Quotidian Report: Grassroots Data Practices to Address Public Safety

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We examine the local data practices of citizens in Mexico who use Facebook sites as a platform to report crimes and share safety-related information. We conducted 14 interviews with a variety of participants who collaborate as administrators and contributors of these online communities. The communities we examined have two central components: the citizens who crowd-source data about instances of crime in different neighborhoods in and around Mexico City, and the administrators of the Facebook sites who use the crowd-sourced data to intervene and collaborate with other stakeholders. From our interviews, we identify the community, data, and action practices used by group administrators to collect, curate, and publish information about public safety that would otherwise go un-reported. The combination of these practices improves the reputation of the groups on Facebook, increases trust, and encourages sustained participation from citizens. These practices also legitimize data gathered by group members as an important grassroots tool for responding to issues of public safety that would otherwise not be reported or acted upon. Our findings contribute a growing body of work that aims to understand how social media enable political action in contexts where people are not being served by existing institutions.

CCS Concepts: • **Information systems → Collaborative and social computing systems and tools**; • **Human-centered computing** → Empirical studies in collaborative and social computing

KEYWORDS: Nonprofit organizations; activism; data practices; work practices; Mexico; social change; digital civics

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1 INTRODUCTION

Social media have come to empower social movements across the world [35,52]. One of the shared conditions that prompt people to turn to computing infrastructures is the collapse or inattention of established institutions to address the physical, social, and cultural conditions of oppression or insecurity. It is within this context that we examined the particular conditions in and around Mexico where citizens have turned to Facebook to catalogue data about local crime. These pages allow users to report local incidents with some degree of anonymity, reducing the burden of retaliation from authorities. Due to the Facebook sites' ability to keep their content visible to anyone on the internet by default, these pages also become sources for the production of data and evidence.

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For many citizens, this platform has become the sole source for learning about issues that are suppressed or ignored by either the government, or by the Mexican media.

In our study, we specifically analyzed the strategies administrators used to turn user-generated content about instances of local crime into data to scaffold action among members of the Facebook group and page (henceforth, Facebook sites). We also examined their practices for building online communities and curating data that had been omitted from official databases and mainstream media in Mexico. Our overarching research agenda is to better understand how local citizens and activists use the content and facilities of social media as a resource for organizing toward systemic social change. With respect to this study, we were concerned with gaining further insight into how local knowledge was being recorded and turned into data so that it might augment or contest incomplete official records. While the data in these pages were valuable because they provided an account of officially un-recorded recurring violence from citizens' perspective, we were also aware of the limitations of these accounts as sources to augment official crime data. First, the data collected are hard to verify because they cannot be validated through any institutional process. Second, the data are unstructured which creates a barrier for use as official evidence. Third, due to a widespread lack of trust, most of the citizens involved in the administration of these pages work anonymously, limiting citizens' ability to link online and offline activities. Despite these limitations, however, we found that administrators have been able to build robust communities that have translated data into actionable results.

In our analysis, we demonstrate how citizens manage and make sense of collective data, while also dealing with safety, privacy, and infrastructure constraints. Second, our work is in conversation with other civic domains that benefit from collective data gathering (*e.g.*, [30,31,36,50]). However, we examine a more complex space where the safety of the contributors is at stake because of the complex relationship to both social and state organizations involved in creating and perpetuating harm against their communities. While our research focuses on Mexico, the issues and insights presented in this work are not unique to the Mexican experience. In particular, our insights regarding data challenges resonate with other situations similar to Mexico, including contexts coping with sociopolitical turmoil and high levels of distrust in authorities (*i.e.*, governments; policing agencies).

2 EMERGING COLLECTIVE DATA PRACTICES

The contemporary moment of widespread access to social media platforms and mobile technology has further facilitated the production and sharing of data of all kinds—from routine social exchanges, to leisure activities, to acute responses to conditions of crisis or unrest (*e.g.*, [3,30,52]). In some contexts, this increased access has translated into a reconfiguration of public participation in civic issues by raising awareness [11], creating affordances for citizen involvement in public affairs [6], or through directly supporting activism [5]. Although large-scale interactive systems have garnered much attention as an instrument to support collective action [39], data are an essential element that ultimately enables citizens to recognize patterns and mobilize to transform a given social situation.

For the purpose of this research, we refer to the user-generated content published on the Facebook sites as data. While often data are assumed to be a collection of atomic units which lead to knowledge and then to information—what Hakken described as the "modernist knowledge progression" [12:40]—we approach these collective accounts in reverse such that local knowledge becomes data, which then can be transmitted as information. The Facebook content provides "the material for informational patterns" [19:123]: it is not that the accounts offers "raw material for information, [but that] data emerges as a result of adding value to information" [23:108]. The value added by the content on the Facebook sites is the record of the incident itself, and the contextualization of local conditions around the recorded incident. Even though most of the testimonies published on the Facebook sites are incomplete, they can be

used to construct a better understanding of the current conditions of violence in Mexico. The ongoing challenge for local activists is how to take the unstructured and incomplete collective accounts present on the Facebook sites and turn them into actionable information.

2.1 Modes of Collective Production

The recent history of collective forms of production provide some insight into the limits and opportunities for bringing diverse individuals together into projects to document, understand, and act in the world. Early examples of drawing citizens into data production can be found in efforts around citizen science. Citizen science consists of leveraging the collective efforts of non-expert volunteers to make observations and to gather data in a broad variety of domains over an extended period of time [46]. Examples of citizen science projects include monitoring air quality or documenting invasive species in a local park [27]. Projects that fall into this category are based on different kinds of collaborations between researchers and volunteers where data quality, collection methods, and the general practices used by the volunteers make up the major concerns [8,46]. Additionally, preserving data, and making data easily accessible both represent constant challenges [22], as do issues of privacy and motivation of the volunteers to collaborate [26].

