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Crowdsourcing sensitive VGI: constructing the Hate Incident Reporting System

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Abstract

Gaps in hate crime and hate incident data are a major roadblock in increasing our understanding of the rising phenomenon of hate in the United States. In this paper, we reflect on the development of our geographically-integrated mobile application (the Hate Incident Reporting System) as an attempt to help close the gap in hate incident data. More broadly, we provide conceptual and methodological insights for working with sensitive Volunteered Geographic Information (VGI) like hate incidents. We identify four key areas of attention in the process of developing digital tools for collecting sensitive VGI: i) participant motivation ii) data management and public research communication iii) accessibility iv) handling of geographic information and v) partnership with existing stakeholders. These factors are critical in the process of working with sensitive geographic data in an ethical fashion and ensuring maximum data reliability. Throughout each of these areas, the role of the ethical researcher stretches beyond academic research to accountability beyond academic research to accountability to participants in the form of tangible benefits.

Keywords: hate, VGI, crowdsourcing, ethics, GIS
1. Introduction

Hate is an increasing threat to security and stability within the United States. In 2018, over 100 violent attacks by perpetrators influenced by the alt right were reported by The Southern Poverty Law Center (2018). Cities in particular have become hotbeds for hate crime (Center for the Study of Hate and Extremism 2017). In the opening two decades of the 21st century, organized hate groups were on the rise, climbing to over one thousand in 2018 (Southern Poverty Law Center 2019).

While hateful activity foments in incidents like the 2017 Unite the Right rally in Charlottesville and in the national debate on the rise of white supremacy (Schein 2018), the US government’s ability to record and track hate crimes remains woeful. The Bureau of Justice Statistics (BJS) estimated that residents of the US experienced on average about 250,000 hate crimes a year between 2004 and 2015, while the Federal Bureau of Investigation (FBI) only recorded roughly between six to eight thousand hate crimes for each of those years (Masucci and Langton 2017, FBI n.d.). Only 41% of hate crimes in 2013-2015 were reported to the police, and of those, only 14% were recorded by the police as hate crimes (Masucci and Langton 2017). The content and slight upticks and downticks in the FBI’s incomplete data- while highly cited in the media- do not paint a complete picture of hate in the US. These statistics instead point to a dual problem: a lack of victim reporting and a shortcoming on the side of officers, agencies, and the state.

Aside from criminal hateful behavior, hate incidents occur every day. There is no way to tell how much overt hate is present anywhere since only criminal behavior has been warranted for data collection. However, communicated hate in all forms contributes to loss of sense of community, resentment, and sometimes retaliation. Hateful incidents often come in the form of
constitutionally protected hate speech, and other insensitivities that the offender may or may not be aware of (e.g., microaggressions). Political correctness norms have shifted and not everybody is up to date on socially acceptable communication, while many may just not care.

These gaps in hate crime and hate incident data are a major roadblock in increasing our understanding of the hate phenomenon. Without a statistically reliable dataset, we cannot get a clear picture of the character and geography of the problem from which to inform appropriate responses on local, state, and federal levels. This points to an obvious need for a better understanding of hate reporting barriers in order to improve hate incident data collection and our general understanding of hate.

This research has two aims. First, the authors developed a digital tool, the Hate Incident Reporting System (HIRS), that allows victims to report all types of hate incidents as an attempt to help close the gap in hate incident data. The authors piloted, monitored, and made improvements to the HIRS in the Salt Lake City metropolitan area in large part through seeking the feedback of potentially targeted communities and law enforcement. The broader goals of the HIRS project were to create a system and implementation plan that can be replicated in other communities, and to contribute to reducing the gap in hate incident reporting across the nation. The mobile application developed for hate incident reporting is the first of its kind. While mobile apps for reporting general crime have been developed in various cities globally (e.g., Agangiba and Agangiba 2013, Viswanath and Basu 2015), the use of a mobile application for collecting sensitive VGI brings up its own set of challenges and opportunities, and is an understudied area of research (Mooney et al. 2017).

In this paper, we reflect on the process of developing the HIRS in order to provide broader conceptual and methodological insights for working with sensitive Volunteered
Geographic Information (VGI) (Shannon and Walker 2018). We define sensitive VGI as information that can bring up personal or group-based emotional sensitivities, in contrast to affectively neutral information gathered in other VGI projects like the identification of birds or marine debris. Through analyzing the development process in addition to community and police feedback, we identify five key areas of attention in the process of developing digital tools for collecting sensitive VGI: i) participant motivation, ii) data management and public research communication, iii) accessibility, iv) handling geographic information, and v) partnership with existing stakeholders. Throughout each of these categories, the role of the ethical researcher stretches beyond academic research to accountability to participants in the form of tangible benefits.

