

Crowdsourcing Women's Experiences of Space: Empowerment, (In)Visibility, and Exclusions - A Critical Reading of Safetipin Map

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As a crowdsourced visual-based technique, participatory mapping has generally been lauded as an innovative method to identify place-based inequities and shape a more inclusive urban world. In the context of sexual violence in public spaces, there is a growing number of mapping initiatives that aim to advocate for spatial justice by involving women in collaborative map production. These initiatives train women to use geographic information system (GIS) to visualise women's spatial knowledge grounded in their experience of navigating public spaces. Using Safetipin, an Indian-based mapping initiative, as a case study, I seek to challenge the simplistic reading that the crowdsourced map provides a transparent pathway to understanding spatial patterns of gender violence in urban space. I argue that this street-level mapping is a performative technique insofar as it materialises our experiences in different ways. Most importantly, it renders an imagination of space as operational—that is, calculable and malleable space that can be operated upon to prevent sexual violence. Significantly, as its visualisation of spatial distribution of safety reterritorialises public spaces, it reproduces other forms of socio-economic exclusion. This article thus argues for a reading of the crowdsourced map not as an inherently politically transformative project. Instead, it calls for an acknowledgment of hegemonic regimes of knowledge production that feminist activism like the Safetipin map is intimately bound up with and may help reproduce. Consequently, this involves attending to diverse regimes of (in)visibilities and marginalisation that such projects may stage.

Keywords: sexual violence; crowdsourced mapping; (in)visibility; spatial justice; performativity

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Introduction

In November 2013, amid public outrage in the wake of the gang rape of a 23-year-old woman in New Delhi, women's rights activist Kalpana Viswanath founded a map-based mobile application called SafetiPin (Viswanath, 2016). It was designed to crowdsource safety-related data in cities by allowing users to conduct a safety audit of public spaces using a set of parameters (Viswanath and Basu, 2015). The aim of it, according to its founder, is “to build a world where everyone can move around without fear, especially women” (Safetipin, n.d.). The user-generated data are then aggregated and visualised in the form of a heat map showing spatial patterns of safety; upon query, it advises users on the safest route from one place to another. What is distinctive in Safetipin's approach, compared to other mapping initiatives of sexual harassment, is its aspiration to inform not only women but also policymakers by providing evidence for effective interventions in city redesign. Since its launch in 2013, SafetiPin is now available in 16 countries and 65 cities worldwide (The Better India, 2021). It has also engaged in partnership with a number of high-profile international organisations, such as UN Women, UNICEF, UN Habitat and Cities Alliance, and has been positively featured in numerous media reviews.

Recent years have witnessed a burgeoning of applications of Geographical Information Systems

(GIS): which incorporate forms of community participation in collecting and visualising spatial data for politically progressive purposes. Applications of GIS are varied, ranging from neighbourhood development, environmental resource management, conflict management over land access, and as in the case study being examined, feminist activism for a safe and inclusive urban space. Safetipin is established on the premise that women and girls are often neglected in urban design and planning decisions, and that women have the best understanding of why spaces are unsafe for them (Viswanath and Basu, 2015). Indeed, it is often lauded as an example of a bottom-up, counter-mapping effort (Kalms, 2018; Mewa, 2020) that challenges hegemonic form of representing space and spatial patterns—what Doreen Massey bemoans as the “dominant form of mapping that positions the observer, themselves unobserved, outside and above the object of the gaze” (Massey, 2005, p. 107), or what Donna Haraway defines as the totalising, all-seeing “God trick” (Haraway, 1998, p. 581). From this vantage point, SafetiPin does appear to present a critical, feminist cartography via crowdsourced mapping that seeks to grant legitimacy and visibility to situated knowledge of women, challenging conventional forms of knowing and seeing beyond controlling and panoptic epistemologies.

Focusing on SafetiPin as an illustrative case study, I seek to challenge the optimistic reading that the crowdsourced map provides a transparent pathway to representing the spatial patterns of (un)safe localities by integrating women’s knowledge of space. Beginning with a brief introduction to the SafetiPin map and its geovisual interfaces, the article will then demonstrate that this street-level mapping is a “performative technique”³ insofar as it materialises our experiences in different ways. Most importantly, the crowdsourced map renders an imagination of space as operational — that is, a calculable and malleable space that can be operated upon to prevent sexual violence. Significantly, as this visualisation of spatial distribution of safety reterritorialises public spaces, it reproduces other forms of socio-economic exclusion. This article thus argues that crowdsourced maps are not inherently politically transformative projects. The challenge of feminist activism using crowdsourced mapping, therefore, is to acknowledge the hegemonic regimes of knowledge production that they are intimately bound up with and may help reproduce, attending to diverse regimes of (in)visibilities and marginalisation that they may stage.

