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**Public Libraries as Social Infrastructure in Disaster
Resilience and Recovery: Houston Libraries and Hurricane
Harvey**

by

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ABSTRACT

Current work in the social sciences highlights social infrastructure and its role in communities, especially in cases of disaster resilience and recovery. This study furthers that body of work by examining the role of public libraries in flooding recovery and resilience through the case of Hurricane Harvey in Houston, Texas. By combining spatial analysis with in-depth interviews with library staff, this study finds that public libraries are well situated to serve vulnerable communities not only during immediate emergency response but also in long-term recovery and resilience planning. Libraries in Houston are located in close proximity to those who experienced flood damage in Hurricane Harvey, as well as to those who are socially vulnerable as indicated by such traits as poverty, renter status, and lack of access to private transportation. In practice, during disaster recovery public libraries provide a place to build social capital, navigate recovery resources, and re-establish a sense of normalcy. Interview results also indicate that library staff themselves are a vital part of the social infrastructure, and are able to extend their impact beyond the physical space of the library. However, there are limitations on staff including compassion fatigue, lack of specific training, and lack of funding. These results encourage further study of social infrastructure within the social sciences, and offer policy implications for the specific roles that public libraries can play both in disaster recovery and enhancing urban resilience in the age of climate change.

INTRODUCTION

When thinking about the challenge of climate change and flood risk, discussions of infrastructure often focus on physical flood mitigation interventions, such as seawalls, levees, and drainage culverts. But the social sciences have increasingly been turning their attention to social infrastructure. Eric Klinenberg pushed forward the concept of social infrastructure in the field of sociology with his body of work beginning on the 1995 Chicago heat wave. Most recently, in *Palaces for the People*, he writes that social infrastructure constitutes the “physical places and organizations that shape the way people interact” and is not social capital, but rather “the physical conditions that determine whether social capital develops” (Klinenberg 2017:5). *Palaces for the People* is largely a tribute to and investigation of public libraries, which are the ideal case of social infrastructure. Following this lead, the present study investigates the role libraries, as the key example of social infrastructure, could play in disaster and resilience planning, focusing specifically on lessons learned from the case of Hurricane Harvey, a Category 4 storm that struck Houston in 2017.

This study begins by asking where this form of social infrastructure is situated spatially in comparison to citizen’s needs, as seen through both flooding vulnerability and social vulnerability. Second, it asks how this social infrastructure is functioning in practice, and how individuals working in libraries conceptualize their role. Ultimately, this research points to Houston libraries as being ideally situated and equipped to play a role in disaster resilience and recovery, however, it also reveals that they could benefit from increased funding and programming development. Klinenberg writes “all social infrastructure requires investment,” and

this study supports the idea that greater investment should be put toward public libraries both in Houston and beyond (2017:20).

LITERATURE REVIEW

Disaster Resilience and Social Capital

Resilience is a term that has been used across disciplines, from engineering and psychology to ecology and economics. Kathleen Tierney writes about disaster resilience in the social science context, drawing on definitions from a variety of disciplines. She writes that “regardless of discipline, the literature generally stresses the idea that resilience involves both absorptive capacity, or the ability to resist disruption and remain relatively stable, and the ability to bounce back, regroup, and restore the activities of the disrupted system” (Tierney 2014:164). For Tierney’s work, she refers to these two forms of resilience as “inherent” and “adaptive” (2014:173). Across various methodologies of measuring disaster resilience is the idea of “social capital.” Social capital has a long history in the social sciences, from the work of De Tocqueville to Bourdieu and Putnam, but one definition as put forward by Portes (1998) is “the ability of actors to secure benefits by virtue of membership in social networks or other social structures” (Tierney 2014:186). Specific to disaster resilience, Aldrich and colleagues write about three types of social capital: bonding (connections between close relationships such as friends or family), bridging (more diverse connections such as acquaintances) and linking (connections between citizens and those in positions of power) (2014:4-5). A number of studies have explored the role of these different forms of social capital. Elliott and colleagues (2010) found that access to bridging social capital, in addition to bonding social capital, increased resilience for residents of different New Orleans Neighborhoods following Hurricane Katrina (Aldrich 2014:8).

