ARTICLES

Another Politics Is Possible: Neogeographies, Visual Spatial Tactics, and Political Formation[1]

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ABSTRACT

Neogeography – the use of interactive online mapping technologies, often by laypersons or grassroots groups – continues its rapid growth, as do debates about its implications for spatial data and map quality, public spatial literacy, and the digital divide. Ongoing efforts to understand whether and how neogeography might enable the participation, influence, and agency of less powerful social actors require greater attention to theorizing neogeography politics. Existing work, tacitly or explicitly, tends to theorize these politics in ways that align with Michel de Certeau's notion of "strategy" or its conceptual partner, "tactics." We argue that a neogeography politics conceived as "strategy" has inherent limits and that the political significance of neogeography "tactics" is even more foundational than has been understood thus far. Recent work has shown neogeography to be a powerful site of political action or engagement, but our evidence suggests further that visual spatial tactics in neogeography are also key sites of political *formation*. Neogeography tactics are significant not just as a site of resistance or political action by less powerful actors but *also* as practices that contribute to the formation of political subjects, mobilized social groups, and shared knowledge. Recognizing neogeography as a site of political formation paves the way toward realizing its broader potential in the development and practice of a critical spatial citizenship. We develop these arguments from a three-year neogeography project conducted with young teens.

Keywords: neogeography, cartography, spatial tactics, politics, the geoweb, youth, visual politics

RÉSUMÉ

Si la néogéographie – l'utilisation de technologies pour la cartographie interactive en ligne, souvent par des amateurs ou des groupes communautaires – poursuit sa croissance rapide, il en est de même des débats concernant ses répercussions sur les données spatiales et la qualité des cartes, la littératie spatiale publique et le fossé numérique. Il faudrait consacrer plus d'efforts et d'attention afin de mieux comprendre comment la néogéographie pourrait favoriser la participation, ainsi que l'effet et le rôle d'agents sociaux moins puissants, afin d'établir une théorie concernant les politiques de la néogéographie. Les travaux existants ont tendance, implicitement ou explicitement, à élaborer des théories sur ces politiques d'une manière qui s'harmonise avec la notion de « stratégie » de Michel de Certeau ou celle de son partenaire conceptuel, « tactique ». L'argument énoncé dans l'article est qu'une politique de la néogéographie conçue comme « stratégie » possède des limites inhérentes et que l'importance politique des « tactiques » néogéographiques serait encore plus essentielle que ce qu'on a cru jusqu'à présent. De récents travaux ont montré que la néogéographie peut devenir un moyen puissant d'action politique ou d'engagement, mais nos résultats suggèrent que les tactiques spatiales visuelles en néogéographie sont aussi des sites clés de *formation* politique. Les tactiques néogéographiques sont importantes non seulement comme site de résistance ou d'action politique par des agents moins puissants, mais aussi en tant que pratiques qui contribuent à la formation de sujets politiques, à la mobilisation de groupes sociaux et au partage des connaissances. Reconnaitre la néogéographie comme lieu de formation politique pourrait permettre de mieux comprendre son vaste potentiel pour le développement et les pratiques d'une citoyenneté spatiale essentielle. Ces arguments sont développés à partir d'un projet de néogéographie mené auprès de jeunes adolescents pendant trois ans.

Mots clés : néogéographie, cartographie, tactiques spatiales, politiques, géoweb, jeunes, politiques visuelles

Introduction

New forms and applications of Internet-based spatial media continue to rise in number and diversity, with these technologies increasingly present in various forms of civic engagement and activism. Multimedia data collection, compilation, and mapping toolkits such as those provided by Ushahidi are being deployed for citizen monitoring of

ethnic violence, election fraud, and disaster relief needs and resources (Okolloh 2009; Goodchild and Glennon 2010; Roche, Propeck-Zimmermann, and Mericskay 2011). A growing number of urban governments now use online and mobile geo-services that allow residents to submit their observations of infrastructural problems and other local needs via a geo-tagged text message or photograph or by adding an object to a map interface (Foth and others 2009; Elwood and Leszczynski 2013; Johnson and Sieber 2012). Citizens have used the high-resolution imagery of virtual globes like Google Earth to monitor military build-up or reveal supposedly secret sites and facilities (Aday and Livingston 2009; Perkins and Dodge 2009). These examples extend a vibrant history of civic applications of the earliest interactive mapping tools, including map mashups of Chicago crime data or post-hurricane evacuation and relief needs in New Orleans (Miller 2006; Crutcher and Zook 2009).

The technologies and practices that underlie these applications of Internet-based spatial media have become known by a dizzying array of new terms in the past several years. Volunteered geographic information (VGI) refers to spatial data sets compiled from the contributions of many individuals, such as citizen reports to a disaster relief map interface (Goodchild 2007; Elwood, Goodchild, and Sui 2012). The geospatial Web originally referenced only the centrality of geographic location as a means of organizing and retrieving online content (Scharl and Tochtermann 2007). The term "geoweb" is now used more broadly to identify this location-mediated Internet content *and* the hardware and software that enable its production, such as GPS-enabled handheld devices or freely available mapping APIs (Elwood and Leszczynski 2013). "Neogeography" has been used to refer to what some users *do* with interactive online mapping tools – namely to the production of maps and other visual spatial artefacts through various geoweb resources, often by laypersons, activists, artists, grassroots groups, and other "non-expert" actors (Eisnor 2006; Turner 2007; Wilson and Graham 2013).

Geographers' interest in these phenomena is wide-ranging, including core GIScience questions about ontologies, data quality, and data integration (De Longueville and others 2010; Grira, Bedard, and Roche 2010; Haklay 2010); disciplinary concerns about the future of cartography and related arenas (Gartner 2009; Kraak 2011; Goodchild and Turner 2013; Kitchin and Dodge 2013); and questions about their social and political implications (Crampton 2009; Dodge and Perkins 2009; Elwood 2010). In the latter arena – the social and political implications of neogeography – we see divergent concerns and predictions. Some scholars trace trends of increasing surveillance and state/private-sector control over the production and circulation of geospatial imagery, maps, and the resources needed to produce and share them (Perkins and Dodge 2009; Gerlach 2010; Leszczynski 2012). Others suggest that neogeography constitutes new spaces of civic engagement or resistance and begins to level access to cartography, geovisual imagery, and deliberative or decision-making forums in which they are used (Madden and Ross 2009; Okolloh 2009; Meier 2011). In particular, as scholars have debated this empowerment/marginalization dialectic (Sheppard 2005), there has been a great deal of interest in whether and how neogeography might enable the participation, influence, and agency of less powerful actors. The existing literature offers two kinds of propositions for how they might do so – by offering less powerful actors greater access to conventional spheres/practices of deliberative decision making and cartography (see Tulloch 2008; Hall and others 2010; Gryl and Jekel 2012), or by enabling them to create their own alternative spheres of deliberation/engagement and cartographic praxis (cf. Kingsbury and Jones 2009; Okolloh 2009; Lin 2013).

These different propositions are, at heart, arguments about the forms of politics that are or might be constituted through the practices associated with neogeography, and it is this concern that will take centre stage in our discussion here. By "politics" we are not referring to the specific realm of electoral politics but rather to a much broader range of individual and collective practices which act on or engage structurally mediated inequalities, the social and material relations of everyday life, and negotiations over identity (Kofman and Peake 1990; Brown and Staeheli 2003). This wider definition of politics is critical for theorizing neogeography, given that it has from inception tended to be pluralist, processual, and rooted in everyday life. For all the discussion of participation, empowerment, democratization, or even liberation with respect to neogeography praxis, there has been comparatively little direct theorization of the *forms of politics* that are or might be advanced via neogeography, save for two recent papers that draw on Michel de Certeau's (1984) notions of "strategy" and "tactics" (Gryl and Jekel 2012; Lin 2013).

For de Certeau, "strategy" is constituted through the spaces and practices of hegemonic actors/institutions and forms of knowledge. Voting, presenting a map and oral testimony at a public hearing, staying out of an area framed in local discourses as a "bad" neighbourhood, or analysing local needs through community development's ubiquitous strength, weaknesses, opportunities, threats (SWOT) technique are all examples of *strategy*. In contrast, *tactics* rework (or at least refuse to cooperate with and reproduce) the norms, representational practices, and spatial meanings of strategy. Going walking in a neighbourhood commonly said to be dangerous challenges this spatial imaginary of danger through the action of occupying the space, and it transgresses a tacit prohibition against going there. "Walking"

this neighbourhood in the virtual space of a neogeography platform such as Google Maps is a visual spatial tactic (Lin 2013) that transgresses the same prohibitions in a digital environment. Of course, these two examples of spatial tactics are *not* identical experiences, given that one occurs in a material space and the other in a virtual space. But the broader point to be taken from Lin's notion of visual spatial tactics is that such digital practices can constitute a transgression or reworking of the spatial norms and restrictions of strategy.

As we will develop further in the next section, much of the existing literature on the societal significance of neogeography is already tacitly structured around this concept pair. Some work focuses upon the potential of neogeography as a practice of strategy (or a politics "from within"), and others emphasize neogeography as an arena for tactics (the means and practice of a "politics from outside" by disempowered and excluded actors). Yet on both sides, this work has to date focused primarily on neogeography as a practice or site of political *action* or *engagement*. We will argue here that neogeography practices – specifically visual spatial tactics – are significant not only because they constitute a space for political action or engagement by less powerful actors, but also because they can function as key sites of political *formation*. In what follows we show how the visual spatial tactics of neogeography can foster the formation of political subjects, the formation of collective action frames (which may spur these political subjects to action), and collaborative formation of shared knowledge. Thus, visual spatial tactics in neogeography are significant not just as practices of alternative political engagement or action by actors "from below" but *even more so* as practices constituting critical antecedents to such action. Tactical neogeography practices constitute subjects as critical thinkers, mobilized actors, and active agents in collaborative knowledge-making.

We develop these arguments from research conducted with young teens ages 10–13 at two Seattle schools from 2009 to 2012. School A is a public middle school enrolling approximately 500 students, 95% of whom are racial or ethnic minorities and 75% of whom come from low-income families. It is located in one of Seattle's areas of highest poverty, with comparatively high rates of unemployment, foreclosure, crime, and violence. School B is a private middle school of 100 students, 35% of them racial or ethnic minorities and 40% of whom receive financial aid for their tuition. Its surrounding neighbourhood grapples with many of the same concerns facing School A's neighbourhood, but arguably to a somewhat lesser degree.

