Empowered Participation: Exploring How Citizens Use Technology in Local Governance

Sheena Erete
College of Computing and Digital Media
DePaul University
Chicago, IL 60604 USA
serete@depaul.edu

Jennifer O. Burrell
MadX, LLC
Alexandria, VA 22302 USA
jennifer@madxllc.com

ABSTRACT
The partnership between local residents and city officials to inform policy and decision-making about government resources, or participatory governance, has been extensively studied. In addition to numerous ethnographic studies about how citizens engage in-person, there has been increased focus in HCI to understand the impact of technology on citizen participation in local governance. Building upon those studies, this paper provides unique insight from a 3-year longitudinal study on the use of online tools that were organically adapted by citizens to engage in local governance in three diverse Chicago neighborhoods. Though the responsiveness of government officials varied across communities, our results suggest that citizens use technology to heighten the visibility of their concerns, to support mechanisms of government accountability, and to provide various options for resident participation in local governance. We argue that while communities may be effective in their use of ICTs, technology may not increase their political power.

ACM Classification Keywords
H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

Author Keywords
low income; civic engagement; participatory governance

INTRODUCTION
For decades, scholars have studied participatory governance, the partnership between local residents and city officials to inform policy [16, 15, 30]. Though traditional studies have focused on citizen engagement in-person, in the past decade HCI scholars have focused more on understanding digital democracy [1, 17]. Many of these approaches do not address institutional inequalities embedded in social, economic, and political infrastructures (e.g., poverty, unemployment, lack of educational opportunities, inadequate housing) that impact community issues such as crime - the topic of this paper.

CHI 2017, May 06 - 11, 2017, Denver, CO, USA.

ACM 978-1-4503-4655-9/17/05...$15.00
DOI: http://dx.doi.org/10.1145/3025453.3025996

Many of the inequalities that impact crime are perpetuated by local policies, which have been mostly shaped by groups with political power [31]. We define political power as the ability of a collective group of citizens to influence local policies. The economic status of a group impacts their political power, and the poor have not traditionally had as much political power to change policies that have direct effects on their health, safety, and educational opportunities [5, 9, 46, 50]. For example, in Chicago (like most major cities), violent crime is disproportionately prevalent in low-income neighborhoods [40]. Yet, much of public policy around violence prevention has been created without the full participation of poor communities that disproportionately experience violent crime. For instance, the mayor's office and the police decide the details of programs, initiatives, and agendas (e.g., policing budgets and the frequency and structure of community-police meetings) to address crime in Chicago, not citizens [42, 40].

Though there is much debate about the effect of state-sponsored community crime prevention programs [16, 15], some scholars suggest that poor communities can gain political power by participating in such programs [15]. Given the pervasiveness of information and communication technologies (ICTs) [44, 45], there is a unique opportunity to explore the role ICTs play in citizen engagement in local participatory governance. Specifically, we examine the research question: *How do ICTs affect political engagement and interactions with city officials around crime prevention in diverse neighborhoods*? By ICTs, we refer to any tools that support interactions amongst many citizens that are relatively easy to access and join (e.g., web forums, email lists, social media websites).

In this paper, we describe how citizens use ICTs to influence local policy, particularly among law enforcement and local government officials. Our results suggest that residents influenced local policies ranging from increasing police presence on a particular street corner to petitioning for the demolition of abandoned buildings by leveraging ICTs to increase the visibility of community concerns, to support holding officials accountable, and to provide additional methods of participation. However, we also observed that though residents in affluent and lower-income neighborhoods used technology similarly, city officials responded more promptly to residents in affluent neighborhoods.

This paper makes several contributions to the field of HCI. First, our findings provide insights into the usage of ICTs to

Table 1. Lexicon of terms

Term	Definition
Alderman	Elected official of a local ward who sits on the City Council.
Beat officer	Police officer assigned to a particular area for at least a year.
Commander	Appointed official who overseas a police district.
Online Moderator	A self-appointed citizen that manages online communication between community members, aldermen, CAPS officers, and other officials.
CAPS Sergeant	One officer per district charged with liaising with the community and is ranked higher than beat officers but much lower than commanders.

support local governance for crime prevention, extending prior HCI research focused on the use of technology to support local engagement [11, 12, 18, 21, 25, 26, 34]. Specifically, this work provides accounts of community ICT usage and its impact on relationships with government as evidenced by local in-person meetings with law enforcement and government officials. Second, our results add to the conversation that technology alone cannot equitably empower citizens to solve deep-seated social problems such as crime without addressing the underlying inequities across communities [48]. Our results indicate that while communities in this study are successful in their use of ICTs to address local issues, technology did not increase their political power. Lastly, our study builds on prior work in HCI that provides insights into designing for traditionally marginalized groups [7, 23, 32, 53, 54].

RELATED WORK

Participatory Governance and ICTs

Local government has a major impact on improving neighborhood issues such as crime, walkability, and investment. The lack of addressing these issues impacts residents' mortality [10], economic mobility [52], health [2, 29], and risk of victimization [28, 35]. This phenomenon is particularly concerning to lower income areas that often lack political capital and collective efficacy, and thereby more susceptibility to continual neighborhood decline [35, 38, 41]. As a result, there has been a push for residents to engage in participatory governance, the practice of involving community members in the local political process. The goal of participatory governance is to create a functional democracy in which community members influence the actions of local government officials [14, 16].

HCI researchers have explored the use of technology to support participatory governance. A theme in recent work is designing tools that incorporate social media and support hyper-local and real-time civic engagement. For example, Yuheng Hu and colleagues designed and evaluated a web service called Whoo.ly that filters content on Twitter that is relevant to a particular neighborhood, which was an effective method to help people find information related to their neighborhood [18]. Bohøj and colleagues designed a mobile phone technology that facilitated citizen engagement in municipal planning using location-activated alerts and augmented reality to communicate a proposed building plan to citizens while they are in-situ. The system incorporated a messaging platform for users to respond and converse about the plan and take further action if they had objections or suggestions for the proposal [3]. Researchers at Aalto University used a participatory design approach to redesign urban planning software that enables conversation and collaboration between planners and citizens regarding proposed traffic plans [33]. These projects use design to encourage the public's engagement in local governance.

Empowered Participation in Chicago

Community engagement in participatory governance has been extensively studied in Chicago [6, 16, 15, 37]. In his book, *"Empowered Participation: Reinventing Urban Democracy,"* Archon Fung describes how Chicago residents participated in monthly meetings with police and educators [15]. He argues that residents were able to influence change by engaging in decision-making processes with city officials and law enforcement agencies. Fung's work provides an example of what participatory governance looked like in practice during the late 1990s and is a relatively optimistic outlook of the power that residents have in influencing their circumstances. Fung suggests that "accountable autonomy," a hybrid of independence and transparent responsibility for government agencies, best impacts residents' ability to participate in local governance about issues such as crime. Essentially, Fung found that participating in government-run crime prevention strategies empowered residents because the Chicago Alternative Policing Strategy (CAPS) meetings were accessible to everyone; and, the structure afforded citizen-led deliberation on issues and decentralized decision-making abilities. Fifteen years after Fung's study, we describe the impact that three communities' online engagement had on local CAPS meetings and the actions taken by city officials. Our results suggest that ICTs further *empowered* residents, particularly those in affluent communities, by increasing the visibility of the community's concerns, improving how residents hold city officials accountable, and diversifying residents' methods of participation.

