighbors and other non-familial people.[38,39] Responses were as follows: *never*, *rarely*, *sometimes*, and *often*. Second, the valence of these social interactions was assessed, with participants asked if these social interactions were positive or negative in nature. Although previous research makes the distinction between positive and negative forms of social capital, no quantitative measurement could be located for the negative representations of social capital. Participants who responded *sometimes* or *often* to the aforementioned social interaction question were then asked two follow-up questions: 1) *Were the social interactions positive, such as borrowing and lending food and household items and offering and receiving support?;* and 2) *Were the social interactions negative, such as in relation to intimidation, crime, and violence?*[41] Thus, if respondents had interacted sometimes or often with neighbors and other non-familial people *and* indicated that the interactions were positive, they received a score of 1. If not, they received a score of 0. Via this approach, the mean for pre-hurricane positive social interactions was .42 ($SD=.50$), while the mean for pre-hurricane negative social interactions was .28 ($SD=.45$).

The approach was more complex for the post-hurricane period. The post-hurricane

assessments involved social interactions in each place a participant had stayed after the hurricane. Because the number of places stayed varied, the responses were divided by the total number of places a participant had stayed. This process resulted in two social capital indices: post-hurricane positive social interactions ($M=.29$, $SD=.33$) and post-hurricane negative social interactions ($M=.15$, $SD=.28$).

Results

Demographics. Of the sample, 25% were Caucasian and 75% African American; 49% were male. The mean age was 47.80 years ($SD=16.23$). The mean education level was 11.52 years ($SD=2.26$), with 57% having a high school degree. As for annual household income, 87% reported less than $25,000, and the remaining 13% reported less than $50,000.

Hurricane experiences. When the hurricane hit, 56% of the participants were at a home in New Orleans, with the rest having evacuated to shelters, hotels, and homes elsewhere. As a result of the hurricane, the participants had traveled *via* car, bus, airplane, helicopter, ferry, canoe, and other types of boats. About 82% of the participants did not have personal access to a vehicle for evacuation; among those with access, several reported car problems that prevented a timely evacuation. The participants had stayed in churches, on bridges, overpasses, off-ramps, airports, schools, universities, and homes of friends and relatives; shelters such as the Superdome, the Convention Center and the Astrodome; and even a donut shop. The mean number of places stayed was 2.67 ($SD=1.43$), with one participant having stayed in 9 different places since the hurricane.

Quantitative findings. Binary logistic regression was employed to test the predictors of the two health outcomes measures: 1) depression; and 2) illness and injury. Control variables included sex, age, income, race/ethnicity, and education. The critical predictors were positive social interactions, negative social interactions, and news reliance, with specific measures representing before the hurricane and after the hurricane. Findings are shown in Table 1. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) are reported.

The first logistic regression model explained 35% of variance in depression, as indicated by the R^2. As depicted in Table 1, there are four significant predictors of depression. An AOR of less than 1 indicates that an increase in a predictor is consistent with the decreased likelihood of an outcome variable. In contrast, an AOR of more than 1 indicates that an increase in a predictor is consistent with the increased likelihood of an outcome variable. Thus, it can be inferred that increases in pre-hurricane positive social interactions and post-hurricane positive social interactions were consistent with not having depression. In contrast, increases in post-hurricane negative social interactions and post-hurricane news reliance were consistent with having depression.

The second logistic regression model accounted for 15% of variance in illness and injury, as indicated by the R^2. As depicted in Table 1, there is only one significant predictor of illness and injury. The AOR indicates that an increase in post-hurricane news reliance was consistent with experiencing illness and injury.

Qualitative findings. News information was critical at various stages of the disaster.

Table 1.