Safetipin: Mapping Method and the Geovisual Interface

Safetipin’s crowdsourced mapping concept has its root in the method called Women’s Safety Audit. It was first developed in Canada in 1989 by the Metropolitan Toronto Action Committee on Violence Against Women and Children (METRAC) as a response to growing concerns about violence against women in public spaces (UN-Habitat, 2008). It is, in essence, a co-design process that enables firsthand accounts and knowledge of women and vulnerable groups to be heard in municipal decision-making. The process starts with a space being identified as insecure; then a group of local women—preferably regular users of the space—will walk through it with a checklist, pinpointing environmental factors that could make women feel unsafe, such as inadequate lighting, inaccessible footpaths, or negative graffiti messages. A report with recommendations will then be presented to local government officials so that they can prevent sexual violence (and other) crimes through environmental design strategies with a gender lens.

The concept of Women’s Safety Audits has since traversed the globe, being adapted into different formats and used in different environments. In the context of SafetiPin, mapping a point of interest starts when a user “pins” a location on a map and “audits” that location using a set of parameters, including both infrastructure and the way a space is used, such as “the extent of lighting, the visibility of the space to watchers, the openness of space, visible security, having both women and men present in the space, and the state of the walk path” (Viswanath and Basu, 2015, p. 50). Each parameter is rated on a scale from 0 to 3, with 0 being poor rating and 3 being good (see Table 1). Except for one parameter — feeling — others are insisted to be “completely objective” (SafetiPin, 2019, p.1).

To make the crowdsourced data more representative, in some cities, Safetipin also devises a second app called Safetipin Nite. Safetipin Nite has been specifically designed to capture photographs of the city at night by volunteers and trained auditors. Mobile phones with the Safetipin Nite app are mounted on the windscreen of cars to take photographs at regular intervals as the car moves along. Safetipin then runs computer vision algorithms on these pictures to extract information on safety parameters. Additional data points are then added by trained coders to complete an audit (Safetipin, n.d).

When someone finishes auditing a space, the information immediately becomes public data, visible for others to use and see (Viswanath and Basu, 2015). All the audits, both from individual users and volunteers, are then aggregated to compute a safety score of an area. For urban planners, the geographies of (perceived) safety are visualised in the form of a heat map (usually in a safety analysis report) in which the safety level of certain areas is colour coded. Women, on the other hand, are encouraged to navigate urban spaces by consulting the mobile app, where they can view safety scores of relevant neighbourhoods in real time and are recommended with the safest route to travel.

The significance of Safetipin compared to the traditional Women's Safety Audit, thus, is not in the novelty of the participatory process, but rather in its way of mobilising and visualising crowdsourced data to generate spatial narratives in an interactive way. In other words, compared to traditional audit reports, spatial patterns represented in the Safetipin map are unfolding in real time as users contribute their ratings. In this manner, cartographic techniques such as classification, abstraction, and simplification, whereby map-makers choose to emphasize certain features and de-emphasize others, are still deployed. For example, Safetipin still prioritises quantitative rather than narrative accounts, patterns rather than anecdotes, and visual forms of evidence rather than non-visual forms. However, unlike traditional cartography, Safetipin map does not merely represent spatial patterns, but also facilitates what Elwood and Leszczynski refer to as "geovisual experience" for its target users (Elwood and Leszczynski, 2013, p.545). For instance, women can use the Safetipin map to decide on the safest way to navigate or inhabit urban spaces. Urban planners, on the other hand, can use the map as evidence for their intervention and improvement of the safety of public spaces.

My reading of the Safetipin's geovisual interfaces is premised on what critical geographers have long argued — that maps never simply depict space but are an active agent in producing and shaping it (Kitchin and Dodge, 2007; Pickles, 2004). To quote John Pickles, "maps no longer are seen to simply represent territory, but are understood as producing it; in important ways maps precede the territory they represent, they inscribe boundaries and construct objects that in turn become our realities" (Pickles, 2004, p. 145). Hence, in the subsequent analysis, I do not attempt to evaluate the validity or truthfulness of the map's visualisation of spatial patterns. Rather, I am interested in the map's performative aspects: how the geovisual interface of the Safetipin map does not simply narrate a pre-given set of spatial patterns, but has the ability to generate realities, mobilise actors, and reterritorialise spaces along new socio-economic lines.

Imagining an Operational Space

Maps have become central to how we conceptualise and imagine space. Yet the maps that we are most familiar with function by imagining space as an ordered surface, a mere container, a silent backdrop against which everyday lives take place (Massey, 2005). Imagining space this way has profound social, economic, and political effects: indeed, the hegemonic conception of space as an ordered surface, as something to be crossed, together with doctrines of discovery and vocabularies of exploration, provided justifications for the project of European conquest and colonisation (Moran, 2002). Probing the kind of space imagined by the Safetipin map becomes imperative, as doing so opens up possibilities for understanding what might be at stake in its project of crowdsourcing and visualising women's experiences of space.