METHODS

During our three-year study, we took a triangulated approach to address our research question using observations, interviews, and qualitative content analysis. In year one, we built relationships with residents and local stakeholders, obtained permissions from locals to observe community meetings, and built tools to gather online data. In year two and three, we continued our observations of community meetings in five geographically-bound areas in Chicago, Illinois, USA. These meetings were sponsored by the City of Chicago's Chicago Alternative Policing Strategies (CAPS) and held once a month with residents and the police. Additionally, in year three we interviewed 45 residents from five communities. By the end of our study, we conducted qualitative content analyses on over 7,000 online messages sent among local residents in three of the five areas through grassroots community-created web forums or email lists. In this paper, we focus on the three

Table 2. Demographic information of the communities based on data from Census and the American Community Survey

	Population	Income Level	% White	% Black	% Latino	Index Crime Rate
Community 1	24,200	Middle	54%	12%	17%	1528
Community 2	10,300	Middle-Low	28%	29%	34%	2889
Community 3	17,260	Low	2%	78%	19%	3048

The Index Crime Rate is the number of serious crimes (e.g., 1st and 2nd degree murder, rape, robbery) per 100,000 residents from August 2012 - August 2013.

communities that used ICTs. Below we describe the three communities and how we collected and analyzed our data.

The Communities

We focus on three communities. We define “community" as a police beat, which is a relatively small geographically-bound area (typically 30 to 40 square blocks) containing approximately 20,000 residents (sometimes fewer in less densely populated areas of the city). We selected police beats as the geographic boundaries because residents often used the terms “beat" and “community" interchangeably in their online and offline language about crime and when appropriating ICTs for community use, residents typically described the tools as being for those who live in certain police beats. Beats may have been heavily used by residents, because it may be easier to have conversations about crime if the targeted boundaries are mapped onto police beats. We do not refer to neighborhoods because a Chicago “neighborhood" refers 77 larger geographic regions with a median population of 31,000. One Chicago neighborhood could be made up of as many as nine beats. We use the term “community" to refer specifically to the areas studied and “neighborhood" to refer to a more general definition open to interpretation by a broader audience outside of Chicago.

The three communities were selected based on crime rates and racial compositions. We considered crime rate because citizens’ behaviors, reactions, and attitudes towards civic participation may be affected by the amount of crime and social disorder they experience on a daily basis [43]. We considered racial composition because crime rates and racial composition are confounded with socioeconomic status (SES) levels [28, 40] and to compare our work to previous studies, which consider race [40, 49].

Two communities (Communities 1 & 2) were classified as middle income based on the median household income, while the other (Community 3) was classified as low income, with poverty and unemployment rates greater than 21% and 15%, respectively. Community 3, the lower income community, also reported higher crime as compared to the middle-income communities. Table 2 provides demographic details of each community.

Data Collection

Observations

We collected over 300 pages of ethnographic fieldnotes from attending 48 meetings and community events. We observed monthly community-police meetings in each of the three communities for a little more than two years. Meetings were held at local churches, libraries, schools, and community centers. There was an average of 22 citizens and four police officers in attendance, including at least one community facilitator (i.e., a resident who volunteered to be the liaison between the community and police). We also attended community events such as community walks, block parties, and block club meetings.

Semi-structured Interviews

We interviewed 27 residents from the three neighborhoods. We recruited nine interviewees at the community-police meetings and 12 from invitations sent on the community-based ICTs. Another six were recruited from public places such as local libraries or by word-of-mouth, which allowed us to gather insight from those who live in the community but do not attend the community-police meetings or use the community-based ICTs.

Interviewees’ ages ranged from 23 to 74 (median age 58). Fifteen of the 27 (56%) interviewees were women. Twenty (74%) of the interviewees were homeowners. Education level of interviewees varied as follows: four (15%) did not complete high school, two (7%) had high school diplomas or equivalent, one (4%) had some college or vocational training, eight (30%) had a bachelors degree, and six (22%) had a degree beyond a bachelors. Race of interviewees varied as follows: twelve (44%) identified as black, fourteen (52%) white, and one (4%) Latino. Interviewees’ demographics, as detailed in Table 3, represent those who actively participate in local governance.

Interviews lasted an average of 50 minutes and were transcribed. We asked residents about their attendance at in-person community meetings and/or participation in online discussions with their neighbors about crime; their online and in-person participation and the factors that influence their decision to select either medium; and their satisfaction with community-police meetings and trust level of the police.

Online Qualitative Content

Lastly, we analyzed online conversations from community-based ICTs created by residents, not by the police or other government agencies. We identified such ICTs by asking residents to describe if and how they engage in online discussions about local issues [13].

Community 1. Community 1’s main method of online communication was a Yahoo! Group that was created in April 2004. Roughly 250 users signed up using their real names, email addresses, and home addresses.

Community 2. From January 2008 - March 2011, Community 2 used an open discussion board, where anyone could send a message to all the members. Posts on the discussion board were publicly accessible but to post, real names and home addresses were required. As of March 2011, over 350 residents

Table 3. Number of meetings observed and demographic information about the interviewees by community.

	# of Meetings Observed	# of Interviewees	Avg. Age	% Female	Race			% Homeowners	% > High School Diploma
					% White	% Black	% Latino		
Community 1	16	7	60	43%	100%	0%	0%	86%	100%
Community 2	17	9	41	56%	67%	22%	0%	33%	100%
Community 3	15	11	61	64%	9%	82%	9%	27%	36%

primarily used a private email list instead of the message board, where a moderator sent messages directly to members.

Community 3. Since May 2011, residents in Community 3 used a private email list with over 300 recipients, where a moderator distributed information related to crime.

Attendees were granted access to the private email lists after signing up at the in-person community-police meetings. After posting a notice to residents about the study and there were no objections, we developed a web crawler to retrieve information such as forum post, date, subject, and author from the community-based ICTs (e.g., web forums). Using this method, we collected 5,425 messages from Community 1's Yahoo! Group, 1,054 messages from Community 2's public message board and private email list, and 665 from Community 3's private email list. The message dates ranged from April 2004 to June 2013. Below is an example of an online forum post written by a resident:

> *"Saw drug dealing on Saturday afternoon @ 2:30 while having late lunch on my front porch. I can identify the car and will look for it now that I know....here's the info: A reddish-marroon Buick (at least 10 yrs old) did a strange move at the stop sign as it was heading south[...] I could not take the license number, but can identify the car again - very shiny!!"*

Though the community-based ICTs in this study were web forums and email lists, we also searched for discussions using search engines and social media websites (e.g., Facebook or Twitter). While we found dated announcements about local meetings, we did not find up-to-date information.