ADJUSTED ODDS RATIOS[a] AND CONFIDENCE INTERVALS FOR PREDICTORS OF HEALTH OUTCOME VARIABLES

	Depression		Illness and injury	
	AOR (95% CI)	p-value	AOR (95% CI)	p-value
Pre-hurricane positive social interactions	.16 (.02, 1.83)	.046	1.60 (.17, 15.22)	.684
Pre-hurricane negative social interactions	.54 (.08, 3.89)	.541	.95 (.13, 7.20)	.962
Post-hurricane positive social interactions	.02 (.00, .74)	.033	.71 (.06, 8.70)	.791
Post-hurricane negative social interactions	17.05 (.92, 315.64)	.047	1.86 (.12, 29.03)	.657
Pre-hurricane news reliance	.59 (.14, 2.50)	.470	.45 (.09, 2.16)	.319
Post-hurricane news reliance	5.49 (1.29, 23.35)	.021	1.13 (1.02, 2.77)	.046
R^2	.35		.15	

[a] Adjusted for race/ethnicity, sex, age, income, and education.
AOR = adjusted odds ratio
CI = confidence interval

For example, in a shelter several days after the hurricane, a woman reported that the absence of information led shelter residents to become frustrated and then hostile. Other participants offered examples of news information being important for their sense of stability.

> In [another] shelter, the news was there. I could see the city and what happened. Here, I don't know nothin.' I don't know if my house is OK. I don't know if my neighbors are OK. It can really bring you down. (Man, 67, African American)

> Not knowin' is the worst thing. I wouldn't feel so bad if I could see my house and know if I could move back. I can't, so things are tough. (Woman, 80, African American)

Satisfaction with news information related to the hurricane varied, with 32% of the participants reporting information satisfaction and 49% reporting information dissatisfaction. Of those who were dissatisfied with information, 29% complained of the lack of information specific to their own neighborhoods. Furthermore, there were numerous cases of mixed messages at different times throughout the disaster. For example, a man reported receiving conflicting messages from the National Guard and television news about whether or not he had to evacuate.

When asked about social connections in New Orleans before the hurricane, 42% of the participants provided examples of the positive forms of social capital.

We had a beautiful community. Neighbors got along wonderful. It was a no-crime area. (Woman, 67, African American)

They was cleaning up the streets, the drug activities. People worked together to do good things. We had a neighborhood watch. (Woman, 21, African American)

In contrast, 28% provided examples of the negative forms of social capital.

Youth were together and doin' bad things. They were killin' like crazy. Everyday killin'. Moms were out there smokin' dope all their life. Kids didn't have no daddy. (Woman, 39, African American)

When people were together, there was a lot of not good. We had a few killings and things like that. It was pretty violent really. (Man, 44, African American)

Other participants offered a mixed picture:

It was kinda nice and kinda violent. People workin' in a good way in some neighborhoods. In other neighborhoods, people were different. People can come together and stick together like family. Other people get together and cause crime. (Man, 25, African American)

When asked about social interactions during and following the hurricane, 50% of the participants provided examples of the positive forms of social capital. For example, one participant, who was caring for an autistic child and two diabetic relatives, referred to being on an Interstate overpass for three days following the hurricane. Another participant agreed:

Where you gonna get your next drink of water the next day and where you gonna get your next food the next day? People worked together. We shared everything, any water, any food. (Man, 53, White)

There were also examples specific to the hurricane shelters:

I got lotta homeboys I knew from New Orleans here. I knew 'em from before. I know 'em again. It brought people closer. People helpin' people. (Man, 25, African American)

We laughed and talked, we created a little group as a family, we just tried to look out for one another, we was a crutch for each other. (Woman, 58, African American)

In addition, one diabetic, who needed regular insulin shots, had lost his medication during evacuation. He reported that another resident, who uses the same type, gave him insulin. Another participant spoke of social support during the hurricane:

I was alone, but in contact with a neighbor. Water coming in, roof collapsing, a skylight created, the wall came down. I was working with a neighbor. The neighbor came over cuz his place was worse. We were holdin' the window in place against the storm. The house was dancin.' Water was leakin' in the kitchen. (Man, 54, African American)

Yet another participant offered an example of how a community helped people in a previous hurricane shelter:

The community reached out with nothin' but love from outside. They came in from the moment we were there. People gave us food, buy us clothes, bring us to their church. They helped us when we weren't feelin' good. (Man, 56, White)