Social Infrastructure, Social Vulnerability, and Libraries

Social capital is often associated in the literature with social resilience, but how is social capital formed? Eric Klinenberg writes that “social infrastructure...[is the] physical conditions that determine whether social capital develops” (2018:4). This idea of social infrastructure as the physical places and urban design that can facilitate the formation of bridging social capital is informed by Klinenberg’s work on the 1995 Chicago Heat Wave. Through this work, he determined that in two equally socially vulnerable Chicago neighborhoods, there were significantly fewer deaths in the neighborhood that had “functioning businesses, a vibrant street life, high population density, and patterns of extended family ties” (Tierney 2014:188). In other words, there were more physical places for interaction, replacing social isolation with the ability to form and maintain social capital. This study suggested that perhaps indicators of social vulnerability (such as race, economic status, age, and exposure to natural hazards) did not tell the whole story about resilience, but highlighted that the presence of social infrastructure was a vital part of the story.

In *Palaces for the People*, Klinenberg further explores social infrastructure, with particular emphasis on the public library. Though acknowledging that the public library is not the most frequent example of a place to build social capital, he writes that the library is “among the most critical forms of social infrastructure” and “one of the most undervalued” (2018:32). Libraries are accessible, free, and open public spaces with extensive programming and a professional staff with a “principled commitment to openness and inclusivity” (2018:36). Additionally, they are valued within their communities. A 2016 Pew Research study found that

66% of respondents thought the closing of their local public library would have a “major impact on their community” (Horrigan 2016).

Public Libraries and Disaster

Public libraries as a place of social infrastructure suggest that they could play a role in building social capital that can contribute to disaster resilience over the short and long term. This connection is not deeply interrogated by Klinenberg, but FEMA has in fact designated public libraries as “essential community organizations” since 2010, qualifying libraries for temporary relocation funding, and a handful of studies have looked at public libraries in the case of disasters (Veil and Bishop 2013). Veil and Bishop (2013) interviewed 22 librarians and 5 library patrons in cities that faced tornado damage from 2011-2012. These authors coded interview findings along different aspects of community resilience (economic development, social capital, information and communication, community competence). Ultimately, the authors asserted that libraries, as places for disaster recovery, had been discussed in internal library sciences literature but not brought into a wider conversation about community recovery planning. The authors recommended further research on the expanding role of libraries as social safety nets, as well as sources of emergency information communication, which this study aims to do. The interview schedule and framework sampling of librarians of Veil and Bishop informed the structure of the present study.

Tu-Keefner and colleagues (2016) also interviewed librarians and patrons through focus groups and one-on-one interviews following 2015 South Carolina flooding events. They focused on the ability of libraries to provide credible public health information during disaster recovery and found the libraries as sources of information navigation and FEMA filing. Grace and Sen

(2013) looked at the role of libraries in community resilience through analysis of the author's auto-ethnographic observations as recorded in a diary, and Hamilton (2011) offered a first person account of the state librarian of Louisiana's experience after Hurricanes Katrina and Rita. Featherstone and colleagues(2008) conducted an oral history of librarians and disaster response, and identified general librarian roles as: institutional supporters, collection managers, information disseminators, internal planners, community supporters, government partners, educators and trainers, and information community builders. Finally, Jaeger and colleagues (2006) looked at the response of public libraries to gulf-coast hurricanes in 2004 and 2005 through examining the 2005 Public Libraries and Internet study, as well as interviewing public librarians. This study pointed to the importance of providing emergency information before and after the storms, as well as the importance of internet access following disasters. These studies represent the extent of the precedent for looking at the role of libraries in disaster recovery, and offer a variety of methodological paths, but none approach the studies of public libraries through the lens of social infrastructure. As such, this study addresses a gap in this literature and also provides the most recent and exhaustive study of public libraries, which is particularly relevant due to the changing landscape of technology and technology access.

The Case: Hurricane Harvey and Libraries

Hurricane Harvey was a Category Four storm when it hit the Texas coast on August 25th, 2017, and though it was downgraded in the coming days, it “stalled, with its center over or near the Texas coast for four days, dropping historic amounts of rainfall of more than 60 inches over southeastern Texas” (Blake and Zelinsky 2018). Hurricane Harvey resulted in over sixty deaths, and was one of the most costly storms in United States history.