Analysis

We analyzed the data described above using inductive qualitative analysis [47], where the first author and two undergraduate research assistants initially read through roughly 20% of the interviews, observations, and online data line-by-line, creating a total of 179 codes. We then recoded the data multiple times, resulting in a final codebook of 145 codes (e.g., community cohesion, action, meeting content, organizing, alderman). The lead author then coded all the data, and after achieving an interrater reliability of 81% using intra-class correlation coefficient using a two-way mixed model and absolute agreement, the two undergraduates each coded 50% of the data. The team met weekly for six months until the application of codes were exhausted. The team then grouped the codes into 13 higher level categories (e.g., trust, visibility, accountability, participation, criticism). In this paper, we discuss three major themes related to our research question, while other publications address other themes that emerged. We present quotes verbatim as illustrations of the repetitive phenomena, with little alteration except to protect the identity of participants.

FINDINGS

Our findings suggest that residents use ICTs for visibility, accountability, and participation when engaging in local governance.

Heightening Visibility

Technology increased the visibility of the community's concerns with city officials. Specifically, residents created email lists and discussion boards to connect with other residents about local issues and persuade the police and the alderman to take action. As time went on, more and more people joined the electronic mailing lists to receive community-generated information. As the number of people on the lists increased, citizens stated that they received better responses from city officials and law enforcement agencies during the in-person meetings. Interviewees attributed the improved response to the fact that city officials recognized that many people were concerned about issues discussed online, even if only one person was stating the concern at the in-person meeting. There were three main ways that residents used technology to increase visibility of their concerns: through open communication strategies where many could reply and engage in online discussions, through a community leader who lead the majority of engagement with the alderman, and through strong relationships with government officials.

Visibility Through Many

In Community 1, residents used their online email forum to discuss and share their concerns and the response (or lack thereof) from the alderman and police. During our observations, the alderman attended over 75% of the CAPS meetings and the commander attended 90% of the CAPS meeting.

Data from our meeting observations, online forum, and interviews suggest that the alderman or a representative from the alderman's office checked the community discussion board to be aware of residents' concerns. There were at least eight instances where the alderman responded to individuals who posted messages addressed to her office about neighborhood disorder. She also addressed the concerns citizens voiced on the discussion board in her weekly newsletter, which was sent out to citizens via email. One citizen, for example, sent a message to the entire online group addressed to the alderman about fliers being posted in the neighborhood that were a nuisance. The alderman responded directly to the resident, not the entire group. The resident later cc'ed the community email listserv with the alderman's response and his subsequent response (below):

"[Citizen's Name], I received your package over the weekend and calls were made on Monday. The businesses were told to stop distributing the literature. This ultimately is a police matter, so if this persists I suggest you contact them. [Signed the Alderman's first name]"

Below is the resident's response to the Alderman, copying the neighborhood group:

"Thanks for the follow up. In the future I would appreciate your office making an effort to contact me (an email would suffice) when action is taken. [...] I took the time to provide the evidence and pay to send the package, all they had to do was make the calls and tell me what happened. Pretty simple to me. I will call the police going forward."

Further, our observations over two years revealed at least six instances where the alderman came to CAPS meetings to describe what she is doing to address issues she read about on the online discussion board. Police officers in Community 1 were also diligent in engaging with community members based on their use of ICTs. Our fieldnotes capture an example, where during a CAPS meeting, a resident stands and states that he,

"sent a message but didn't hear additional information. Officer [name] says 'Sorry I printed out an email. Sorry I didn't get back to you on that. I have it here.' She holds up a paper with the information that the person was requesting."

Overall, the data suggest Community 1 successfully used ICTs to leverage their political power. This was demonstrated as government officials attended community meetings and were responsive to electronic messages from Community 1 residents. Community 1's success may be attributed to the number of citizens engaged online to report community issues. Evidence demonstrates that the alderman consistently maintained a connection with the community by responding online and attending community meetings. Further, she influenced the commander's meeting attendance after citizens complained about a lack of results.

Visibility Through Community Leader

During this study, we observed residents in Community 2 use an open discussion board initially and change to a private email list. Despite the changes in the technologies, Community 2 mainly communicated their concerns through a community leader that was informally elected by the neighborhood. This community leader who served as the online moderator was also the beat facilitator.

During our observation, the alderman never attended a CAPS meeting; however, he sent representatives from his office to over 65% of the CAPS meetings. The district commander for both Communities 1 and 2 attended less than a third of Community 2's CAPS meetings (compared to 90% in Community 1). (The commander changed twice during our fieldwork. Here, we refer to the longest standing commander during the two years of fieldwork.)

Our data demonstrate that the alderman and CAPS sergeant were made aware of residents' concerns via emails sent from Community 2's online moderator. Also, according to online data and an interview with the moderator, the alderman and CAPS sergeant were responsive to the emails. After the moderator received a response, he would then broadcast the results of the information to the rest of the community. Though the online moderator described having a contentious relationship with the alderman's office, the email list was a major factor in the alderman's quick response. The online moderator said:

"I intimidated [alderman's name]! I mean I would have never in a million years [intimidated him] out of all the stuff going on [without the email list]."

It seemed that the alderman and CAPS sergeant promptly responded to the moderator because of his role in sending out information to hundreds of people on the email list. For example, the aldermanic administrator of abandoned buildings stood up at the CAPS meeting and said that she would now be attending the meetings to represent the alderman's office based on emails from the community email list about unresolved abandoned and deleterious buildings. In this instance, the alderman's office sent a representative to directly address recent concerns that had been shared online about buildings that were a nuisance to the neighborhood.

Data from our observations demonstrate that police also responded to Community 2's online grievances at the CAPS meetings. Though they never officially posted to the discussion boards, over ten times during our observations, the police stated that they received all the messages shared on the discussion board including pictures of graffiti. The CAPS sergeant, for example, instructed citizens in Community 2 at a CAPS meeting to upload images of graffiti to the community website, because they go directly to his phone. As described in our fieldnotes:

"The CAPS sergeant says 'Take a photo and email it to us. We want to know if it's from a gang. There's graffiti before shootings.' He says that people should upload it to [the community website]. The CAPS sergeant says 'When it's sent there, it goes directly to my phone.'"

When another resident pointed out a problem street corner, the CAPS sergeant said, *"Send me an email and I'll figure out what issue it is."* Both of these statements reveal how the sergeant used email on his phone to keep up-to-date about neighborhood issues. Community 2's CAPS sergeant said that she received all emails from the community email list and forwards the "serious" emails to the commander. She stated that she never responds publicly because of liability issues with the police department.

Although there were major differences in the role that the alderman and the commander played in Community 2 as compared to Community 1, the data suggest Community 2 successfully leveraged their political power as well. Evidence demonstrates that the alderman and CAPS sergeant were aware of and responsive to the residents' issues. However, it was not to the level of Community 1 where the alderman and commander both attended in-person meetings with the community and proactively addressed local issues. In Community 2, we saw the CAPS sergeant, who has less power than the commander to address issues, respond. We argue that Community 2's success can be attributed to the moderator using technology to increase the visibility of community's concerns. A notable

concern about this approach is that there is a heavy reliance on the one person to represent the entire neighborhood.

