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Participation and marginality on the geoweb: the politics of non-mapping on OpenStreetMap Jerusalem

Valentina Carraro and Bart Wissink

Abstract This paper contributes to the literature on participation and marginality on the geoweb by exploring the politics of non-mapping on OpenStreetMap (OSM). To this end, we reflect on our collaboration with Grassroots Jerusalem (GJ) – a Jerusalem-based Palestinian non-governmental organization (NGO) – and their engagement with OSM. Specifically, we draw on observations from mapping workshops with Palestinian youth, and on the analysis of GJ's involvement in the dispute about the name 'Jerusalem' on OSM. We address the following research questions: *How should we understand Palestinian underrepresentation on OpenStreetMap? What does this imply for the conceptualisation of participation and marginality in the geoweb literature?* We suggest that the underrepresentation of Palestinian mappers stems in part from the project's technical and linguistic barriers, and in part from a deliberate 'exit' tactic linked to Palestinian anti-normalisation efforts. These findings challenge prevailing understandings of (non)participation as the product of exclusion alone, and indicate that geoweb scholars should pay greater attention to non-users, and their engagements with crowdsourced projects from an outsider position.

Keywords Geoweb, OpenStreetMap, Palestine, Jerusalem, crowdsourcing, critical cartography

1. Introduction

Over the last decade, geoweb scholars have investigated how new spatial media widen the range of actors involved in the production of geographic information, with some arguing that this makes cartography more democratic (Lin, 2011; Mattmiller, 2006; Warf and Sui, 2010). Others have highlighted the disempowering effects for groups without the capacity or resources to harness these technologies (e.g. Elwood, 2010). Studies have demonstrated time and again that women (Ford and Wajcman, 2017; Stephens, 2013; Antin et al., 2011), rural dwellers (Sieber et al., 2012; Whitacre and Mills, 2007; Malecki, 2002), citizens of the Global South (Graham et al., 2014, 2015), non-English speakers (Shilad et al., 2015; Kumar 2017), and people of colour (Crutcher and Zook, 2009) and from the working class (e.g. Haklay and Budhathoki, 2010) are systematically underrepresented online. If we want to explore how these underrepresented groups approach, negotiate, and contest digital geographies, it is necessary to expand the scope of research into participation and marginality on the geoweb beyond online spaces. To our knowledge, no study to date has taken this route.

To our mind, this shortcoming has roots in the often-implicit conceptualisation by the geoweb literature of participation and marginality, and, by extension, inclusion and exclusion. In particular, we argue that there should be more attention paid to the ways in which groups that are underrepresented on the geoweb interact with the 'public cyber-sphere' from an outsider position. To illustrate our point, we draw on our experience working with Grassroots Jerusalem (GJ), a Jerusalem-based Palestinian NGO, and their encounters with OpenStreetMap (OSM), an online crowdsourced mapping project. In 2011, the group was briefly involved in a dispute around the name-tag associated with the ‘Jerusalem’ node on OSM. Contrary to previous studies recounting this episode (Bittner, 2016a; Glasze and Perkins, 2015; Perkins, 2014), we focus here on GJ's perspective on the events. This episode provides a starting point to discuss the politics of Palestinian 'non-mapping' in OSM Jerusalem, which we address through the following research questions: *How should we understand Palestinian underrepresentation on OpenStreetMap?* What does this imply for the conceptualisation of participation and marginality in the geoweb literature? We argue that the relative absence of Palestinian mappers stems in part from the project's technical and linguistic barriers, and in part from Palestinian strategies of non-engagement. To use Hirschman’s (1970) terminology, in this instance GJ mappers prefer to ‘exit’ the OSM deliberative forum, rather than engaging with Israeli OSM mappers by

voicing their opposition. The geoweb literature should pay more attention to this potential strategic nature of 'non-mapping' practices.

We come to these conclusions in the following six sections. First, we give a brief review of the literature on both geoweb and crowdsourced cartographies, before turning our attention to OSM, discussing the patterns of exclusion that characterise the project. This section is followed by a discussion of the prevalent frameworks underpinning the conceptualisation of participation and marginality in this body of work, resulting in the suggestion that non-participation can be a justified and deliberate choice. We then introduce our case study by discussing the context of Israel/Palestine, highlighting the role of maps in advancing competing territorial claims, as well as transformations associated with crowdsourced maps. After a brief discussion on methods, we describe the dispute around the Jerusalem node, concluding that Palestinians are remarkably absent. Next, we draw on this case study, and our work with GJ, to reflect on the reasons behind this non-participation. In the conclusion, we summarise our findings and elaborate on implications for future research on OSM and participation on the geoweb.

2. (Dis)Empowerment on the geoweb

Since the mid 2000's, Information and Communication Technologies (ICTs) increasingly incorporate and rely on geographic information. This has transformed spatial media, their contents, forms, and practices, giving rise to what is now commonly referred to as the geoweb (Elwood and Leszczynski, 2013; Haklay et al., 2008; Leszczynski and Wilson, 2013). Initially, the term geoweb designated spatially-referenced web contents, and the use of this information to organise the web (Scharl and Tochtermann, 2007), but it has come to refer more broadly to new spatial media and the practices that support them (Elwood and Leszczynski, 2013).

A growing body of work has sought to theorise and comprehend these phenomena and their social and political implications, often building on insights from critical and feminist GIS studies (Burns and Meek, 2015; Elwood, 2008, 2010; McCall et al., 2015; Wilson and Graham, 2013). This has brought into relief the knowledge politics of the geoweb, i.e. 'the ways in which individuals and institutions leverage digital spatial data and spatial technologies in negotiating social, political, and economic processes, often doing so in ways that rely upon the differential influence and authority that is granted to particular forms of knowledge or

representations' (Elwood, 2010, p. 352). New spatial media introduce new ways to generate and represent geographic information, as well as new modes to establish their legitimacy through notions of transparency and peer-verification (Elwood and Leszczynski, 2013). Different groups, however, have access and control over these technologies in highly stratified ways, so that online geographies tend to reflect and reinforce offline inequalities (Gilbert, 2010; Zook et al., 2013). In sum, the geoweb may be empowering for some groups, but further marginalises those who do not have the skills or resources to make use of these technologies (Elwood, 2010).