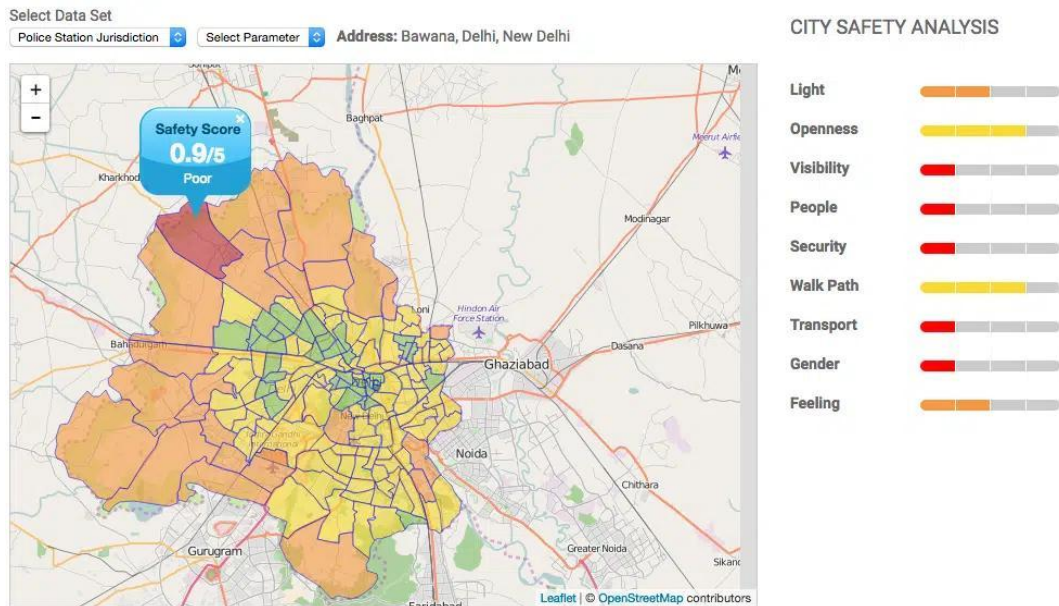


Figure 1: See Note 5 below

Let us start with the language Safetipin uses to describe its process of mapping. For Safetipin, to report if a place is safe is called conducting an “audit”. The word “audit”, which resembles the language of the Women Safety Audit in the 1980s, seemingly conveys a sense of impartiality and objectivity, instead of acknowledging the messiness and contextual details of experiences. Auditing a space, as repeatedly mentioned by Safetipin’s founder, is ostensibly completely objective as it is conducted based on a well-defined rubric (see Table 1). Safetipin’s founder said they preferred the rubric over the traditional Likert scale, ranging from “strongly agree” to “strongly disagree”, was “too subjective” (Visanath and Basu, 2015, p. 50).

Table 1. The SafetiPin Safety Audit Rubric. A Safety Score is calculated from the combination of nine safety audit parameters (Viswanath and Basu, 2015, p. 51).

	0	1	2	3
Light (night)	None. No street or other lights	Little. Can see lights, but there is low visibility in the area	Enough. Lighting is enough for clear visibility	Bright. Whole area brightly lit
Openness	Not open. Many blind corners and no clear sightline	Partially open. Able to see a little ahead and around	Mostly open. Able to see in most directions	Completely open. Can see clearly in all directions
Visibility	No eyes. No windows or entrance of shops or residences overlook this point	Few eyes. Less than 5 windows or entrances overlook the point	More eyes. Less than 10 windows or entrances overlook the point	High visibility. More than 10 windows or entrances overlook this point

People	Deserted. No one in sight	Few people. Less than 10 people in sight	Some crowd. More than 10 people visible	Crowded. Many people within touching distance
Security	None. No guards or police visible in surrounding area	Minimal. Some private security visible in surrounding area but not nearby	Moderate. Private security within hailing distance	High. Police/reliable security within hailing distance
Walk Path	None. No walking path available.	Poor. Path exists but in very bad condition	Fair. Can walk but not run	Good. Easy to walk fast or run
Public Transport	Unavailable. No metro or bus stop, auto/rickshaw within 10 minutes walk	Distant. Metro or bus stop, auto/rickshaw between 5-10 mins walk	Nearby. Metro or bus stop, auto/rickshaw between 2-5 mins walk	Very close. Metro or bus stop, auto/rickshaw available within 2 mins walk
Gender Usage	Not diverse. No one in sight, or only men	Somewhat diverse. Mostly men, very few women or children	Fairly diverse. Some women and children	Diverse. Balance of all genders or more women and children
Feeling	Frightening. Will never venture here without sufficient escort	Uncomfortable. Will avoid whenever possible	Acceptable. Will take other available and better routes when possible	Comfortable. Can take this route even at night.
	0	1	2	3

If rating a space based on the Likert scale is “too subjective”, I would argue that the rubric promotes a way of seeing space and social phenomena that is profoundly disembodied. The rubric disaggregates lived experiences into modifiable pieces of data that feed its calculations to categorise risky spaces. Indeed, phenomenological accounts of women’s spatial experience have pointed out that there is no way for women (and perhaps for everyone else) to objectively experience spaces since experience is always lived, embodied, and connected to other forms of violence. As Vera-Gray concisely puts it, “we cannot know our world outside of ourselves in it, and similarly we cannot know ourselves outside of existing in the world” (Vera-Gray 2017, p. 25). In other words, experiences of space and spatiality are constantly shaped and reshaped through the body which has lived and relived intrusion in public spaces, or simply the body that is in a constant state of anticipating intrusion even when violence is not realised. Safetipin’s parameters and rubric are strikingly similar to discourses around women's safety pervading environmental criminology scholarship and urban safety planning. These so-called environmental factors have been relentlessly lamented by feminist critics as they mechanistically locate crime, disorder, and fear within the built environment rather than considering them in relation to socio-political structures such as gender, class, race, and age which cut across space (Koskela and Pain, 2000).