In the days leading up to Hurricane Harvey, library leadership and branch managers began preparation, drawing on knowledge from past storm experience, by establishing internal communication trees and physical preparations such as securing windows and doors and moving electronic equipment and ground level books to higher areas. Branch locations were closed during the duration of Hurricane Harvey. Once flood waters had subsided enough for library employees to check on the branch locations, they were able to open undamaged locations that had available staff (who were distributed based on where they could safely travel). Houston Public Libraries opened 18 of their 42 locations the following Tuesday, with rolling starts in the following weeks, and Harris County Public Libraries opened 20 of its 26 branches on Friday, September 1st (Peet 2017).

The Houston Public Library Central Branch opened as a day-camp for the children of the City of Houston employees. This day-camp, called “Camp HoUSton,” filled a child-care gap left by closed schools and closed day-cares for “approximately 150 City of Houston employees” (Peet 2017).

In addition to this camp at the central branch, neighborhood branches opened for immediate recovery functions, with some extending hours and opening on the weekend in order to better provide services to customers in need. Temporary locations were launched as quickly as possible to supplement locations closed long-term due to flood damage. Finally, for months following the storm, both library systems suspended fines and forgave lost and damaged books. Six library branches remained closed due to Hurricane damage for the next year, and though some branches have since re-opened, others are closed indefinitely, waiting on funding or relocation (Ward 2018).

METHODS

Methods Overview

This study was conducted in Houston, Texas in 2019 using mixed methods to explore the role of public libraries in Hurricane Harvey recovery and long-term resilience. The first stage of the mixed methods approach used ArcGIS to integrate FEMA and Census data for spatial and statistical analyses of relative access to public libraries before Hurricane Harvey. The second stage then used interviews and a focus group to collect data from librarians themselves.

Spatial Analysis

In ArcGIS, I geo-coded and mapped the locations of 70 Houston Public Library and Harris County Public Library branches. I then mapped a representation of flooding using a dataset of individual assistance FEMA claims after Hurricane Harvey. Both homeowners and renters, as well as business owners who have sustained disaster-related loss, can apply for FEMA individual assistance for disaster-related expenses. This data-set, generated from the National Emergency Management Information System, reflects applications for that aid (OpenFEMA Dataset n.d). This data-set from 2017-2018 contains approximately 449,881 individual assistance claims filed with FEMA in Harris County after Hurricane Harvey. Not all of the individual claims in the data-set had yet been inspected in-person by FEMA to validate damage. As such, I chose to focus on the variable of “floodDamage” which indicated, for units that *had* been inspected by FEMA, whether there was “damage caused by flooding” in the home. I chose to use a variable that indicated validated flood damage in order to ensure my analysis was reflecting the reality of flood damage, rather than just the number of applications. I aggregated to block-level counts of flood damage, and then imported that data into ArcGIS. This allowed me to

categorically assign each block as flooded (flood damage count > 1) or not-flooded (flood damage count <1) as well as compare the extent of flood damage between blocks.

In order to assess the spatial distribution of these flooded blocks in relation to the location of libraries, I created quarter mile and half mile buffers around each library location. These buffers were intended to represent reasonable walking distance for library patrons, in reflection of patrons that perhaps do not have vehicle access, or in the event of flooding, could not utilize their vehicles. Each block in Harris County was then evaluated against these buffers, so that each block has a yes/no value for whether it was located within a quarter or half mile of a Houston area library, respectively. If any part of the block was located within the buffer, it received a “yes” value for the respective radial distance; it did not need to be totally contained. The data reflects whether a block is located within the buffer of at least one library, but does not reflect whether it falls within multiple buffers. From ArcGIS I exported two data sets: first all blocks relative to the quarter mile and half mile buffers, and second only flooded blocks relative to the buffers.

These data-sets were then imported into Stata, and statistical analysis was performed to evaluate correlation between library spatial distribution and a number of demographic variables, such as race, percent of families in poverty, and homeownership. Data from the 2016 ACS 5-year Summary File at the block and block group level was used. Statistical analyses focused on simple bivariate correlations. In instances where census data were collected at the block-group level, correlations were computed using a logistic regression model with a Huber-White correction to account for clustering of blocks within block groups, as access to libraries was computed at the block level, but census data is computed at the block-group level. The lone

exception is the correlation for the number of flooded housing units, for which both variables are measured at the block level; thus, no correction is required. Significance for each correlation was then evaluated with a p-value of .05.