Our action research with these two schools examined the potential roles of interactive mapping platforms in fostering civic engagement, collaboration, and place-based teaching and learning. In each of the three years, we conducted a 7- to 15-session module of interactive mapping activities, designed to complement the school's or teacher's existing efforts to have students learn from and about their city. In year 1, in a class we offered as part of the educational after-school program at School A, sixth and seventh graders created interactive maps of their "everyday geographies." In creating and sharing their maps, they represented and reflected upon the opportunities, constraints, and patterns in the places and movements of their own daily lives and those of their classmates. In year 2, as part of our activities with a seventh grade social studies class at School B, students created interactive multimedia maps exploring key sites and spatial processes in the urban histories of racial and ethnic minority groups in Seattle. In year 3, we conducted our mapping activities in the "environmental stewardship" curriculum of a fifth grade science class at School B. Students researched and mapped the environmental and cultural histories of two river systems in the Puget Sound area.

In each of these three mapping units, participating students created their interactive maps in an open-source mapping platform developed for this project. Offering a simpler set of tools than many existing commercial mapping websites, our platform enables students to create a map object (point, line, or polygon), position this object on a base map, give the object a name or title, and add text, images, URLs, or video in a textbox. When a map object is selected, this associated content appears in the window to the right of the map view (Figure 1). Another key feature of our platform is an interactive commenting function that allows users to select a map object and add (or respond to) comments, questions, or additional information. These comment streams appear beneath the map view and are accessed by clicking the map object (see Figure 1). The students primarily created their maps in this platform, but many of them knew about and used Google Maps in parallel, to access some of its additional services.[2] Specifically, they used its search engine to find particular addresses or place names and its street view service to explore photographic street-level panoramas of specific areas.

While our three mapping units were quite different in substantive theme, we structured all three around a similar cycle of individual and collaborative mapping, exploration of content, and critical reflection. Using Kolb's (1984) "experiential learning" cycle, this process moved from observing, sharing, or learning about concrete activities, events, or places in the "real world" to understanding the more abstract processes that generate them. As students mapped sites or spatial processes they deemed important (to the theme of each of the three units), our goal was for them to learn about and critically reflect upon the social, political, and economic processes and relationships

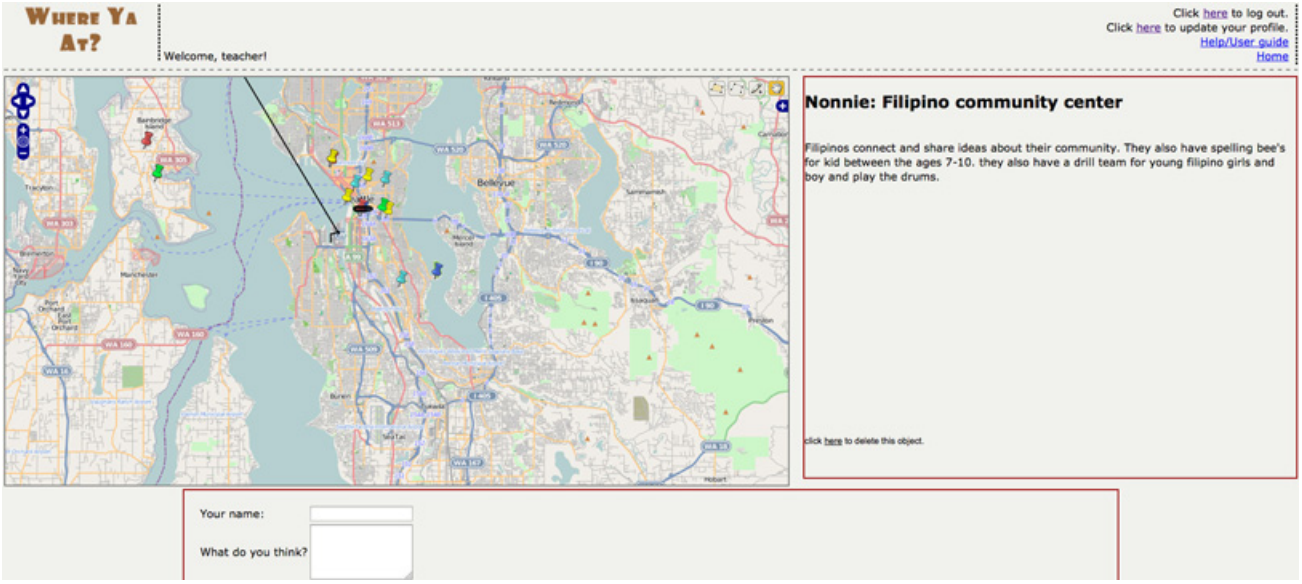

Figure 1. Interactive mapping platform design, showing map view, content window, and comment window.

that produce these geographies. Unsurprisingly, they also gained cartographic skills and experience with digital spatial technologies, but this was not our primary pedagogical objective. Further, while this research has generated contributions to scholarship in geography education and youth geographies (Elwood and Mitchell 2012; Mitchell and Elwood 2012a, 2012b, 2012c, 2013), our purpose here is to use evidence from this project to illustrate a more theoretical contribution to ongoing efforts to articulate the forms of politics that are or might be advanced in neogeography practice. With their emphases on examining and engaging social and spatial processes and relationships, especially vis-à-vis the past histories and present conditions of places in which they live, the youth neogeographies generated as part of our project are a rich source of evidence through which to consider these questions.

The pedagogic practices described above generated the empirical basis of our research on neogeography, children's politics, and citizenship education. Our research design follows Burawoy's (1998) extended case method, an inductive approach for generating theory from qualitative ethnographic research (as opposed to deductive research designs structured around testing hypotheses). In this approach, a case is selected on the basis of its ability to illuminate the conceptual questions of the research – for us, questions about the forms of politics that are possible for neogeographers who operate from positions of disempowerment and exclusion. Our questions about the political potential and significance of neogeography for less powerful actors further demand an inductive analysis of evidence that can illuminate processes, meanings, and social relations. To this end, our evidence included the students' multimedia maps; map comments from teachers, parents, and peers; and field notes produced by all members of our research team after each class session. Our inductive analysis involved iterative interpretive review of the data to generate and refine propositions about the nature and forms of politics advanced through the children's neogeographies. We validated our emerging findings through triangulation across multiple sources of evidence, aimed at identifying tensions, contradictions, and commonalities in the data. The specific examples presented below are illustrative demonstrations of the forms of politics practised by our young neogeographers but are not the only instances in which these practices occurred in the project.

Neogeography and the political

Recent scholarly work on neogeography has moved in several different directions. Some scholars have begun to trace the conditions of its emergence, particularly the hardware and software developments enabling it (Goodchild 2007; Haklay, Singleton, and Parker 2008). Others examine the shifting political-economic relationships around the production of spatial data and maps signalled by neogeography, with particular interest in the changing roles and relations of state and private-sector actors in this enterprise (Goodchild 2007; Harvey 2007; Radcliffe 2009; Boulton

2010; Kinsley 2010; Leszczynski 2012). Others have focused on the substantive content produced through neogeography practices, with particular interest in how people, places, or phenomena are represented (or not) and implications of these presences and absences for the (re)production of social difference, inequality, and the digital divide (Zook and Graham 2007; Crutcher and Zook 2009; Graham 2010; Graham 2011; Graham and Zook 2011).

Another key debate has been the implications of neogeography for cartography, GIScience, and geography. Some have characterized the roles of academic and professional cartographers and geographers as diminished, whereas others argue they are transformed but still essential (Gartner 2009; Goodchild 2009; Goodchild and Turner 2013). Map quality and public cartographic and spatial literacies have also sparked concern. For instance, the head of the British Cartographic Society recently worried that neogeographers (or "lay cartographers") will diminish the quality of maps (Crampton 2010), a concern mirrored in criticisms of neogeographers' cartographic design (Das and Kraak 2011; Kraak 2011). Perhaps prompted by these concerns, a number of recent interventions offer pedagogies aimed at using neogeography platforms to foster spatial literacy, principles of cartography and GIS (Patterson 2007; Allan 2008; Campbell 2008; DeMers and Vincent 2008; Papadimitriou 2010), and active citizenship and civic participation (Milson and Earle 2008; Harris, Rouse, and Bergeron 2010; Gryl and Jekel 2012).

Finally, this ever-growing literature has examined the social and political significance of neogeography by considering the purposes for which individuals and social groups engage these platforms. Some have considered the potential and limits of neogeography for public involvement in local government planning and decision-making (Rouse, Bergeron, and Harris 2007; Tulloch 2008; Johnson and Sieber 2012; Sieber 2012) or for citizen participation in activities such as redistricting (Crampton 2013). Several studies consider the rising use of neogeography interfaces to elicit and circulate citizens' observations of on-the-ground needs and conditions in natural disasters and other crises, with particular emphasis on the extent to which these applications may enhance the effectiveness of government and NGO relief efforts (Liu and Palen 2010; De Longueville and others 2010; Zook and others 2010). Some studies examine the ways that activist groups, NGOs, and other citizen groups use neogeography to connect with diasporic communities, disseminate counter-narratives, or mobilize diverse forms of action by members or potential advocates (Corbett 2012; Elwood and Leszczynski 2013; Lin 2012, 2013). Many of these counter-hegemonic neogeographies have included forms of recreation or art, ranging from "spot the black helicopter" games that "surveil back" on the state to digital map art that troubles traditional cartographic rationalities (kanarinka 2006; Cobarrubias and Pickles 2009; Crampton 2009; Kingsbury and Jones 2009; Lauriault and Wood 2009; Perkins and Dodge 2009).

Threading throughout this work on neogeography applications is a strong interest in their potential to foster inclusion, agency, and empowerment, especially for disempowered/excluded social groups or the context of deeply asymmetrical state-society relationships. Yet they tend to seek these outcomes in two very different arenas. Some focus on how neogeography has been or might be used in conventional spheres of deliberative politics, such as participatory governance schemes or the negotiations of NGOs/citizen organizations with state actors and institutions (Elwood and Leszczynski 2013). Others examine how neogeography may constitute an alternative site for citizens' articulations, deliberations, and cartographies (Kingsbury and Jones 2009; Lin 2012, 2013) – a way for citizens to advance counter-narratives, cartographic representations, or forms of (political) speech unlikely to be recognized or included in conventional deliberative spheres. These two approaches are implicitly differentiated by where and how they situate the realm of the political neogeography practice, and they do so in ways that draw on de Certeau's (1984) notions of "strategy" and "tactics." One emphasizes a "politics from within" – neogeography as a means to gain access to existing structures of deliberative democracy – whereas the other emphasizes a "politics from outside," neogeography as an alternative realm for citizen voice.

As an example of neogeography politics conceived as strategy, Gryl and Jekel (2012) argue that collaborative online "geo-media" (which has been termed neogeography in this article) can be sites for the development and practice of critical spatial citizenship. They argue that this critical spatial citizenship depends upon citizens' abilities to engage in "strategic practices" (de Certeau 1984), such as having the cartographic and spatial thinking skills necessary to use geo-media in ways that will be recognized by policymakers or other citizens and to use these platforms to disseminate their own spatial narratives or challenge those put forth by others. A more inclusive public sphere will emerge, Gryl and Jekel argue, when citizens are able to use interactive geo-media to engage in the representational and deliberative practices of "strategy."