The geoweb's reliance on user-generated information has captured the attention of critical scholars. This phenomenon is now commonly referred to as 'crowdsourcing' (Zimmerman, 2016; Dodge and Kitchin, 2013; Brabham, 2008; Howe, 2006). According to one established definition, crowdsourcing is 'an online, distributed problem solving and production model whereby an organisation leverages the collective intelligence of an online community for a specific purpose' (Brabham, 2012, p. 395). This 'model' is not unique to geographically-referenced contents, as it fits a larger trend towards web-based 'populist counter-knowledge' (Crampton, 2010), with Wikipedia being a well-known example. In this conception, crowdsourcing has blurred distinctions between experts and amateurs, producers and consumers (Dodge et al., 2011), and lent more authority to knowledge-claims by lay people. The magnitude of this shift, however, should not be overstated, as 'the crowd' turns out to be largely constituted of professionals or experts (Brabham, 2012). Crucially, the inclusiveness of crowdsourced projects is severely limited by access to the Internet, uneven IT skills and language barriers, in ways that replicate existing inequalities between genders (Ford and Wajcman, 2017; Gruwell, 2015; Antin et al., 2011), ethnic groups (Crutcher and Zook, 2009), the global North and South (Graham et al., 2015; Graham and De Sabbata, 2014; Graham et al., 2014), as well as rural and urban areas (Sieber et al., 2012; Whitacre and Mills, 2007; Malecki, 2002).

Within the realm of cartography, OSM – the focus of our study – provides an example of a crowdsourced project, and is often viewed as the most successful of its kind (e.g. Haklay and Weber, 2008). Created in 2004, this collaborative project aims to generate a free online world map. The OSM website was modelled on Wikipedia, and OSM core principles emphasise local knowledge, community-driven decisional and operational mechanisms, and an open data policy (http://www.openstreetmap.org/about).

The development of crowdsourced cartography was met with great enthusiasm, both in the popular discourse and in the academic literature. Several observers (Lin, 2011; Mattmiller, 2006; Warf and Sui, 2010) argued that these new practices have the potential to make cartography more democratic, allowing more and more people to have a say in what is mapped, and how. Thus, the rise of non-professional cartographers has been saluted as a potentially emancipatory shift away from the historical monopoly of the state over geospatial representations. However, empirical research into OSM's social dynamics challenges such an optimistic reading, suggesting that the project displays patterns of participation and exclusion, similar to crowdsourced projects discussed above.

Several quantitative studies indicate that the OSM's 3 million users (as of December 2016) conform to the so called 90-9-1 rule of Internet communities, whereby 90% of users are passive consumers, 9% make minor contributions, and 1% actively produce new content (e.g. Arsanjani et al., 2013; Neis et al., 2013). Furthermore, even among active users, there is a hierarchy of contributions: while many users undertake routine tasks, more complex operations – such as coding the editing and rendering software or moderating disputes - are carried out by a few gatekeepers (Perkins, 2014). Importantly, coding skills and free time are unevenly distributed among classes, genders, ethnic groups and geographies. Haklay and Budhathoki (2010), for instance, found that 96% of their user sample were male, 78% university-educated, and 64% aged between 20 and 40. A recent Oxford Internet Institute study found that 80% of OSM content is in countries that are classified as high-income by the Organisation for Economic Cooperation and Development (Shilad et al. 2015). These unequal representations can result in biases on OSM, which in turn constrain contributors' options. In a study of the gendered nature of OSM features, Stephens (2013) found that OSM presents a masculine perspective, and that spaces of care that are traditionally associated with femininity tend to be overlooked. For example, OSM offered only two categories for childcare facilities – 'kindergarten' and, oddly, 'baby hatch' – while it categorised venues for night entertainment with much more detail, distinguishing, for instance, between 'bar', 'pub', 'biergarten', 'night club', 'swinger club', 'strip club' and 'brothel'. In short, the literature lends support to OSM self-description as a 'do-cracy' (OSM Foundation, 2015), but also highlights that its 'doing elite' is predominantly male, white, well-educated, urban and middle class. So, although OSM may

indeed have opened up new ways of mapping while generating new knowledge communities, these changes often end up reifying existing power relations, rather than subverting them (Perkins, 2014).

One of the main takeaways from this body of work is that marginalised groups struggle to gain access to and control over geoweb technologies, and often fail. We should then raise the question of how these marginalised groups view and engage with the space and practices from which they are excluded. What do geoweb access barriers look like, from their perspective? Do they seek to advance their claims through other channels? How do they go about negotiating or contesting existing discourses? These questions tend to remain not only unanswered, but also unasked. We argue that this blind spot relates to biases in the conceptualisation of participation underpinning geoweb literature.

3. Rethinking participation and marginality on the geoweb

With a few notable exceptions (Boulton, 2010; Haklay, 2013; Lin, 2013; Nunes, 2013; Walker and Rinner, 2013), studies of crowdsourcing draw on notions of participation and democracy without explicitly conceptualising these terms (Young, 2012). This combination of frequent use and loose theorisation has brought about a kind of 'semantic inflation', analogous to the one registered by Corbett and Keller in the 'public participation geographic information system' (PPGIS) literature on empowerment (2005, p. 93). Jason Young and Michael Gilmore (2014) aptly observe that the geoweb literature often implicitly operates within a Habermasian framework, in line with the PPGIS tradition (for an overview on PPGIS see Sieber, 2006). According to this perspective, mapping technologies fulfil two tasks: they help communities formulate consensus, and then enable those communities to 'inject' their internal consensus into the public sphere through authoritative representations that are likely to impact the wider debate. The easier it is to harness these technologies, the greater their democratising potential, since marginalised groups will not need to rely on experts or mediators to voice their claims.

Young and Gilmore persuasively argue that the application of this framework to digital mapping involving marginalised groups is problematic, suggesting that it equates empowerment with public visibility, thus downplaying the importance of protecting the participating communities' privacy. We would like to take this critique further by pointing out other pitfalls. First, the emphasis on a single, virtual, public sphere assumes

that participation in (online) deliberation is in the best interest of all groups, at all times. It risks leaving underexplored how organisations and individuals engage with the dominant discourse 'from without'. This limitation is reflected in the methodological choices of many OSM scholars, who draw on data from the OSM database, the OSM forum threads, and ethnographic work with OSM mappers (Bittner, 2016a, 2016b; Gerlach, 2015; Lin, 2011; Stephens, 2013). There is no denying that these are sensible and precious data sources, but what about the bits of geographic information, discourses and individuals that have not made it onto OSM?