Interviews

In the Spring of 2019, I sent seventy initial contact letters to Houston area libraries to introduce the scope of my research. From those letters, I received emails from a few interested librarians in the Harris County and Houston Public Library systems. These letters caught the attention of a public relations liaison within the Houston Public Library (HPL) System. She invited me to conduct a focus group with 10 employees of the HPL system after a meeting of senior managers. This focus group was conducted in-person at a neighborhood branch over lunch, and lasted approximately an hour. From that focus group, I conducted three follow-up interviews. The Deputy Assistant Director of Customer Experience helped arrange an additional three interviews with individuals not at the initial focus group. Finally, two more interviews were conducted through individual contact after hearing about my research from my letters and social media. The focus group and interviews contained a mix of managers and executive leadership staff, as well as administrative staff, librarians, and library staff. All but one of my interviews were conducted in the Houston Public Library system, with one interview from the Harris County Public Library system. Though the focus group was conducted in person, seven of the eight interviews were conducted over the phone to better work within the schedules of the interviewees. Interviews were recorded, and consent to participate in research and have the interviews be recorded was obtained ahead of time. The consent form specified that there may be “minimal risk associated with discussing Hurricane Harvey, as memories of the natural disaster

may be upsetting to some participants” and included resources if interviewees did feel upset about discussing past trauma. The interviews were semi-structured, with an initial interview schedule created drawing on the questions asked by Viel and Bishop (2014:732). Follow up questions varied across interviews.

I transcribed interviews using an online AI based transcription service. The system performed the initial transcription, and then I listened to the interviews in full to verify the transcripts. As I listened to the interviews I created a code-book of themes. I then sorted the codebook into major themes, and pulled out quotes sorted under those themes.

LIBRARY PROXIMITY TO SOCIAL AND FLOODING VULNERABILITY

First, and using the case of Hurricane Harvey in Harris County, Texas, I ask where libraries -- as vital social infrastructure -- are located relative to those who ended up needing individual assistance. Answers to this question speak to potential inequalities in nearby access among those most environmentally at risk.

> Table 1: Public Library Access for All Census Blocks in Harris County, Texas, by FEMA Verified Flood Damage during Hurricane Harvey in 2017

	Within ¼ mi of public library	Within ½ mi of public library	Outside ½ mi of public library	Total
All blocks	2,316	6,852	68,554	75,406
(% of Total)	3.1	9.1	90.9	100.0
Flooded blocks	511	1,455	12,873	14,328
(% of flooded blocks)	3.6	10.2	89.8	100.0

Second, I ask whether this spatial inequality in nearby access varies by race, class, and other characteristics of particular neighborhood areas. Answers to this question speak to the social nature of inequalities documented in the first question, as well as where new libraries might be located to alleviate these social inequalities in the future, especially for more socially vulnerable communities.

> Table 2: Pairwise Correlations between Respective Variables and a Nearby Public Library, by Distance†

	All Blocks		Flooded Blocks Only	
	Library within ¼ mi	Library within ½ mi	Library within ¼ mi	Library within ½ mi
<i>Block Level</i>				
Any flooded homes (yes/no)	.202*	.162*	---	---
# Flooded housing units	.006*	.010*	.005*	.008*
<i>Block Group Level</i>				
% White	.023	-.015	-.293	-.559
...				
% of families in poverty	1.411*	1.391*	1.211*	1.645*

Median Household Income	1.69e-06	1.41e-06	1.14e-06	-1.07e-06
% on public assistance	-2.765792	-.3440696	1.981538	3.572951
% with some college education	-3.15656*	-2.191352*	-1.768518*	-.8087551
% of owners with a mortgage	-1.457604*	-1.447721*	-1.393143*	-1.555936*
% renter occupied	1.017911*	1.047487*	.5350106	.9475184*
% of renters paying 30 percent or more in rent	.195898	.0147121	.3686503	.3245085
% of households with kids 0 to 14 years of age	-3.41775*	-3.224988*	-1.152032	-.8169224
% of households with elders 65 and older	.5237005	.1931778	2.201179*	2.046673
% with no vehicle	3.697316*	3.462901*	3.698325*	4.263797*
Total Population	-.000289*	-.0002133*	-.0002075*	-.0001389*
N (blocks)	75,406	75,406	14,238	14,238
n(block groups)	2,140	2,140	1,961	1,961

† Note: All correlations are computed using a logistic regression model with a Huber-White correction to account for clustering of blocks (the unit of geography for which access to libraries is computed) within block groups (the unit of geography for which census data are computed). The lone exception is

the correlation for the # of flooded housing units, for which both variables are measured at the block level; thus, no correction is required.