In a critique of similar neighbourhood safety apps that solicit anonymous ratings of places, Leszczynski (2016, p. 1701) refers to this crowdsourced data as ‘urban derivatives’—urban data that are decontextualised and re-aggregated with other data elements such as crime statistics to decide the relative safety of different areas. As Leszczynski argues, urban derivatives come into being from an amalgam of disaggregated data. The context of these data—for instance, class, race, and gender positionality of the users who contribute their ratings—are often obfuscated (Leszczynski, 2016). A neighbourhood might seem frightening and attract poor ratings if bodies deemed unsavoury such as homeless, racialised, or sexually minoritised others are present, yet we are unable to discern these webs of social relations from the disaggregated data. But this is not to argue that collecting more contextual data would solve the problem, as the spatial context in which urban encounters take place is far from being inert and static. As cultural geographers have long argued, urban social spaces are relational, dynamic, and open (i.e. Lefebvre, 1991; Massey, 1994). In other words, space is always in the process of becoming as a result of continuous, dialectical negotiations of power among different actors, and thus is irreducible to quantification or datafication. Having police within hailing distance does not guarantee a sense of “high security” as Safetipin’s rubric defines. To those sleeping rough on the streets, people of colour, or sex workers, the presence of police can be perceived as incredibly disruptive and uncomfortable (DeVylder et al, 2017; Klambauer, 2018; Taylor and Walsh, 2006). Here, the relevance of Safetipin’s map for the making of space lies exactly on the moment of operationalisation: translating embodied and relational experiences of space into quantitative, disaggregated, and disembodied data sets of physical environment and infrastructure in order to impose a logic of calculability on space.

When sexual violence is seen as a pure effect—a confluence of numerous variables located in physical and disembodied space, be it bumpy footpaths or badly lit stations—remedying spatial inequality automatically becomes a matter of intervening in space. Hence, more than a digital depiction of an existing reality on the ground, the Safetipin map signifies a certain way of relating to, imagining, and shaping space. This shaping of space is evident in two levels of intervention proposed by Safetipin, where both are undergirded by a logic of calculability: algorithmically calculated guidance that routes women away from what is deemed as risky space; and data-driven recommendations for urban planners on how they could improve safety levels for supposedly risky areas (Safetipin, n.d). The attempt by the Safetipin map to address sexual violence by intervening on and through space produces what I would term an “operational space”—space that is not only “amenable to thought” (Osborne and Rose 2004, p. 212), but calculable, malleable and governable.

My notion of “operational space” is borrowed from Mark Andrejevic’s vision of an “operational city”: the potential for a new mode of city governance that involves practices of automated data collection, analysis, and response in public space (Andrejevic 2020). Following this logic, mitigating sexual violence involves capturing data about the condition of the physical environment and modulating the “choice” environment in individuated ways (i.e., suggesting individually customised safest routes when queried). In other words, as causes of sexual violence are attributed to environmental factors (rather than stemming from systemic asymmetrical power relations), tackling it requires governing through the “milieu”: that is to provide an immersive and flexible “choice architecture” that influences users’ behaviour rather than imposing a disciplinary power on them (Andrejevic 2020, p. 95). For Andrejevic, this is rather a terrifying prospect since this operational logic of governance abandons any effort to seek causal explanation for a system merely concerned about generating actionable correlations (Andrejevic 2020, p. 32). In the context of Safetipin, who cares anymore about the social relations that motivate sexual violence in the first place? What really matters is the correlation between spatial factors (lighting, walk path, public transport) and spatial distribution of (perceived) safety. For example, problematic places, according to Safetipin are “places where the crowd parameter is high but the safety score is low” (Safetipin, n.d., no page).

Problematic places require intervention. So, if Andrejevic’s notion of an “operational city” points towards the technocratic dream of transforming the city into a fully interactive space for automated

control, “operationality” in the case of the Safetipin explicitly expands the mode of intervention to the physical environment. Urban planners can also use data provided by Safetipin to better illuminate certain streets, widen footpaths of certain localities, install more CCTVs, or deploy more police patrols to certain areas. In fact, this has been the reality in India where the Delhi Police is working with Safetipin’s data to determine the patrol routes of their police vans (Viswanath, 2019). “Operational space” thus not only refers to an automated mode of governance of space, but also indexes an emergent ontological understanding of space configured by the Safetipin map, where space is no longer considered a passive, silent backdrop against which everyday lives take place, but open to intervention. “Operational space” is constantly becoming, both in the virtual and physical sense.