Second, while much work has gone into exploring how social inequalities hinder participation in crowdsourced projects, less attention has been paid to how they may skew interactions once access has been gained. Admittedly, there are exceptions to this trend. For example, while focusing on the percentage of women involved in producing geographic information, Stephens (2013) also discusses the gatekeeping role played by male users vis-à-vis women who do participate. Nevertheless, the majority of studies focus on contribution rates (e.g. Bittner, 2014; Crutcher and Zook, 2009; Graham et al., 2014), rather than seeking an understanding of the dynamics between user groups. We should be wary of these attempts: traditional methods have already taught us that participation is difficult to measure and grasp, and these lessons hold true for participation on the geoweb as well (Sieber et al., 2016).

Finally, an implicit focus on consensus building as the privileged mode of decision-making overlooks other forms of communication through which users may engage with the map.[1] A poignant example is the interpretation of what is called 'cartographic vandalism' as purposeless disruption (Coast, 2010). While scholars have worked on tools and techniques that help to detect and prevent vandalism on crowdsourced projects like Wikipedia (Sumi et al., 2011; Adler et al., 2011; Kittur et al., 2007) and OSM (Singla et al., 2014; Neis et al., 2012), they have paid less attention to its significance as a form of communication. In what is, to the best of our knowledge, the only academic study dedicated to cartographic vandalism, Andrea Ballatore (2014) recognises that some acts of vandalism express a political message. However, by collapsing political vandalism with online hate speech and cyber-bullying, Ballatore implicitly, and in our opinion prematurely, negates its legitimacy. As also noted by David Tulloch (2008), contributions to crowdsourced maps can be interesting and informative regardless of their motives and truth-value.

[1] Mouffe (2007) makes a similar argument while discussing the counter-hegemonic nature of artistic practice.

These remarks support Young and Gilmore's call (2014) for a deeper engagement with political theory in studies of participation and marginality on the geoweb. The work of Iris Marion Young (2001, 2002) on inclusion and democracy provides a good starting point. In Young's model of deliberative democracy, parties argue for solutions to collective problems in a spirit of open confrontation. Deliberators should consider each other's interests, and agreement should be reached through dialogue, rather than by force, or 'distorted communication' (Habermas, 1970). There is a clear analogy between this model and the optimist accounts of crowdsourced mapping described above.

However, Young (2001) is acutely aware of the limitations of this model in a real-world setting. In a list of activist challenges to deliberative democracy, Young points at four ways in which inequality can affect deliberation. First, some groups do not have access to deliberative forums. Participation in online discussions at the very least requires access to a computer and the Internet. Second, even when formal inclusion is guaranteed, structural biases can favour more powerful actors. For instance, in geographical settings where access to the Internet is virtually universal, variables such as broadband speed (Graham et al., 2015), or the presence of a supportive network of technology-savvy peers (Sieber et al., 2016), influence the level of inclusion. Third, social, economic and cultural barriers constrain the range of alternatives available for deliberation. For example, most mappers may be able to contribute data, but not to modify the data structure or the rules governing the 'look' of the map. Finally, even without these obstacles, hegemonic discourses influence participants on a subconscious level. To give one example: most maps reproduce the division of the world into nation-states, and even groups disempowered by this logic frequently accept it without question. Young concludes that, in unequal situations, citizens should resist participation. Deliberation could then be replaced by other means of expression, like boycotts, demonstrations, sit-ins, and performances. From this perspective, the refusal to participation can be as meaningful as participation itself, while digital vandalism becomes a legitimate expression of dissent.

The role of such 'strategic forms of action' (Hendriks, 2006, p. 494) is of course not only a theoretical issue, nor is it limited to online spaces. Indeed, the Palestinian Boycott Divestments and Sanctions (BDS) Movement follows precisely this line of thinking. The call for BDS was issued in 2005 by a broad coalition of over 170

Palestinian civil-society organisations, urging 'international civil society organizations and people of conscience all over the world to impose broad boycotts and implement divestment initiatives against Israel similar to those applied to South Africa in the apartheid era' (BDS Movement, 2005). Particularly relevant to our argument is the BDS Movement's appeal to resist normalisation, defined as '[participation] in any project or initiative or activity, local or international, specifically designed for gathering (either directly or indirectly) Palestinians (and/or Arabs) and Israelis, whether individuals or institutions, that does not explicitly aim to expose and resist the occupation and all forms of discrimination and oppression against the Palestinian people' (Palestinian BDS conference, Ramallah 2007, quoted in Kassis, 2015). This stance stems from the premise that such projects ignore the structural inequalities that inevitably shape Israeli-Palestinian relations in favour of a 'kissing cousins cure' (Rivers, 2015, p. 158); reinforcing the notion that the lack of mutual recognition and empathy are the major obstacles to the 'peace process'. As we will see, Palestinian (non-)participation on OSM in general, and in the 'edit war' that provides the starting point for our analysis, in particular, should be interpreted in this light.

4. Mapping Jerusalem

Jerusalem is a contested city. While any attempt to summarise its complex history in a few paragraphs is bound to fall short (see instead Abowd, 2014; and Dumper, 2014), we provide a short overview to help readers place our case study into context. One of the milestones in Jerusalem's history is UN resolution 181, which in 1947 recommended the creation of a Jewish and an Arab state, with the city as a 'corpus separatum' under UN control. This resolution led to a war with tellingly different names: 'Independence War' for Israelis and al-Nakba, or 'The Catastrophe', for Palestinians. When war ended in 1949, the armistice line or 'Green Line' cut Jerusalem in half: West Jerusalem, to be ruled by the State of Israel, and East Jerusalem, under Jordanian control. The ensuing scramble of refugees in both directions dramatically changed the ethnic landscape of the city. Jerusalem remained divided until 1967, when Israel de-facto annexed East Jerusalem, and occupied the West Bank and the Gaza Strip. In 1980 the Israeli Parliament passed the 'Jerusalem Law', declaring the city 'the undivided capital of Israel'. Several UN resolutions (including 242, 476 and 478) pronounced the annexation illegal under International Law, and called for retraction of the Jerusalem Law. Nonetheless, to this day, an Israeli Municipal Authority controls the city. Palestinians from East Jerusalem have been granted the status of Israeli residents, but not full citizenship. They can vote in municipal elections (although many choose not to),

but not in national elections. Israel claims it as its capital (Knesset, 2009). The Palestinian Authority claims sovereignty over East Jerusalem, and considers the whole city subject to permanent status negotiations (PLO/NAD, 2013). The United Nations still envisions the establishment of a corpus separatum (Cattan 1980).