Positive correlation was found between flood damage and being in close proximity to a library, both in terms of presence of flooded homes and total number of flooded homes. The results do not indicate statistically significant correlations related to race, median household income, public assistance, or presence of rent-burden. However, there were a number of significant correlations when looking at other measures of social vulnerability. Higher percent of families living in poverty is positively correlated with being within both a quarter and a half mile of a library, both regularly and in the case of flood damage. The negative correlation of percent of owners with mortgages and positive correlation of percent of renter-occupied suggests renters are over-represented as being in close proximity to libraries. College access was also negatively correlated with proximity to a library, while there was a positive correlation between seniors in flooded block groups and quarter mile proximity to libraries. Finally, there is a positive correlation between lack of access to a vehicle and proximity to the library.

These results, particularly a lack of significant racial correlation but high representation of renters, families living in poverty, and individuals without vehicles, lines up with the anecdotal descriptions of communities the libraries serve given by the librarians interviewed. The over-representation of these indicators of social vulnerability in close proximity to libraries suggests that this form of social infrastructure is uniquely positioned to provide services in times of crisis. These results suggest that libraries are located in close proximity to flood risk, at least as predicted by flood damage in Hurricane Harvey, and in close proximity to those who most need these services: families in poverty and without vehicle access. With this unique positioning

in mind, I interviewed library employees in order to document and assess their experiences with providing assistance after Hurricane Harvey as well as their thoughts on the benefits and obstacles of bolstering this type of assistance in the future. The addition of these interviews to the spatial analysis is key to this assessment of resilience challenges, as it asks how individuals most directly involved in maintaining this social infrastructure -- librarians -- view their potential to do so.

LIBRARIES AS SOCIAL INFRASTRUCTURE DURING RECOVERY

Providing a Place for Social Capital

Interviews with librarians made clear that libraries are social infrastructure, first through the library's nature as a physical space where people can gather. As a senior library administration official put it, "We're sort of that one place that people can go that they don't have to pay for anything, they can be there for hours on end...In times of crisis I think that this is some place that people just know intuitively that they can trust us and that we're going to help them" (Interviewee 1). Another similar description came from a senior manager: "For a lot of our community, the library is that third space that they go to, whether it's for technology, meeting neighbors, coming to the free events with their families. We play pretty much a vital role in people's lives..through their entire life potentially" (Interviewee 2). The physical space of the library, as well as its broad accessibility, offers one avenue for building social capital.

The libraries also provided community outreach beyond their physical locations, particularly for branches that were closed. Staff members would go to venues such as churches, community centers, and schools, sometimes with the intention of putting on programming for an existing community event, but other times simply going to assess community needs. In the words

of one branch manager, “Sometimes it was just going. No table, no program, just reaching out to people to be like, ‘Hey, you know how you guys doing? Do you need something from us?’ ...it's more like just making sure we maintain those relationships...we made sure people understood that even though the buildings were closed, that we were still a presence in the community...in whatever capacity they needed us to be" (Interviewee 3).

This dedication to meeting community needs reflects the importance of the infrastructure in underserved areas. As one staff member in the focus group put it, “the library is the heart of the community. And that's why it has been so important for us to maintain those temporary libraries in Kashmere and Lakewood. There's not a lot of infrastructure in those areas....the staff have done a really good job to connect with those communities and the customers and to just kind of be a friendly ear and a shoulder to cry on.” The libraries not only provide a venue for forming social capital with other customers, but customer relationships with librarians themselves are a source of social capital. Additionally, librarians' active efforts to maintain relationships within the community, especially post disaster, make this social capital enduring.