Visibility through Relationships

In Community 3, residents used a private email list to communicate, where an email moderator, who was a long-standing, well-respected community member received private emails from citizens about what was happening in the neighborhood. The moderator then anonymized the information before sending it to the alderman and CAPS sergeant.

During our observation, the alderman never attended a CAPS meeting and sent representatives to less than 35% of the meetings. The commander attended one meeting after the third commander change in less than one year. Beat officers attended less than a third of meetings.

Our analysis revealed that although the alderman received the emails, little action was taken to address community concerns as a result of information that was shared via the private email list. Only two times during our three years in Community 3 did the alderman's office clearly respond to the community's concerns shared online. In one instance, an aldermanic representative began attending the CAPS meetings after a representative from the state's attorney office attended another official city meeting where she stated that their office received messages from the community's email list and that representatives from their office now planned to participate future CAPS meetings in the neighborhood. The email moderator stated that after the incident with the state's attorney representative, the alderman began to respond more promptly to requests, concerns, and needs. All interviewees in Community 3 strongly criticized the alderman's office, with one interviewee saying:

> *"You got a problem...they want you to call the Alderman's office. Well, we didn't have much success calling the Alderman's Office."*

Others agreed saying,

> *"I feel that her role should be to get a little bit more involved with the police, their head man over there, the commander."*

> *"A lot of things that we talked to the aldermen about, they say 'Oh, we're going to fix it. We're going to take care.' But we don't get any response. We only see them when...they really want to be reelected. And that's another thing, they should really stick to what they say."*

A woman described what she believed was the major reason for crime and disorder in the neighborhood, saying:

> *"I think also the Alderman has a lot to do with it. Having a good alderman means a lot."*

The email moderator agreed with citizens' characterization of the alderman's office as neglectful, but said the alderman's office was unresponsive to community concerns until they felt that the community-based email list may be too large to ignore. Specifically, the moderator stated that by keeping it anonymous, the alderman's office was unaware of the email list's reach except when evidence suggests that influential and powerful officials are on the list when they begin getting involved in community issues (e.g., the state's attorney's office). When asked who, besides that alderman and the sergeant, are on the email list, he says,

> *"What kind of powerful people are in the community? They're in the State Attorney's Office. they're in the Attorney General's Office. Most people don't know it anymore. They don't know [whose on the email distribution list] because my list has expanded from what it was. And now it's blind copy...So you don't know but the reason [local city officials] know it because I can show up to any meeting, anytime, anyplace and they wonder who invites me. [Laughter] I done walked in meetings and they're like, 'What is he doing here?' [Laughter]"*

During our interviews, residents described having a positive, trusting relationship with the CAPS sergeant and saw him as effective at addressing local concerns, though they always shared their concerns with him through the moderator. It is important to note that the sergeant had been in the position longer than any of the police commanders during our observations and had built a strong rapport with the community. The email moderator of the Community 3 email list said that he emailed the CAPS sergeant often but never emailed the commander. He said he interacted with the commander only if he went to the district police station.

Community 3 used ICTs similarly to Community 2, but the data suggests they were not as successful in translating their online concerns to action by government officials. The alderman did not attend CAPS meeting and commander rarely attended. Also, emails were not responded to promptly by the alderman but were by the sergeant, who had little power. We argue that in the rare instances when alderman or commander took action, it was the result of leveraging relationships with powerful officials outside of the community on the anonymous email list and having a positive relationship with the CAPS sergeant.

Supports Accountability

With community concerns being increasingly visible, it is essential that local residents have the ability to hold government officials accountable for addressing those concerns as well as keeping their promises. In Chicago, CAPS meetings have long been an opportunity for citizens to not only share their concerns, issues, and problems with the police, but also challenge the police's efforts in addressing the problems [40]. Local residents in Communities 1, 2, and 3 used technology to deliberate about the important issues (and sometimes solutions) and share those issues during the in-person meetings with the police, subsequently influencing the in-person meeting agendas. They then used the technology to document the agreed upon solutions to follow-up on whether local officials completed specific tasks. The use of community-based ICTs seemed to increase pressure on police and city officials to take action because their responses (whether action or inaction) were easily accessible to citizens and decision makers.

Accountability By Sharing Agendas and Meeting Minutes

Residents in both Communities 1 and 3 created agendas and meeting minutes, respectively, for the CAPS meetings. The police also created agendas for the meetings. The moderators distributed the agendas and minutes both online and at the CAPS meetings. These documents were used to discuss prior concerns from previous meetings and to record action items that the police said they would accomplish. These digital documents were brought to susequent meetings to remind

citizens of the agreed upon solution, which then allowed them to hold public officials accountable by asking if they have completed a task.

One example of citizens using technology to support efforts in holding government officials accountable is when Community 3's alderman stated during a ward meeting, which is alderman-run, that she would not approve any new permits for pawnshops on a crime-ridden, commercial street in the neighborhood. Most residents in the community agreed, stating they wanted higher quality retail stores in the area and that they were opposed to any additional pawnshops to the area because there were already four in a two block radius on the commercial street. When the alderman discreetly approved a fifth pawnshop, residents referred back to digital documents they created that recorded when the alderman stated that no more pawnshops would be allowed. Citizens conveyed their discontent at the alderman's office and the CAPS meetings. They also shared their outrage on the community email list, where they organized greater in-person attendance at the CAPS meeting. Residents who could not attend shared ideas with the moderator about how to leverage city ordinances that prohibit the unwanted store as well as community organizations and lawyers that may help residents fight the decision.

Accountability Through Sharing Police Responses

Community 2 did not create official community agendas or minutes. Instead, Community 2's residents sent emails informing others of the alderman or police's response to specific issues that were reported online. For example, resident posted that they contacted the alderman's office about a troubled building, saying:

> *"We have requested that the alderman call in the building owners, who have been unresponsive to our e-mails. Will post when a meeting is scheduled. "*

After the CAPS meeting, attendees posted an update:

> *"Here's an update on [building address]. An officer went inside the building there is someone who lives on the 2nd floor only now, and a woman with 4 kids currently moving out. It's in foreclosure the bank owns the building (mortagage [sic] fraud). [..] The Alderman, [alderman's name]'s office is doing their part as are the police at this juncture. The building will remain accessible evidently until it's bought, something catastrophic happens or the bank secures it."*

In addition to sharing what the in-person responses are to community concerns, residents in Community 2 also shared written responses about incidents, whether it was originally private or not. For example, one resident posts an email from the police commander to the alderman:

> *"Regarding last weekend's disturbances [the police] will be beefing up attention for the summer, see correspondence from [the] Police Chief [..] to [the alderman]: I have review the letter you submitted to our department concerning the elevated activity in the [..] area. [..] I have spoken with Deputy Chief [name] and extra attention will be give to this area as the warmer weather approaches. I have also instructed Mr. [name] to capture video related to the below listed incidents for review. Your concerns are important to me and please feel free to contact me at [phone number]."*

Residents use ICTs in all three communities to document decisions made in community meetings and to keep those who did not attend informed. Using this community-created documentation proves useful for monitoring progress and pushing the community agenda forward. Although the outcomes of the meetings do not always result in action from local officials, ICTs can be used to hold government officials accountable to their verbal commitments.