Yet conceiving of the political potential of neogeography through notions of strategic practice has inherent limits. Critical cartography and GIS scholarship have long underscored that access to the bounded disciplinary practices of cartographic "strategy" is by definition partial and that many forms of spatial knowledge cannot be represented as "geographic information" nor expressed through conventional cartographic representation (Pickles 1995, 2004; Crampton and Krygier 2005). Feminist critiques remind us that structural inequalities and even definitions of "the political" exclude some social groups from the realms and practices of deliberative politics (Fraser 1990; Howell

1993). Indeed, de Certeau's effort to recognize the actors, practices of politics, and forms of knowledge that remain outside the realms of "strategic practice" are at the heart of his concept of "tactics." Because of these inherent limits, theorizations of the political significance and possibilities of neogeography must also include tactics.

Though not theorized as such, tactics are in evidence in many initiatives that use neogeography platforms for performance, art, and other counter-cartographic practices (kanarinka 2006; Kingsbury and Jones 2009; Perkins and Dodge 2009).[3] These performative/artistic neogeographies are characterized as political on the basis that they parody notions of cartographic omniscience or expose the inability of their representational practices to fully capture human experience/perception, or that they challenge state control over spatial data production and circulation by revealing (and making fun of) what is supposed to be secret or concealed. Lin (2013) engages the notion of tactics directly in her study of Chinese neogeographers fighting rapid urbanization, forced demolition, and illegal expropriation. In this context, the sites and practices of a politics of "strategy" simply do not or cannot exist – online activities are tightly controlled and monitored, and citizens have little access to formal decision-making structures. Yet citizens concerned with forced urban removal have developed neogeography tactics that contest dominant narratives and institutions and restrictions on activities and mobilities in particular places. For example, in one of their Google-based map mashups, users can "stroll" an off-limits lakeshore or share artistic representations of it, virtually reclaiming and reimagining a space that cannot be occupied in real life.[4]

These examples show the potential of neogeography as the basis for a politics of tactics – a site for citizens to produce new spaces and share counter-narratives in a context where direct confrontation is not possible and for actors who are excluded from a politics of "strategic practice." As Lin (2013) and others suggest, attention to tactics as an important part of the political repertoire of neogeography greatly expands the forms of politics (and by extension, the range of political actors) we can recognize. Yet our research with young teens' neogeographies suggests that the significance of visual spatial tactics extends *beyond* their potential as a form of political action or civic engagement. The visual spatial tactics profiled in much of the literature on counter-hegemonic neogeographies are largely performed by *already existing* political subjects, *already mobilized* by their concerns about various inequalities, injustices, or social, political, economic, and environmental conditions. Neogeography serves as the site or space in which these mobilized subjects perform their resistance. Our evidence suggests that visual spatial tactics in neogeography can have an even more foundational significance, serving not just as a site of political *action* but as a site of political *formation*. That is, we will show how visual spatial tactics of neogeography can be sites for (1) the formation of political subjects, (2) the formation of interpretive frames that can mobilize these subjects for action, and (3) the formation of shared knowledge through collaborative cartographies. Neogeography praxis has the potential to constitute political subjects, mobilized political collectivities, and shared knowledge – the critical antecedents to any form of political engagement.

In the discussion following, our concept of the politics is rooted in feminist scholarship that theorizes the political as practised in negotiations over structural inequalities, social relations, and identities and subjectivities, often in the realms of everyday life (Brown and Staeheli 2003). This framing does *not* mean that everything children do (or in our case, map) is "political." Rather, for us, visual spatial tactics that reveal youth people's recognition or active negotiation of these structures, relations, and identifications are a practice of politics.[5]

Youth neogeographies as visual spatial tactics

The neogeographies of young teens provide a rich source of insight into a politics of spatial tactics, in part because of constraints and exclusions experienced by children and adolescents. Young people are restricted from and forced into particular spaces and behaviours in their schools, homes, or neighbourhoods (Philo 2000; Jeffrey 2010). Young people also tend to be systematically excluded from traditional forums of deliberative democracy, simply based on age or because of their actual or perceived inability to articulate their positions in the forms of deliberation and representation demanded in these settings (Kallio and Häkli 2010; Skelton 2010; Skelton and Valentine 2003; Bosco 2010). In short, children are on many levels the kind of actors whose politics tend to emerge in and through tactics. This concept has been widely used to theorize the sites and practices of children's politics in the face of such exclusions (Cope 2008; Kallio 2008; Elwood and Mitchell 2012). The literature referenced earlier has well established that children themselves often do not articulate their tactics as "politics," so it would be fruitless simply to ask participating children to self-identify particular practices as political. Instead, our design interrogates their map content, mapping process, and discussion/collaboration to discern their tactics.

Here we focus less on young people's political *action* through neogeography and more on their political *formation*. Specifically, we will show that visual spatial tactics in neogeography have a central role to play in the formation of political subjects, the formation of interpretive frames that may mobilize these subjects to action, and their collaborative formation of shared knowledge. That is, visual spatial tactics matter because they may constitute some of

the critical antecedents of political practice and civic engagement – a proposition that nuances and deepens existing theorizations of the political significance of neogeography. Although our examples are drawn from youth neogeographies, we do not argue that the practices and politics described here are necessarily unique to young people. Rather, we focus on youth neogeographies as a window for examining the "politics from below" that are possible through neogeography praxis.

FORMING POLITICAL SUBJECTS

In the mapping activities we conducted in the after-school learning program at School A, participating students generated maps of their "everyday geographies" – places they travel to (or through) in their daily lives. We intentionally framed these activities in a very open-ended way, explaining that the object was for everyone to create a map of the places or experiences in their everyday lives that are important to them and would help someone else understand their lives. The students generated content for their maps through brainstorming discussions with each other and with us, photographing parts of their journeys between home and school, writing down observations between class sessions, taking us and one another on "guided tours" of the school and the surrounding neighbourhood, sharing their ever-expanding maps with one another, and adding or responding to comments associated with particular map objects.

The content of the neogeographies that emerged from this process was wide-ranging. It included a brightly painted house that one girl enjoys seeing on her walk to school, the bus stop that several students avoid because they have heard that older teens sell drugs there, a park where a boy can view a distant mountain, the school restrooms and gym locker rooms where some students see and fear bullying, and an Asian market where a family does their shopping. At the simplest level, the students' everyday maps constitute visual spatial tactics because they make visible sites and experiences that are often invisible to adults or in media and other public representations of the students' school or neighbourhoods. Further, the maps constitute visual spatial tactics by making visible important and meaningful places and experiences that might be overlooked or discounted as insignificant from the perspective of a school administrator or urban planner.

But beyond simply constituting a space of articulation for often-silenced or excluded actors, these neogeographies may *also* be a spatial practice through which actors come to recognize themselves as political subjects by developing insight into group-based exclusions. For instance, every single student in our class at School A included shops or fast-food restaurants near the school that they visit by themselves or with friends, and importantly, their map annotations and comments revealed contradictory spatial meanings. They clearly placed deep value on being able to go to these places without parents or teachers, but many of their map annotations (or discussions with us and their classmates as we explored their maps) *also* identified them as sites of exclusion and discrimination. For instance, alongside one fast-food restaurant near the school that appeared in every map, one student's annotation notes, "They have a new rule, only 3 kids allowed in at a time I feel so bad" (Figure 2). Another boy in the class represented a similar story of exclusion from a small market near the school. He was taking some time to decide on his purchase when the manager told him to leave. He explained that he was going to buy something, but she continued to insist that he leave and finally ejected him from the store, saying, "You're not in Africa anymore!" As other students began to engage this map content, they noted similar experiences in these specific businesses and other places in their everyday lives.

Producing and sharing these experiences through their maps is significant for the simple fact that these young teens are able to voice experiences of exclusionary social and material spaces. But of further importance, through their interactive engagement with one another's maps, the students began to discern common experiences constituted on the basis of shared social status and to question and challenge the broader axes of differentiation or exclusion behind them. For instance, responding to the story of the boy who was kicked out of the shop, he and his classmates engaged the intersecting racism and xenophobia underlying this experience: "I was born in Texas!" he said, rolling his eyes. "But you're black," responded one of his friends (also of East African descent). In other cases, the students noted that everyone's map showed a place they had been denied access to on the basis of their status as "kids." In lamenting the unfairness of these exclusions to each other and to us, students told stories of seeing adults being disruptive or stealing things in such places or argued that though some teens may be selling drugs or fighting in and near these places, they do not and, furthermore, they avoid these kids. These narratives question both the legitimacy of group-based exclusions (why exclude kids when adults also act badly?) *and* their own positioning within it ("kids" is not a fixed category – other kids may do this but not us!). This recognition, questioning, and rejection of structures/relations of inequality are a strong demonstration of the form of politics that emerges through the practice of what de Certeau calls tactics.

Through these neogeographies – understood as constituted by the maps themselves *and* the students' interactions with one another's map content – these young teens began to recognize the ways that their individual experiences are shaped by social categories ("child," "immigrant," "black"), shaped by inequalities produced around these categories, and shared by others. These insights are fundamental to the formation of political subjects: actors who perceive

Figure 2. Map view and student annotation of object representing a nearby fast-food restaurant

themselves as part of a collective "us" can discern social boundaries (an "us" in relation to "them"/"others") and can recognize inequalities produced through these social boundaries. Political formation is an essential antecedent to political engagement, for the practice of politics of course requires political subjects, and neogeography tactics constitute an important site of such political formation.

FORMING COLLECTIVE ACTION FRAMES

Another important spatial tactic practised by these young neogeographers was their use of our mapping platform and other neogeography services to virtually explore places they cannot go in actual practice. For instance, as the students at School A were creating and sharing maps of their everyday geographies, they used these platforms to virtually "walk" each other (and us) from their homes to school, to favourite parks, and to the places they go after school, panning along their routes and zooming in to show street-level images (in Google Street View) or zooming out to show surrounding areas. In many instances they used these "virtual excursions" to access places they now cannot go. Two boys used this technique to "visit" their old elementary school, which closed over fierce community objections. A pair of girls (after discovering that their maps included references to having lived in New York City) used the same technique to "visit" the streets where they each had lived before moving to Seattle.