The uncertainty around Jerusalem's status makes evident the political nature of its maps: the names of streets and neighbourhoods, which landmarks are highlighted, the way the map is framed, or how the city's boundary is drawn. Such choices appear self-evident in other cities, but the controversies that surround then in Jerusalem offer an entry point into the politics of mapping, allowing us to investigate the map 'in-the-making', to paraphrase Latour (1987), and start to disentangle the ways in which state, politics and knowledge co-produce one another (Jasanoff, 2004). It is not surprising therefore, that there is a rich body of work exploring these entanglements. To begin with, various studies discuss the crucial role of maps in the development and dissemination of Zionist narratives, portraying Palestine as a Biblical land 'without people' (Bar-Gal, 2003; Benveniśtî, 2002). Maps were also used by the Ottoman and British administrations to extend their control over the land (Quiquivix, 2013; Zureik et al., 2010), impose taxation (Gavish and Kark, 1993; Kark, 1997; Kark and Gerber, 1984), and facilitate land purchases by Zionist settlers (Quiquivix, 2012). After the establishment of the State of Israel in 1948, Israeli authorities have drawn on cartography to consolidate their territorial claims, and Israel's national identity (Bar-Gal and Bar-Gal, 2008; Benveniśtî, 2002). To this day, maps including urban plans (Jabareen 2010) and road atlases (Leuenberger and Schnell 2010) play a crucial role in advancing Israel's domestic geopolitical agenda.

By contrast, a Palestinian cartography did not emerge until the late 1970's, and it was only in the early 1990's that those efforts scaled up into a systematic strategy. According to Linda Quiquivix (2012: ch. 2), these developments reflect a political shift in the Palestinian camp, from liberation struggle, dominated by the discourses of Pan-Arabism, the global decolonialisation movement, and popular insurgence, to an institutionalised independence movement aimed at the establishment of a nation-state. In other words, when territorial claims became the focus of mainstream Palestinian political forces, maps gained importance as key assets in the 'peace negotiations' (see also Said 1996). Over the past three decades, the Palestinian Authority has endeavoured to match Israeli cartographic efforts (Leuenberger, 2012b; Wallach, 2011), engaging in a 'war of maps' (Medzini, 2012) to establish the legitimacy of its own territorial claims. As Christine Leuenberger and

Izhak Schnell observe, “maps of the region have become one of the many battlefields in which political conflicts over land claims are being waged” (2010, p. 833).

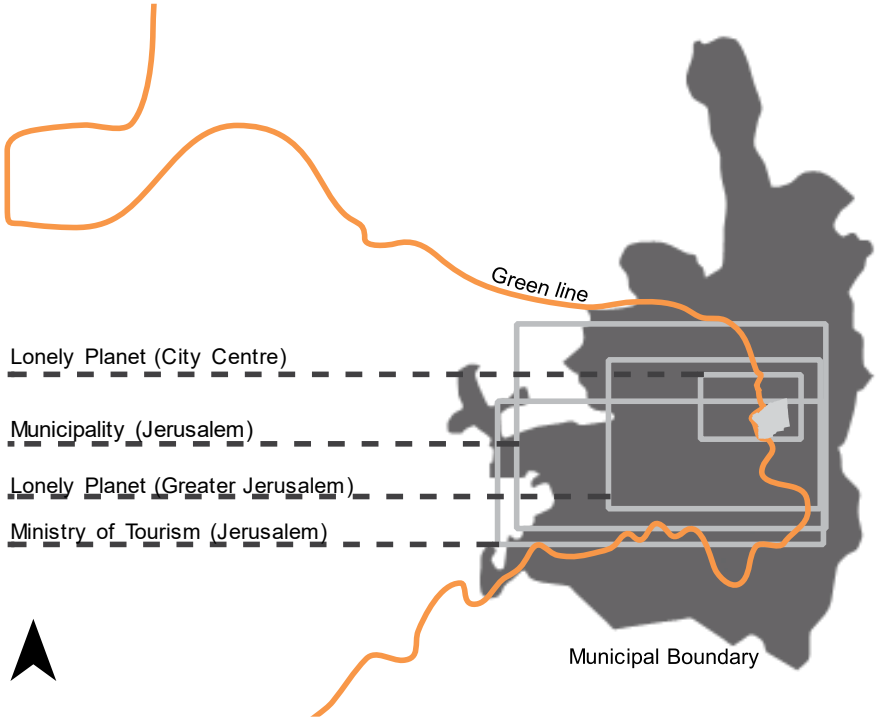

Figure 1 The framing of Jerusalem on popular tourist maps. The lighter grey area shows the Old City. (source: own graphic with data from Robinson, 2012; Israeli Ministry of Tourism, 2014; and iTravel Jerusalem, 2013)

However, this apparent symmetry should not obscure the different power positions from which Israelis and Palestinians make their claims. Unequal access to land, mapping technologies, economic resources and military power puts the Israeli side at an advantage (Bier, 2017; Tawil-Souri, 2012). This is confirmed by a look at widely used maps of Jerusalem. For instance, many are framed in such a way that places West Jerusalem at the centre (Figure 1). They also consistently exclude Palestinian neighbourhoods.