In contrast, 26% offered examples of the negative forms of social capital:

Some young men get together and aren't doing anything. They sit outside, smoke, talk trash, listen to music. And they doin' this and that. You got people stealing things left and right, my money, my cell phone, my medicine. (Woman, 51, African American)

In fact, about 12% of the participants had been victims of theft in the hurricane shelters. In addition, 11% witnessed looting in New Orleans, with about 4% reporting participation in such looting activities (where that term includes taking essentials such as water and foodstuffs). Relevant examples include the following:

Some people doin' bad things. Everybody was mixed up: bad animals and the good animals. The bad animals lootin' stores. (Man, 53, White)

Everyone went [into Sav-A-Center]. They got everything, with buggies, food, beer everything. (Man, 44, White)

The looters started arriving. They're goin' in. They coming down the street in canoes. They were every age. They had their children out there lootin.' There were families lootin.' They're comin' back with hair driers, anything. The looters were lootin' each other. (Man, 54, African American)

Discussion

It is important to note that the hurricane shelter populations were primarily African American, with low incomes and little education. This suggests that the population that ended up in the hurricane shelters was vulnerable even before the hurricane hit. These residents of New Orleans had little access to transportation to evacuate the city and few options when it came to short-term lodging after the hurricane.

Shelter residents sought out news information as a means of dealing with the disaster and related uncertainty and health threats.[15,16] The residents relied primarily on television leading up to the hurricane and in the hurricane shelters thereafter, but expected to rely even more on radio in the weeks and months ahead. In general, however, news reliance was not common, with participants, on average, relying on less than one

media outlet both before and after the hurricane. That post-hurricane news reliance was associated with greater likelihood of psychological and physical health problems is inconsistent with research that has suggested the importance of news information in disaster scenarios,[17,18] but consistent with other research that has linked viewing of graphic television images to psychological illness.[19,20] These associations, as well as the low levels of news reliance, may also be explained in terms of information dissatisfaction. As suggested by the qualitative data, misinformation and mixed information were frequent, and such information is likely to foster uncertainty rather than resolve it.[16] Also, media access and user control in the shelters were much more limited than they normally were, which would likely constrain media learning.[43] Finally, the most common stimulus to information dissatisfaction was the lack of information about specific affected neighborhoods. This suggests a first paradox. The Internet appears to have been the best medium for accessing information about specific neighborhoods, including flood levels, but only 4 of the 57 participants reported using the medium for hurricane-related information, and 2 of these required assistance to do so. (There were a limited number of open-access Internet terminals in the hurricane shelters, but they were not widely used.)

There are two other potential reasons for the associations between news reliance and health outcomes. First, it could be that people who faced psychological and physical health problems related to the hurricane subsequently relied more than others on the news media. Perhaps, these people turned to the news media as a potential solution to, or buffer from, their problems. Second, it could be that the news media stimulated increases in psychological problems as a result of the nature of news coverage of the hurricane. Such news coverage included extensive detailed and graphic depictions of the effects of the hurricane, including crowded shelters of last resort, flooded streets and homes, and drowned bodies.

It is important to note that the relationships between news reliance and health outcomes were not clearly borne out by the qualitative data. As noted above, some shelter residents viewed news information as a bridge to understanding and stability, not one to psychological and physical suffering.

The quantitative analysis above was designed in part to identify the social capital predictors of health outcomes. Depression was more common among participants with low levels of pre- and post-hurricane positive social interactions, but high levels of post-hurricane negative social interactions. These findings support research indicating that social capital in positive forms can result in positive health outcomes,[25,26] while social capital in negative forms worsens health outcomes.[32,33] It could be that people who were less depressed were able to develop and rely upon more social connections or that people's mobilization of social connections and related social resources helped them fight off depression.