The operational space is facilitated by what can be considered operational datasets. For the SafetiPin app, individual women’s ratings of places are aggregated into overall safety score for route suggestion. In this sense, data are deployed for operational purposes (Rettberg 2020, p. 8): they do not merely represent how safe an area is, but also mobilise certain actions. Similarly, street photographs captured by SafetiPin Nite can also be regarded as “operational” images where, in artist Trevor Paglen’s words, “instead of simply representing things in the world, the machines and their images were starting to ‘do’ things in the world” (Paglen, 2014, n.p.). As Safetipin claims, it runs machine learning algorithms on these images to extract information of safety parameters which then feeds the calculation of route guidance or informs data-driven urban redesign, which exemplifies its various ways of “doing things” in the world. Following Scott McQuire (2017), I also argue that these images are operational in another sense: the meaning of each image is not merely in what each displays visually, but is dependent on its relation to the wider set of images. Instead of being understood as a discrete image—that this photograph depicts this corner of this street at this particular moment — each image becomes a data point whose meaning cannot be understood unless it is aggregated together with a bigger data set. That is, these images are not a form of aesthetics, intended for human eye, but captured for automated machine analysis.

Thinking of space as ‘operational’ has very grounded, unexpected, and at times undesirable consequences for lives beyond the map. In Lefebvrian terms, abstract imagination of space that is conceived in maps, drawings, and schematics constantly interacts with lived spatial practices and perceived experiences (Lefebvrian 1991), and this interaction constructs our social world in a variety of ways. As I shall argue in the next section, the Safetipin map is troubling not merely because it subordinates all lived spaces under its logic of calculability in a way that risks decontextualising embodied experience, but more significantly, for how the map has the potential to reproduce new geographies of exclusion.

Reterritorialising Space and Reproducing Socio-Economic Exclusion

Critical geographers have already provided insightful analyses of the ways space becomes imbricated in, and transformed through, maps and mapping practices (Pickles, 2004; Kitchin and Dodge, 2007). Again, to paraphrase Pickles, maps do not reveal but produce reality. In this section, I discuss what kinds of realities are materialised when space is understood to be “operational”, being deterritorialised and reterritorialised by the colour-coded map and computed safety score.

Firstly, this discrete, simplistic categorisation of urban spaces as “safe” or “unsafe” continually redraws cognitive maps of consumer choice, influencing decisions of consumption, economic investment, and at the same time, setting the stage for various forms of financial harm. Cartographic design of the Safetipin heat map is strikingly straightforward, with spaces neatly demarcated into distinct zones, colour-coded in red, orange and green based on the aggregated safety score. This simplification helps to communicate a single, clear narrative to provide city planners with “actionable” insights. Here, there are notable parallels between Safetipin map and the Market Value Analysis (MVA)³, a data-driven technology that has guided city planners in cities across the United States to prioritise their investment and housing policies since 2001 (Safransky, 2020). Safetipin and MVA are similar to each other not only in their clearly delineated and attention-grabbing colour-coded zones, but also in the epistemic power

wielded through the appeal to what David Beer refers to as “calculative objectivity” (Beer, 2017, p.7). Consequently, both generate geographical distribution of wealth and poverty in a seemingly evidence-based manner. Safetipin map, like the MVA, is in essence, a sorting mechanism: it streamlines neighbourhood evaluation methods and renders places legible for evaluation and decision-making, consequently (wittingly or not) creating new frontiers for capital accumulation and displacement from within. In fact, in its review of the Women’s Safety Audit (the root concept of Safetipin), the United Nations Human Settlements Programme (UN-Habitat) noted that gentrification may have taken place in areas where safety audit recommendations have been implemented (UN-Habitat, 2008). It is likely that “objective” scores influence the decisions around where to buy or invest in property, which hotel seems safe to visit, and which are best to avoid.

The Safetipin map also bears a number of similarities to several neighbourhood safety apps, such as (now-defunct) SketchFactor (launched in 2014) and Ghetto Tracker/Good Part of Town (launched in 2013), which have received their fair share of criticism for racist and classist overtones. These apps solicit user-contributed personal reviews of urban neighbourhoods and combine these contributions with public data such as crime statistics, socio-economic and demographic data to inform users on how to steer clear of spaces that have a certain degree of “sketchiness” and “ghettoness”. The parallels between Safetipin and these neighbourhood safety apps are conspicuous, not least in how they reterritorialise the city along the lines of a crime map, attaching a wholesale “good” or “bad” neighbourhood assessment to certain locations based on the density of red, orange and green “sketches” or “pins”. Infamously dubbed as “technological redlining” (Thatcher 2013) or “digital gentrification” (Zukin 2017), these maps not only reinforce the perception of particular urban spaces, but potentially stigmatise and discriminate against neighbourhoods with “undesirable” profiles.