A standing critique of citizen science programs is that there remains a gap between the citizen and the science, where rote data collection and entry, while important for the larger scientific endeavor, do not in themselves make for rich participation in science: the kinds of data that can be produced and the professional practices of science still govern the inclusion or exclusion of citizen-produced data [14,43]. Instead, we might turn to the broader field of amateur making that includes forms of citizen science as well as other modes of production that establish a deep set of commitments to participation beyond simple data collection. Among these kinds of projects are accounts like Kuznetsov's examination of biohackers that articulate their practices as well as their commitments to safety, ethics, and transparency when working in small, amateur lab settings [28]. We can also find a range of projects that take seriously modes of social and cultural production where local values stand in resistance to dominant assumptions of who participates and how they do so, whether through notions of community [45], culture [18,34], or innovation [34].

Across these diverse projects, we can begin to draw out the ways in which forms of production—of data, of devices, of culture—intermingle to create communities with shared commitments. These commitments in turn create new capacities that enable communities to take action [29]. In some cases, this might be through local environmental monitoring [49], or through more focused modes of data production meant to inform policy [31]. What many of these instances share are sustained efforts that take place over larger periods of time. Likewise, building spaces for collective forms of digital production takes time to develop community standards, enculture a set of shared values, and establish norms that help sustain the community. Issues like trust, engagement, and resilience become important elements in enabling these forms of collective production.

2.2 Mobilizing for Acute Response

Where collective forms of production might emphasize engagements that transpire over longer periods of time, there are also acute incidents that result in widespread, but brief response. Falling under the banner of crisis informatics, recent research has focused on how people mobilize through social media when natural and man-made disasters occur (*e.g.*, [3,51,53]). The key to much of this work comes through looking at the differences between top-down command-and-control responses to crisis events and the flat peer-to-peer organizing that occurs through social media. In the case of the response to Super Storm Sandy in the northeast US in 2012, the on-the-

ground network of activists who were part of Occupy Wall Street became a crucial network for delivering humanitarian aid more flexibly and responsively than the established aid institutions could manage (governmental or otherwise) [3].

One of the difficulties in relying on social media to collect and share information during a crisis is the bridge between those participating via social media and those in institutional roles that need to coordinate across multiple service boundaries. On the one hand, more people can provide aid indirectly by organizing funding and supplies and information [50,52]; on the other hand, the fact that these activities take place on social media limits and shapes the available data both in terms of who produces it and who has access to it. Another challenge lies in the way social media platforms restrict data availability; for example, Twitter limits queries to returning 3,200 tweets [44]. This limit might exclude crucial information and there is no procedural way to examine what was left out and how to alter queries to ensure more robust results. Further, even when large datasets are available, the format limits its use. Again turning to Twitter, content is returned in a JavaScript Object Notation (JSON) format that strips the tweet of its conversational context [44].

Managing the material and platform constraints of how data are collected, handled, and reported becomes a substantial source of labor in its own right. Large data sets impose challenges for volunteer organizations to scope data in a pertinent manner in order to meaningfully answer questions [44]. While social media data are not necessarily representative of a given geographic population, they do represent a range of behaviors, ideas, and opinions that have a role to play alongside traditional disaster response. But there are specific issues around data curation and selection that mean on-the-ground efforts still require human intervention to appropriately contextualize and prioritize information. Local knowledge matters, in part to create appropriate responses, and in part to ensure that the overall network of volunteers, official authorities, and the affected population are supported, rather than hindered, by the production and sharing of information.

2.3 Data and People and Institutions

If we take a step back and consider the collection of practices that make up activities like citizen science, novel sites of digital production, and moments of social information sharing, we begin to outline the contours of new forms of digital civic engagement—where the relations between people are instantiated and mediated by an array of data, computing interfaces, and local contexts [42]. The recent turn to digital civics has focused on exploring the use of technology when supporting community organizations. These interventions have used a variety of digital technologies such as social media [11,17], mobile and web platforms, civic games [10,17], and hackathons [15]. The goals for these interventions varies from supporting broad participation in local government and institutions, to constructing social movements that empower communities in shaping their civic life (*e.g.*, [11,17,20]). Additionally, drawing on the movements mentioned above, researchers have examined ways to motivate different types of users to gather data about their neighborhoods through interfaces that focus on increasing data gathering [41], the offering of rewards [7], or creatively deploying game mechanics [36].

While each of these examples illustrate particular strengths and encourage different modes of engagement, they also present challenges related to the kind of data that make citizen participation possible. For example, in the case of blogging and networking sites that support collaboration [17], citizens both generate the data and interpret them. In other cases, communication is mediated by the partnership between different stakeholders towards shaping their communities and the provision of public services. For example, Harding et al. developed a web platform that supported real-time communication between civic workers and citizen reports, mediating trust between the public and municipal officials [20].

The examples mentioned thus far refer to platforms where citizen data collection is structured and organized by the systems themselves—whether scientific modes of data collection or

interactions through social media. These structures matter in how people might take action using collected data, and on how information signals and organizational capacities are amplified or dampened within those structures [52]. When looking specifically at data collected via social media, the flexibility afforded by open ended content creation, mixed media artifacts, and network metadata can make it difficult to validate the quality and provenance of any given post—one need only look to the advent of 'fake news' as a form of propaganda both in fact, and in allegation. Managing these ambiguities in a community setting, where social media networks are used to stand-in for inattentive institutions only raises the stakes for what data get collected and what might be done with those data. For example, when looking at the evolution of effective responses to the persistent violence from four different cities in Mexico heavily affected by the Mexican Drug War, De Choudhury et al. showed a desensitization to violence in communities embroiled in the armed conflict [13]. However, such analyses, in turning only to data contained within social network data sets, misses the discursive context and effect of such posts and how they may signal different kinds of resistance to sustained violence.