These digital mobilities are a spatial tactic in that the students are using neogeography to circumvent spatial constraints. School and parental rules largely prevent them from exploring their school or home neighbourhoods, and most are only allowed to go directly to and from school, home, and their bus stops. Many rely on public transit vouchers for low-income students that can only be used for school/home travel. Even our efforts to take the students on a field trip were stymied by school program rules, gaps in light rail provision, and other restrictions. In their virtual excursions, these students seize neogeography platforms to produce mobilities not possible in their everyday lives, working against structures that are very difficult for them to confront directly – parents, school rules, transit policy, poverty. Although our focus in this paper is on visual spatial tactics as a site of political *formation*, we note that these "virtual visits" can be read as a kind of resistant action. On these virtual visits the children all seemed to go to "lost" places, often homes and neighbourhoods they have been forced to move away from or schools that have been closed. Their choices about what and where to "visit" might be read as acts of nostalgia or remembering. But they can also be understood as an act of recovering spaces lost to them through the dislocations and spatial limits often experienced by young people from impoverished families and neighbourhoods, an active effort to circumvent the experienced spatial effects of structural inequalities.

These visual spatial tactics are also significant as sites of political formation. In the process of conducting these collaborative virtual explorations, the children began to pose critical questions about the social and spatial forces

behind the constraints they were trying to circumvent. Visiting their now-closed elementary school, Newo[6] and Bumblebee asked, "Why did they close our school and not one in another neighborhood?" As they explored virtual spaces off-limits for actual visits, other students noticed the near-ubiquitous presence of prohibitions against going anywhere in the neighbourhood except school or home, and many asked us why we couldn't take the planned class field trip. These questions served as a pathway to insights into the broader structures behind these spatial constraints as the students discussed possible answers with one another and sometimes searched for additional information online. Perhaps the elementary school closed for declining enrolment, the kids suggested, because families were leaving or being forced out of this impoverished neighbourhood (School A's neighbourhood was at the time experiencing one of Seattle's highest rates of foreclosure during the housing crisis and economic recession of the late 2000s). They suggested that rules restricting their movements in the neighbourhood were rooted in school and parental fears about violence but wondered whether this might be less related to actual risks than to adult perceptions of children's vulnerability ("Just because we're kids!"). Trying to understand the myriad reasons behind our cancelled field trip, they noted that the new light rail line has no stops near their school and pointed to a variety of restrictions (such as extended school hours) placed on their school because it is federally designated as "failing."

Through their virtual excursions and exploration of the questions prompted by them, the students began to link individually experienced restrictions or grievances with the concerns/experiences of others *and* began to interpret or frame these experiences through broader social and spatial processes. The spatial constraints or restrictions they were engaging and discussing through their virtual excursions became seen as things not just that happen to them as individuals but that happen to particular kinds of people and places (children, impoverished neighbourhoods, "failing" schools). This linking of individual experiences to collectively felt constraints is an essential element in mobilizing subjects for political engagement, as are the nascent explanations the students developed for them.

Social movement scholars have long suggested that an important catalyst for collective action is the coalescing of groups or communities when individual grievances become perceived as shared (McCarthy and Zald 1977; Gamson 1990; Martin 2003). This mobilization is often forged through "collective action frames," interpretations through which groups make sense of or explain grievances and begin to re-articulate individual harms as collectively experienced (Goffman 1974; Snow and Benford 1988; Benford 1993; Martin 2003). It is precisely such a process that we see being catalysed through these young neogeographers' visual spatial tactics. The dialogic and interactional nature of the students' framing process is key to its potential for mobilizing action. The collective process of developing and discussing various possible answers to their critical questions is a kind of "frame alignment" (Snow and others 1986), a collective articulation of an explanation that resonated with the participating children. Their evaluation of the likely explanations is a process of collective consciousness formation, something that social movement scholars have long argued is critical to mobilization for collective action (see Tarrow 1992). In short, collective action requires a collective and these often coalesce through development of a shared explanatory narrative, as we see in these students' visual spatial tactics.[7]

So while Lin's (2012) examples and countless others remind us that neogeography practices can constitute a space of resistance or civic engagement, the above-mentioned examples suggest that visual spatial tactics in neogeography can also serve as a pathway for formation of collectively held explanations and interpretive frames. The interpretive frames that emerged from the students' interactive mapping practices did catalyse ideas about how they *might* act to engage some of their collectively experienced grievances. In sharing and reacting to their exclusion from and harassment in various neighbourhood establishments, they talked about creating a "best places for kids" map of their neighbourhood. Such a map, they argued, might be a good way to help other youth find welcoming sites (such as a store where the shopkeeper occasionally let them purchase items even if they did not have quite enough money) and avoid places where they might be treated badly or excluded altogether.

FORMING SHARED KNOWLEDGE THROUGH CARTOGRAPHIC FRAMING

One striking aspect of the visual spatial tactics produced by students in all three of our mapping exercises was their use of cartographic techniques to try to shape the interaction of other user-authors with their emerging map content. Instead of using cartographic symbols such as points, lines, and polygons to represent geographic phenomena, or the distribution and concentration of these features to represent "real-world" spatial patterns, they quite often used them to guide or "frame" the interaction of other user-authors with map content or other information linked to a map object. Parks's (2009) critical media studies analysis of Google Earth introduced the idea of "framing" via neogeography interfaces, with a focus on how the substantive meanings that map users receive are framed through multimedia content embedded in map objects. Our use of "framing" here follows more closely Elwood and Leszczynski's (2013) notion of framing as the deployment of cartographic and other visual symbols in neogeography as a means of guiding users' *interactions* with multimedia content. Framing involves the use of visual objects less for conventional cartographic communication than for

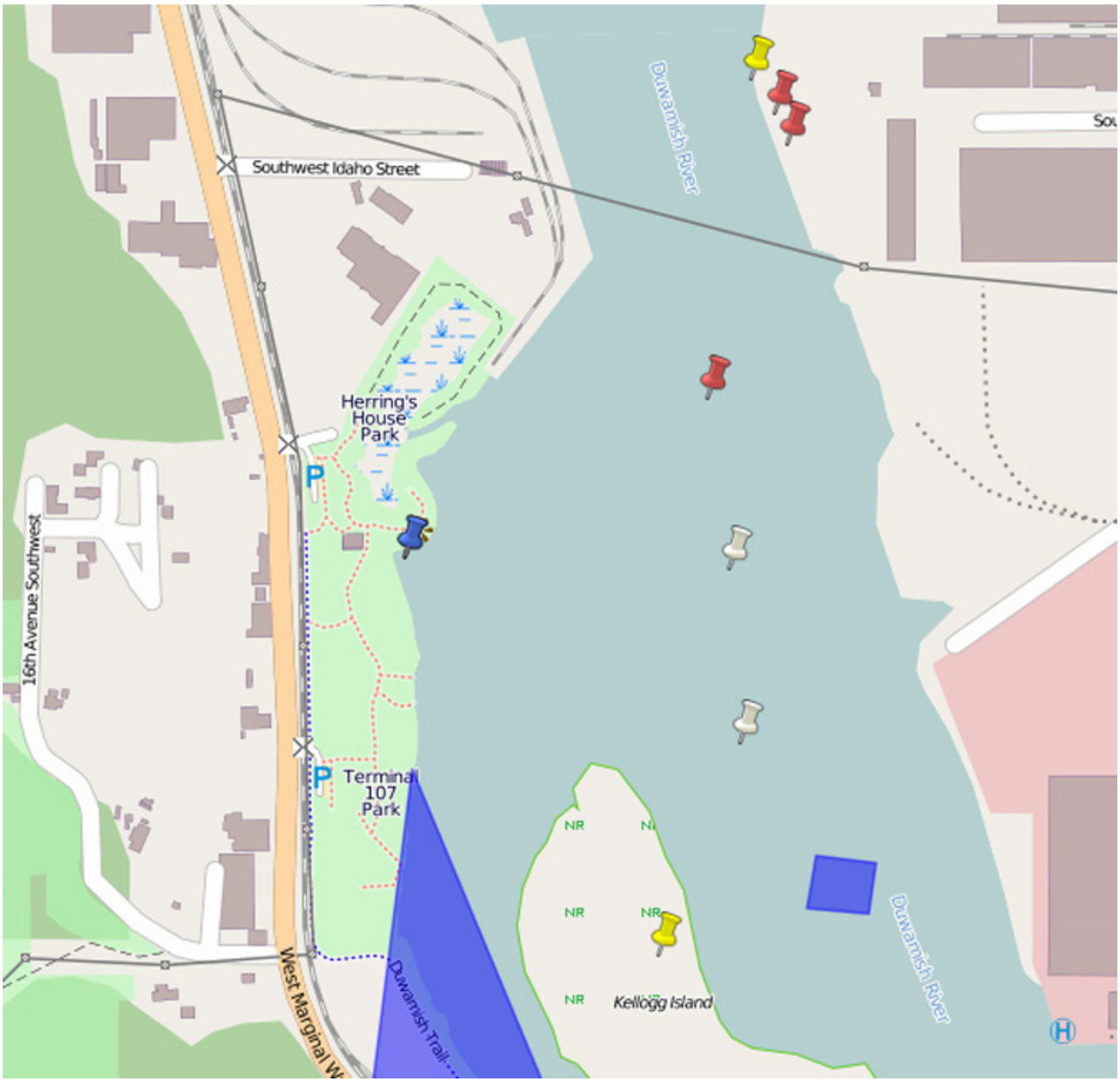

Figure 3. Cartographic symbols used for interactive framing

shaping users' interaction with map content, toward particular ends (e.g., getting the user to *do* something). That is, framing is more than simply making points, lines, or areas on a map; it is the intentional use of visual objects to produce particular meanings over others or to get users to do particular things as they engage map content. Methodologically, framing cannot be understood solely through examining map inscriptions, but rather it requires a process-oriented methodology that can illuminate mapmakers' intended purposes, intended meanings, and interactions of users with this content.