Finally, the stigmatisation of certain neighbourhoods as a result of algorithmic reterritorialisation may also lead to long-lasting harm to the communities who are living within them. As mentioned, law enforcement agencies in Delhi have started using Safetipin’s maps and data to inform their decisions on certain routes to patrol, commonly known as “predictive policing”. Although Safetipin’s founder said “[its] data is used to advocate for better and safer urban public spaces so that urban neighbourhoods are not stigmatised but improved overtime” (Safetipin, n.d., n.p.), it is not clear how these unintended consequences might be mitigated. Gstrein and van Eck, in their examination of five websites and smartphone apps that similarly crowdsource users’ review of places, are rightly concerned that predictive patrolling might create a self-fulfilling prophecy: there will be more arrests in areas with a higher police presence, consequently justifying the negative sentiment about them (Gstrein and van Eck, 2018, pp. 14-15). I share Gstrein and van Eck’s concern that this situational, pre-emptive approach will only increase surveillance, further damaging the reputation of a certain area without resolving the root causes of sexual violence in public space.

In examining the cartographic regimes of HarassMap, a mapping project that allows users to report incidents of sexual harassment in real time, Sunday Grove argues that ethics of precision in aerial warfare is noticeable in HarassMap’s rhetoric of criminalised subjects and spaces in need of intervention (Grove, 2015). This ethics of precision, once prevalent in warfare discourse, has now migrated and penetrated our everyday lives as we struggle to rationalise uncertainties. Notably, it is evident in the discourse of the contemporary smart city paradigm, which embraces data-driven spatial planning to tackle so-called ‘wicked’ urban problems, from poverty, to sustainability, to spatial justice. The MVA, Ghetto Tracker, and Safetipin’s map are all different initiatives, but all of them seek to govern on and through space to solve complex social issues by appealing to the logics of calculability undergirded by large-scale data collection. But in rendering places commensurable across distance and difference, in distilling a range of discrete personal “audits” of space into a smoothed out colour-coded visualisation that justifies intervention, they evacuate space of social meanings and contexts. Paradoxically, in seeking to remedy spatial inequality, Safetipin map potentially legitimises other forms of social exclusion and marginalisation.

This logic of calculability, at first glance, seems to be commonsensical: more data allows for more informed decisions. As Safetipin's founder puts it, "large-scale data collection can lead to change, and that safety will ensue when more people become engaged with the issue" (Viswanath and Basu 2015, p. 46). However, the issue with seeing space as calculable, malleable, and governable is not merely that various forms of harm might eventuate, but that this also encourages the depoliticisation of data-driven urban planning decisions. After all, who could argue with the safety score?

Sun-ha Hong, in their cogent critique of data's promise of objective truth, argues that efforts to resolve historical bias — for example, efforts of mapping cases of police violence on African Americans — encounter the difficulty where alternative, messier ways of telling stories, embedded in lived experiences, become increasingly difficult to be represented (Hong, 2020, p. 183). Hong imagines the standard response to communities whose conditions cannot be datafied would be "We don't have the data. We don't know if what you're telling us is true." The road to empowerment is consequently confined within a set of technical solutions, "reflecting broader differences in what kinds of databases are funded and which are not, what kinds of populations are heavily datafied and in what ways" (Hong, 2020, p.183). We might generalise this to Safetipin map to argue that its vision of spatial justice depends on whether we can make women's experiences of space legible to be codified, calculated, and visualised, which is undesirable, if not elusive, as women's embodied and relational experiences of space are irreducible to data points.

Conclusion

Focusing on the case study of Safetipin's map, I have demonstrated that the crowdsourced map is not simply a representation of space and spatial patterns. The Safetipin map is a performative technique, constructed to mobilise a particular conception of space, with grounded consequences for lives beyond its visual interfaces. The fact that it is performative, however, does not invalidate its claim that women have been living violence and abuse in public spaces. Yet Safetipin does invite critical examination of how it functions to facilitate our conceptions of space. We must question how such conceptions might be structurally responsible for various forms of marginalisation and exclusion.

Safetipin map also illustrates the paradoxes that exist within any effort to operationalise a spatial justice agenda. On the face of it, the crowdsourced map is a form of feminist activism attempting to incorporate women's lived experiences and perspectives in the fight for equal access to public space. On the other hand, its relentless appeal to universally applicable parameters, to calculability, to transcendent objectivity in making sense of the world and operating on it, stands at odds with what it set out to achieve: that is to make visible women's situated knowledge of space. Unfortunately, enrolling more women in the project only serves to strengthen its calculative logics when women are reduced to only sensors, their lived and embodied experiences are disaggregated into environmental data which are then repackaged to feed security calculation and reveal actionable insight. The promise of the map to produce singular representation from a myriad of situated, relational, contextual experiences repositions itself as the cartographic gaze — the totalising God's eye view that it seeks to challenge in the first place.

To what extent can attempts to empower women be pursued without amplifying the dominant techniques that are being used to legitimise other forms of exclusions and marginalisation? I share with feminist geographer Mei-Po Kwan the importance of practicing reflexivity with respect to map-making and visualisation processes (Kwan, 2002, p.649). That is, while I do not think that we can totally disentangle ourselves from the world we inhabit (and the mode of knowledge production that is prevailing), I would propose that, at least, feminist activism such as Safetipin map could acknowledge the existing spheres of political-economic power it is intimately bound up with and might help replicate. This means that instead of rendering the map as amenable to universal application, we should recognise it as only a particular mode of seeing and seeking to change the world, with the various forms of exclusions, silences, and invisibilities that it might stage.