Navigating Recovery Resources

A key service the library provides to customers is accessing and navigating external resources, particularly through technology help and FEMA aid. Two terms that came up across interviews were “digital desert” and “digital divide,” referencing a lack of access to technology and internet at home in many Houston neighborhoods. That ongoing lack of access, compounded by loss of power access in the aftermath of Hurricane Harvey, made providing computers, wifi-hotspots, and power for charging key services of the library. These services were offered in the physical space of the library, but also had mobility, through the Mobile Express Bus based

computer lab and mobile hotspots that could be deployed to area shelters. For example, though the Kashmere Gardens library branch was closed due to flood damage, library staff set up a computer lab in the parking lot, “with power cords running from everywhere, with laptops out in front with fans blowing...WiFi hotspots everywhere, just so the customers could come to be able to do their [aid] applications,” according to a senior customer service clerk (Interviewee 4).

These services are particularly significant when applying for emergency aid, as applications are often not optimized for mobile devices, do not accept paper applications, and may be difficult for community members to navigate. In the words of a former senior administration staff member, “You know, that's not necessarily something that FEMA and these other entities think about—what resources are you going to bring in if you're requiring this community that's in disaster to do everything electronically?” (Interviewee 5). Interviewee 4 echoed this: “Everybody's saying, apply for services, apply for services. Apply online. Okay—how are they going to do that? We were helping people that didn't know how to use the computers, didn't have email addresses, because you have to have an email address to set up an account. So we went into service mode, trying to help the customers be able to just even apply to let people know ‘Hey, this happened to me.’” Houston area libraries were able to fill the gap of access to aid, even when government bodies could not.

But libraries are not simply glorified computer labs or sources of wifi. Library staff are a trusted and knowledgeable source for navigating resources, including contacting area shelters and assistance agencies. Interviewee 6 said, “And so we assisted with that, contacting the Red Cross and the Salvation Army, just helping navigate that. Anything that we could to help alleviate any stress for them.” A former special projects manager spoke to how helpful this

assistance can be for customers: “There's so many different agencies for which they can apply for assistance. And then there's somebody [library staff] who's trained and helpful. And, you know, has a computer skill set to help somebody who may be unfamiliar with even how to click a mouse, much less use a touchpad to navigate that whole process and all the paperwork” (Interviewee 7).

In addition to assisting with applying for emergency aid, connecting customers to longer-term resources like job access is important following a storm. As put by Interviewee 7, “A lot of small businesses and even some chains did not reopen in locations because they had flooded. And so those are jobs lost...where the library comes to play into that is that we are in that place of workforce development, we know how to help people look for jobs. And so that's part of that resilience.” Another interviewee agreed that they upped their job search services due to increased dislocation following the storm.

Interviewees also spoke to the important balance of not overstepping their role into giving legal or financial advice beyond their qualifications. As Interviewee 7 put it, “a lot of people are going to come in and ask about insurance. And so there needs to be sort of a basic triage of what you can answer and what you can't answer because a lot of that's private information.” This balancing act is made more difficult by the fact that library staff are such a trusted resource.

“I [say, ‘I can't look at your personal information’] and they're like ‘we're not worried about you...help me.’ You know they trust us to the point where they put us on speakerphone with the people that they are talking to so we can hear. So we have to be careful not to cross that line.” (Interviewee 4). While not crossing lines is a key concern of librarians, it is clear that their

unique positions of trust within the community function as a source of bridging social capital that facilitates access to a number of other aid resources.

Re-establishing A Sense of Normalcy

In addition to providing help with navigating resources, a major theme in the role of the library was providing a sense of normalcy and a listening ear during the potentially traumatic event of the storm. In the words of Interviewee 7, “Another part of resilience is that there's a sense of normalcy that's lost. And so when you can keep doing programs and services, as much as you can, then that's helpful.” By opening as soon as possible and resuming regular programming, the library was able to provide services that were particularly helpful for “those that are most vulnerable--children and seniors” (Interviewee 6).

Programming for children was referred to as an opportunity “to get away from that very traumatic experience” and “restore families to some type of normalcy” (Interviewee 6). In addition, this allowed parents to focus on life-mending tasks. In the words of Interviewee 3, “our role was to step in and sort of engage those kids and everything while they're trying to get critical tasks done. So that meant, you know, movie time story time board games, video games, pretty much anything that we could do to sort of alleviate the burden of having to entertain children while you're trying to accomplish this task.” This is important in the larger context of the cumulative potential of storm trauma.