For example, Figure 3 shows a portion of the environmental/cultural histories maps of the Duwamish River produced by the fifth graders at School B. The large triangle in the southwest corner of the map does not represent a particular geographic feature in or by the river (such as barge or factory). Rather it functions as a framing device seeking other user-authors' engagement with related content a student embedded in the map when she added this object. Clicking the polygon opens to a comment where the student wrote, "Check this video out. It's an interview with James on KTCS9," and provided the URL to the online video clip (James is a Native American leader the class met as part of their cultural histories research on the river. KTCS is a local television station). When we asked the student why she chose a polygon as the map object for this content, she said she wanted the symbol to be larger than the nearby point markers. She reasoned that this visual cue would make other user-authors more likely to "open" the map object as they explored the map

 Cartographica 48:4, 2013, pp. 275–292 doi:10.3138/carto.48.4.1729

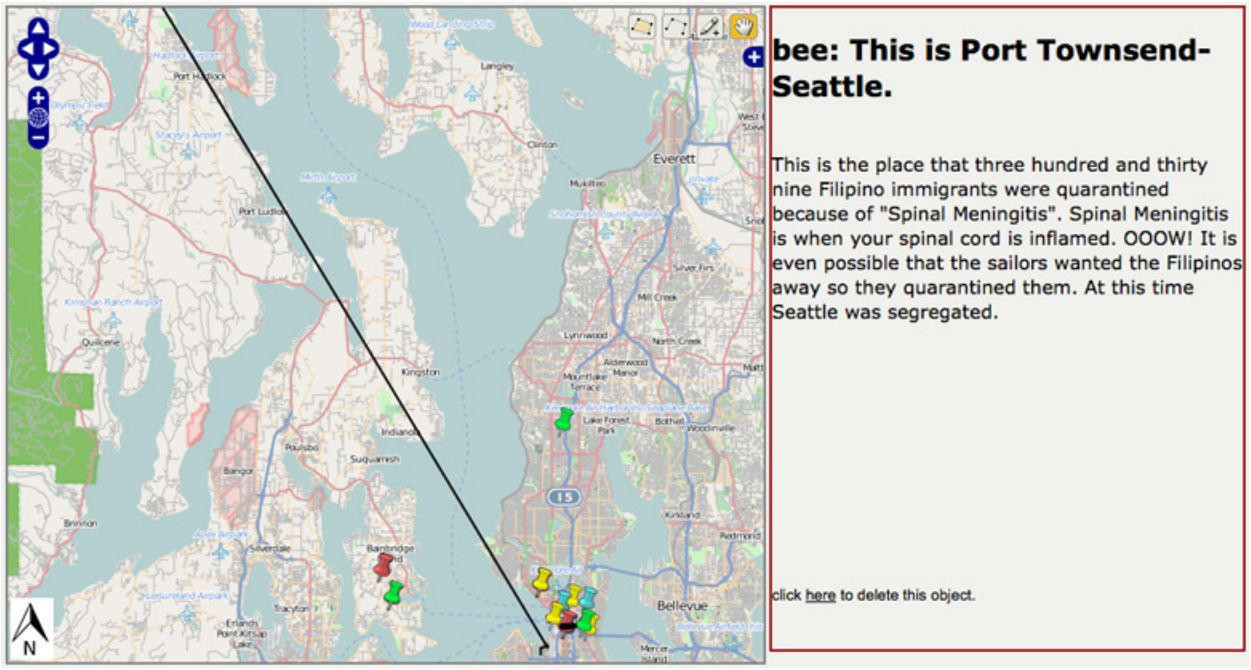

Figure 4. Filipino spatial histories map, including a linear "frame" to the distant quarantine area

and thus find her link to the video. Figure 3 includes additional examples of this "cartographic framing" tactic. The concentration of point symbols evident on the eastern riverbank emerged as several students added content such as historic photographs of industrial activity along the river. They placed these points without regard to the actual location where the photo was taken. Rather, when asked about their mapping decisions, students explained that they put their content near an emerging concentration of other map objects, to guide map users to interact with this content because of its tight concentration in one area.

Examining these maps or the decision-making behind them through the lens of cartographic "strategy," we would no doubt read them as "bad" maps – the product of novice or untrained cartographers misusing cartographic symbolization and scale, being inattentive to positional accuracy, and so on. Yet engaging these neogeographies as visual spatial tactics prompts us to ask instead how and to what ends this set of visual practices produces meaning or knowledge. From this perspective, these young neogeographers are redeploying the visual practices of cartography, not toward data representation or scripting a particular spatial meaning to a receiving audience but rather toward a collaborative process of knowledge-making. They use the visual tools and interactive capabilities of our mapping platform to frame user interaction with their emerging visualizations, quite often with a goal of eliciting further information or feedback from these other user-authors.

This process of cartographic framing and collaborative creation of shared knowledge is evident in Figure 4, a portion of the map created by several seventh graders at School B. This group of students was studying the historical geographies of Seattle's Filipino community. In their effort to identify and map key historical events, the students learned about the forced removal of many Filipino residents to a distant town where they were quarantined during an epidemic. At the default zoom level of their interactive map, this location was not visible. Their solution was to add this content to the map by way of a line connecting Seattle with the distant quarantine site (see Figure 4). The map object, the students explained, was supposed to prompt the user to zoom out and see what it was connected to (and by extension, engage the information associated with this map object).

The success of this framing strategy is apparent in Figure 5, the comment stream that emerged as others in the class explored the map and clicked on this linear object. The robust exchange between several contributors in this comment stream begins to form shared knowledge of the historical event and the broader socio-spatial processes it evidences. As questions are asked and answered through interaction with this map object, the original annotation is enriched to speak much more fully to connections between social relations and spatial processes. The original entry is a bit preoccupied with accounting for exact numbers of individuals affected and describing the disease itself. But further user-author interaction (through the map object) moves toward a deeper shared account of racism/discrimination underlying multiple spatial practices of confinement or removal. It is imperative to note that this process is in no way inevitable or determined simply

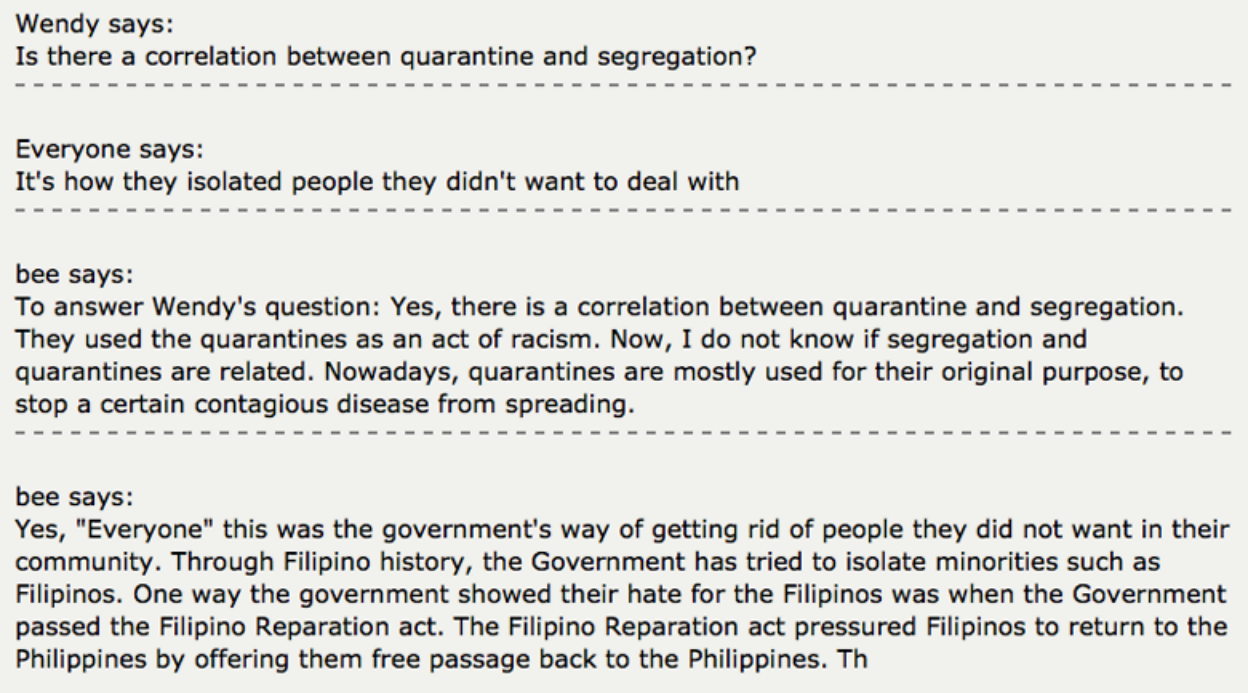

Figure 5. Comment stream associated with a linear framing object from Filipino spatial histories map

because of the availability of flexible mapping and commenting tools in our platform, but rather it results from the way the students opted to *engage* these representational and interactive tools available to them in this digital visualization environment.

These examples of cartographic framing to shape a dynamic process of shared knowledge-making expand our understanding of the political significance of visual spatial tactics in neogeography. Lin (2012) demonstrates how theorizing neogeographies as visual spatial tactics makes apparent some forms of resistance not otherwise visible or prone to being read as mundane or insignificant. Our examples illustrate that theorizing neogeography practices as visual spatial tactics *further* opens the window onto reconsidering the nature and significance of neogeographic cartographies. Measuring the geovisual representations of many neogeographers against the imperatives of cartographic strategy shows only "bad" practice. But engaging these neogeographies as visual spatial tactics reveals significant geovisual knowledge-making practices. In the Filipino spatial histories example, we see a group of actors building shared understanding and a collectively developed set of explanations for a particular event. This process of collaborative knowledge-making is another important piece in the processes of political formation we have been tracing here. These involve the formation of political subjects able to discern their situation vis-à-vis social structures and relations, the formation of critical insights or interpretive frames that might mobilize these subjects for collective action, and the collaborative development of shared knowledge.

Discussion

With the continued proliferation of interactive mapping interfaces and mobile spatial devices, the breadth and diversity of neogeography practice will no doubt grow apace. As more and more actors and institutions use neogeography in efforts to advance their claims, these politics will surely include conventional representational and deliberative practices recognizable from within conventional or hegemonic structures, as well as more counter-hegemonic visual spatial tactics. Existing scholarship has underscored the necessity of theorizing the political potential of neogeography in ways that recognize tactics to discern resistant, alternative, or suppressed articulations and spatial imaginaries that might otherwise be overlooked or deemed insignificant. To add to this theorization of neogeography as a space of political *practice*, we have illustrated here that neogeography may also be a space of political *formation*. That is, visual spatial tactics in neogeography are not only a sphere of engagement or action but a constitutive practice through which actors may come to understand themselves as political subjects, generate critical insights and collectively held interpretive frames that can mobilize collective action, or collaboratively develop shared knowledge. This contribution extends prior theorizations of neogeography politics and underscores the extent to which they are produced at the intersection of the social and the technological. For instance, the "tactic" of using cartographic symbolization techniques to structure user-author interaction emerges not from the existence of interactive

capabilities in a neogeography platform but from the way that knowledge-making actors engage these interactive functionalities.