Diversifying Methods of Participation

There are numerous barriers to attending the CAPS meetings. Eight (80%) of the ten interviewees who did not attend the CAPS meetings stated that other obligations hindered their attendance. Whether it was a second job, sickness, lack of transportation, or a single parent who needed to be home in the evenings, there were various reasons given for not attending the CAPS meetings. In the past, Chicago citizens may have felt that they needed to be physically present at the CAPS meetings for their concerns to be heard by law enforcement [40]. However, technology can address such barriers to participation. More than half of interviewees that used the community-based ICTs said that they used it as either an alternative or supplemental method of participating in community crime prevention.

Online Engagement to Supplement In-Person Meetings

In all three communities, citizens still felt that their online presence was a type of participation in community crime prevention. In Community 1, people used the technology to facilitate community discussion about problems and solutions. Six out of seven (85%) interviewees believed that their online participation influenced the police's reaction to solving issues.

One woman in Community 1, for example, explained why she did not attend the CAPS meetings but shared that she was aware of what happened at the meetings, saying,

> *"I have health issues. So that's a big part of it. That was really the main thing so usually I am pretty tired by that time in the evening. [But] I usually hear it online, like somebody would be talking about it.*

Similarly, a male from Community 1 said,

> *"I was really heavily participating in CAPS, but since they changed that [meeting] day, I've had to pull away from it. But I still kind of, monitor the site. I post things on our neighborhood site that I think are pertinent, if crimes happened or something has happened."*

Both of these residents believed that their online participation allow them to be involved in crime prevention despite their lack of in-person participation at the CAPS meetings.

Residents in Communities 2 and 3 received emails from moderators (one-to-many communication) about what happened in the in-person meetings and were able to respond back to only the moderator. During the interviews, citizens reported instances that they emailed the moderator about issues that were later discussed at the in-person meetings. Also, many felt they were active participants in the community crime prevention efforts because they informed their neighbors who were not on the email list about community-created agenda and minutes read online (though they did not attend the CAPS meeting).

This was particularly prevalent in Community 3, where all interviewees discussed the significance of “word-of-mouth" communication among residents.

Online Engagement Supports Offline Participation

Though some citizens are unable to attend the CAPS meetings, we observed that residents in Community 1 & 2 used ICTs to organize face-to-face meetings with residents that differed from the CAPS meetings. These meetings, for example, were more about “positive loitering," in which community members organize informal walks and spend time outside talking to each other to discourage crime and disorder in the community by having “eyes on the street." It should be noted that, we did not observe instances where the email list was used to help organize informal community-driven meeting in Community 3. A post on Community 2’s online discussion board describes the most recent community walk, which the alderman attended. The post said:

> *“Update on last night’s (July 20) group walk...Attendance was down for this walk [but] we were joined by Alderman [name]. [..] Nevertheless, we did manage to distribute some flyers and also get the message across to a few ‘questionable’ sort that neighbors here are getting organized. The walks do have an impact, but we need more walkers! Our area has been relatively quiet since the spring outbreak of violence. While our walks are not solely responsible for that, they have contributed to reducing problems. The more people we can get to these walks the more we send the message that we will not tolerate abusive behavior in our neighborhood."*

The community-based ICTsS seem to make organizing these types of activities easier. Law enforcement officials were not required to be present. Yet, at six out of the eight community-organized positive presence walks that we attended in Communities 1 and 2, at least two beat officers were present. While there were mixed feelings about law enforcement showing up to such unofficial community events, it demonstrates how online organizing can help stimulate police attention. This finding suggests that the vast number of people that ICTs can reach may nudge police and other city officials to be aware of what the community is doing.

DISCUSSION

This paper describes the role that ICTs play in supporting citizen participation in local governance in three Chicago communities. We framed our approach using Fung’s definition of *empowered participation*, which suggests citizens have the ability to engage local governance in ways that allow for citizen deliberation and decentralized decision-making. Theoretically, empowered participation leads to government officials being held accountable and accessible to the public. Based on our analysis, we found both similarities and differences across the communities studied. All three communities used ICTs to increase the **visibility** of local issues. Community 1 accomplished this by leveraging the power of many to engage and interact with the alderman and police. Community 2, on the other hand, relied on a trusted community member to liaison with city officials. Though using a similar approach as Community 2, Community 3 also needed to leverage relationships, specifically strong ties with the police sergeant and those in powerful positions outside of the community to motivate local change. Each community used ICTs to hold local officials **accountable** by sharing community-driven meeting agendas and minutes (Community 1 & 3) and decisions made by local officials about specific issues (Community 2). Lastly, citizens used ICTs as another method of **participation** in local governance, specifically by engaging online when they are unable to attend in-person meetings (Communities 1, 2, & 3) and by using ICTs to organize community-based, in-person meetings (Communities 1 & 2). We frame our discussion of these findings around our two major points: technology alone cannot equitably empower citizens and, the experiences of the marginalized can inform ICT design for local governance.

Technology Alone Cannot Equitably Empower Citizens

In *"Empowered Participation, Reinventing Urban Democracy,"* Fung argues that participatory democracy can effect social change. Based on our data, we support the notion that participatory-democratic organizing creates channels through which residents can voice their concerns about local issues. Furthermore, ICTs support the concept of empowerment as described by Fung [15] by serving as a tool through which citizens share information, discuss potential solutions, and supplement their ways of participating directly in local governance. ICTs also provide an alternate or complementary means by which a relationship between city officials and the community can be initiated and developed. Using these tools, community members can, over time, generate and utilize a "durable network" [4, p. 248] to strategically confront local issues like crime. Despite these promising empowerment strategies, our research also suggests that less affluent neighborhoods still have the same problems affecting change as observed by Fung and other scholars for decades [15]. Though technology provides an opportunity to make citizens’ concerns visible, to hold officials accountable, and are an avenue for alternative methods of engagement; we argue that the use of ICTs alone cannot change ongoing challenges in marginalized communities lacking the social relationships inherent in more wealthy communities.

Fung suggests that *"much of the inequality in service provision, opportunities, and outcomes across different neighborhoods stems from the background of social and economic disparity that characterizes all urban environments in the United States"* [15, p. 23]. Our work supports this notion. Our analysis suggests there are larger structural issues at play. One of the most noticeable and critical differences across communities is race [19], which tends to be confounded with wealth due to hundreds of years of ongoing educational, employment, and otherwise economic disenfranchisement [27, 51, 52]. Subsequently, there continues to be a devaluing of predominantly Black and poorer communities politically, economically, and socially which is evidenced by the lack of public revitalization efforts, local resources, private investments, and the overly simplistic and stigmatized reporting when referring to these communities [27, 51].