2. Current limitations in hate crime reporting

2.1 Existing official hate crime data

Hate, or bias, crimes are defined by the Inter-University Consortium for Political and Social Research (ICPSR) as crimes motivated by a ‘preformed negative opinion or attitude toward a group of persons based on their race, religion, disability, sexual orientation, or ethnicity/national origin’ (Inter-University Consortium for Political and Social Research, 2015, p. 94). This hate crime dataset originates from the FBI’s Uniform Crime Reporting (UCR) system and in this case is processed further by the ICPSR. The highest resolution hate crime data are provided at the city scale. Hate crimes are recorded by the UCR as different categories including murder, arson, assault, and vandalism. Incident counts by year in the U.S. are given in Figure 1. Since 2000, 2001 had the highest hate crimes recorded (9,721), while the low was recorded in 2014 (5,462).
When considering hate crime locations, the numbers are low for some states, including a large portion of the Southern U.S. (e.g., Louisiana, Arkansas, Mississippi, Alabama), which leads to the question of regional reporting biases. Non-violent hate crimes in 2012 are estimated to be 293,790 by the BJS (Wilson 2014), while the UCR data are underestimated at 5,790 for the same year. The UCR data only account for incidents reported to the police, which is a fraction of the hate crimes that actually occur. Another issue is that only those institutions that participate in the National Incident Based Reporting System (NIBRS) report bias crime data, and furthermore, only those departments which are able to include those specific data in their magnetic tape submissions. The number of hate crime offenses reported by the UCR by state for 2018 (8,496), the most recent year of available data, is illustrated in Figure 2. The total number of hate crime incidents reported for 2018 was 7,036 (incidents can have multiple offences).

In the late 1980s, politicians finally relented to fomenting pressure on the part of religious, LGBTQ, race, and ethnic advocacy groups and passed the first federal legislation on hate crimes (US Department of Justice 1999, Jacobs and Eisler 1997). This was the Hate Crime Statistics Act of 1990 (Title 28, U.S.C., Section 534) (U.S. Department of Justice 1999; Federal
Bureau of Investigation 2012). Despite high hopes for the passage of this legislation, its execution 30 years later remains marginal—tangled in a mess of uneven state policies, local politics, department cultures, officer biases and victim’s complicated decision-making processes.

Many states also have their own hate crime policies, which vary wildly in the way they define, criminalize, report, persecute, and mandate law enforcement training for hate crimes (Smith and Foley 2010). Some even extend hate crimes beyond race, nationality, ethnicity, and disability to include other classes of people, such as religious and sexual orientation and gender identity. Florida includes homeless status and Washington D.C. mental status. Some states include biased-based institutional vandalism as hate crimes. Not all states extend federal protections more broadly. Arkansas has no legal statute for crime enhancement that names classes of people as targets of hate crimes, but does protect places of worship (Smith and Foley 2010).

Police departments—given the mandate to execute the law—are faced with a myriad of issues that deter from that mission: local political pressure, departmental policies and practices, and issues with officer reliability. Local politicians may fear hate crime reporting will increase negative perception of their community, exerting influence to discourage it, while interested advocacy groups pressure local institutions to increase reporting (Jacobs and Eisler 1997, Nolan and Akiyama 1999). Many departments do not even have an official policy on hate crimes (37.5% in Balboni and McDevitt’s 2001 study).

When departments do prioritize hate crimes, positive impacts on hate crime reporting have been found (Nolan and Akiyama 1999, Balboni and McDevitt 2001). However, few departments have a dedicated hate crime officer (24.7% in Balboni and McDevitt’s 2001 study), of those who do, it is usually only a few officers who do not work hate crime on a full-time basis
Larger agencies may have the resources to take hate crime reporting seriously, and those who have strong community-police relationships may be incentivized (Nolan and Akiyama 1999, Balboni and McDevitt 2001). Departments play a key role in forwarding officers’ hate crime reports to the state UCR program which moves them on to the FBI (Nolan and Akiyama 1999).

Even in a department with favorable circumstances for hate crime reporting, officers have their own beliefs and potential biases that interact with situational circumstances. Definitions provided by the FBI and state legislation have certain ambiguities that must be applied to dynamic and complex real-world scenarios (Jacobs and Eisler 1997, Nolan and Akiyama 1999). Departments with supportive policies, practices, resources, training, and interpersonal support from supervisors and colleagues can be encouraging for officers (Nolan and Akiyama 1999). However, some officers might not take hate crime seriously, because they are for example racist, or believe it’s ‘just another political issue,’ not more serious than non-bias crime (Balboni and McDevitt 2001). Even well-trained and intentioned officers may not be able to clearly identify the offender’s intention and/or motivation (Boyd et al. 1996, Martin 1995, McDevitt et al. 2000, McDevitt et al. 2001, Nolan and Akiyama 1999). From the state down to the officer, there are a myriad of hurdles to successfully recording hate crime on the part of the government and the law.