Conceiving of neogeography practices as tactics and as a site of political formation also usefully re-situates persistent debates around geospatial technologies and "participation." In early discussions of neogeography and the geoweb, some scholars characterized these practices as individualistic or not sufficiently participatory (Sieber and Rahmatulla 2010; Corbett 2011; Poore 2011; Sieber 2011). Although the concern they raise is quite important, their framing around an "individualistic vs. participatory" binary requires prefiguring the kinds of practices that will "count" as participatory or not. In prior research on public participation GIS and participatory GIS, this conceptual centring around "participation" has led to seemingly endless debates about what practices are sufficiently participatory, what forms of participation are most appropriate in certain contexts, how to define the "public," and so on (Jankowski and Nyerges 2003; Laituri 2003; Rambaldi and others 2004; Schlossberg and Shuford 2005). Conceiving of neogeography through this binary transfers this impasse to theorizations of neogeography practice and limits the range of subject positions we can discern in these efforts. The very concept of "participation" prefigures a deliberative "inside" to which some actors are invited and sets up asymmetrical power relations between a convening authority and "participants" from the outset (Cooke and Kothari 2001), and it risks overlooking neogeography practices that occur outside this convener/participant relation. Theorizing visual spatial tactics and political formation in neogeography opens the door to more fully accounting for the diversity of neogeography praxis and its political significance.

Theorizations of neogeography that incorporate visual spatial tactics also allow for more nuanced conceptualizations of the subjects who practice neogeography. As noted previously, a consistent concern in early debates about the societal implications of neogeography centres on how and whether these practices may foster "bad" cartography and a loss of public spatial literacy, often understood as the ability to navigate material spaces, interpret thematic maps, or make decisions using spatial concepts (e.g., Weeks 2010). These framings conceive of the neogeographer largely through his or her positioning vis-à-vis the disciplinary heritages and conventional skills and concepts of cartography and geography, recognizing as knowledgeable actors only those who are insiders to these bounded knowledge systems.

Broadening our understanding of neogeography practices to include visual spatial tactics allows us to discern a wider range of significant knowledge-making practices and, by extension, a wider range of knowledgeable subjects (whose presence and contributions might be overlooked or discounted through the lenses of cartographic and geographic "strategy"). The young neogeographers in our project reveal themselves to be novice cartographers, and one could argue that many have yet to develop robust spatial literacies. Yet examining the processes and products of their neogeography practices as visual spatial tactics shows that they nonetheless hold rich pragmatic knowledge about how, for instance, to use digital visual practices to elicit information or generate interaction. Regardless of whether or not (or the degree to which) they hold conventional spatial literacy, these young neogeographers prove themselves as knowledgeable social actors when their visual spatial tactics enable them to draw critical insights about their own subject positions and about social and spatial relations. Of course, conventional cartographic principles and spatial literacies remain tremendously important for contemporary citizenship, and addressing deep inequalities in opportunities to develop these competencies deserves our utmost attention. But here, our purpose has been to offer conceptual tools for more fully recognizing the socially and politically significant "knowledge work" being done by neogeographers of all kinds.

Recognizing a wider range of knowledgeable actors and knowledge-making practices in neogeography, through the ideas of visual spatial tactics and political formation, also points to an expanded role for neogeography in education. Existing pedagogies focus almost exclusively on neogeography platforms as a way to teach "pre-GIS" digital and spatial skills, principles of cartography, or conventional forms of spatial reasoning in more accessible and lower-cost ways. But in spite of calls for work exploring the potential of neogeography platforms for progressive pedagogies (Dodge and Perkins 2009), there have been comparatively few attempts to do so.[8] The examples we have offered here begin to suggest the tremendous potential of neogeography for some engaged pedagogies or popular education (Freire 1972; Jarosz 2004; Giroux 2011). The activities of our young neogeographers enhanced their insights into social, political, and economic structures and histories that underlie inequality, exclusion, and marginalization along lines of race, class, gender, age, and other axes of difference – educational outcomes that we discuss in more detail in Mitchell and Elwood (2012b and 2012c). Though the 10- to 13-year-olds who participated in our project would likely use different terms to describe what they learned, the examples presented here do speak to this kind of critical learning from their process of mapping, interacting, collaborating, and reflecting. This cycle of activities could form the basis of exploratory learning processes designed to help students develop insights into social and spatial inequalities and the structures that produce them. In particular, given the emphasis in neogeography on the visualization and exchange of *personal* experience and perspectives (Eisnor 2006; Turner 2007), it may hold promise in experiential learning pedagogies that use the specific, the particular, and the personal as an entry for students' learning about more abstract, structural, and

societal concepts and propositions (Cone and Harris 1996; Howitt 2001; Elwood 2004).

Finally, our discussion has implications for how we conceive of and seek to foster critical spatial citizenship. Gryl and Jekel (2012) understand this as critically reflective uses of geographic information and spatial media to contribute to societal deliberations and decision-making in active and influential ways. Critical spatial citizenship is more important than ever in a world of "geocoded subjects" produced through a ubiquitous engagement with digital locational technologies in many places and ever-advancing panoptic, surveillance, and colonizing practices associated with new spatial technologies (Schuurman 2004; Dodge and Kitchin 2007; Wilson 2011; Elwood and Leszczynski 2011). But while Gryl and Jekel's notion of critical spatial citizenship focuses primarily on the political/geospatial realms and practices of "strategy," our work points to the necessity of understanding multiple pathways. Visual spatial tactics in neogeography must be recognized as an avenue for critical spatial citizenship because they can foster political subject formation, collaborative interactions that generate shared knowledge, and critical insights that mobilize these subjects for engagement. In a world of persistent inequalities and digital divides, opportunities for a critical spatial citizenship built around politics of strategy remain deeply problematic for many people and in many places, so our continued recognition of "tactics" as a practice of such critical citizenships is of the utmost importance.

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Note

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2. Google Maps creators must be 13 years old, so we could not use this service as a mapping platform for our project.
3. It is important to note that such visual spatial tactics were central to counter-cartography or participatory GIS projects long before the advent of neogeography (see, e.g., Cieri 2003; Elwood 2006).
4. Another multimedia map mashup compiles and shares memories of people's past experiences in an area that was destroyed for intensive urban development. Notably, they opted to map this area in the "wrong" location, thus avoiding official scrutiny and censorship, in essence re-creating the place beyond the reach of these constraints.
5. For a more extended discussion of conceptualizations of children's politics that draw on these traditions of feminist and political theory, see Elwood and Mitchell (2012).
6. All students selected a pseudonym to use for their mapping activities.
7. Allen's (2003) notion of relational power offers another way of conceptualizing the significance of these collective interactions. Claiming, "Power [. . .] is a relational effect of social interaction," Allen (2003, 2) argues that power is always established in *specific* relational linkages. Associational relations, such as those produced through the collective process of generating explanations for collectively experienced spatial inequities, tend to establish "power to" – the catalysing basis of action.
8. Professor Amy Hillier's historical Mapping Dubois project (http://www.mappingdubois.org/maps.html) and the Omaha Public Schools' Making Invisible Histories Visible project (http://www.ops.org/invisiblehistory/portals/0/MapIndex.html) offer wonderful examples of the creative potentials for critical pedagogies that rely on Web-based geovisualization resources.

References

Aday, S., and S. Livingston. 2009. "NGOs as Intelligence Agencies: The Empowerment of Transnational Advocacy Networks and the Media by Commercial Remote Sensing in the Case of the Iranian Nuclear Program." *Geoforum* 40(4): 514–22. http://dx.doi.org/10.1016/j.geoforum.2008.12.006

Allan, T.R. 2008. "Digital Terrain Visualization and Virtual Globes for Teaching Geomorphology." *Journal of Geography* 106(6): 253–66. http://dx.doi.org/10.1080/00221340701863766

Allen, J. 2003. *Lost Geographies of Power*. Oxford: Blackwell. http://dx.doi.org/10.1002/9780470773321

Benford, R. 1993. "Frame Disputes within the Nuclear Disarmament Movement." *Social Forces* 71(3): 677–701.

Bosco, F. 2010. "Play, Work or Activism? Broadening the Connections between Political and Children's Geographies." *Children's Geographies* 8(4): 381–90. http://dx.doi.org/10.1080/14733285.2010.511003

Boulton, A. 2010. "Just Maps: Google's Democratic Map-Making Community?" *Cartographica* 45(1): 1–4. http://dx.doi.org/10.3138/carto.45.1.1

Brown, M., and L. Staeheli. 2003. "'Are We There Yet?' Feminist Political Geographies." *Gender, Place and Culture* 10(3): 247–55. http://dx.doi.org/10.1080/0966369032000114019

Burawoy, M. 1998. "The Extended Case Method." *Sociological Theory* 16(1): 4–33. http://dx.doi.org/10.1111/0735-2751.00040

Campbell, J. 2008. "GloVis as a Resource for Teaching Geographic Content and Concepts." *Journal of Geography* 106(6): 239–51. http://dx.doi.org/10.1080/00221340701849799

Cieri, M. 2003. "Between Being and Looking: Queer Tourism Promotion and Lesbian Social Space in Greater Philadelphia." *ACME: An International E-Journal for Critical Geographies* 2(2): 147–66.

Cobarrubias, S., and J. Pickles. 2009. "Spacing Movements: Mapping Practice, Global Justice and Social Activism." In *The Spatial Turn: Interdisciplinary Perspectives*, ed. B. Warf and S. Arias, 36–58. New York: Routledge.

Cone, D., and S. Harris. 1996. "Service-Learning Practice: Developing a Theoretical Framework." *Michigan Journal of Community Service Learning* 3(1): 31–43.

Cooke, B., and U. Kothari. 2001. *Participation: The New Tyranny*. London: Zed Books.

Cope, M. 2008. "Patchwork Neighborhood: Children's Urban Geographies in Buffalo, New York." *Environment & Planning A* 40(12): 2845–63. http://dx.doi.org/10.1068/a40135

Corbett, J. 2011. "The Revolution Will Not Be Geotagged: Exploring the Role of the Participatory Geoweb in Advocacy and Supporting Social Change." Paper read at annual meeting of the Association of American Geographers, 13 April, Seattle, WA.

Corbett, J. 2012. "'I Don't Come from Anywhere': Exploring the Role of VGI and the Geoweb in Rediscovering a Sense of Place in a Dispersed Aboriginal Community." In *Crowdsourcing Geographic Knowledge: Volunteered Geographic Information (VGI) in Theory and Practice*, ed. D. Sui, M. Goodchild, and S. Elwood, 223–40. New York: Springer.

Crampton, J. 2009. "Cartography: Performative, Participatory, Political." *Progress in Human Geography* 33(6): 840–48. http://dx.doi.org/10.1177/0309132508105000

Crampton, J. 2010. *Mapping: A Critical Introduction to Cartography and GIS*. Oxford, New York: Wiley-Blackwell.

Crampton, J. 2013. "Political Applications of the Geoweb: Citizen Redistricting." *Environment & Planning A* 45(1): 70–76. http://dx.doi.org/10.1068/a44486

Crampton, J., and J. Krygier. 2005. "An Introduction to Critical Cartography." *ACME* 4(1): 11–33.