In fact, since the 1960s studies of Chicago communities, social networks, and subsequent support or the lack thereof in minority and poor communities has been a well-known challenge [52, 42, 36]. The communities we studied all used ICTs to

effectively communicate with local government officials, but varied in terms of racial and socioeconomic status. While each community in the study had a strong online presence, political figures responded differently to concerns across these communities. Seemingly most attentive to Community 1 –a majority white and middle-high income community– local political figures attended meetings and were responsive in addressing residents' concerns. Although eventually addressed, more pressure was required for government officials to tackle local concerns in the two lower income, racially mixed and minority communities (Communities 2 & 3, respectively). In fact, we saw varying levels of engagement from government officials across communities, with the poorest community (Community 3) receiving the least amount of support. Therefore, through a venue designed to empower communities, poor and minority community residents' lack of power was demonstrated instead, potentially undermining their political power as compared to other communities.

This begs the question if technology alone can remedy the problem of suppressed political power in minority and poor communities. Residents in the low-income community we observed responded to the call to engage in local governance using ICTs and at CAPS meetings because they believe their participation will make a difference. While theoretically, these strategies increase communication and improve the likelihood of attention, the effectiveness of this approach in producing improvements in one community and not in others is a source of inequality. Subsequently, as evidenced by our research, there is still a need for these communities to engage in local governance at greater levels than more affluent communities in attempts to achieve the same goals while having a lower probability of success than more affluent communities.

Fung contended that, *"Voices of minority, less educated, diffident, or culturally subordinate participants are often drowned out by those who are wealthy, confident, accustomed to management, or otherwise privileged"* [15, 5]. We agree and assert that powerful social ties with those in power who can and will advocate on behalf of residents in minority and less affluent communities are a necessity to change and citizen empowerment. The absence these social connections (or relationships), can lead to these residents' loss of confidence in local governance and a widening civic empowerment gap [24]. Therefore, scholars must seek to uncover how the increased levels of and varied participation that ICTs encourage in communities, particularly minority and poor communities, can be used to generate a durable network of relationships and support that leverages and deploys political power in ways we have not seen before. The poses an opportunity for future work for HCI scholars.

Designing for the Experiences of the Marginalized

The communities in this paper highlight complex, underlying issues such as the impact of race, class, and power on public policy and local governance [39, 52]. Wilson's seminal work criticizes approaches to public policy that do not consider the reciprocal impact of policy decisions and economic mobilization of lower income citizens, particularly those who live in areas with concentrated poverty [52]. Similarly, when developing community-based ICTs to support local governance, we must consider traditionally marginalized, lower income citizens and their realities of action (or inaction) by local city officials. By examining the differences in use, we can begin to draw insights into how to design tools that attempt to shift notions of power by moving beyond simply supporting information sharing and communication and aim to improve equity in local governance and action for disenfranchised communities. Based on our findings, we propose three approaches to designing such ICTs. We suggest designing ICTs that 1) support relationship-building between the community and those in power beyond local decision makers to put outside pressure on local officials; 2) highlight local decisions made during in-person meetings to expose inaction and improve accountability; and, 3) support community organizing to successfully encourage citizen participation.

ICTS that Support Relationship Building

As evidenced in our study, explicit relationships with powerful government officials played a critical role in catalyzing change and action amongst local officials in the minority, lower income neighborhood (Community 3). While the effectiveness of this method is not completely clear, it is evident that creating relationships with more powerful people was successful in getting the alderman's attention (e.g., the state's attorney office lead the alderman to address a local situation). Therefore, ICTs that support relationships alone may not be the best solution; while, ICTs that help citizens understand the local hierarchy and build relationships with people that have the ability to put pressure on local officials would be more effective. For example, the commander answers to the Deputy Chief who answers to the Police Chief who answers to the Police Superintendent. ICTs also have the ability to help citizens consider non-traditional approaches to power; for example, the alderman who is on city council has the (unofficial) power to influence who becomes the commander in their area, which may be one reason why Community 1's alderman was very successful in engaging the commander. However, state representatives and senators have the ability to impact the decisions of the alderman. Helping residents identify and build relationships with potential advocates in the unofficial city, regional, and state power structure may be unconventional, but necessary to persuade local officials to address the community's concerns.

ICTs that Expose Local Action and Inaction

We observed immediate responses from the alderman in Communities 1 & 2 as a result of community concerns shared online. However, such reactions were not as prevalent in Community 3, despite the fact that there were similarities in the use of technology. Given that residents in lower income neighborhoods may have to do more than those in more affluent areas to see results, we imagine ICTs supporting their efforts to hold public officials accountable by publicizing local officials behavior beyond the email list. In Community 3, for example, the alderman who approved the creation of a fifth pawn shop, may have assumed that residents in Community 3 would not expose her actions. However, the uproar by the community led to the story being covered by several major newspapers and media outlets. As a result, she was not reelected, which is very

rare for an incumbent alderman in Chicago with the mayor's support. Key states, *"The blunt truth is that politicians and officials are under no compulsion to pay much heed to classes and groups of citizens that do not vote"* [22, p.99]. A tool allowing residents to not only record decisions that were made in the meeting, but to also share them in a more public format can increase the amount of pressure that local politicians feel from their constituents. All three neighborhoods shared information; however, future work can explore the impact of exposing local decisions to a broader audience.

ICTs that Support Local In-person Organizing

Community walks, positive-presence events, and community-based meetings demonstrate solidarity amongst community members and help spur local change [8]. Although Community 3 residents were engaged in trying to improve local issues, we did not observe such organizing online or in-person by citizens in Community 3. Despite this, we do not attribute their lack of organizing to a lack of interest in government or crime prevention as some previous studies suggest about citizens in low-income, minority communities [40]. Low in-person attendance can be the result of overwhelming and competing responsibilities (e.g., second jobs or child care) that lower income citizens have to negotiate. For example, we witnessed Community 3 residents petition against the development of the fifth pawnshop in a two block radius; and, there was a large amount of public support for this effort as evidenced by the numerous people who signed the petition. However, despite this, the community's complaint was dismissed, and the pawnshop was approved because not enough opponents attended a meeting at city hall. This meeting was held at 10am on a weekday when residents were most likely working.

We imagine designing ICTs for local governance that inform citizens of the optimal times when their in-person attendance will have the greatest opportunity to enact change. Such technologies, for example, could alert residents when it is essential to be physically present at a meeting versus signing a petition to show support. It is unlikely that citizens in Community 3 understood the gravity of the city hall vote. They were passionate about this issue; and, we believe with the right information and tools, they would have organized to have better representation from the community at the meeting. Technology could provide an understanding of the sometimes murky political process and boost efforts to organize in-person by helping residents decipher when it is essential to participate in-person.