3 CONTEXT

Turning to the conditions in Mexico where an ongoing human rights crisis continues, we wanted to understand how social media was being mobilized to confront the daily experiences of residents in different parts of Mexico City. The ongoing crisis is the result of three converging factors. Each has historic roots, but since 2006, they have created a feedback loop that has made worse an already difficult situation. The first issue is that due to decades of impunity and Mexico's long and complicated history of police and political corruption, much of the Mexican population distrust the justice sector. The resulting lack of trust creates an environment that discourages citizens from filing criminal complaints but also prevents authorities and non-government organizations from having an accurate understanding of the magnitude of the situation, and from developing appropriate policy responses [2,55]. In some cases, victims fear reprisals against their families or themselves and do not inform authorities of crimes. Citizens are also unlikely to report incidents because of a perceived hostility from the authorities and because reporting procedures are onerous and ineffective [55]. This lack of reporting contributes to what many Mexican citizens and institutions refer as the "black figure," which is the percentage of crimes not reported, or reported crimes that did not result in an investigation [54,55]. According to the National Survey on Victimization and Perception on Public Safety, the black figure in 2016 was 93.6% nationwide (modestly down from 93.7% in 2015). Results of this survey also show that the main reasons preventing victims of crime from reporting are rooted in their relationship to the authorities: in 2017, 62.4% of victims reported not filing complaints because of reasons related to the authorities. Of these, 33.1% of victims considered filing complaints a waste of time and 16.5% stated not trusting the authorities as their rationale for not reporting a crime [56].

The second issue arises from recent increased hostility toward the free press. While censorship and a general lack of freedom of expression are not entirely new in the country, since the beginning of the war on drugs, censorship and violence against journalist have increased considerably [24]. In 2017, there were 14 journalists killed in Mexico from which at least six murders were confirmed as direct reprisals for their work. None of these cases led to a conviction [16]. To put the problem in perspective, in 2017 Mexico was the deadliest country for journalists outside conflict zones such as Iraq and Syria [57].

Finally, in addition to threats and reprisal that journalists face by cartels and armed groups, the overall media landscape faces censorship and control from the federal government. The administration under Enrique Peña Nieto spent more than thirty-six billion Mexican pesos (almost two billion US dollars) in official advertising, exceeding the official budget by 71% [1], and outspending every prior president on media advertising [4,40]. This figure represents an expense of

24.8 million pesos per day, or one million pesos per hour in a country where the minimum wage is roughly, 88 pesos per day ($4.84 dollars) [48].

The consequence is that not only are crimes not being reported to the authorities, but they are also being kept out of the public discourse through violence against journalist and a state-funded campaign to capture and control public debate via massive media spending. All of this has created a perfect storm where concerned citizens have had to look outside established institutions in order to act for their own public safety and to begin to address the systemic challenges faced in both urban and rural parts of Mexico. These conditions help explain the rise of social media, in particular Facebook, as a site that enables citizens to report and publicly display stories and experiences about crimes that would otherwise go unreported.

4 METHODS

In order to understand data and organizing practices that have arisen recently in Mexico, we conducted a five-month-long qualitative study with citizens that use Facebook to report and track crime and safety issues. Through a series of semi-structured interviews, we worked with administrators of both Facebook sites, which are public by default, and Facebook groups which might be public, or member restricted. We also interviewed regular users who were active in participating on the sites we identified. The goal of the interviews was to gain an understanding of administrators' motivations and expectations when setting up these pages, as well as citizens' experiences and processes while publishing incidents when they suffered from crime.

During the last year, the lead author had been following and conducting observations of several Facebook sites that report on crimes from different cities across Mexico, as well as from neighborhoods within Mexico City. We recruited administrators' participation in the study by approaching the individuals who ran these pages. Then, we continued to increase the sample by seeking additional groups and pages according to three main criteria, a) geographic location, b) content and c) interaction among members. Across these three criteria, we looked for pages whose contributors where within Mexico, for content focused on issues of crime, security, and safety, and for an active base of contributors. Sites outside of Mexico, or those focused on general neighborhood concerns—such as trade, events, classified announcements, road advertisements—or those without active interaction among members were discarded. Likewise, we discarded pages that had a single source of content (often the administrator) because our goal was to gain more insight into how citizens mobilized user-generated content to translate online collective collaboration of citizens when reaching into offline action.

The pages we focused on recruiting to the study contained detailed testimonies of crimes experienced by community members. In some cases, the testimonies included pictures of the offenders, missing or abducted people, or pictures of stolen property (most often stolen vehicles). Videos usually showed criminal assault and theft such as carjacking, kidnappings, burglary, and robbery. Finally, the text of these pages provided exhaustive descriptions of crime, including the address where the crime happened, a physical description of the offenders, and modus operandi (see Figure 1).

In total, we contacted forty-five sites; we received a response from ten administrators. Of those ten, we were able to interview seven—three dropped out of the study last-minute due to concerns about safety. For the recruitment of citizens who were either following or had shared information on the Facebook sites we identified, we followed two strategies. First, we recruited citizens through personal networks based on prior work we had done in Mexico. Second, we looked for people who were recently active on the Facebook sites and contacted them directly through Facebook messenger. Across both modes of recruitment, we contacted twenty-five citizens and received responses from seven people.

The concerns about safety carried through the all of the interviews: the participants we spoke with were all very concerned about protecting their identity. This limited the amount of

demographic data we could collect. Of the 14 people we interviewed, five were women and nine were men. Our participants' ages ranged from 24 to 48. Eight of the participants reported having a bachelor's degree, three reported having master's degree, one participant reported having Doctoral degree, and two participants refused to give this information.