Crutcher, M., and M. Zook. 2009. "Placemarks and Waterlines: Racialized Cyberscapes in Post-Katrina Google Earth." *Geoforum* 40(4): 523–34. http://dx.doi.org/10.1016/j.geoforum.2009.01.003

Das, T., and M.J. Kraak. 2011. "Does Neogeography Need Designed Maps?" In *Proceedings of the 25th International Cartographic Conference*. Paris, France. Available at http://icaci.org/files/documents/ICC_proceedings/ICC2011/Oral%20Presentations%20PDF/B3-Volunteered%20geographic%20information,%20crowdsourcing/CO-123.pdf

De Certeau, M. 1984. *The Practice of Everyday Life*. Berkeley: University of California Press.

De Longueville, B., A. Annoni, S. Schade, N. Ostlaender, and C. Whitmore. 2010. "Digital Earth's Nervous System for Crisis Events: Real-Time Sensor Web Enablement of Volunteered Geographic Information." *International Journal of Digital Earth* 3(3): 242–59. http://dx.doi.org/10.1080/17538947.2010.484869

DeMers, M., and J. Vincent. 2008. "ArcAtlas in the Classroom: Pattern Identification, Description, and Explanation." *Journal of Geography* 106(6): 277–84. http://dx.doi.org/10.1080/00221340701851225

Dodge, M., and R. Kitchin. 2007. "'Outlines of a World Coming into Existence': Pervasive Computing and the Ethics of Forgetting." *Environment and Planning. B, Planning & Design* 34(3): 431–45. http://dx.doi.org/10.1068/b32041t

Dodge, M., and C. Perkins. 2009. "The 'View from Nowhere'? Spatial Politics and Cultural Significance of High-Resolution Satellite Imagery." *Geoforum* 40(4): 497–501. http://dx.doi.org/10.1016/j.geoforum.2009.04.011

Eisnor, D. 2006. "What Is Neogeography Anyway?" Available at http://platial.typepad.com/news/2006/05/what_is_neogeog.html

Elwood, S. 2004. "Experiential Learning, Spatial Practice and Critical Urban Geographies." *Journal of Geography* 103(2): 55–63. http://dx.doi.org/10.1080/00221340408978576

Elwood, S. 2006. "Beyond Cooptation or Resistance: Urban Spatial Politics, Community Organizations, and GIS-Based Spatial Narratives." *Annals of the Association of American Geographers* 96(2): 323–41. http://dx.doi.org/10.1111/j.1467-8306.2006.00480.x

Elwood, S. 2010. "Geographic Information Science: Emerging Research on the Societal Implications of the Geospatial Web." *Progress in Human Geography* 34(3): 349–57. http://dx.doi.org/10.1177/0309132509340711

Elwood, S., M. Goodchild, and D. Sui. 2012. "Researching Volunteered Geographic Information (VGI): Spatial Data, Geographic Research, and New Social Practice." *Annals of the Association of American Geographers* 102(3): 571–90. http://dx.doi.org/10.1080/00045608.2011.595657

Elwood, S., and A. Leszczynski. 2011. "Privacy Reconsidered: New Representations, Data Practices, and the Geoweb." *Geoforum* 42(1): 6–15. http://dx.doi.org/10.1016/j.geoforum.2010.08.003

Elwood, S., and A. Leszczynski. 2013. "New Spatial Media, New Knowledge Politics." *Transactions of the Institute of British Geographers* 38(4):544–59. http://dx.doi.org/10.1111/j.1475-5661.2012.00543.x

Elwood, S., and K. Mitchell. 2012. "Mapping Children's Politics: Spatial Stories, Dialogic Relations and Political Formation." *Geografiska Annaler. Series B, Human Geography* 94(1): 1–15. http://dx.doi.org/10.1111/j.1468-0467.2012.00392.x

Foth, M., B. Bajracharya, R. Brown, and G. Hearn. 2009. "The Second Life of Urban Planning? Using Neogeography Tools for Community Engagement." *Journal of Location Based Services* 3(2): 97–117. http://dx.doi.org/10.1080/17489720903150016

Fraser, N. 1990. "Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy." *Social Text* 25/26: 56–80. http://dx.doi.org/10.2307/466240

Freire, P. 1972. *Pedagogy of the Oppressed*. London: Penguin.

Gamson, W. 1990. *The Strategy of Social Protest*. 2nd ed. Belmont, CA: Wadsworth.

Gartner, G. 2009. "Applying Web Mapping 2.0 to Cartographic Heritage." *e-Perimitron* 4(4): 234–30.

Gerlach, J. 2010. "Vernacular Mapping, and the Ethics of What Comes Next." *Cartographica* 45(3): 165–68. http://dx.doi.org/10.3138/carto.45.3.165

Giroux, H. 2011. *On Critical Pedagogy*. London: Continuum.

Goffman, E. 1974. *Frame Analysis: An Essay on the Organization of Experience*. Cambridge, MA: Harvard University Press.

Goodchild, M. 2007. "Citizens as Sensors: The World of Volunteered Geography." *GeoJournal* 69(4): 211–21. http://dx.doi.org/10.1007/s10708-007-9111-y

Goodchild, M. 2009. "Neogeography and the Nature of Geographic Expertise." *Journal of Location Based Services* 3(2): 82–96. http://dx.doi.org/10.1080/17489720902950374

Goodchild, M., and A. Glennon. 2010. "Crowdsourcing Geographic Information for Disaster Response: A Research Frontier." *International Journal of Digital Earth* 3(3): 231–41. http://dx.doi.org/10.1080/17538941003759255

Goodchild, M., and A. Turner. 2013. "Neogeography and Volunteered Geographic Information: A Conversation with Michael Goodchild and Andrew Turner." *Environment & Planning A* 45(1): 10–18. http://dx.doi.org/10.1068/a44483

Graham, M. 2010. "Neogeography and the Palimpsests of Place." *Tijdschrift voor Economische en Sociale Geografie* 101(4): 422–36. http://dx.doi.org/10.1111/j.1467-9663.2009.00563.x

Graham, M. 2011. "Time Machines and Virtual Portals: The Spatialities of the Digital Divide." *Progress in Development Studies* 11(3): 211–27. http://dx.doi.org/10.1177/146499341001100303

Graham, M., and M. Zook. 2011. "Visualizing Global Cyberscapes: Mapping User-Generated Placemarks." *Journal of Urban Technology* 18(1): 115–32. http://dx.doi.org/10.1080/10630732.2011.578412

Grira, J., Y. Bedard, and S. Roche. 2010. "Spatial Data Uncertainty in the VGI World: Going from Consumer to Producer." *Geomatica* 64(1): 61–71.

Gryl, I., and T. Jekel. 2012. "Re-Centering Geoinformation in Secondary Education: Toward a Spatial Citizenship Approach." *Cartographica* 47(1): 18–28. http://dx.doi.org/10.3138/carto.47.1.18

Haklay, M. 2010. "How Good Is Volunteered Geographical Information? A Comparative Study of Openstreetmap and Ordnance Survey Datasets." *Environment and Planning B: Planning & Design* 37(4): 682–703. http://dx.doi.org/10.1068/b35097

Haklay, M., A. Singleton, and C. Parker. 2008. "Web-Mapping 2.0: The Neogeography of the Geoweb." *Geography Compass* 2(6): 2011–39. http://dx.doi.org/10.1111/j.1749-8198.2008.00167.x

Hall, B., R. Chipeniuk, R. Feick, M. Leahy, and V. Deparday. 2010. "Community-Based Production of Geographic Information Using Open Source Software and Web 2.0." *International Journal of Geographical Information Science* 24(5): 761–81. http://dx.doi.org/10.1080/13658810903213288

Harris, T., L. Rouse, and S. Bergeron. 2010. "The Geospatial Web and Local Geographical Education." *International Research in Geographical and Environmental Education* 19(1): 63–66. http://dx.doi.org/10.1080/10382041003602944

Harvey, F. 2007. "Just Another Private-Public Partnership? Possible Constraints on Scientific Information in Virtual Map Browsers." *Environment and Planning. B, Planning & Design* 34(5): 761–64. http://dx.doi.org/10.1068/b3405com

Howell, P. 1993. "Public Space and the Public Sphere: Political Theory and the Historical Geography of Modernity." *Environment and Planning. D, Society & Space* 11(3): 303–22. http://dx.doi.org/10.1068/d110303

Howitt, R. 2001. "Constructing Engagement: Geographical Education for Justice Within and Beyond Tertiary Classrooms." *Journal of Geography in Higher Education* 25(2): 147–66. http://dx.doi.org/10.1080/03098260120067600

Jankowski, P., and T. Nyerges. 2003. "Toward a Framework for Research on Geographic-Information Supported Participatory Decision-Making." *URISA Journal* 15 (APA1): 9–17.

Jarosz, L. 2004. "Political Ecology as Ethical Practice." *Political Geography* 23(7): 917–27. http://dx.doi.org/10.1016/j.polgeo.2004.05.014

Jeffrey, C. 2010. "Geographies of Children and Youth I: Eroding Maps of Life." *Progress in Human Geography* 34(4): 496–505. http://dx.doi.org/10.1177/0309132509348533

Johnson, P., and R. Sieber. 2012. "Motivations Driving Government Adoption of the Geoweb." *GeoJournal* 77(5): 667–80. http://dx.doi.org/10.1007/s10708-011-9416-8

Kallio, K. 2008. "The Body as a Battlefield: Approaching Children's Politics." *Geografiska Annaler. Series B, Human Geography* 90(3): 285–97. http://dx.doi.org/10.1111/j.1468-0467.2008.293.x

Kallio, K., and J. Häkli. 2010. "Political Geography in Childhood." *Political Geography* 29(7): 357–58. http://dx.doi.org/10.1016/j.polgeo.2009.11.001

kanarinka. 2006. "Art-Machines, Body-Ovens and Map-Recipes: Entries for a Psychogeographic Dictionary." *Cartographic Perspectives* 35(1): 24–40.

Kingsbury, P., and J.P. Jones III. 2009. "Walter Benjamin's Dionysian Adventures on Google Earth." *Geoforum* 40(4): 502–13. http://dx.doi.org/10.1016/j.geoforum.2008.10.002

Kinsley, S. 2010. "Representing 'Things To Come': Feeling the Visions of Future Technologies." *Environment & Planning A* 42(11): 2771–90. http://dx.doi.org/10.1068/a42371

Kitchin, R., and M. Dodge. 2013. "Crowdsourced Cartography: Mapping Experience and Knowledge." *Environment & Planning A* 45(1): 19–36. http://dx.doi.org/10.1068/a44484

Kofman, E., and L. Peake. 1990. "Into the 1990s: A Gendered Agenda for Political Geography." *Political Geography Quarterly* 9(4): 313–36. http://dx.doi.org/10.1016/0260-9827(90)90032-6

Kolb, D. 1984. *Experiential Learning: Experience as a Source of Learning and Development*. Inglewood Cliffs, CA: Prentice-Hall.