LIMITATIONS AND FUTURE WORK

There are several limitations to this study, and thus opportunities to engage in future research that can potentially lead to greater understanding of the role of technology in deliberative governance. First, our qualitative approach to understanding our research questions does not lend itself to broad generalizations. While we believe there may be similar dynamics in other cities, our results must be taken in the context of Chicago. Although we attempted to include more Chicago communities, the other communities we initially investigated did not engage with a prevalent community-based technology, and our research question did not lend itself to an investigation of communities that do not use ICTs. However, future research can explore how ICTs can support community organizations (e.g., churches, community centers) that have traditionally been activists in communities but do little online grassroots organizing. Recent studies regarding attitudes and perceptions about community technology found that minorities, those who are lower income, those who have less trust of the police, and residents in high-crime neighborhoods tend to use technology less to engage with government officials about local issues [20]. Citizens from these communities instead relied heavily on in-person meetings. It would be interesting to see a comparison of grassroots results across different communities that include communities that do not engage with ICTs. Additionally, future work could examine the extent to which neighborhood characteristics influence the type of technologies citizens use and the structure of information sharing [13].

Lastly, it is important to consider the difference between measuring the action of government officials versus the promise of action. Whereas other scholars have used voting patterns of city officials as a measure of political power [41], we measured the responses by government officials as confirmed by citizens. However, it is difficult to know if those actions actually took place. The realization of action versus the promise of action is a limitation of this study that presents an opportunity for future research. Furthermore, our approach of viewing action as political power may differ from residents feelings. Though we saw less action from government officials in Community 3, demonstrating inequity in political power, we did not investigate if residents themselves are aware of this inequity or feel less empowered. Future work can measure citizens feelings as a result of their technology use. Addressing these types of questions will provide us with a richer understanding of the social and political factors that designers must consider to effectively design technology that supports civic engagement in various communities.

CONCLUSION

The relationship between citizens and city officials is incredibly complex and requires a deep understanding of the social and political environments. Though many times we design technology to affect the behavior of a user, researchers should consider the greater ecological implications. In Chicago, for example, residents initially appropriated ICTs to share information and support discussions amongst residents. Heightened visibility of community concerns, police accountability, and varied participation were subsequent effects. Scholars who research technology's affect on social issues (e.g., crime, sustainability, health) should potentially extend beyond examining technology's influence on individual behavior. Instead, we may consider how technology affects the ability of communities, particularly those that are disproportionately plagued by challenging social problems, to influence their political, social, and economic circumstances.

ACKNOWLEDGMENTS

We would like to thank our participants who so graciously welcomed us into their community, Jessa Dickinson, and Dan Lewis. This work was supported by the NSF GRFP.

REFERENCES

1. Michael L. Best and Amanda Meng. 2015. Twitter Democracy: Policy Versus Identity Politics in Three Emerging African Democracies. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development (ICTD '15)*. ACM, New York, NY, USA, Article 20, 10 pages. DOI:http://dx.doi.org/10.1145/2737856.2738017
2. Marcel Bilger and Vincenzo Carrieri. 2013. Health in the cities: When the neighborhood matters more than income. *Journal of Health Economics* 32, 1 (2013), 1 – 11. DOI: http://dx.doi.org/10.1016/j.jhealeco.2012.09.010
3. Morten Bohoj, Nikolaj G. Borchorst, Susanne Bodker, Matthias Korn, and Pär-Ola Zander. 2011. Public Deliberation in Municipal Planning: Supporting Action and Reflection with Mobile Technology. In *Proceedings of the 5th International Conference on Communities and Technologies (C&T '11)*. ACM, New York, NY, USA, 88–97. DOI:http://dx.doi.org/10.1145/2103354.2103367
4. Pierre Bourdieu. 1986. The Forms of Capital. In *Handbook of Theory and Research for the Sociology of Education*, Richardson J (Ed.). Macmillan, New York, 46–58.
5. Henry E Brady. 2004. An analytical perspective on participatory inequality and income inequality. *Social inequality* (2004), 667–702.
6. Michael X. Delli Carpini, Fay Lomax Cook, and Lawrence R. Jacobs. 2004. Public Deliberation, Discursive Participation and Citizen Engagement: A Review of the Empirical Literature. *Annual Review of Political Science* 7, 1 (2004), 315 – 344.
7. Tawanna R. Dillahunt and Amelia R. Malone. 2015. The Promise of the Sharing Economy Among Disadvantaged Communities. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM, New York, NY, USA, 2285–2294. DOI: http://dx.doi.org/10.1145/2702123.2702189
8. Peter Dreier. 1996. Community Empowerment Strategies: The Limits and Potential of Community Organizing in Urban Neighborhoods. *Cityscape* 2, 2 (1996), 121–159.
9. Bill Edwards, Mark Goodwin, Simon Pemberton, and Michael Woods. 2000. Partnership working in rural regeneration. *Governance and Empowerment* (2000).
10. Ingrid Gould Ellen, Tod Mijanovich, and Keri-Nicole Dillman. 2001. Neighborhood Effects on Health: Exploring the Links and Assessing the Evidence. *Journal of Urban Affairs* 23, 3-4 (2001), 391–408. DOI: http://dx.doi.org/10.1111/0735-2166.00096
11. Sheena Lewis Erete. 2013. Protecting the home: exploring the roles of technology and citizen activism from a burglar's perspective. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*. ACM, 2507–2516.
12. Sheena L Erete. 2015. Engaging Around Neighborhood Issues: How Online Communication Affects Offline Behavior. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*. ACM, 1590–1601.
13. Sheena L. Erete, Ryan Miller, and Dan A. Lewis. 2014. Differences in Technology Use to Support Community Crime Prevention. In *Proc. of CSCW*. 153–156.
14. Frank Fischer. 2006. Participatory governance as deliberative empowerment the cultural politics of discursive space. *The American review of public administration* 36, 1 (2006), 19–40.
15. Archon Fung. 2009. *Empowered participation: reinventing urban democracy*. Princeton University Press.
16. Archon Fung and Erik Olin Wright. 2001. Deepening democracy: Institutional innovations in empowered participatory governance. *Politics and Society* 29, 1 (2001), 5–42.
17. Mike Harding, Bran Knowles, Nigel Davies, and Mark Rouncefield. 2015. HCI, Civic Engagement & Trust. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM, New York, NY, USA, 2833–2842. DOI: http://dx.doi.org/10.1145/2702123.2702255
18. Yuheng Hu, Shelly D Farnham, and Andrés Monroy-Hernández. 2013. Whoo. ly: facilitating information seeking for hyperlocal communities using social media. In *Proc. of CHI*. ACM, 3481–3490.
19. Jackelyn Hwang and Robert J. Sampson. 2014. Divergent Pathways of Gentrification: Racial Inequality and the Social Order of Renewal in Chicago Neighborhoods. *American Sociological Review* (2014).
20. Aarti Israni, Sheena Erete, and Che Smith. 2017. Snitches, Trolls, and Social Norms: Unpacking Perceptions of Social Media Use for Crime Prevention. In *Proc. of the ACM Conference on Computer Supported Cooperative Work & Social Computing*. ACM.
21. Cristina Kadar, Yiea-Funk Te, Raquel Rosés Brüngger, and Irena Pletikosa Cvijikj. 2016. Digital Neighborhood Watch: To Share or Not to Share?. In *Proc. of CHI EA*. ACM, New York, NY, USA, 2148–2155. http://doi.acm.org/10.1145/2851581.2892400
22. Valdimer O. Key. 1950. *The Georgia Historical Quarterly* 34, 4 (1950), 349–350.
23. Christopher A. Le Dantec and W. Keith Edwards. 2008. Designs on Dignity: Perceptions of Technology Among the Homeless. In *Proc. of CHI (CHI '08)*. 627–636.
24. Meira Levinson. 2010. The Civic Empowerment Gap: Defining the Problem and Locating Solutions. In *Handbook of Research on Civic Engagement in Youth*, Lonnie Sherrod, Judith Torney-Purta, and Constance A. Flanagan (Eds.). John Wiley & Sons, Hoboken, NJ, Chapter 13, 331–361.