Barriers are also found on the level of the victims themselves, a subject of scant attention in the literature (Wong and Christmann 2008). While victims may want the help of police, and the acknowledgement of injustice, reporting a hate crime is not a guarantee of either. Many victims fear that police will not take a hate crime incident seriously, or will actually reveal their own racism, homophobia, or other bias (Nolan and Akiyama 2002). This fear of ‘secondary
victimization' by police has been called out by gay rights activists (Perry 2002). LGBTQ populations are strongly influenced by perceived police homophobia when contemplating reporting a hate crime (Miles-Johnson 2013). Positive community-police relationships may help counteract these fears (Grattet and Jenness 2008, Balboni and McDevitt 2001).

Beyond considerations of police, victims weigh a number of other factors. On a practical level, victims may consider the time and effort of reporting in their decision-making process. They may feel that the incident is trivial, or a private matter of personal responsibility (Wong and Christmann 2008). The threat of recriminations if privacy and anonymity cannot be guaranteed is a serious consideration (Wong and Christmann 2008). Recognition that a crime has taken place, the responses of close relations, victim characteristics, and social context factors are additional factors (Wong and Christmann 2008).

The individual, the social context, and the nature of the hate crime all blend to influence a victim's decision (Wong and Christmann 2008). Further, the negative impacts of hate crime victimization often go beyond the victims themselves to the wider identity-group (Bell and Perry 2015). ‘Fear of crime’ held by members of minoritized groups is often situated spatially, with variability across spaces and places (Pain 2000).

A tangled and messy web of factors on individual, social, institutional, and political levels present themselves in hate crime reporting. The development of the HIRS in the present study was an attempt to bypass many of these obstructions to hate incident reporting.
2.3 Barriers to reporting general hate

Issues that arise when attempting to collect hate crime data are much smaller than when considering data collection on non-criminal hate incidents. Government resources may not be given to collect behavioral data such as these, and at the state level, the same issues with differences in culture and understanding of hate crime exist. However, general hate and hate incident data would be valuable to governments and community leaders, as knowledge of hate likely falls short. Understanding the nature of hate within a community of any size would allow for more effective planning and outreach efforts, and might ultimately reduce the number of hate crimes. Gaining knowledge of community harmony and bias levels is difficult. Hate speech is not illegal, but it can cause many issues within a community, and can lead to illegal activities in the future. The authors are not aware of any previous effort to collect data on hate speech or other non-criminal incidents of hate. Anecdotal evidence may be heard from people in positions of power (e.g., law enforcement, politicians, teachers), but in most cases, no penalty can be administered when no crime has been committed, and while records of individual incidents may be kept, they are not included in any database for research and/or policy implications. Thus, we do not know how much hate individuals and/or groups are exposed to.

2.4 VGI and citizen science mobile applications

The HIRS system makes use of VGI, part of the larger body of geospatial web technologies, methods, and activities and a form of 'citizen science' (Elwood 2008, Goodchild 2007a, 2007b). Mobile phone applications have enabled citizens across the globe to contribute data to projects ranging from hazards mapping, to marine garbage distribution, urban noise, invasive species, and air quality monitoring— a real revolution in the way that big data can be
collected. While the creation of our mobile tool for hate incident reporting may circumvent many of the aforementioned barriers to hate incident reporting, collecting VGI comes with its own set of challenges and opportunities.

Mobile phones have been used as a source of data in a variety of research areas where data collection on large spatial and temporal scales makes direct data collection difficult or impossible, in addition to lowering costs relative to the volume of data (Hochachka et al. 2012). Research products collected through mobile or web devices allow for real-time input and access to products throughout the research process (Kyem and Saku 2009). Compared with proprietary Geographic Information Systems (GIS), internet-based mapping services are easier to use and more accessible to the public (Vermes 2006). The ubiquitous use of web-based GIS technologies like Google Maps in the United States allows researchers to confidently embed similar technologies in VGI applications for citizen scientists to add geographic information to their contributions (Anderson 2016).

The use of mobile technology by police and potential victims of hate crime is encouraging towards the application of the HIRS app. Law enforcement has begun to rely on social media as a communicative and intelligence tool (Kim et al. 2017). For example, police used social media to spread information and in the investigation following the deadly explosion at the Boston Marathon (Davis et al. 2015). On a more daily level, police also use social media to interact with citizens (Brainard and McNutt 2010), some have used it to monitor tensions (Williams et al. 2013), and most officers use it as a tool in investigations (LexisNexis Risk Solutions, 2014). Law enforcement officers use social media to anticipate crime, close investigations more quickly, and as a communicative device (LexisNexis Risk Solutions 2014).
Among the general population, smartphone use is ubiquitous. The Pew Research Center estimates that 77% of adults own smartphones, with numbers higher in urban (83%) and suburban (78%) areas (Pew Research Center Mobile Fact Sheet 2017). In terms of social media use, 69% of adults in 2018 used at least one social media site (Pew Research Center Social Media Fact Sheet 2017). These statistics are encouraging toward the potential use of the HIRS app by victims of hate.