Kraak, M.J. 2011. "Is There a Need for Neo-Cartography?" *Cartography and Geographic Information Science* 38(2): 73–78. http://dx.doi.org/10.1559/1523040638273

Laituri, M. 2003. "The Issue of Access: An Assessment Guide for Evaluating Public Participation Geographic Information Science Case Studies." *URISA Journal* 15 (APAII): 25–32.

Lauriault, T., and J. Wood. 2009. "GPS Tracings – Personal Cartographies." *Cartographic Journal* 46(4): 360–65. http://dx.doi.org/10.1179/000870409X12549997389628

Leszczynski, A. 2012. "Situating the Geoweb in Political Economy." *Progress in Human Geography* 36(1): 72–89. http://dx.doi.org/10.1177/0309132511411231

Lin, W. 2012. "When Web 2.0 Meets Public Participation GIS: Volunteered Geographic Information and Spaces of Participatory Mapping in China." In *Crowdsourcing Geographic Knowledge: Volunteered Geographic Information (VGI) in Theory and Practice*, ed. D. Sui, S. Elwood, and M. Goodchild, 83–103. Dordrecht: Springer.

Lin, W. 2013. "Situating Performative Neogeography: Tracing, Mapping, and Performing 'Everyone's East Lake.'" *Environment & Planning A* 45(1): 37–54. http://dx.doi.org/10.1068/a45161

Liu, S., and L. Palen. 2010. "The New Cartographers: Crisis Map Mashups and the Emergence of Neogeographic Practice." *Cartography and Geographic Information Science* 37(1): 69–90. http://dx.doi.org/10.1559/152304010790588098

Madden, M., and A. Ross. 2009. "Genocide and GIScience: Integrating Personal Narratives and Geographic Information Science to Study Human Rights." *Professional Geographer* 61(4): 508–26. http://dx.doi.org/10.1080/00330120903163480

Martin, D. 2003. "'Place-Framing' as Place-Making: Constituting a Neighborhood for Organizing and Activism." *Annals of the Association of American Geographers* 93(3): 730–50. http://dx.doi.org/10.1111/1467-8306.9303011

McCarthy, J., and M. Zald. 1977. "Resource Mobilization and Social Movements." *American Journal of Sociology* 82(6): 1212–41. http://dx.doi.org/10.1086/226464

Meier, P. 2011. "Do 'Liberation Technologies' Change the Balance of Power Between Repressive States and Civil Society?" PhD diss., Fletcher School of Law and Diplomacy, Tufts University. Available at http://irevolution.net/dissertation/

Miller, C. 2006. "A Beast in the Field: The Google Maps Mashup as GIS." *Cartographica* 41(3):187–99. http://dx.doi.org/10.3138/J0L0-5301-2262-N779

Milson, A., and B. Earle. 2008. "Internet-Based GIS in an Inductive Learning Environment: A Case Study of Ninth-Grade Geography Students." *Journal of Geography* 106(6): 227–37. http://dx.doi.org/10.1080/00221340701851274

Mitchell, K., and S. Elwood. 2012a. "Mapping Children's Politics: The Promise of Articulation and the Limits of Nonrepresentational Theory." *Environment and Planning. D, Society & Space* 30(5): 788–804. http://dx.doi.org/10.1068/d9011

Mitchell, K., and S. Elwood. 2012b. "Engaging Students through Mapping Local History." *Journal of Geography* 111(4): 148–57. http://dx.doi.org/10.1080/00221341.2011.624189

Mitchell, K., and S. Elwood. 2012c. "From Redlining to Benevolent Societies: The Emancipatory Power of Spatial Thinking." *Theory and Research in Social Education* 40(2): 134–63. http://dx.doi.org/10.1080/00933104.2012.674867

Mitchell, K., and S. Elwood. 2013. "Intergenerational Mapping and the Cultural Politics of Memory." *Space and Polity* 17(1): 33–52. http://dx.doi.org/10.1080/13562576.2013.780712

Okolloh, O. 2009. "Ushahidi, Or 'Testimony': Web 2.0 Tools for Crowdsourcing Crisis Information." *Participatory Learning and Action* 59: 65–70. Available at http://pubs.iied.org/pdfs/G02842.pdf

Papadimitriou, F. 2010. "A 'Neogeographical Education'? The Geospatial Web, GIS and Digital Art in Adult Education." *International Research in Geographical and Environmental Education* 19(1): 71–74. http://dx.doi.org/10.1080/10382041003602969

Parks, L. 2009. "Digging into Google Earth: An Analysis of 'Crisis in Darfur.'" *Geoforum* 40(4): 535–45. http://dx.doi.org/10.1016/j.geoforum.2009.04.004

Patterson, T. 2007. "Google Earth as a (Not Just) Geography Education Tool." *Journal of Geography* 106(4): 145–52. http://dx.doi.org/10.1080/00221340701678032

Perkins, C., and M. Dodge. 2009. "Satellite Imagery and the Spectacle of Secret Spaces." *Geoforum* 40(4): 546–60. http://dx.doi.org/10.1016/j.geoforum.2009.04.012

Philo, C. 2000. "'The Corner-Stones of My World': Editorial Introduction to Special Issue on Spaces of Childhood." *Childhood* 7(3): 243–56. http://dx.doi.org/10.1177/0907568200007003001

Pickles, J., ed. 1995. *Ground Truth: The Social Implications of Geographic Information Systems*. New York: Guilford.

Pickles, J. 2004. *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. London: Routledge.

Poore, B. 2011. "VGI/PGI: Virtual Community or Bowling Alone?" Paper read at annual meeting of the Association of American Geographers, 13 April, Seattle, WA.

Radcliffe, S. 2009. "National Maps, Digitalisation and Neoliberal Cartographies: Transforming Nation-State Practices and Symbols in Postcolonial Ecuador." *Transactions of the Institute of British Geographers* 34(4): 426–44. http://dx.doi.org/10.1111/j.1475-5661.2009.00359.x

Rambaldi, G., M. McCall, D. Weiner, P. Mbile, and P. Kyem. 2004. "Participatory GIS." Integrated Approaches to Participatory Development. Available at http://www.iapad.org/participatory_gis.htm

Roche, S., E. Propeck-Zimmermann, and B. Mericskay. 2011. "GeoWeb and Crisis Management: Issues and Perspectives of Volunteered Geographic Information." *GeoJournal*, Epub ahead of print. doi: 10.1007/s10708-011-9423-9

Rouse, J., S. Bergeron, and T. Harris. 2007. "Participating in the Geospatial Web: Collaborative Mapping, Social Networks and Participatory GIS." In *The Geospatial Web: How Geobrowsers, Social Software and the Web 2.0 Are Shaping the Network Society*, ed. A. Scharl and K. Tochtermann, 153–58. London: Springer. http://dx.doi.org/10.1007/978-1-84628-827-2_14

Scharl, A., and K. Tochtermann, eds. 2007. *The Geospatial Web: How Geobrowsers, Social Software and the Web 2.0 Are Shaping the Network Society*. London: Springer.

Schlossberg, M., and E. Shuford. 2005. "Delineating 'Public' and 'Participation' in PPGIS." *URISA Journal* 16(2): 15–26.

Schuurman, N. 2004. "Databases and Bodies – A Cyborg Update." *Environment & Planning A* 36(8): 1337–40. http://dx.doi.org/10.1068/a3608_b

Sheppard, E. 2005. "Knowledge Production through Critical GIS: Genealogy and Prospects." *Cartographica* 40(4): 5–21. http://dx.doi.org/10.3138/GH27-1847-QP71-7TP7

Sieber, R. 2012. "Participatory Geospatial Web 2.0: Theory Meets Practice." Available at http://giscience.org/proceedings/abstracts/giscience2012_paper_176.pdf

Sieber, R. 2011. "Volunteered Geographic Information: Motivation or Empowerment?" Paper read at annual meeting of the Association of American Geographers, 13 April, Seattle, WA.

Sieber, R., and H. Rahmatulla. 2010. "Model of Public Participation on the Geoweb." Available at http://www.giscience2010.org/pdfs/paper_240.pdf

Skelton, T. 2010. "Taking Young People as Political Actors Seriously: Opening the Borders of Political Geography." *Area* 42(2): 145–51. http://dx.doi.org/10.1111/j.1475-4762.2009.00891.x

Skelton, T., and G. Valentine. 2003. "Political Participation, Political Action and Political Identities: Young D/deaf People's Perspectives." *Space and Polity* 7(2): 117–34. http://dx.doi.org/10.1080/1356257032000133892

Snow, D., and R. Benford. 1988. "Ideology, Frame Resonance, and Participant Mobilization." In *International Social Movement Research*, vol. 1, *From Structure to Action: Comparing Social Movement Research across Cultures*, ed. B. Klandermans, H. Kriesi, and S. Tarrow, 197–217. Greenwich, CT: JAI Press.

Snow, D.A., E.B. Rochford, S.K. Worden, and R.D. Benford. 1986. "Frame Alignment Processes, Micromobilization, and Movement Participation." *American Sociological Review* 51(4): 464–81. http://dx.doi.org/10.2307/2095581

Tarrow, S. 1992. "The Social Psychology of Collective Action." In *Frontiers in Social Movement Theory*, ed. A. Morris and C. McClurg-Mueller, 53–76. New Haven, CT: Yale University Press.

Tulloch, D. 2008. "Is VGI Participation? From Vernal Pools to Video Games." *GeoJournal* 72(3–4): 161–71. http://dx.doi.org/10.1007/s10708-008-9185-1

Turner, A. 2007. *An Introduction to Neogeography*. Sebastopol, CA: O'Reilly Media.

Weeks, L. 2010. "From Maps to Apps: Where Are We Headed?" National Public Radio. Available at http://www.npr.org/templates/story/story.php?storyId = 124608376

Wilson, M. 2011. "'Training the Eye': Formation of the Geocoding Subject." *Social & Cultural Geography* 12(4): 357–76. http://dx.doi.org/10.1080/14649365.2010.521856

Wilson, M., and M. Graham. 2013. "Situating Neogeography." *Environment & Planning A* 45(1): 3–9. http://dx.doi.org/10.1068/a44482

Zook, M., and M. Graham. 2007. "Mapping Digiplace: Geocoded Internet Data and the Representation of Place." *Environment and Planning B: Planning & Design* 34(3): 466–82. http://dx.doi.org/10.1068/b3311

Zook, M., M. Graham, T. Shelton, and S. Gorman. 2010. "Volunteered Geographic Information and Crowdsourcing Disaster Relief: A Case Study of the Haitian Earthquake." *World Medical and Health Policy* 2(2): 7–33.