The qualitative data imply the same relationships. For example, shelter residents provided examples of positive forms of social capital, as well as positive outcomes that followed. Specifically, shelter residents received emotional support from loved ones, information from acquaintances they had known before the hurricane, and insulin from people whom they had just met. These findings support previous research,[25,26] including

some specific to disaster response.[4,27,29] Social capital took on negative forms, as well.[32] For example, participants reported looting in New Orleans and theft in the hurricane shelters, which are consistent with the criminal and antisocial behaviors noted by previous research.[34,35] These negative outcomes of social capital appear to have a basis in two rationales: the exclusion of outsiders and downward leveling norms.[32]

It is interesting that there were no significant correlations between the social capital measures and physical health problems related to the hurricane. This could indicate one of three things. It could mean that social capital and related social connections and social support are not effectual determinants of health in the context of a major natural disaster except in the case of psychological problems. Second, it could be that social capital plays a more complex role than that tested in this study. For example, one previous study indicated that social capital's role in these scenarios is one of statistical moderation, not one of correlation, which is what was tested in this study.[27] Third, it could be that the effects of Hurricane Katrina, because of the disaster's enormity, were beyond any control by residents of New Orleans. Thus, social capital was insufficient for avoiding illness and injury.

A second paradox appears in relation to social capital and the shelter population. Social capital is especially important to African Americans in poor urban communities as a means to the attainment of social and economic well-being and advancement.[44,45] Nevertheless, social capital in such environments is limited in its extent and primarily involves bonding. *Bonding social capital* involves social connections that reinforce exclusive identities and homogeneous groups,[46] such as people of the same ethnicity or same socioeconomic status (SES). In contrast, *bridging social capital*, which forms in the presence of weak ties, involves inclusive social connections with people from different social groups.[21,47] In comparison with bridging social capital, bonding social capital allows for only a limited expansion of access to information and social resources. The benefits and detriments of bonding social capital can be seen in the context of the current study. Before, during, and after Hurricane Katrina, kin and friends provided one another with myriad forms of support. Among the shelter population, however, these bonding ties were with people who were also of low SES and, importantly, also residents of New Orleans. The presence of SES-bridging ties, especially to wealthier New Orleans residents, could have facilitated transportation for evacuation. In addition, the presence of geographic-bridging ties, to people who lived outside of the area threatened by the hurricane, could have yielded better places to stay during and following the hurricane.

The current study has two limitations that should be noted. First, generalization of the current findings is limited to residents in Red Cross shelters in Louisiana following Hurricane Katrina. Participants were randomly selected, but it is expected that the functions and uses of news information and social capital may vary by disaster and by geographic region. Second, the sample size has a sampling error that is larger than ideal, which could lead to instances of Type I error, with the null hypothesis rejected even though it is true.[48] Although a bigger sample was considered, the final sample size was decided upon as a result of funding limitations and the fact that later interviews generated redundant qualitative data.

Conclusion

The results of the current study help elucidate the roles of news information and social capital in a time rife with chaos and uncertainty. When Hurricane Katrina hit, a low-income, low-education population was left on its own. It faced the considerable obstacles imposed by evacuation and subsequent lodging. Although a lack of financial resources and bridging social resources landed the participants in hurricane shelters, the participants did not give up when confronted by the hurricane and its aftermath. They traveled by myriad types of vehicle, stayed in myriad places, some makeshift, and developed and redeveloped means of access to news information and social capital that allowed them to confront uncertainty and public health threats in a time in which social support greatly outweighed governmental support.

An avenue for improvement in information following a natural disaster is the Internet. The Internet, after all, would have been the best source of specific types of information, while more traditional mass media provided more general information. For example, the Internet could provide hurricane evacuees with access to neighborhood-specific information, including damage estimates and online entries of neighbors, some of whom had revisited the area. The problem, as noted above, is that the hurricane shelter population was ill prepared to employ this new medium as an informational tool following Hurricane Katrina. Although there were a limited number of open-access Internet terminals in the hurricane shelters, few of the shelter residents availed themselves of this resource. Social capital is important, as well. It is a social resource that anyone, rich or poor, highly educated or not, can develop and mobilize, providing benefits to psychological health, even in the context of the United States' worst-ever natural disaster.

Acknowledgments

Notes

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