However, web-based VGI does not come without challenges. The use of the internet can limit participation due to unequal access to it (Kyem and Saku 2009). The 'digital divide' or 'digital inequality' points to gaps in use, awareness, and skills in internet communication technology (ICT, Hargittai and Hsieh 2012). Internet access is shaped by already existing social inequalities, which can compound inequality due to the importance of the internet in society today (Wei 2012). Making space for an array of culturally sensitive considerations and including a broad range of concerns and values remain difficulties (Cai et al. 2003).

Equity in participation among stakeholders can be difficult to achieve (Steinmann et al. 2014). Participation inequality describes the case wherein a significant proportion of the information is generated by a small percentage of participants (Haklay et al. 2008). Any research that uses crowdsourced information must take into account the implications of participation inequality on the data and in the analysis (Haklay et al 2008). Geographically, participation inequality brings up the question of how to regulate the survey area, as data may be overreported in high density areas (Bird et al. 2014). In many cases it is possible to correct for inaccuracies using statistical tools (e.g., Bird et al. 2014).

Crowdsourced data also come with accuracy limitations (Conrad and Hilchey 2011). The quality of the data, especially in the case study presented here, hinges on the trustworthiness of
the contributions. The authors of the data are unknown in most cases and, thus, difficult to trace, with an unknown reputation and questionable reliability (Criscuolo et al. 2016). Some studies have attempted to construct credibility models, by analyzing for example user characteristics, sources, and drives, but the issue is still unsettled (Metzger 2007). The present study uses a form of quality control presented by Criscuolo et al. (2016) through prevention and correction by the team which lead to warning and/or removal of bad data (see results section for further discussion).

The nature of the data contributed in the present research is set apart from the large majority of VGI in that hate incidents can constitute sensitive, emotionally laden information. As such, it poses different challenges- the need for accessibility is underlined, in addition to the call highlighted by Institutional Review Boards to create benefits for participants and minimize risks (Mooney et al. 2017). Such ethical considerations in GIS are an understudied area (Crampton 1995, Mooney et al. 2017).

VGI actors do not have a good understanding of the legal, privacy and ethical issues raised by VGI (Mooney et al. 2017). A number of privacy concerns are brought up by VGI, especially on whether the contributor could be identified through their contributions. In the public health realm, confidentiality of the data has been identified as an issue (Goranson et al. 2013). For example, publication of disease related information can create negative emotional and financial impacts on individuals and neighborhoods (Goranson et al. 2013). Ethical considerations should be taken by both the data producer (e.g., by making participants aware of the purpose of the project, not sharing data for commercial purposes or other purposes without consent) and by users (e.g., false reporting). Legal considerations are complex, understudied, and should be taken into account from the perspectives of the participants and the researchers.
Sula (2016) suggests the following in the pursuit of ethics in big data collection: public dissemination of research, options for participants to correct personal information, avoidance of collection of private information, and involvement of participants throughout the research process. Blakemore and Longhorn (2004) iterate 'The Ten Commandments of GIS Ethics' which focus on potential abuses on the part of data collectors. Crampton (1995) recommends considering the dialectical relationship of approaching GIS from both an internal (scientific inquiry, technical disciplinary questions) and external (meta-disciplinary) perspective. In this paper, we argue that communication between researchers and potential participants within the process of creating and refining applications of sensitive VGI. The collection of sensitive, emotionally-laden information may impose additional challenges than those limited insights found in the literature; in what follows we explore our attempt to do so in an ethical fashion and share our insights that other researchers collecting sensitive VGI should benefit from when communicating with potential participants.

3. Case Study: The Hate Incident Reporting System

This research involved two phases. First, we developed a digital hate crime reporting tool (the Hate Incident Reporting System). Second, we piloted the HIRS in the Salt Lake City metropolitan area, seeking feedback from potentially targeted communities, and making adjustments to the app as necessary. The reasoning for choosing Salt Lake City was not only due to our proximity to that location. According to the NCVS, hate crime is more prevalent in the West, in suburban and urban areas (Masucci and Langton 2017). Thus, the Salt Lake City metropolitan area provided a well-suited area in which to conduct a pilot study.
3.1 The Hate Incident Reporting System

The creation of the participatory online victim reporting tool, the Hate Incident Reporting System, was undertaken in conjunction with the University of Utah’s DIGIT lab. The DIGIT lab, an auxiliary unit of the Geography Department, created the mobile application for the HIRS, available on the Google Play and Apple App Stores. The mobile application was constructed with traditional coding languages (e.g., html, php, javascript) and interactive mapping components use ESRI developer software.