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Notes

1. The encyclopedic entry of the National Geographic website defines Geographic Information System (GIS) as a computer system designed to capture, store, and edit spatial data (data that has location attribute). One advantage of GIS is that can show many different kinds of data on one map, such as streets, buildings, and vegetation. This enables people to easily see, analyse, and understand patterns and relationships, which enables it to be a favoured tool for problem-solving. [Chrisman](#) (2002, p. 175), however, argues that GIS is more than just software. They argue for a definition of GIS that takes into account its political and social aspects, that “GIS is organized activity by which people measure and represent geographic phenomena then transform these representations into other forms while interacting with social structures.” Hence, mapping, analogue or digital, is always a political project.
2. There are a number of mapping initiatives such as Hollaback! (global), HarassMap (Egypt), FreetoBe (Australia), Safe & the City (UK) which have similar approach of reporting, geolocating street harassment and visualising them in form of a map. Safetipin’s uniqueness is that it does not only seek to raise awareness of the issue, but also works with local governments to advocate for environmental change. In its own words, it is “solution-focused rather than symptom-focused”.
3. The proposition that maps are performative is consistent with the notion that science and technologies function to materialise experience—that science and technologies themselves are active participants in this materialisation, not neutral tools or an unmediated window on reality (see, for example Barad, 1998; Jasanoff, 2004; Wajcman, 1991).
4. Market Value Analysis (MVA) approach is a data-driven technology of spatial governance that has been used since 2001 to guide urban development in dozens of cities across the United States (Safransky, 2020). The MVA is an example of a broader phenomenon of algorithmically calculated market value assessment. Heralded as a public interest technology in the age of austerity, the MVA guides public officials and private investors on which neighborhoods they should target for investment, development and continued public service delivery, and which they might divest from or more strategically invest in (for example, via environmental amenities) based on data-driven assessment of financial risk (Safransky, 2020). This approach to urban analysis and investment rests on the assumptions that decisions should be evidence-based, and that public subsidy is scarce, and it alone cannot create a market where there is none. Hence, public subsidy must leverage or clear the path for private investment, depending on market circumstances.
5. Figure 1: Safetipin’s map shows the ‘safety score’ of various neighbourhoods in the Indian City of New Delhi.

Note: From The Asia Foundation. <https://asiafoundation.org/2016/05/11/safetipin-tool-build-safer-cities-women/>. Copyright 2016 of Kalpana Viswanath

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Figure 1. Safetipin’s map shows the ‘safety score’ of various neighbourhoods in the Indian City of New Delhi. Note: From The Asia Foundation. <https://asiafoundation.org/2016/05/11/safetipin-tool-build-safer-cities-women/> . Copyright 2016 of Kalpana Viswanath

References:

- Andrejevic, M. (2020). *Automated Media*. London: Routledge.
- Barad, K. (1998). Getting Real: Technoscientific Practices and the Materialization of Reality. *Differences: A Journal of Feminist Cultural Studies*, 10(2), 87–128.
- Beer, D. (2017). The social power of algorithms. *Information, Communication & Society*, 20(1), 1-13.
- Chrisman, N.R. (1999). What Does “GIS” Mean?. *Transactions in GIS*, 3(2), 175–186.
- DeVylder, J., Oh, H., Nam, B., Sharpe, T., Lehmann, M., & Link, B. (2017). Prevalence, demographic variation and psychological correlates of exposure to police victimisation in four US cities. *Epidemiology and Psychiatric Sciences*, 26(5), 466-477.
- Elwood, S., & Leszczynski, A. (2013). New spatial media, new knowledge politics. *Transactions of the Institute of British Geographers*, 38(4), 544–559.
- Foucault, M. (2007). *Security, Territory, Population: Lectures at the College de France*. New York: Springer.
- Grove, N. S. (2015). The cartographic ambiguities of HarassMap: Crowdmapping security and sexual violence in Egypt. *Security Dialogue*, 46(4), 345–364.
- Gstrein, O. J., & Ritsema van Eck, G. J. (2018). Mobile devices as stigmatizing security sensors: the GDPR and a future of crowdsourced “broken windows”. *International Data Privacy Law*, 8(1), 69–85.
- Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14(3), 575-599.
- Hong, S-h. (2020). *Technologies of Speculation*. New York, USA: New York University Press.
- Jasanoff, S. (Ed.). (2004). *States of Knowledge: The Co-Production of Science and the Social Order*. London and New York: Routledge.
- Kalms, N. (2018). Crowd-mapping gender equality – a powerful tool for shaping a better city launches in Melbourne, *Theconversation.com*. Retrieved 21 January, 2021 from <http://theconversation.com/crowd-mapping-gender-equality-a-powerful-tool-for-shaping-a-better-city-launches-in-melbourne-105648>.
- Kitchin, R., & Dodge, M. (2007). Rethinking maps. *Progress in Human Geography*, 31(3), 331–344.
- Klambauer, E. (2018). Policing roulette: Sex workers’ perception of encounters with police officers in the indoor and outdoor sector in England. *Criminology & Criminal Justice*, 18(3), pp. 255–272.
- Koskela, H., & Pain, R. (2000). Revisiting fear and place: women’s fear of attack and the built environment. *Geoforum*, 31(2), 269–280.
- Kwan, M-P. (2002). *Feminist Visualization: Re-Envisioning GIS as a Method in Feminist Geographic*