Four of the administrators managed Facebook sites dedicated to collecting data focused on the state of Mexico, including the municipalities of Naucalpan, Ecatepec, and Nezahualcóyotl. Two administrators focused on Mexico City and one focused on the state of Jalisco. The seven citizens we interviewed reported following Facebook sites based on the location of work and home. All of the participants lived in Mexico City and they followed pages from the municipalities of Coyoacán, Azcapotzalco, Tlalpan, Álvaro Obregón and Gustavo A. Madero (GAM). These regions illustrate a diversity in crime and economic conditions.

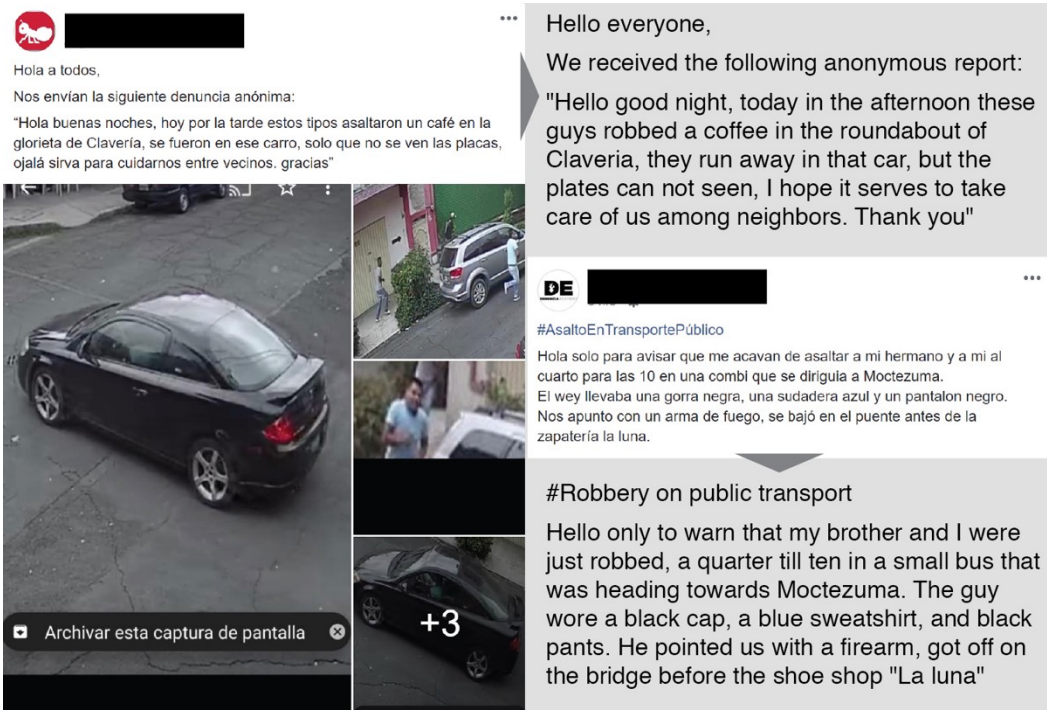

Fig. 1. Two examples of the kinds of accounts citizens posted to the Facebook sites tracking issues of crime and public safety.

The interviews lasted between 30 and 76 minutes (average of 50 minutes) and were conducted via Skype, Google Hangouts, Telegram, or over the phone. The manner of interview was left to the participant as a way to help manage personal safety and privacy. Participants had real concerns of having their identities exposed through the interviews and we collectively took steps to maintain their anonymity, including using only voice (no video) for interviews. The interviews were audio-recorded and then transcribed in Spanish and translated to English for the purpose of reporting here. In reporting the interview data below, we have anonymized the names and genders of our respondents to protect their identities.

To analyze the data, the lead author inductively and iteratively coded the transcripts, using memoing and coding [37,38]. The initial codes focused on understanding general practices of administrators and citizens around data, community, and action; the memos connected these codes with data examined in the Facebook posts. Following a standard practice of qualitative analysis, we then developed a set of themes describing common practices in three areas: within-

group practices of administrators and citizen, between-group practices as administrators and citizens worked together, and extra-group practices as administrators used the data shared on Facebook to contact outside authorities in order to address the conditions in their communities. These themes form the basis for our understanding of how Facebook enabled a set of data-sharing capacities within a number of concerned communities in Mexico City, and how those capacities translated into real-world action to address the conditions of crime and violence being experienced in the city.

5 HUMAN INFRASTRUCTURES: CITIZENS AND ADMINISTRATORS

The Facebook sites that we examine in this study were established based on specific geographic locations in and around Mexico City that were, and continue to be, dealing with high-rates of violent and serious crime. Through the interviews we conducted, we examined both the citizens who used the Facebook sites to post and learn information related to their personal safety, and the administrators of these sites—the people who initiated the Facebook group or page and who often took on additional work to manage, curate, and share information provided by regular citizens. Administrators' expectations with these pages were diverse but they all agreed that building online communities where citizens could express their concerns and organize to find solutions to issues of local crime was a priority. For some administrators, the main motivation was to gather and centralize data about current events in their neighborhoods as a way to overcome misinformation and lack of official data. For others, the expectation was to maintain an independent record of crime and its effect on their communities. Juan, one of the administrators shared a common view, "*In recent years in our neighborhood, the problem of crime and insecurity has grown a lot and we noticed that people distrust so much when they have to file complaints and talk with authorities. [Citizens] prefer to have an anonymous channel where they can publish the security problems that are happening and that is the motivation for creating this platform.*"

Across the different motivations for establishing and maintaining the Facebook sites, administrators played a key role in defining the criteria for filtering the stories and data that were published. Administrators also decided if and how they will take action. It was the administrators' criteria that had the largest impact on the quality and type of data posted to the sites. Guiding their community members on what and how to post was essential to translate the data into further action. As Vanessa put it, "*Our goal is to encourage people to file more complaints [with the police] and if they do not feel safe doing so, we offer them the alternative to do it collectively in these pages.*" The administrators understood that building a record of incidents on Facebook was not enough, that citizens needed to report things to the police as well, and so part of their work was identifying information that would strengthen such reports and encouraging the citizens who visited their pages to make those reports.