For seniors, listening and providing a sense of routine was important. In the words of a library director, “You know what, like, every Thursday, I go to the library, well, you can still come. One of the roles I think we also played for a few weeks afterward was as a listening post for people who wanted to tell us about what happened to them. The staff was very good about

just listening because there were particularly some of the seniors that just wanted to talk about the experience. So you know, we listened.” (Interviewee 8).

Interviewees also spoke to how providing a sense of consistency and familiarity went a long way with customers, and that this role was one brought into focus by the storm: “I think people sometimes take libraries for granted in a sense. Like, you sort of don't realize the role you play in the community until something like this happens....I was just overwhelmed afterwards by how many customers were just happy to see us. I think just being there makes people feel reassured, like, okay, I know this person's face, you know, I feel comfortable around this person” (Interviewee 3). This quote points to the importance of the library as an institution that is rooted in the community, and whose staff have impact beyond just the physical space. Interviewees also spoke to this being inherent to the nature or job of librarians. “I really, I think most of the librarians that I know of and would run across already do this” (Interviewee 8).

CONSIDERATIONS FOR LIBRARY STAFF AS AGENTS OF SOCIAL INFRASTRUCTURE

Impact on Library Staff: Compassion Fatigue

In addition to the themes addressed above, one trend that became clear across interviews, despite the absence of a specific question addressing the issue, was the impact of the storm on library employees themselves. In answering a general question about experience with the storm, interviewees would often begin with a description of personal impact, followed by the impact on the staff at their branch location.

Of the approximately 500 staff members within the Houston Public Library system, 135 staff members suffered direct losses from the storm, and many others had close friends or family with direct losses from the storm. The challenge of balancing this degree of personal loss, while

continuing to serve library customers, was a common theme across interviews. As one library manager said, “I think one of the hardest things to balance is the staff and your service to the public” (Interviewee 8). This was echoed by Interviewee 3, who said, “One thing that we talked about afterwards was compassion fatigue...I had several employees that were impacted by the storm.... And during this time, for a lot of people, the staff of the library were who they offloaded a lot of their feelings and frustrations about the event....you’re empathizing with the customers because you are there with the customer... it could get very stressful trying to navigate all of it.” Other interviewees echoed this, applauding staff for coming to work and endeavoring to help customers in the midst of personal loss. In addition to library leadership being mindful of stress and fatigue of the staff, they also implemented internal programs to help their staff, including an anonymized staff clothing and appliance drive.

Lack of Disaster Training & Resiliency Programming

Across these themes it is clear that libraries provide vital functions to the communities they serve. But there are limitations to the services they provide related to disaster recovery and resilience, and the root of these limitations are two-fold. First is a lack of prioritization of climate resilience as a major programming goal, though those I talked to seemed receptive to adopting such a goal.

The staff that I talked to were not able to point to any specific disaster preparedness training, despite referencing other training such as active-shooter training. They did speak to being able to leverage other knowledge. For example, prior training on homelessness became relevant after the storm as many customers were looking for shelters: “We’ve had homeless

training on how to serve homeless customers. So that was very helpful. The fact that we've had that training within the last year so we were able to pull from that information” (Interviewee 6).

Additionally, more than one senior manager interviewed said that they would bring the idea of disaster specific training to the wider team after the prompting of my question. They also spoke to the attitude of assuming this won't happen again. In the words of a senior manager, “Everyone's just kind of hoping, okay, hopefully, doesn't have this again. You know, they said 500 year event, so maybe for another 500 years, we'll see that but it doesn't hurt to be prepared anyway.” (Interviewee 9). Another IT staff member suggested that the library system needed to take a more proactive approach to prioritizing this issue: “I don't see that this library is thinking about it as proactively as they need to” (Interviewee 10).

Limitations of Funding

Limitations in funding are also key. One staff member, whose home branch remained closed for a period after the storm, was concerned about the vulnerable community members that the library was not able to serve in that gap: “What I felt really lost about was that, well, what's the neighborhood that we serve needing? Because I recognize there's a lot of people who don't have as much means, may have gotten their transportation compromised. They're not all residents who have their own cars to begin with. We got a lot of apartment complex residents that come to our branch, not just single family homeowners” (Interviewee 10). He also provided a parallel case of climate resilience to flooding, in serving the role of a cooling center: “We are certainly told during the summer during the high heat days, that we're a cooling center...But how does it serve as a cooling center if it's closed on Mondays until noon, because we had shifted our

hours briefly this summer over a budget concern, and the same question can be asked, ‘How are you a cooling center on Sunday when you're closed?’” (Interviewee 10).