The ubiquity of GPS in consumer electronics and availability of ready-made products through third-parties (such as ESRI here) provide access to complicated technologies, even with limited computational skill sets. Customization is still possible while using these third-party tools and the level of programming experience necessary is dependent on the tools used. We believe that the necessary skills can be found in any geography department with a graduate program that houses GIS capabilities. It is also important to note, however, that some tools, especially those that simplify workflows, sit behind paywalls, including the ESRI software used here. Open source software can be used, but will likely require more experience with customization and web development.

The application works as follows. Upon downloading and installing the app, the user must agree to the consent form, which was written based on Institutional Review Board and legal protocol. The home page screen includes a large orange button for reporting incidents and a grey button for working on drafts. The top left corner features a menu bar.

When the 'Report Incident' button is selected, a map appears which instantly pins the user to their location (if they have location services activated). The user has the option to keep the pin where it is, to move it manually, or to type in an address. The ability to move the pin is important
in case a victim or witness is not able to report the incident exactly when and where it occurred. After a location is identified the 'Next' button is selected, where the user may take a photo using their phone’s camera, or upload one from their photo album. The photo is optional. On the next page, the user can enter details regarding the incident. The details page includes a dropdown menu for 'Hate Type' with the following selections: Disability, Gender/Identity, Race/Ethnicity, Religion/Sexual Orientation, and Other. A second dropdown menu for 'Action Type' includes: 'Verbal,' 'Propaganda,' 'Violent,' and 'Other.' The user can then enter an 'Incident Description' (255 characters available). 'Contact Name' and 'Contact Email' are both optional. The user then has the option to save as a draft or submit. If saved as a draft, the user can access the draft from the home screen.

The dropdown menu in the home screen has several informational tabs. 'How to Use' contains instructions on the usage of the app and troubleshooting information. 'What is a Hate Incident' relates the definition of a hate incident used by the app, and additional definitions of types of hate incidents (as related to the 'Action Type' in the form). 'Contact' automatically drafts an email to the HIRS contact email using the phone’s email server. 'About' shares some general information about the research and research team. 'Settings' allows the user to adjust the font size, turn on or off 'Dark Mode' which makes the screen easier to read at night. 'Resources for Support' contains a hate crimes hotline, and links on how to file a police report, find an attorney, contact the local FBI field office, and seek relief via victim assistance and compensation programs.

[Figure 3 about here]

Figure 3  HIRS App Pages
Data submitted to the app is directed to a secure server on the University of Utah’s campus. Only the research team has access to the data. As of March 2020, 131 reports had been submitted.

The authors note that we suspect that the app had become the target of false reporting, specifically by individuals identifying with the alt-right. We believe this occurred because our University newspaper published a press release about the HIRS app that was picked up by local and national newspapers, including alt-right media outlets, the prime example being InfoWars.com. We noted that in the comment sections of these newspaper articles, there were calls by commenters to sabotage the app by submitting false reports. These suspected false reports were categorized by extremely racist and derogatory language. The strong reactions to the HIRS app and our related research on hate groups and hate crimes was so pervasive and of such a nature that we believe merited specific attention, see Medina et al. (in review). This is, of course, a result of dealing with sensitive data.

3.2 Seeking community feedback

After completion of a pilot version of the app, we sought community feedback in order to ensure that the app responded to the particular needs of those affected by hate. We worked with local advocacy groups and cultural centers to identify focus group participants from a variety of organizations that are targets of hate crime. We conducted five focus groups with leaders of organizations of ethnic, racial, religious, sexual, and gender minoritized groups. Each focus group session was composed of approximately 2-5 individuals from these groups. The focus group questions centered around barriers to reporting hate and hate crime to police and discussion of the Hate Incident Reporting System, in order to receive feedback around how the
tool could be modified to better answer the concerns of potential victims. One interview was conducted with the Salt Lake City Police Department. This interview centered around challenges in responding to, recording, and reporting hate crimes to the FBI, and also included discussion of the Hate Incident Reporting System.

All focus group sessions were audio-recorded and transcribed (without any personally-identifiable information to protect the privacy of the participants). The process used in this paper is an inductive approach to qualitative content analysis, as described in Cho & Lee (2014). The transcriptions were coded by at least two members of the research team using an inductive analysis to draw out emergent themes, an exploratory, content driven approach where themes are not predetermined but are derived from the data (Alhojailan 2012, Bernard 2017). Codes were compared between coders to ensure inter-coder reliability (Bernard 2017). The analysis of the focus groups will identify the character, frequency, and intensity of barriers to hate crime reporting, in addition to feedback on the HIRS app. These insights are currently being used to inform the modification of the HIRS.

4. Implications

Community and police feedback on the challenges of reporting hate incidents and the HIRS were an essential part of the process-oriented approach we advocate for in collecting sensitive VGI. In this section, we identify four key areas of attention in the process of developing digital tools for collecting sensitive VGI: i) participant motivation ii) data management and public research communication iii) accessibility, iv) partnership with existing stakeholders and v) handling geographic information. Throughout each of these categories, the role of the ethical researcher stretches beyond academic research to accountability to participants in the form of
tangible benefits. We provide recommendations for researchers working with sensitive VGI in each of these sections.