Underlying this need to increase the number of reports to the authorities are issues of quality of data. Here we mean the level of detail in these narratives, and the type of data such as videos or pictures. In our study, we identified and organized five categories of the most frequent accounts that were gathered through these pages, including: *social complaints*, which refer to any citizen report regarding the lack of city services (such as water or electricity); *street crime*, which encompasses incidents like street muggings, carjacking, and burglary; *disappearances*, which refers to any report or information of missing people—in Mexico this is often connected to kidnapping and hostage-taking for ransom; *community service*, including citizens' reports on missing dogs, donations, reporting accidents, and real time updates of the city (*e.g.*, massive traffic); and finally *calls to action* where citizens encourage their neighbors to file official complaints or go to the police.

Across these different categories of posts and reported content, administrators worked to build a trust with their community. As previously mentioned, distrust, censorship, criminal impunity, and a dearth of accurate information were the main factors that contributed to the birth

of these online communities. Therefore, administrators' practices were directed to counteract those factors. In order to build their communities, administrators first needed to attract the attention from inhabitants of the affected neighborhoods. Then, to keep the community growing and to sustain meaningful engagement and the posting and sharing information, they had to ensure that the information gathered was useful and helped the community act on the specific incidents reported.

5.1 Community Practices

Administrators' practices to build communities varied depending on the targeted location of the Facebook site. However, the interviews we conducted revealed three common practices the administrators used to encourage trust and citizen participation. First, the administrators filtered and monitored members who asked to join the group or follow the page. As mentioned above, we identified both Facebook groups and Facebook pages that focused on citizens sharing safety-related issues. There is an important difference in how these sites operate on Facebook: pages are public, meaning anyone can choose to follow a page and will get updates as new posts arrive (to the degree that Facebook propagates these updates to individual timelines); conversely, when creating groups, the administrator decides whether to make it publicly available for anyone to join, whether to require approval for members to join, or whether to keep it private and make it visible to other Facebook users only by invitation.

The choice to setup a page or a group was intentional among the administrators we interviewed. Some administrators preferred to create groups in order to have more control over who became a member: "*We did have bad experiences, and because of that now what we do is, first verify that the profile is real. So, we make sure that the profile was created more than one year ago and also, we verify that the profile has real pictures, not only one or two. We also verify that the profile has more than 200 friends, and with that [information] we make sure that it is a real profile. Then, if we can verify the friends of the profile, we also do that*" –Juan. Even after admitting new members, administrators reported continually monitoring member's behavior and interaction in the groups and pages: "*Generally, we do not monitor all the comments, but when we see that they [citizens] are insulting to each other or something like that, we remove them. We also want to maintain good communication between people preventing them from reaching that kind of thing. But we do not have a very hard policy to moderate or comments unless it is very serious*" –Juan. These practices were put in place to establish the integrity of the group and to maintain community norms to help ensure people treated each other with respect and kept on-topic.

The second shared practice centered around how administrators curated and shared content to attract attention from a broader audience. Here, the administrators took an active role in selecting data to share in posts in order to build a following. Some, like Bruno, used public events that were not specifically focused on crime in order to draw attention: "*During my last year of college, I helped to distributed toys to the children in my neighborhood and I uploaded the photos of the event [to the page]. And there was a very good response from people [followers and community members of the Facebook site], I think I gathered 30 or 40 more followers that day and then I decided to continue feeding the page with news, with the information people sent me and it was growing very organically ... I did not expect people to start sending me information.*" By focusing on positive activities within the neighborhood, Bruno created a site focused on community news that then became a place where others began posting and sharing information. Other pages were focused from the beginning on issues of crime and neighborhood challenges, "*At the beginning, what we did was to invite the community to be informed about the security issue... So, we uploaded data, information, statistics, but we also shared reforms that had been made to different regulations, police security, traffic regulation, etc. And we uploaded [newspaper] notes about all these issues and people started giving their opinions and discussing these issues*" –Vanessa.

Finally, administrators worked to build alliances with local institutions and authorities to strengthen the community so that the information collected on their site would lead to police investigations, or otherwise result in some response for the community. Some of this was apparent in the quote from Vanessa above where she pointed to specific instances of reforms as examples of how sharing such information could lead to change. She went on to point out the challenge in getting outside authorities to pay attention: "*When we started it was very difficult for us to get recognition [with the page], we wanted to get the attention of the neighbors we want them to recognize us [as the people behind the page]. We also try to connect with some people who were leaders, and it has not been easy because the leaders [from government] belong to political parties*" –Vanessa. Building alliances on multiple fronts was a challenge for the administrators, however, given the severity of the conditions in their neighborhoods, each persisted in order to build local coalitions to address the issues of violent and serious crime. What they each recognized was that there was power in the production and sharing of data: "*We do try to encourage them [citizens] to give us information through the page, and we appreciate that they share with us the information about criminals to alert other people and others can be more careful. Even so, this will not have an effect on the government statistics. They [the government] can argue that crime is being reduced just because people are not filing complaints and that is exactly why we tell them [citizens] that is very important to go to the police station and file the complaints but sometimes they do not even know where the police stations are*" –Jorge. The difference here is that the data collection mechanisms were not explicitly tied to civic bodies as other kinds of systems have been [31] , so the administrators had to build out additional practices for working with data and then turning those data into opportunities for action.