In recent years, several Palestinian NGOs, activist groups and passionate cartographers have created counter-maps to challenge Israeli cartographic representations (Bier, 2017; Leuenberger, 2012a; Wood, 2010). Often, these maps also challenge the PA's claims, for example by emphasising the historical Palestinian presence within the 1948 Israeli territories, or the unity of Palestinian people across borders, including refugees in the diaspora (Abu-Sitta, 2007, 2010, Quiquivix, 2012, 2014). By doing so, such grassroots mappings develop a distinct understanding of Palestine's past, and a vision for its future. These efforts are not an exercise of the

imagination without practical consequences: on the contrary, geographers have long recognised the importance of conceived space in the production of space (Lefebvre, 2011; Soya, 1996). Building on this work, and focusing on Palestinians in Jerusalem, Yosef Jabareen (2016) underlines the importance of popular agency in the conception of space, especially in contexts where some groups are thoroughly excluded from the formal planning process. Seen in this light, conceptualising space is a right, and grassroots maps an everyday form of resistance that emerges from the lack of formal representation and legal rights (Jabareen, 2016).

While crowdsourced mapping technologies have contributed to these developments, rendering map-making easier and cheaper, their emancipatory potential should not be overstated, as they remain embedded in the material and socio-political reality of the Occupation (Tawil-Souri and Aouragh, 2014). In a series of recent papers, Christian Bittner (2014, 2016a, 2016b) explores these issues, questioning whether geoweb technologies could represent a 'game changer' for cartography in Israel/Palestine. In one important contribution, Bittner documents the extent to which Jerusalem's Palestinian neighbourhoods are underrepresented on OSM through an analysis of node-features (2014). More specifically, Bittner classifies the city's neighbourhoods according to their cultural-ethnic make-up: secular Jewish, ultra-orthodox Jewish, or Arab. The analysis shows that secular Jewish neighbourhoods have by far the highest density of nodes, while ultra-orthodox and Arab areas are severely under-mapped (Figure 2). Bittner (2016b) also compares data from OSM with data from Wikimapia, another crowdsourced project, and finds that, compared with Israeli neighbourhoods, Palestinian areas are underrepresented on OSM, but overrepresented on Wikimapia. Different platforms, then, display different biases.

Bittner (2016a) also draws on a mix of database analysis and interviews with mappers in order to compare the genesis of OSM Israel and OSM Palestine, concluding that Israeli and international mappers dominate the project, while Palestinians are largely absent. In Bittner's view, nationalist motives are not a major influence on the project. Rather, OSM's depoliticised epistemological principle to only map 'facts on the ground' alienates Palestinians, since 'many aspects of the factual material space might appear not as neutral physical objects but as results of suppression, in which case, any 'accurate' spatial representation, such as OSM, becomes objectionable' (2016a, p. 1). As a consequence, Bittner argues, OSM has not become one of the many battlefields between the two sides (2016a, p. 46), because Palestinians do not seem to be interested in

participating, while the 'conflict' does not play a major role for the Israeli mapping community. Bittner examines the dispute to investigate how the 'Palestinian question' is tackled, or neglected, by the Israeli OSM community. We would like to contribute to that discussion by reconsidering that episode from the perspective of Grassroots Jerusalem, the Palestinian NGO involved in the dispute.

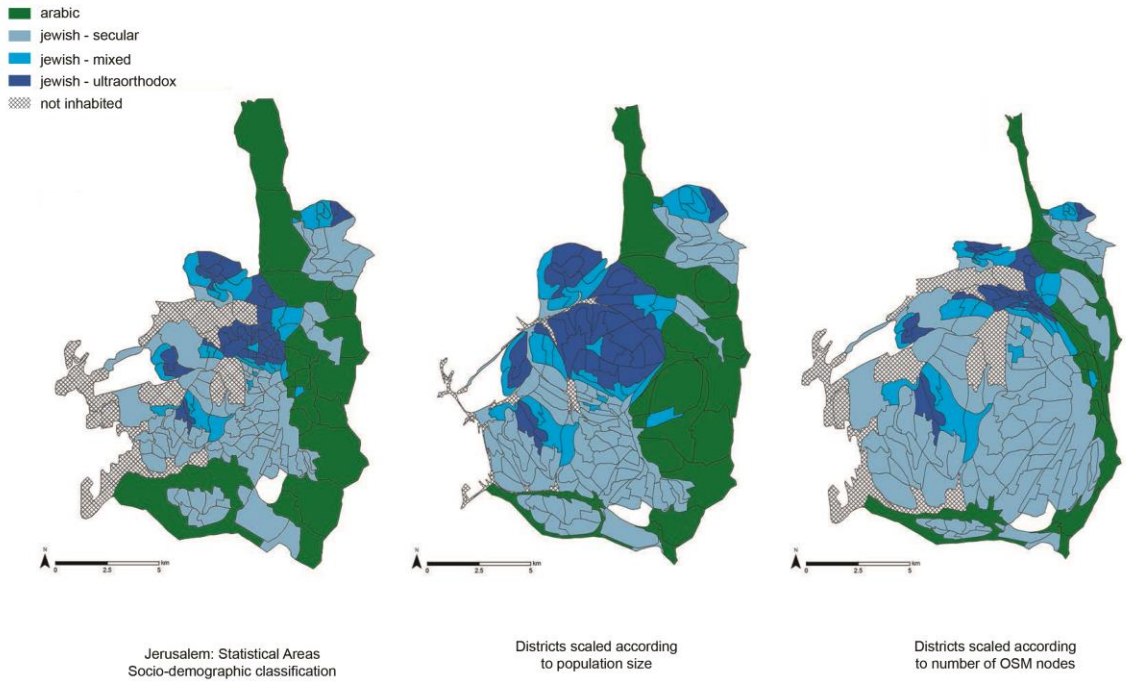

Figure 2 Jerusalem neighbourhoods shaded according to sociodemographic characteristics and represented, from left to right, to scale, in proportion to population size, and in proportion to density of OSM node features (source: modified from Bittner 2014)

5. Methods

The usual sources used in OSM research – forum threads (e.g. Budhathoki and Haythornthwaite, 2013), surveys of mappers (e.g. Stephens, 2013), ethnography at OSM conferences (e.g. Lin, 2011), analyses of the OSM database (e.g. Bittner, 2014), etc. – are poorly suited for investigating non-participation. After all, we are after the perspective of those who are absent or marginalised from these spaces, whether by choice or constraint. Arguably, it is easier and more useful to start by approaching non-participants who have shown an interest in mapping by registering on the OSM platform. We did so by conducting a survey of OSM contributors in and around Jerusalem, but this route, too, proved difficult. Using Pascal Neis' online tool, 'Overview of OpenStreetMap Contributors aka Who's around me?' (http://resultmaps.neis-one.org/oooc), we identified potential respondents. We included all accounts that had contributed more than 10 change sets to the map

(53), and fifty accounts by 'non-recurring' mappers, who made less than 10 edits. Of these 103 accounts, however, about half (50) had not been used in the past 2 years, which can, at least in part, explain the low rate of responses (18). Among respondents, only two identified as Palestinians, while 9 reported to no longer live in Israel/Palestine. More generally, only two were 'non-recurring' mappers, suggesting that it is difficult to reach marginal contributors via OSM channels.