4.1 Participant motivation

The barriers to reporting hate crime reported by respondents largely aligned across different minority statuses. Here, we describe the three most cited barriers. First, fear of police was the most often cited barrier to reporting hate crime. As a representative of an LGBTQ support organization noted, trans and/or queer people of color may fear that the police themselves could be the cause of the hate crime. For immigrant communities, fear of reporting to the police was also associated with fear of deportation. As a leader of a Latinx community organization shared, 'people will always ask, ‘so, what’s going to happen?’ and ‘are they going to share my information?’ ‘is it going to affect me? Would it affect my status?’ ‘is it going to affect other family members?’ so definitely fear is just...it’s just huge... in our communities.' (Interview with Authors, May 2019).

Second, many shared that incidents had happened which would not qualify as a crime (e.g., hate speech), but which nevertheless caused the victim serious distress, with no outlet to remedy. For example, a member of the Muslim community shared that a woman had been verbally harassed for physically expressing fear of dogs when walking by another woman with her daughter and dog. Shaken by the incident, she nevertheless had no outlet to remedy or report the incident (Interview with Authors, October 2019). Others shared a fear that despite the personal distress associated with sharing their stories, 'nothing would happen' and there was a 'lack of consequences,' if the incident didn’t technically qualify as a crime (Interview with Authors, May 2019).
The two barriers to reporting hate crime to police most often cited by those interviewed are hopeful towards the usefulness of the HIRS. In the case of fear of the police, the HIRS app can allow those who would not normally report an incident to police (e.g., because of fear of the police) to share their stories via the app. The app will also allow the capture and study of incidents not qualifying as crimes but which are both nonetheless harmful to victims and important towards understanding the character of hate in the US.

In general, the feedback received from potentially targeted groups was positive.

‘I definitely hope we can definitely take this to the next level because the fear is growing, and people are afraid of reporting and then the scariest thing is that it's being normalized to a certain point- that’s what breaks my heart- it's taking us a lot of time for us to tell people, ‘that’s not normal, that shouldn't be happening, you have rights’ that's what we're seeing and that's really heartbreaking.’ (Interview with Authors, May 2019).

Others shared that the HIRS app would help relieve some of the burden of having to report hate crimes multiple times to multiple organizations. These sentiments are encouraging to the future of the HIRS.

‘The motivations of participants in other applications will likely be different. What is important is for researchers to have a clear understanding of potential participant motivations such that they can tailor their data collection and outreach strategies to them. Understanding motivation also goes beyond researchers’ drive to get the highest quality and quality of data possible- with sensitive VGI, this data is personal, and researchers working ethically should use their understanding
of participant motivation to help give back and abate the problems faced by the communities with whom they are working.'

4.2 Data management and public research communication

The most common feedback we received on the app was a concern about the storage, analysis, and ultimate presentation and impact of the data. Concerns were shared that participants might like to know that it 'isn’t just a survey,' how people will use the data, and 'what’s going to happen regarding action, responses and what that action is' (Interview with Authors, June 2019). The concern over where the data go was also related to submission incentives. Many wanted to know what impact their submissions would actually have in the real world. One respondent advised including 'something more meaningful and grounding in what the value of contributing to the app was... more activation that goes along with it… your incident is not in vain’ (Interview with Authors, October 2019). Many suggested that it should be clearer if the incident is reported to police automatically via the app.

All respondents indicated that they were interested in seeing the data. Respondents were interested in seeing figures and diagrams that could display patterns of hate crimes detected. Two members of community advocacy organizations expressed a desire to see data as it is coming in so that they could offer feedback for their clients and to their staff to help with education on risks. As one respondent noted,

‘On our end, a lot of the work I'm doing is organizing and advocacy, I would be highly interested in the data, because that's part of what we naturally do, right. Because we are servicing people, we have our hearts and ears out there to
figure out what is really happening and then we take that and we say, ‘what can we do to change this?’ (Interview with Authors, May 2019).

The concerns over how the data are stored and handled, and what practical impact submissions may have are somewhat complex to address. The authors of this paper shared their intentions to use the data in aggregate form to help increase the general understanding of hate crimes and hate incidents. This message was somewhat difficult to communicate with the public, which may be related to scientific literacy or a critique of the practical impacts of research efforts. As a result, the authors intend to add some further explanation in the app around what practical impact submissions have, including our intention to share the findings with public audiences via our website and publically-geared reports. In addition, the app also will be modified so that users can checkmark a box in the submission page signifying whether or not they have or intend to report the incident to police.

The former concern is also related to the issue of communicating results to the public. We plan to make the aggregated entries available in an anonymized form to those organizations interested in seeing them on our website. The website will communicate the data in simple figures, graphs, and infographics such that it is easily understood by the public, on a web-based platform that was also requested by respondents for the purpose of entering submissions.