- Research. *Annals of the Association of American Geographers*, 92(4), 645–661.
- Leszczynski, A. (2016). Speculative futures: Cities, data, and governance beyond smart urbanism. *Environment and Planning A: Economy and Space*, 48(9), 1691–1708.
- Livengood, A., & Keya, K. (2012). Enabling Participatory Planning with GIS: A Case Study of Settlement Mapping in Cuttack, India. *Environment and Urbanization*, 24 (1), 77–97.
- Massey, D. (2005). *For Space*. London: Sage.
- McQuire, S. (2016). *Geomedia: Networked Cities and the Future of Public Space*. Cambridge, UK: Polity Press.
- Mewa, T. (2020). Participatory Methods in Open Data. In A. Tandon, T. Mewa, & S. Chattapadhyay (Eds.), *Handbook of Gender and Open Data*. Retrieved from <https://cis.pubpub.org/pub/participatory-methods-open-data/release/2>
- Moran, J. (2002). *Interdisciplinary*. London: Routledge.
- National Geographic. (n.d.). GIS (Geographic Information System). Retrieved 22 September, 2021, from <https://www.nationalgeographic.org/encyclopedia/geographic-information-system-gis/>
- Paglen, T. (2014). Operational images. *E-Flux J* 59. Retrieved from <https://www.e-flux.com/journal/59/61130/operational-images/>
- Pickles, J. (2004). *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. London: Routledge.
- Safetipin. (2019). Gwalior: Safety Analysis Report. Retrieved 7 May, 2021 from https://safetipin.com/wp-content/uploads/2020/01/Gwalior-City-Safety-Analysis-Report_Safetipin_2019.pdf.
- Safetipin. (n.d.). About our company. Retrieved 6 May, 2021 from <https://safetipin.com/about-our-company/>.
- Safransky, S. (2020). Geographies of Algorithmic Violence: Redlining the Smart City. *International Journal of Urban and Regional Research*, 44 (2), 200–218.
- Taylor, M. & Walsh, T. (Eds.). (2006). The impact of police move-on powers on homeless people in Queensland. The University of Queensland. Retrieved from <https://core.ac.uk/download/pdf/83962493.pdf>
- Thatcher, J. (2012). Can we get there from here? Technological redlining and avoiding the ghetto, Antipodeonline.org. Retrieved 7 May, 2021 from <https://antipodeonline.org/2012/03/14/can-we-get-there-from-here-teleological-red-lining-and-avoiding-the-ghetto/>
- The Better India. (2021). This App Is Helping 1 Lakh Women Across 16 Countries Take The Safest Route Home, ThebetterIndia.com. Retrieved 6 May, 2021, from <https://www.thebetterindia.com/250569/kalpana-vishwanath-delhi-app-safetipin-women-safety-public-spaces-reclaim-roads-urban-spaces/>

Thomas, O., & Rose, N. (2004). Spatial Phenomenotechnics: Making Space with Charles Booth and Patrick Geddes. *Environment and Planning D: Society and Space*, 22 (2), 209–228.

UN-Habitat. (2008). *Women's Safety Audit: What Works and Where?* Retrieved 6 May, 2021 from <https://unhabitat.org/womens-safety-audit-what-works-and-where>.

Vera-Gray, F. (2017). *Men's Intrusion, Women's Embodiment: A critical analysis of street harassment*. London: Routledge.

Viswanath, K. (2016). SafetiPin: A Tool to Build Safer Cities for Women, Asiafoundation.org. Retrieved 7 May, 2021, from <https://asiafoundation.org/2016/05/11/safetipin-tool-build-safer-cities-women/>

Viswanath, K. (2019). Safetipin empowers women to create safe public spaces, Theurbanactivist.com. Retrieved 7 May, 2021 from <https://theurbanactivist.com/idea/safetipin-empowers-women-to-create-safe-public-spaces/>

Viswanath, K., & Basu, A. (2015). SafetiPin: an innovative mobile app to collect data on women's safety in Indian cities. *Gender & Development*, 23(1), 45–60.

Wajcman, J. (1991). *Feminism confronts technology*. University Park, PA: Pennsylvania State University Press.

Zukin, S., Lindeman, S. & Hurson, L. (2017). The omnivore's neighborhood? Online restaurant reviews, race, and gentrification. *Journal of Consumer Culture*, 17(3), 459–479.

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