As a result, our analysis strongly rests on one of the researchers' collaboration with Grassroots Jerusalem (GJ). This took place in two phases. She first worked for the NGO as cartographic assistant between October 2014 and March 2015. Then, between February and May 2017, she organised weekly mapping workshops for Palestinian youths in partnership with GJ. While the workshops had a wider focus than OpenStreetMap, they included tutorials on how to use the platform, as well as discussions with participants about the politics of mapping in Jerusalem. Over these two phases of fieldwork, we observed about 20 novice mappers getting to know OSM. These experiences form a rich basis for observation. Undeniably, this work-environment comes with a bias. But recognising the situatedness of our views, we are moved not by partisanship, but by a genuine worry about unequal representation, both online and offline, and we aim to use the Palestine case to explore the dynamics behind underrepresentation further. To make our argument more specific, we discuss non-participation through a case study, i.e. the dispute around the naming of Jerusalem on the OSM map. Here, we complement previous research (Bittner 2016a) through two one-hour long interviews. In the first one, we spoke with A., the Palestinian GJ mapping officer who was involved in the dispute. In the second, we talked with M., one of the NGO's co-founders, an Israeli, who briefly intervened in the online thread, and has since left the organisation. We also contacted the OSM Data Working Group (DWG) via email for additional clarifications. Since we could draw on Bittner's research for the perspectives of the other mappers involved (2016a), we feel these sources allow us to give a well-rounded account of the dispute.

Some may question the usefulness of studying participation through a case study as 'extreme' as the Jerusalem controversy. Yet, it is precisely around heated disputes that gatekeeping is at its strongest. Edit wars, then, highlight some of the mechanisms used to exclude unorthodox knowledge-claims, including reliance on scientific authority (König, 2013), reference to one side's greater expertise, and appeals to 'majority rule' within the crowdsourcing community (Kumar 2017). Admittedly, there are limitations to the extent to which

we can generalise from this case study. First, GJ should not be made to stand for Palestinians as a whole. In fact, it is likely that Palestinians from different social backgrounds, or with different political positions, would approach OSM differently. That said, in a context where Palestinian engagement with OSM is so rare, we see the work of GJ as a useful case study. In addition, in the years since the dispute, GJ has continued to work on mapping projects involving local Palestinian communities. In this sense, their difficulties with OSM are likely to reflect the experiences of a wider range of people.

Second, our observations span a relatively long period: from 2009, when the dispute first broke out, to 2017, when the workshops took place, and much has changed over these eight years. For example, in 2009 OSM was still relatively new in Israel/Palestine, and many areas were still largely uncharted. Furthermore, the number of registered users worldwide soared in this period from just over 200,000 to over 4 million, while active users per month grew from 10,000 to 40,000 (OSM Wiki, 2017). The local political context has also altered in ways that are far beyond the scope of this research. These transformations have likely impacted the dynamics between OSM users, and demand further investigation. That said, what appears to have stayed consistent, at least since 2011-12, is GJ's approach to OSM, which is the focal point of this study.

Finally, we recognise that there is a risk of oversimplifying the issues surrounding the mapping of Jerusalem by reducing them to the juxtaposition of opposing views of Israelis and Palestinians. As we have seen, other groups are underrepresented on OSM, and the fragmentations within both Israeli and Palestinian society should not be overlooked. Yet, the violent history of Israeli-Palestinian relations, and the role that maps have played in this history, make the study of the engagement of these two groups with crowdsourced mapping particularly compelling. What is more, we believe that future research investigating other 'cartographic divides' in the city – for example why ultra-orthodox communities, or working-class Israelis do not participate in OSM - may also benefit from exploring whether these groups have engaged with the project 'by other means than direct participation.

6. Naming node #29090735

6.1 The dispute

On the OSM map, each feature corresponds to a basic geometric ‘type’: nodes defining points, ways defining linear features, and relations defining how multiple features work together (for example, the discontinuous lines delimiting the West Bank and Gaza Strip are grouped together as a relation to represent the 'Palestinian Territories'). These nodes, ways and relations are then described by one or more tags, which in turn are linked to a key and related value. Thus, Jerusalem is represented by node #29090735, which in February 2016 was linked to 155 tags, including ‘place’= ‘city’ and ‘population’=‘780200’. This structure applies to any point on the map. If users disagree on the choice of tags, they are encouraged to work together to find a solution. If this proves difficult, the default rule is that tags and features should reflect what is on the ground. So, for example, in case of a dispute about a street name, the name that appears locally on the street sign should prevail. If users still cannot agree, they can contact the OSM DWG and ask them to intervene as mediators (OSM Wiki, 2015).

Node #29090735 was first created in October 2007, with the name tag ‘Jerusalem’ (in English), and the is_in tag, indicating the node's location, set to ‘Israel’. Figure 3 offers an overview of the edits to selected tags in the node’s history. Bars with multiple colours indicate that the tag-value contains more than one name (e.g. Name Tag = ‘Jerusalem - ירושלים’). Generally speaking, the city has been tagged as the capital of Israel, and its name tag has been in Hebrew. Due to a change in the data licence in mid-2012 (for more information on this change, see OSM Foundation, 2016), versions 22 to 39 have been deleted. This gap includes the dispute, referred to earlier as the ‘edit war’, but we could partially reconstruct the changes made during that period through the mailing list thread about the dispute (Robinson, 2011). The dispute took place between January 2009 and December 2010, when the tag name was changed back and forth eleven times. Reflecting the do-ocratic nature of OSM, most of these edits – 8 out of 11 – were made by two experienced mappers, who had already contributed over 10,000 edits each.