More broadly, we suggest that researchers working with sensitive VGI carefully consider and communicate with potential participants around data management and public research communication. Researchers should solicit the questions, concerns, needs, and values of participants in relation to public communication of the data. The requests for data may vary amongst different stakeholders (e.g., organizations vs. general public); researchers should consider with potential participants what solutions may be best for each audience.
4.3 Accessibility

In terms of accessibility, many suggested that more people would use the app if it were translated into more languages. There was also the perception that the availability in languages other than English may be perceived as a welcoming gesture. Language translation remains a resource constraint.

Translation of the app onto a web-based environment accessible via desktop or laptop computer was also a suggestion of many respondents. This was expressed both over a concern of accessibility by potential users and by organizations helping clients to enter data into the system. As one respondent noted, ‘definitely if it could be accessible by computer and that way i could tell the team, ‘hey if anyone calls you can report this through here if they want’... If we’re able to access that through a computer it would be helpful.’ (Interview with Authors, May 2019).

Working with sensitive VGI implies that users have a personal and emotional stake in the issue at hand, so it is particularly important to take into consideration the ability of users from different cultural, financial, and digital literacy orientations to access the app. This factor presents technical and financial challenges to app development. For example, language translation not only requires a translator for the app content, but also duplications of the app content and translations of reports.

Issues with accessibility unfold on different levels. Technologically, researchers must consider who has access to their application, and if there might be a way to account for the digital divide in the platform or delivery. Socially, they should consider what languages are needed, and/or what types of tools could be used to rely less on language (photos, for example). Culturally, considerations include how different questions would be interpreted, what questions are appropriate or missing. In terms of digital literacy, developers must consider how the
application can be made for maximum ease of use. Researchers in this field should do well to assess and prioritize accessibility issues in relation to needs and resources.

4.4 Handling Geographic Information

Handling geographic information ethically comes with a unique set of challenges and opportunities in the case of dealing with sensitive VGI. It may be presumed that publicly sharing the most detailed (personally de-identified) geographic information would be the most ideal—under perhaps the dictum that knowledge is power. However, this presumption did not align with the feedback we received.

In particular, some organizations with whom we spoke reported a concern that if the data are publicly shared, it should be on a geographical scale large enough that particular locations of community organizations could not be pinpointed, because of a concern that people might be afraid to frequent their organization if it were viewed as a dangerous place. Some organizations noted that hate crimes had been committed on their properties, and they did not want their clients and community members to feel unsafe frequenting their properties and participating in their programs. Police, rather than requesting the full swath of available geographic data, requested hot spot maps, so that resources could be distributed to particularly affected areas.

In the case of sensitive VGI, public communication of geographic data needs to be considered carefully and in conjunction with participants. The physical safety— the emotional well-being— and the trust of participants are critical— and these factors mean that more data is not always better.

In regard to the feedback we received, we discussed with community participants our ability to present the data on different geographic scales, and asked for their feedback on what
geographic scale they would be most comfortable with us sharing publicly (e.g., census tract, zip code, county, state, etc.). The police, of course represent a different interest and accordingly requested a different scale of geographic data.

Other ways of dealing with this geographic sensitivity issue could include not presenting any geographic information publicly, instead using this data only for analysis that is used to benefit the public via general discussion and recommendation to relevant stakeholders. Another option could be to make different types of geographic data available to different sectors (e.g., largest resolution data to the public, finer resolution to community stakeholders, police, public officials). Whatever method is chosen, the critical point is that researchers arrive at a solution in conjunction and consultation with participants.

4.5 Partnership with existing stakeholders

Throughout our development process, the authors primarily worked with nonprofit and advocacy organizations that represent potentially targeted communities. This is reflected in the four former sections. In addition, the authors also met with a high-level representative of Salt Lake City’s police department. The primary concern related was that police would not have to duplicate their efforts as a result of the HIRS. They suggested the HIRS form include a question on reporting to the police (if the individual has reported to police, or intends to report to police). The police representative expressed the most interest in using information gathered from the HIRS to use as a diagnostic tool (Interview with Authors, May 2019).

The HIRS is not intended to replace traditional reporting to police, while it does offer a solution to many of the police- and political-level problems currently faced in hate crime
reporting. The data may be less reliable than that collected and verified by police, as this is VGI. However, we have implemented measures for quality control. Following Criscuolo et al. (2016), our approach to quality control uses both prevention and correction (via procedures that are contextual to the submission of information). Prevention occurs via the accessible map, photo, web form (multiple choice) which are an easy to use guide for participants in creating their contributions. Correction, which occurs after submissions are made, are carried out by the administration team, manually performed by the project coordinators. Contributions considered unsuitable are subjected to a warning (symbol within data sheet) with potential removal from all future use and processing. These are important factors to consider as sensitive data often involves police or third party victim services, which likely have their own forms and processes for collecting incident reports.