5.2 Data Practices

Where community practices concerned how the different Facebook sites were run, data practices cover the range of management activities involved in selecting and publishing data. From our interviews, we identified two data management approaches. In the first, the administrator acts as gatekeeper; they post all of the data. A side effect of this mode of site management is that visitors to the site are unable to identify the source of the post because all the data appears to come from the administrator. While this protects the identities of individuals contributing details about crime, it does mean participation in the site is constrained by the gatekeeping administrator. The second management practice simply allowed site members to freely post stories. In this case, the administrator' role was more akin to that of a moderator and less like gatekeeper.

In the sites were administrators were the gatekeeper, they reported having two main sources of information: members of the community or local authorities. The type of data varied depending on the source. When community members reported information, their focus was mostly on the categories of social complaints, street crime, disappearances, and community service. In contrast, when the information came from local authorities, the content focused on sharing private information and making a call to action. For example, in some cases the authorities sent pictures of people who had been arrested and detained in police stations: "*There are police officers who let us know when they arrest someone and take him to the police station and send us pictures. We share them [pictures] on the page so if somebody recognizes the [alleged criminals] then the citizens can file a complaint. And there have been cases where citizens recognized them, and they file complaints*" –Felipe. The purpose of sharing these pictures was to encourage citizens to file reports in case they recognize the arrested individuals from other criminal activity. However, these practices raised some concerns, even among the administrators, since much of this information is hard to verify and affects the safety of the alleged criminals.

As a result of these concerns, before publishing any data, many administrators filter and curate the content. The former refers to choosing what pieces of information are published and what data are not published. The latter refers to the practices of deciding how to present the data; for example, editing or cropping pictures, revising text, and otherwise manipulating posts to

focus attention on the details deemed most important. Most of our participants reported having strategic criteria for deciding what content should be published in order to prevent the propagation of false or outdated information. For example, Vanessa remarked in response to how she managed her site, "*then [we] started to filter the information, for example, [citizens] cannot upload [pictures of] faces. We put filters on the face so it is no longer visible. [These filters also apply to us] because we may decide to upload the information, but without including the full names and without being too sensationalist.*" The goal here was to establish a reliable channel for information that did not expose individuals unnecessarily.

Among other aspects administrators considered was the authenticity of the profile of the person who sent the information, the quality of the data—the level of detail—and the type of data—such as photo or video. Beyond following these basic criteria, administrators also chose between stories that better represented the tone of their site—keeping in mind that each of these sites had their own character. As noted above, some grew out of sharing general interest topics in the neighborhood, while others were more specifically focused on issues of crime from their outset. Across these practices, however, administrators recognized the limitations to how information shared on their sites would help them corroborate with outside institutions and authorities. In either case, the data practices—whether as gatekeeper or moderator—where about establishing community norms, grooming information that was posted to their site, and finding ways to effect change. The administrators recognized that this last step, while crucial, was also not something that occurred naturally from simply cataloging incidents of crime on social media.

5.3 Action Practices

The communities we examined in this study are built, in part, as result of the data reported by the citizens. Based on these reports, administrators intervened and collaborated with other stakeholders to address the specific instances of crime. This, in turn, helped to improve the reputation of the online communities on Facebook, increasing trust and encouraging participation from citizens. Establishing these ties also helped to legitimate the data gathered among the members.

We describe these interventions as action practices and their outcomes depended heavily on the neighborhood, the available data, and the amount of time the communities had been working together. As we mentioned above, these are location-based communities. Although most of the neighborhoods we examined were experiencing similar conditions of violence and lack of safety, the urgency and the scale of the problem varied from wealthy to more marginalized communities. Different neighborhoods also reflected disparate approaches to protecting their communities. Likewise, the kinds of responses they received from local authorities differed along expected lines of socio-economic status.

Translating data into actionable results required administrators to build alliances with key stakeholders. These alliances leveraged the efforts from the data and community practices—the combination of both a vibrant and vocal community presence on social media with data about instances amplified the capacity of the neighborhood to receive attention from different stakeholders [2]. Among these stakeholders were government institutions, local authorities, and media outlets.

The processes employed to connect to these different stakeholders varied greatly depending on the neighborhood and the degree of anonymity the administrators' sought to maintain. Participants who were afraid of retaliation preferred to keep an anonymous profile (on Facebook, this requires creating and maintaining a pseudonymous profile), and exclusively using online interactions with stakeholders. On the other hand, some administrators reported being comfortable showing their identity while making reports to local authorities and news media. Local authorities such as the police, prosecutors, and neighborhood leaders were among the main col-

laborators with whom the administrators partnered. The situations where they collaborated most were often related to lack of services (*e.g.*, lack of water, street lighting), and not on issues of crime. By partnering with local authorities on lower-risk issues, the administrators were able to build relationships that could then be used when addressing the more serious issues of crime and public safety.

The most common pattern of action followed when citizens tried to solve an issue through the proper local or municipal office, but due to a lack of action, turned to the online communities to report their concerns and bring other kinds of public pressure to bear. The administrators would then intervene on behalf of the online community members. These interventions were both online and offline, usually navigating through different platforms to amplify their efforts and getting a response to the given issue. Juan provided a clear example of these kinds of practices: "*What we do is that we skip the municipality office. For example, there have been people who had already gone with them [to complaint] and the office gives them a tracking number, but they do not take care of the issue. So, what we do is to contact the Urban Management Agency of Mexico City because they are in charge of following up with municipal offices. We contact this Agency via Twitter and give them the tracking numbers of the issues we collect. The Agency pressures the municipal offices and they even sometimes send somebody to solve the problem.*" These kinds of service issues were possible to ameliorate through social media platforms because administrators could leverage the wide distribution of information that social media supports. As others have observed, social media, in cases like this, can help citizens bypass normal channels of official response [31].