Figure 3 Edits to the OSM Jersalem node between October 2007 and April 2016 (Source: own graphic, data from: http://osm.mapki.com/history/node.php?id=29090735)

A forum thread from July 2011, entitled "'Edit War' over Jerusalem - meeting with East Jerusalem mappers", addresses the dispute (OSM Forum, 2011). The 'East Jerusalem mappers' are members of GJ. At this meeting, mappers discussed three related issues: the main tag's language, whether the node should be tagged as capital, and, if yes, as capital of which country. The following solution was put forward: there would be two nodes, one in Hebrew and one in Arabic, and each mapping community would decide on the appropriate tags. The OSM DWG, however, decided to remove the existing name-tag from node #29090735, adding a note that urged users to refrain from making any further edits. The node would remain unnamed until the involved parties could agree on a compromise (OSM Wiki, 2015).

Israeli mappers viewed this measure as an abuse of power by the OSM DWG, and experienced the intrusion of GJ members, who were not 'real' OSM mappers but political activists, with "a feeling of betrayal" (Bittner, 2016a, p. 40). The dispute around the node continued, first on the Israeli OSM forum, and then in the OSM talk list, broadening beyond the local community. GJ mappers, however, did not participate beyond the initial meeting. Eventually, the debate died down without a resolution, in part also because Palestinian non-participation made a compromise between local communities impossible. As Bittner puts it, Israeli mappers found themselves without a counterpart for negotiation. In the years since, the node has been renamed, once again, in Hebrew, and the OSM DWG note has been removed. Neither action has caused any further complaints. If we only focus on the OSM sources, the dispute around node #29090735 is a clash between the

Israeli OSM community and the OSM DWG. After the initial meeting, GJ mappers never even tried to participate, and it is easy to conclude that 'they soon lost interest in the case' (Bittner, 2016a, p. 40). Based on these sources, the reasons for their loss of interest remain obscure, and we are left with the impression that Palestinian mappers lacked resolution. However, a different picture emerges when we expand our scope to what happened outside the OSM deliberative spaces.

6.2 Disinterest or non-engagement?

When the dispute broke out, GJ had only recently started its mapping work, and was experimenting with OSM, advised and trained by Mikel Maron, a prolific OSM mapper and OSM Foundation board member (Maron, 2011). 'I remember myself being there not really understanding what is this tool, or what we are going to do with this tool, how is it efficient for us, or useful for us (…) We really didn't know where we were going, or what we wanted to do', recalls A., GJ mapping officer. Soon afterwards, Israeli mappers questioned the data generated by GJ, and called the meeting to discuss the issue. A.'s main recollection of this meeting was that GJ and the Israeli mappers could not agree on anything. Likely due to her lack of familiarity with OSM and its procedures, A. did not know that the discussion continued in the online forums after the meeting. Seen in this light, GJ's non-participation is an example of how inexperienced users have less influence on mapping decisions.

On the other hand, A. is hesitant as to whether she would have joined the discussion, had she known about it. As GJ became more familiar with OSM and its deliberative mechanisms, she recounts, the team discussed how to use the mapping platform strategically, and decided to avoid direct dialogue with Israeli mappers:

> *Debating with Israelis is really not my goal. In any forum (…) I don't think it's useful. (…) And, the maximum which I can get from Israelis is that I might write Ras al Amud, or Silwan, or East Jerusalem... which is OK because it does reflect the reality, but not one hundred percent. But it is not justice, and freedom for a Palestinian, I won't really be able to go back to Ein Karem and see refugees in Ein Karem in OSM, which is a destroyed village in the West part of Jerusalem. It would have certain limits, which I cannot really cross, afterwards.*

In other words, OSM may agree to change the language of some tags, but will never represent Jerusalem as envisioned by Palestinians. In Young's terms, existing social and political structures constrain the range of alternatives that can be debated. If GJ agreed on a compromise with the Israeli OSM community, the resulting

map would be more authoritative thanks to Palestinian endorsement. So, in the belief that she is not in the position of negotiating a fair agreement around how to map Jerusalem, she prefers to avoid dialogue altogether.

As previously mentioned, M., an Israeli member of GJ, did intervene in the online debate on two occasions, albeit in a private capacity. Meanwhile, he questions whether participation was the best course of action in the circumstances:

> *Well, that was six or seven years ago, and I didn't have much of an understanding of the principles of solidarity, the kind of "dharma" [an hinduist concept that refers to a universal moral code], that I now respect as a white Israeli being part of the pro-Palestinian movement. Since then, I developed an increased awareness of my own privilege, and if I had the chance to do it again, I would probably stand in solidarity with A., and also refuse to engage.*

He also stresses that his personal development goes hand-in-hand with a larger-scale shift in the Palestinian solidarity movement, which has progressively adopted anti-normalisation as a tactic (Abu Sarah, 2011; Barakat and Goldenblatt, 2012).

6.3 Grassroots Jerusalem and OSM

Before moving on to our conclusions, we would like to put the dispute about node #29090735 into context, considering GJ's engagements with OSM more broadly. Here, we are interested in what their experience tells us about the underrepresentation of Palestinian mappers in OSM Jerusalem. These remarks are based on A's account of her mapping work, and on our observations from mapping workshops.

GJ's experience confirms that, as indicated by OSM studies elsewhere, technical and linguistic barriers pose a challenge to new mappers, especially those coming from disadvantaged groups. Recalling a workshop aimed at familiarising Palestinian youth with OSM, A. notes:

> *We trained one group how to upload the data by themselves, and it was really hard. Even using the Arabic for it! So the system itself it's not accessible for Palestinians. And all of the guidance [notes] were written in English, and you are not really talking with academics, who really speak the language very well; you are approaching youth on the ground, and they have other problems...*

We had a similar experience in our workshops. Importantly, linguistic and technical barriers did not manifest themselves as impenetrable walls, so to speak, but rather as rolling hurdles. For example, participants with excellent English skills would struggle over the more technical sections of the OSM documentation. Or, participants comfortable when using their computer for daily tasks such as homework, emails and social media, would frequently grow frustrated with the seeming uncooperativeness of mapping software. Crucially, since it was important to users to customise their maps in ways that deviated significantly from the OSM default, our tasks went beyond routine operations. For instance, the map is set up to be rendered in the official local language, which, as mentioned, for Jerusalem is Hebrew. By contrast, making a map in Arabic is relatively complicated, since it requires modifying the rendering parameters.