The senior leader echoed this point on funding but suggested that Hurricane Harvey may have highlighted the role the library plays more: “A budget’s a budget. I do think that Harvey, as bad as it was, was something that it was able to expose, even to our other city departments, that we could serve as that resilience center. Because initially, the shelters were thinking of the parks department or the health department to sort of entertain children and things like that. And we're like, ‘Well, what about us? What about us? What about us?’ So I think some of it is just exposure. Some of it is just communication and making sure that people understand what it is that we're providing. Funding, like I said, it's always going to be an issue just because there's finite resources” (Interviewee 1). Indeed resources are finite, but the results of this study suggest that finite resources should be directed to the resources of the library.

DISCUSSION & CONCLUSION

This study follows in the body of social science literature that has begun to investigate not only social infrastructure but also disaster resilience and recovery in the long term. In the case of Houston, public libraries are situated in proximity to both flooding and social vulnerability and are currently playing the role of social infrastructure in the communities in which they are based. Unlike relief resources, such as FEMA or volunteers, which may descend on a disaster-struck area for a short period of time, libraries are consistently present in their communities, providing familiarity and trusted resource navigation. As such, opposed to recovery that focuses on property or short-term survival, libraries are suited to facilitate longer term resilience through facilitating social capital, resource access, and a sense of normalcy for

customers. For future studies investigating how to restore community, rather than just property, libraries are an important institution to consider.

Following Tierney's definition of disaster resilience to include both adaptive and inherent qualities, library branches clearly have the capacity to aid in the development of both. Houston area libraries were able to immediately respond to the needs following the storm, including childcare and internet access. In terms of inherent resilience, the library as a neighborhood space strengthens the bonds of communities they are placed in, but could increase their contributions to inherent resilience through developing specific resilience programming. The role of social infrastructure in developing this resilience is an important area of further study, and it is important not to underestimate the role public libraries can play. It seems public libraries are often forgotten as an area of study and policy, but in the words of one interviewee, "What about us?"

There are also implications for policy-makers and planners. Libraries are currently flourishing the best they can as community institutions but face major funding limitations. Rather than attempting to develop new sources of community resilience, policy-makers should pair funding and design choices to supercharge existing and new neighborhood library branches. Libraries are already situated close to those in need, are familiar with the needs of their communities, and are a trusted institution within those communities. With more dedicated funding they could more quickly re-open damaged branches, increase staff and hours, and maximize their impact on community resilience.

This study is limited to one city, and though interviewees consistently suggested that their actions are likely universal to all library staff, these findings are not necessarily generalizable to

other metropolitan areas. In particular, the spatial analysis is unique to Houston, and future study ought to investigate if the placement of libraries relative to vulnerability is a trend that holds for other cities.

Finally, it is clear that libraries as social infrastructure flourish not because of the physical space they offer or the resources they contain, but because of the library staff inside of them. Library staff are a source of bridging social capital, connecting customers to the community as a whole, as well as wider resources. As such, all scholarship and policy considering the role of libraries as social infrastructure ought to consider the importance of these actors and prioritize their wellbeing in the midst of disaster recovery.

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APPENDIX ONE

Interview Schedule

1. Describe your experience related to Hurricane Harvey preparation within the library.
2. Describe your experience related to Hurricane Harvey recovery.
3. Describe any experience with previous flooding events.
4. What key services did the library provide to patrons around Hurricane Harvey?
5. What resources were needed to provide those services?
6. Did government or private organizations assist with providing these key services?
7. What role did your library play in enabling the community to recover from Hurricane Harvey?
8. What would you want other libraries to know to prepare for other disasters? (For example, what worked well/what are you most proud of? What did not go well/what would you change?)
9. Does the library offer programming directly related to disaster preparation?
10. Do you think the library builds community resilience?
11. How do you think climate change relates to the library?
 - a. Has climate change impacted library administration, priorities, or programming?