Administrators also built alliances with police officers and prosecutors. Most of these alliances happened online, allowing both parties to maintain anonymity. These collaborations, in contrast to the service issues above, were usually initiated by police officers who contacted the Facebook sites with different kinds of information. In some cases, with pictures and details on people detained at the police stations, and in other cases by providing updated information on developing situations. The purpose of sharing pictures of people detained was to encourage members of the online communities to file complaints. Jorge described the overall practice as a way to hold policy makers accountable, "*We do try to encourage [citizens] to give us information through the page, and we appreciate that they share with us the information about criminals to alert other people and others can be more careful. Even so, this will not have an effect on the government statistics. [The government] can argue that crime is being reduced just because people are not filing complaints and that is exactly why we tell [citizens] that is very important to go to the police station and file the complaints but sometimes they do not even know where the police stations are.*" The strategy here was motivated by the large number of un-reported crimes and an attempt to the consequences that underreporting has for funding and staffing public safety.

While this practice was reported by most of our participants, not everyone approved of it. Prior work has pointed out the importance of considering the role of trust in the relationship between community and police [33], and how trust affects the usage of technology. In our case, when the police post pictures of alleged criminals it raised concerns among some administrators that such information might lead to false accusations. The balance administrators had to strike was often difficult. On the one hand, connections with the police and prosecutors could lead to more up to date information about current incidents and prompt quicker response from the police (in a context where police response is typically very low); but on the other, administrators had to trust the motivations of the police in sharing information, again in a context where trust in the authorities is low due to a history of complicity in crime. Due to these concerns, some administrators refrained from publishing pictures, videos, or any material on the Facebook sites that might have led to false accusations. In spite of these challenges, we learned that by voicing and sharing their opinions, citizens were encouraging collective action among police and administrators. This in return contributed to raised awareness among citizens not only to report crimes with the police, but also to demand more accountability from the authorities.

Similar to the findings in recent work in India where an citizens expressed a desire to report crimes via social media [47], the use of these Facebook sites in Mexico not only help to overcome social fears while communicating issues of concern, but also help increased the personnel available for identifying crime. In our case, we additionally found that administrators established communications with news media outlets and journalists. Communication was often initiated by administrators who shared relevant local news to journalists hoping they would publish them, but once relationships were established, the sites became an established source: "*In the beginning, when I felt that it was worth it that was important I reached out to [journalist and newspapers] and asked them to please publish the case. But, lately even if I do not contact them, [journalists] take the cases, the information that I publish*" –Bruno. Some of the success administrators had when reaching journalists was due to having a background in journalism and knowing which media outlet and journalist to contact.

In one particular example, an administrator posted about a missing girl that resulted in widespread social action: "*One night I received a photo of a girl who disappeared, so all I did was post it on the group I manage… the next day the case got more attention because a journalist contacted the victim's family in the middle of the night, interviewed the parents, made a video and posted it in the newspaper website and the story became viral. Then, people started creating Twitter accounts demanding justice for her, and then a very particular phenomenon happened because people began holding meetings that were not even organized by the municipal government but by students, and people from the neighborhood… they also organized marches, and everything happened only because of the call that was made across different accounts in social networks*" –Bruno. While the outcome of this event was positive because citizens were able to organize and draw enough attention from the government to collaborate and help the family of the victim, the event also illustrates how contingent this alliance is due to the unequal relationship between administrators and journalists. Ultimately, administrators depend on their network, their reputation, and the power of their allies to scaffold action through the data collected on their online communities.

6 DISCUSSION

Despite the value of the crowdsourced data from the communities we examined, the fact that it was unstructured and hard to verify limited the way administrators and contributors could use it to address issues of crime and public safety. In this respect, one of the major challenges that citizens face when attempting to scaffold action with these data is that there is no clear mechanism to make it actionable. This follows Tuomi's description of data brought up in the opening sections of this paper: data come from knowledge, but in order to become instrumental information, there needs to be a path to toward structured transmission that can be automatically processed [23]. One response might be collecting more data or to deploy more sophisticated analytical techniques that would help communities and officials make sense of the data. However, it is not just the messiness of the data and its creation that raise barriers to effectively supporting community action. The socio-cultural context in Mexico also complicates the way data, individuals, and institutional authorities come together to address systemic problems. As Le Dantec et al. have pointed out previously, we need to understand data as a product of social relations while also recognizing the context to identify how technology can catalyze appropriate actions [31].

6.1 From the Individual to the Systemic

One of the features that stood out in our analysis of how administrator and citizens used the different Facebook sites to collect and share crime data was that the strategies were case-based. While the data in these sites are valuable, their case-by-case nature meant that administrators and authorities could only ever address issues individually. The challenge here is that the kinds

of crime that were affecting the communities of Mexico City was not the result of small, acute acts by a few individuals, but was systemic—from the presence and power of the cartels, to the complicity of local authorities—and so any meaningful response to these issues would also need to be systemic.

Our interviews revealed some of the reasons these communities rose up to respond to issues in a highly localized way. First, the quality of data, which is usually unstructured and hard to verify, meant that the ability to sort and make sense of incoming posts, images, and videos was bound by the work it took for administrators to go through the content and curate it according to their local knowledge. In some cases, administrators reported receiving an overwhelming number of cases each day. This not only complicated the tasks of filtering and curating data, but also the process of making sense of problems at a larger scale. The second difficulty, as we pointed out above, is that the collaborations with outside stakeholders and institutions were unstable which meant administrators had to build and maintain those relations at the same time they were sorting through incoming posts. Finally, members' participation was often sporadic, so the number of individuals posting information or contributing to the Facebook site would wax and wane as conditions within the neighborhood became more strained or improved—there was not a stable set of contributors that could be tapped to help share the burden of managing site data or working with outside institutions.