25. Sheena Lewis and Dan A. Lewis. 2012. Examining Technology That Supports Community Policing. In *Proc. of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12)*. ACM, New York, NY, USA, 1371–1380. DOI: http://dx.doi.org/10.1145/2207676.2208595

26. Christina A. Masden, Catherine Grevet, Rebecca E. Grinter, Eric Gilbert, and W. Keith Edwards. 2014. Tensions in Scaling-up Community Social Media: A Multi-neighborhood Study of Nextdoor. In *Proc. of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. ACM, New York, NY, USA, 3239–3248. DOI: http://dx.doi.org/10.1145/2556288.2557319

27. Douglas S. Massey and Nancy A Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Harvard University Press, Cambridge.

28. J.D. Morenoff, R.J. Sampson, and S.W. Raudenbush. 2001. Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology* 39, 3 (2001), 517–558.

29. Jeffrey D. Morenoff, James S. House, Ben B. Hansen, David R. Williams, George A. Kaplan, and Haslyn E. Hunte. 2007. Understanding social disparities in hypertension prevalence, awareness, treatment, and control: The role of neighborhood context. *Social Science & Medicine* 65, 9 (2007), 1853 – 1866. DOI: http://dx.doi.org/10.1016/j.socscimed.2007.05.038 Placing Health in Context.

30. Deepa Narayan-Parker. 2005. *Measuring empowerment: cross-disciplinary perspectives*. The World Bank.

31. William Outhwaite and Tom Bottomore. 1993. *The Blackwell Dictionary of Twentieth-Century Social Thought*. Blackwell Publishers, Oxford.

32. Andrea Parker, Vasudhara Kantroo, Hee Rin Lee, Miguel Osornio, Mansi Sharma, and Rebecca Grinter. 2012. Health Promotion As Activism: Building Community Capacity to Effect Social Change. In *Proc. of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12)*. ACM, New York, NY, USA, 99–108. DOI: http://dx.doi.org/10.1145/2207676.2207692

33. Joanna Saad-Sulonen, Andrea Botero, and Kari Kuutti. 2012. A Long-term Strategy for Designing (in) the Wild: Lessons from the Urban Mediator and Traffic Planning in Helsinki. In *Proceedings of the Designing Interactive Systems Conference (DIS '12)*. ACM, New York, NY, USA, 166–175. DOI: http://dx.doi.org/10.1145/2317956.2317982

34. Niharika Sachdeva and Ponnurangam Kumaraguru. 2015. Social Networks for Police and Residents in India: Exploring Online Communication for Crime Prevention. In *Proc. of the Conference on Digital Government Research (dg.o '15)*. ACM, New York, NY, USA, 256–265. DOI: http://dx.doi.org/10.1145/2757401.2757420

35. Robert J Sampson. 2012. *Great American city: Chicago and the Enduring Neighborhood Effect*. University of Chicago Press.

36. Robert J. Sampson and W. Byron Groves. 1989. Community Structure and Crime: Testing Social-Disorganization Theory. *The American Journal of Sociology* 94, 4 (1989), 774–802.

37. Robert J. Sampson, Doug McAdam, Heather MacIndoe, and Simón Weffer-Elizondo. 2005. Civil Society Reconsidered: The Durable Nature and Community Structure of Collective Civic Action. *Amer. J. Sociology* 111, 3 (2005), pp. 673–714.

38. Robert J Sampson and Jeffrey D Morenoff. 2006. Durable Inequality: Spatial Dynamics, Social Processes, and the Persistence of Poverty in Chicago Neighborhoods. In *Poverty Traps*, Samuel Bowles, Steven N. Durlauf, Karla Hoff (Ed.). Princeton University Press, Princeton, 176–203.

39. Robert J Sampson and William Julius Wilson. 1995. Toward a theory of race, crime, and urban inequality. *Race, crime, and justice: A reader* 1995 (1995).

40. Wesley G. Skogan. 2006. *Police and Community in Chicago: A Tale of Three Cities*. Oxford University Press.

41. Wesley G. Skogan. 2012. Collective Action, Structural Disadvantage, and Crime. *Tides and Currents in Police Theories: Journal of Police Studies* 25 (2012), 135–152.

42. Wesley G. Skogan and S.M. Hartnett. 1997. *Community Policing, Chicago style*. Oxford University Press.

43. Wesley G. Skogan, Dan. A. Lewis, Aaron Podolefsky, Fredric DuBow, Margaret Gordon, Albert Hunter, Michael Maxfield, and Greta Salem. 1982. *The Reactions to Crime Project*. Technical Report. U.S. Department of Justice-National Institute of Justice, Washington DC.

44. Aaron Smith. 2010a. *Americans and their Gadgets*. Technical Report. Pew Internet and American Life Project.

45. Aaron Smith. 2010b. *Mobile Access 2010*. Technical Report. Pew Internet And American Life Project.

46. Frederick Solt. 2008. Economic inequality and democratic political engagement. *American Journal of Political Science* 52, 1 (2008), 48–60.

47. A. Strauss and J.M. Corbin. 1990. *Basics of qualitative research: Grounded theory procedures and techniques.* Sage Publications, Inc.

48. Kentaro Toyama. 2015. *Geek heresy: Rescuing social change from the cult of technology*. PublicAffairs.

49. Tom R. Tyler. 2005. Policing in Black and White: Ethnic Group Differences in Trust and Confidence in the Police. *Police Quarterly* 8, 3 (2005), 322–342.

50. Eric M Uslaner and Mitchell Brown. 2005. Inequality, trust, and civic engagement. *American Politics Research* 33, 6 (2005), 868–894.

51. Bas W van Doorn. 2015. Pre-and Post-Welfare Reform Media Portrayals of Poverty in the United States: The Continuing Importance of Race and Ethnicity. *Politics & Policy* 43, 1 (2015), 142–162.

52. William Julius Wilson. 1987. The truly disadvantaged: The inner city, the underclass, and public policy. *Chicago: University of Chicago* (1987).

53. Jill Palzkill Woelfer, Amy Iverson, David G. Hendry, Batya Friedman, and Brian T. Gill. 2011. Improving the safety of homeless young people with mobile phones: values, form and function. In *Proc. of the Human Factors in Computing Conference*. ACM, 1707–1716.

54. Sarita Yardi and Amy Bruckman. 2012. Income, Race, and Class: Exploring Socioeconomic Differences in Family Technology Use. In *Proc. of CHI*. 3041–3050.