On the other hand, we would argue that linguistic and technical barriers alone cannot fully account for the dramatic underrepresentation of Palestinians on OSM, especially considering the high level of education registered among this group: for example, the literacy rate is 96.3% (UNDP, 2014) while 39.8% have a secondary degree or higher (Palestinian Central Bureau of Statistics, 2016). Our case study suggests that, at least for *some* Palestinians, non-mapping fits into a larger strategy of non-engagement.

In the case of GJ, this strategy was consolidated after the dispute. The NGO avoided further interactions with Israeli mappers, at the cost of giving up the ambition of changing the OSM main map. Instead, they decided to download OSM data and use it to produce their own maps, retaining full control over features and labels; a strategy that is open to any user of this platform. In this respect, GJ continued both their political activities and their contestation of how OSM represents Jerusalem, but through other channels.

This choice reflects GJ's attitude towards the OSM project, which is seen as a tool, and not a community of peers, in contrast with the Israeli mappers interviewed by Bittner. Indeed, GJ cast their mapping against the activity of Israeli mappers, and the cartographic status quo. A. regards the OSM Foundation and mapping community as foreign institutions, associated with Palestine's colonisers:

> *If you want to change anything in OSM there is a certain committee, that its headquarters are in London, if I'm not mistaken, and there were two Israeli representatives working on OSM from Tel Aviv. (...) Because*

the message was from the headquarters, I mean, they [the OSM Foundation] *can change this if we* [Israeli and Palestinian mappers] *get consensus.*

Given these views, it is no surprise that GJ do not feel invested in improving the OSM project, and prefer to refrain from contributing rather than compromising on their mapping politics.

7. Discussion and conclusions

At the start of this paper, we questioned how we should understand the Palestinian underrepresentation on OSM Jerusalem. Based on our work in collaboration with GJ, we argued that it stems from a mix of exclusion and political strategy. More specifically, we pointed at linguistic and technical barriers faced by aspiring Palestinian mappers when approaching OSM. We also suggested that non-mapping should in this case be viewed as part of a wider strategy of non-engagement.

To some extent, our research lends support to Bittner's conclusion that the lack of Palestinian participation is related to OSM's aforementioned 'on the ground' rule, which works to depoliticise OSM mapping practices, while foreclosing critical counter-mappings actions (2016a, p. 46). However, our approach also complicates Bittner's conclusions. By widening the study's scope beyond the OSM database and community, we show that non-mapping is, at least in the case of GJ, a political position for Palestinian mappers. This, in turn, brings us to question Bittner's conclusion that nationalist motives play no significant role in the activities of mappers from either side (2016a, p.46). Instead, we argue that, by engaging with Palestinian mappers we can draw out the politics in claims and policies that would otherwise seem to be factual statements. For example, Bittner's choice to adopt the division of Israel/Palestine, and each side's 'mapping responsibilities', along the green line, is politically-charged. Once accepted, the Israeli mappers' willingness to join cross-border mapping parties and lend support to 'the other side' reported by Bittner's study may indeed appear as a mark of open-mindedness and non-hostility (2016a). From GJ's perspective, however, this division of territory, communities and mapping competencies amounts to a deal-breaker, since it implicitly legitimises the 1948 borders. In this light, we may need to redefine what constitutes a 'political agenda' or a 'nationalist motive' (Bittner, 2016a), including not only Palestinian attempts to edit the Jerusalem name tag, but also Israeli claims on the land they already control. Some readers may view GJ's approach to OSM as short-sighted. Granted, the costs of 'exiting' a

crowdsourced project can be steep. For GJ, in this case they include giving up what could be a powerful advocacy platform, whose database is disseminated through many geographic applications, reaching millions of users every day. Yet, 'voicing' also has its costs, such as involuntarily legitimising a problematic version of the map, or the risk of being viewed as 'normalisers' by other Palestinian actors. What is more, the benefits of speaking out in this case are unclear, as GJ is unlikely to see its demands satisfied, and has little interest in marginal and gradual improvements to a project it sees as governed by Israeli and British authorities. Following Jabareen (2016), we see GJ's refusal to contribute to OSM as a strategy that stems from a state of necessity, and their choice to produce their own maps, though less widely disseminated, as an example of a Palestinian tactic for producing their own cultural and social spaces by other means than formal participation.

Admittedly, our study focuses only on OSM, and a small group of mappers. Geoweb platforms differ in terms of aims, features, policies, and user-groups. These differences matter, and shape participation in major ways, as demonstrated by Bittner's (2016b) comparison between Wikimapia and OSM to which we referred above. On the other hand, it is hard to ignore that patterns of exclusion rooted in structural inequalities cut across platforms. This is demonstrated by quantitative research (e.g. for gender inequalities compare Stephens, 2013; and Ford and Wajcman, 2017), and also by other case-studies on edit wars in crowdsourced platforms (e.g. Kumar 2017 on Wikipedia). Thus, while further research is needed to understand whether our case study is specifically informed by OSM's peculiarities, we suspect it points to a broader phenomenon within crowdsourced projects; namely, non-participation as an expression of dissent. Similarly, while our findings may be specific to Israel/Palestine, we see significant parallels between the situation of Palestinians and that of indigenous populations around the world. Without denying the specificities of each context, other groups have found that participating in mapping and/or deliberative processes is not necessarily empowering (see for example Roth, 2009; Wainwright and Bryan, 2009).

In conclusion, we suggest that geoweb scholars can develop a better understanding of exclusion and marginality by engaging more deeply with non-participants, and widening the scope of research beyond designated online deliberative spaces, especially when working in contexts of stark inequalities. We suspect that future studies of non-participants will further complicate the characterisation of this group: some may have chosen not to contribute, some may be disillusioned former users, some may have tried and failed to

become involved, etc. (see also Wyatt, 2003). Only by attending to these nuances can we gain a fuller account of non-participation, and avoid inheriting the blind spots of the crowdsourced projects we study.

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