Despite these limitations, the content in these online communities could have a significant role to play in Mexico due to the diversity of crimes, testimonies, and data formats that are concentrated on these sites. Additionally, these data, if exploited, could help to identify patterns and more concretely identify the scale and type of crimes. However, to amplify administrators and contributors' efforts, these need to transition from individual to systemic practices. Much in the way that Tufekci discussed how the intersection of on-the-ground organizing in combination with effective social media use can raise the capacities of small grassroots organizations [52], we would argue that a similar complementary apparatus is needed to more fully empower local communities when confronting systemic issues. One approach to achieving this goal is to learn from the strategies used in other disciplines, specifically building communities with shared commitments [29]. For example, in citizen science practices, trust and engagement are two of the main elements that enable collective production. Additionally, sharing commitments helps to build a stronger sense of community that in turns helps members of these collectives address challenges such as data validation and provenance. Currently, the way the practices were distributed in these sites rely mostly on the administrators as a single point of activity—whether as gatekeeper or as moderator—and only cursory and uneven collaboration with a larger set of stakeholders and citizens.

One way trust and engagement could be encouraged in this context is by showing citizens how the data they contribute are used by administrators to make social change. Building on recent work that has begun to tease apart both the role of trust and how it might operate within a socio-technical capacity of civic systems [9], we would point to opportunities for building and maintaining trust via social media, provided there were concrete feedback loops that afforded two-way accountability between community members and the authorities. Currently, the use of data takes place in the background, without informing the online community about how and where the data they produced have effect. Given the fact that Facebook was the main platform citizens were using, we believe that rather than identifying opportunities for design in a commercial product over which the public has no control (and which has no accountability to the public for its operation), we find it more suitable to develop strategies that leverage Facebook's capabilities. For example, current administrators' strategies do take advantage of the visibility and virality that Facebook affords. These affordances could be redirected to help contributors to learn about the effect and value of their data. These affordances could also contribute to the distribution of tasks, encouraging participation and trust while also maintaining anonymity. By

making this shift we believe that common concerns would emerge, instead of only focusing on administrators' concerns.

6.2 Methodological Considerations for Safety and Security

Finally, the research we have presented here poses some specific methodological challenges that need to be addressed. While CSCW research has long understood the need for establishing relationships within research sites [21], along with the particular challenges when doing community-based research in distressed social contexts [32], there were some specific concerns that arose given the very real personal risk our participants were taking in speaking with us and, as we have now learned, in using Facebook as a platform at all [25].

In our case, while recruiting administrators, we initially faced a low response rate and, in some cases were asked to provide proof of our research and our identities. We believe this distrust and skepticism was due to several reasons. First, these pages constantly publish sensitive information and administrators handle videos, pictures, and other evidence not only from criminals but also from cases of police corruption and abuse. As such, the administrators we contacted were very wary of outsiders who might be working on behalf of the cartels or police in an effort to exact reprisals for reporting criminal activity. Second, because all of our correspondence with prospective participants was via messenger, establishing credibility and trust was difficult—the main facility for doing so was showing our identification card, there was no other way to prove our identity. In the end, after four months of using the same methods and strategies to recruit participants, we had a key interaction with an administrator who helped us adjust the message we were using to recruit other administrators to make it less formal and more concrete. This adjustment allowed us to recruit two more administrators in short order and serves to underscore the importance of having an ally within the community of concern to help navigate local considerations.

We also had to navigate a geographical gap. Even though the lead author is from Mexico City, working at a US institution meant coming from outside where the personal stakes were greatly reduced. Part of this is due to the fact that we were unable to establish presence as more traditional community researchers do. The platforms of interaction themselves, and the desire of our participants to remain anonymous prevented us from following more common strategies like attending in-person meetings in order to build familiarity. Beyond these challenges, as researchers, we needed to be sensitive when approaching these community leaders and be able to balance their expectations with our research commitments.

That all of these elements were in the context of individuals already taking on substantial personal risk by confronting cartel and state violence only served to push to the extremes a set of challenges that are present in any community-based research program. As we continue to develop this research, we expect to need to develop new strategies for communicating these risks to the individuals we work with. In part, this comes from what we now know is a clear exposure of personal data through the platforms these communities are using, and the fact that many of the administrators and other motivated citizens have no other choice but to continue to use the very platforms that expose them.

7 CONCLUSION

In this paper, we examined the local data practices of citizens in Mexico who use Facebook sites as a platform to report crimes and share safety-related information. We identified the community, data, and action practices used by site administrators to collect, curate, and publish data about public safety that would otherwise go un-reported. In order to build their communities, administrators first needed to attract the attention from inhabitants of the affected neighborhoods. Then, to keep the community growing, and to sustain meaningful engagement through

posting and sharing information, they had to ensure that the information gathered was useful and helped the community act on the specific incidents reported. Through a qualitative analysis of interviews with a set of administrators, we were able to reflect on a set of common practices they developed in order to manage their locally-focused online communities, to cultivate data collection and curation within those communities, and to connect both to forms of action that would result in positive outcomes with respect to addressing violent crime. What we show establishes an initial understanding of how the affordances of Facebook in particular enable and constrain civic action to address violence and suggests direction for future work that will seek to overcome those limitations while acknowledging the pragmatic reality that commercial social media platforms will continue to dictate many of the terms of social engagement, even at a local level. This work contributes to a growing body of work that aims to understand how social media enable political action in contexts where people are not being served by existing institutions.

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