The ability of researcher interventions to be useful must take existing processes into account to achieve complementary rather than redundancy. Researchers working with sensitive VGI should begin their process of communication with potential participants by identifying the stakeholders and the appropriate people to contact within those organizations. Awareness of the concept of ‘research fatigue’ (see e.g. Clark 2008), is critical towards acting with respect and generating tangible benefits to communities. Rather than assuming that academics know best, academics looking to collect sensitive VGI in an ethical fashion should respond to the needs, values, and interests of the communities at hand.

5. Conclusion

The primary problem this study identifies is with hate crime reporting nationwide. If the HIRS was adopted nationally it could potentially help close this gap; however, it comes with its
own statistical and representational challenges. We have learned a great deal about designing VGI applications for the collection of sensitive data and social impacts of our efforts.

What makes a successful VGI? Without enough volunteers, there is not enough data to be useful. Many volunteer their geographic data unknowingly, even though they sign data sharing contracts during the application installation. Companies including Google and Amazon, as well as many smaller companies, are notorious for all types of user data collection. But, things are different when the entire purpose of an application is to collect data. We are left with the question, how do we grow our user base? In this case, we do not have the luxury of collecting and storing data peripheral to the app’s primary use. Overall, we believe that the HIRS could potentially act as a boon to hate incident reporting because it eliminates political and police-level barriers to hate crime reporting. It may also reduce some victim level barriers, such as fear of police, feeling that the incident is too trivial, and the time and effort associated with filing a police report.

Broader concerns with the reliability of crowdsourced data are of note in the present application. Unlike reporting marine mammal sightings or garbage debris, the data reported in this case affects the participants in a very personal matter. In this context, we hope that the producers of the data have a strong commitment to quality data. Biases in the data may result from factors such as participation inequality, especially when the app is launched nationally. It is possible that hate crimes will be overreported for example in higher density areas, by those who culturally are more privy to using the app, and/or temporally when hate crime is a hot news topic.
Perhaps the largest practical challenge of all is related to concerns around the potential geographical range the HIRS app can cover. The research efforts related to the HIRS may be constrained or enabled pending funding needed for a dedicated research team and marketing program. The same may be true for other VGI projects, and researchers should take careful stock of available resources when designing their projects.

As the VGI literature identifies, this VGI product carries inherent benefits. Products are received in real time, costs are lowered relative to volume, the platform is already familiar to users. Law enforcement does tend to use social media, and the public, smartphones. As we highlight in this paper, collecting sensitive VGI comes with its own set of challenges, and should be approached with a cautious process-oriented methodology.

In working with sensitive VGI, careful attention needs to be paid to the process of data collection, processing, and broader research interpretation. The four factors identified in this paper were found to be critical in the process of working with those sharing sensitive data in an ethical fashion and to ensuring maximum data reliability. They point to the need for projects working with sensitive VGI to go beyond analysis and provide actual accountability to users via tangible data products and potential real-world impacts. These lessons apply to researchers looking to collect data in areas of epidemiology, personal health, crime, and other areas of personal implications.

We recommend that researchers who intend to work with sensitive VGI begin their projects by making contacts with existing stakeholders and collecting feedback from potential participants. Depending on the resources available, this could take the form of a survey, interviews, or focus groups, and could take a formal (structured) or informal (open-ended)
approach. Whatever the chosen form, researchers should carefully and intentionally construct a plan for seeking community feedback.

In regard to specific topics to pay attention to when seeking feedback, we recommend inquiring into i) participant motivation ii) data management and public research communication iii) accessibility iv) handling geographic information and v) partnership with existing stakeholders. As this paper highlights, researchers should attempt to seek feedback on participant motivation and elements necessary for maximum accessibility, as participation is perhaps the most critical piece of any project that relies on volunteered information. Researchers should also ask the potential participants about their feelings on data management and communication, including the use of geographic information; this is critical in building and maintaining trust. Others concerns and topics may also come up that are specific to the project at hand. The key take-home lesson here is that researchers should not assume that they know best- but should ask for and make use of community feedback.

The world is increasingly digital, as our lives move online the importance of digital geographies grows. Being willing to share sensitive information requires participants to trust those with whom they share. As geographers working with digital tools, we must be deserving of this trust, which calls on us to think carefully, intentionally, and with empathy when we are designing these systems. At the present moment, the global pandemic highlights this need even more urgently. There is great potential for digital tools to help abate the spread of the novel coronavirus. But in order for these interventions to be effective- to save lives- public trust in these types of tools must be built. Massive breaches of data erode trust in addition to the mistrust of ‘surveillance’ and the ‘surveillance state’ on the political right. Digital geographers must not
only pay attention to the technicalities - the hard skills - but also to the sociality - the soft skills - of conducting research with the public.

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Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:
