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Data matter(s): legitimacy, coding, and qualifications-of-life

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Abstract. Data are central to geographical technologies and provide the pathways in which geographic investigations are forwarded. The mattering of data is therefore important to those engaging in participatory use of these technologies. This paper understands 'mattering' both in the material sense, that data are products resulting from specific practices, and in the affective sense, that data are imaginative, generative, and evocative. I examine these senses of mattering, of both presence and significance, in a discussion of a community survey project held in Seattle, USA. During this four-year project, residents in ten neighborhoods were asked to collect data about their community streets using handheld computers. Residents tracked 'assets' and 'deficits' by locating objects such as damaged sidewalks and graffiti on telephone booths. These data records were then uploaded to a central server administered by a local nonprofit organization. The nonprofit worked with community residents to help link these data about their changing neighborhoods to agencies in the municipal government. Here, I argue that the legitimacy of these data practices is constructed through processes of standardization and objectification and that these processes transduct urban space. I ask, as participatory mapping practices target governing agencies with their data products, what are the implications for the kinds of knowledge produced and for its legitimacy? In other words, how does data come to matter?

Introduction

Cities in advanced capitalistic societies are an accumulation of data, among other material-semiotic 'things'. This data accumulation in everyday urban living has more recently captured the attention of geographers increasingly interested in the interplay of technology and society (Crang and Graham, 2007; Dodge and Kitchin, 2005a; 2005b; 2007; Thrift, 2004; Thrift and French, 2002; Zook and Graham, 2007a). Data are collected toward the calculation/management of municipal functions (Beckett and Herbert, 2009; Crampton and Elden, 2006; Crang et al, 2007; Kaika, 2005; Kaika and Swyngedouw, 2000; Rose-Redwood, 2006), toward the surveillance of its residents (Galloway, 2004; Graham, 1998; 2005; Graham and Marvin, 2001; Graham and Wood, 2003), as well as toward economic competitiveness and development (McCann, 2002; 2004; 2007). It is somewhat unsurprising then that nongovernmental entities feel compelled to argue in the terms of data, to compete in this coded landscape.

More specifically, data about city spaces are increasingly expected in cartographic form (Crampton, 2010a; Elwood, 2006a; Elwood and Leitner, 2003; Ghose, 2007; Harvey, 2005; Sieber, 2007). As a result, formal and informal knowledges of the city are being encoded using emerging spatial data models, in what has been called Mapping 2.0, neogeography, the geoweb, and volunteered geographic information (Crampton, 2009; Elwood, 2008; Goodchild, 2007; Haklay et al, 2008; Zook and Graham, 2007b). These developments have drawn attention to the (de)professionalization of mapping practices and have generated concern within GIScience as to the natures of data themselves.[1]

[1] A couple of events mark an early interest in reining in and reorganizing disciplinary thought towards these emerging mapping practices. In 2007 Michael Goodchild and Rajan Gupta announced a specialist meeting of around thirty participants on 'volunteered geographic information'

Crampton depicts a "field of tension in mapping" between practices of securitization and practices of resistance; the former having to do with more conventional development/implementation in mapping and the latter with critique and new spatial media (2010b, page 5).

However, the more particular challenges of transforming community knowledges into data are less understood. Here, we might turn to work in participatory uses of geographic information technologies (Craig et al, 2002; Elwood, 2006a; 2006b; Elwood and Ghose, 2004; Harris and Weiner, 2002; Merrick, 2003; Nyerges et al, 2006). That community knowledges can be represented as data is, of course, central to participatory GIS. Yet, further inquiry as to the constitutive cultures of technology use is largely missing in this body of research (Wilson, 2005). Here, I ask how geographical data practices are made legitimate in everyday, neighborhood engagements. How are the potential effects of these practices mitigated? In other words, how do data practices materialize and come to matter in urban politics?

I consider these questions in light of a specific neighborhood mapping initiative facilitated in Seattle, USA. In 2003 a nonprofit called Sustainable Seattle set out to bolster their constituencies' claims[2] to neighborhood revitalization by using geographic data. In what follows, I discuss these matters of data. 'Mattering' is understood both in the material sense, that data are products resulting from specific practices around form and substance, and in the affective sense, that data are imaginative, generative, and evocative. Enrolling these multiple understandings of materialities, I conceptualize data beyond merely storage devices and instead as pathways for urban-political imaginations. To do so, I discuss how the work of indicators in urban assessment links data about declining built environments to the management of social disorder. More specifically, I draw on the concept of transduction (Dodge and Kitchin, 2005a; Mackenzie, 2002) to discuss how indicators about urban quality-of-life are made 'legitimate' through techniques of standardization and objectification—to decontextualize, depoliticize, and ultimately qualify certain lives, especially through motifs of crime, homelessness, and graffiti. Here, knowledge is disciplined and disciplinary; concerns about neighborhood quality-of-life are geocoded, become data, and made legitimate. These materializations, from the perspective of those practicing them, diversely matter in regimes of urban assessment.

Technologies of coding

> "The principle is one of multiplication: materiality is never apprehensible in just one state, nor is it static or inert."
>
> Anderson and Wylie (2009, page 332)

The coding work of urban assessment is material. However, as Anderson and Wylie (2009) suggest, materiality is "turbulent, interrogative, and excessive" (page 332), recovering a concept of materiality as a gathering, an assemblage, or a coming together, drawing on Deleuze and Guattari (1987). Here, I follow Whatmore's (2006) similar recuperation of materiality, as a return to the "processes and excesses of 'livingness'" (page 604), to destabilize notions of the material defined against the immaterial.

[1] continued
in Santa Barbara, CA, sponsored by the NCGIA, the Los Alamos National Laboratory, and the Vespucci Initiative. Similarly, a World University Network seminar was held in 2008, organized by David Unwin, to further explore the "technical, societal and academic challenges to traditional academic views and practices".

[2] Survey participants were primarily composed of the 'usual subjects' of Seattle neighborhood activism—individuals representing local chambers of commerce and neighborhood associations, and those volunteers who were available during working-day afternoons.

Materiality cannot be (nor was it ever, perhaps) this dead, immutable substrate (Anderson and Tolia-Kelly, 2004; Bingham, 1996). Indeed, feminist geographers and theorists have, for some time, taken up a return to the material, as they posit the ways in which the bodily[3] exceeds discourse (Butler and Parr, 1999; Grosz, 1992; Longhurst, 2001; Rasmussen and Brown, 2005; Rose, 2003). Within such materialist geographies, matter is, as McCormack (2010) argues, unsettled by "agitations and animations" through interventions that call for a materiality that is an "emergent quality of hybrid relations and associations", that "is itself in process", is "differentially" affective, and is an "enactive practice" (pages 642 – 643). In this sense, the materiality of code-work exceeds the stabilization of digital bits and bytes within the physical machine. Rather, it is multiple. How, then, are geographers to trace these multiplications in the urban?

One approach is to read the city as a "mechanosphere" which, according to Amin and Thrift (2002), is "a set of constantly evolving systems or networks" (page 78). Bodies, actions, and objects are enrolled in the creation of urban space. Amin and Thrift highlight the representational roles of objects, that they are enabled "to create coherent spaces and times" (page 88). Here, the emphasis is on the connectivity between objects, not necessarily as a space of flows (Castells, 1996), but in a Latourian frame as the stuff of "momentary associations" (Latour, 2005, page 65). Amin and Thrift's (2002) approach, as much of technology studies within geography, draws on this concept of the creation of space – time, that these "gatherings", as Latour (2005) calls them, can be "found everywhere" (pages 114 – 115). This notion of materiality demands a movement from "social constructivism", wherein objects are made "with some *other stuff*" (the 'social', the nonnatural), toward a *constructivism*, where "we account for the solid objective reality by mobilizing various entities whose assemblage could fail" (Latour, 2005, page 91, emphasis original). This provides a kind of ante-chamber through which we begin to trace these gatherings, these moments in which 'livingness' happens.

Geographies of technology have articulated how objects participate in the mapping of worlds (Hinchliffe, 1996; Kirsch, 1995). Geographers enroll concepts such as quasi-objects (Latour, 1993) and cyborgs (Haraway, 1991) to express the hybridities of technocultural world-making. That these hybridities have spatial dimensions is not new (Whatmore, 2002; Wilson, 2009). Rather, more recent geographies of technology point to the imbrication of the urban and the digital, the techno and the cultural. The point is to cause software, standards, and classifications to surface, to emerge from the background (even, of our own accounts), to demonstrate the renderings that make space (Bowker and Star, 1999; Thrift and French, 2002). Inquiry into the making of space is, of course, not unique to geographies of digital technology. Political geographers have drawn on the recently translated lectures of Foucault (2007), projects which examined calculative regimes as the sine qua non of modern government,[4] to interrogate the territorial logics within contemporary, governmental technologies (Crampton, 2010a; Crampton and Elden, 2006; 2007; Elden, 2007; Huxley, 2006; Legg, 2005). The increasing interplay of these technologies of government and digital technologies affords new modes of calculation that redefine, iteratively, the political production of self-knowledge.

[3] Throughout, I enroll 'bodies' instead of the fully formed 'person' to signal the fleshy materials that are actually not yet persons, but are in a state of becoming human, following Grosz (1992), through social processes that produce "an integrated and cohesive totality" (page 243).

[4] It is Foucault's turn from discipline to a "triangle of sovereignty – discipline – government" and the emergence of the concept of 'governmentality' that has reinvigorated concepts of territory and population as governmental analytics within recent political geographies; see Elden (2007, page 30) for a discussion of Foucault's lectures of 1977 – 78.

Studies of digitality have shifted as well. Perhaps signaling a departure in thinking around 'cyberspace', pervasive or ubiquitous computing marks the digital infrastructures that are present in everyday life (as opposed to the supposedly immaterial spaces of virtual reality). This emerging research examines designed interactions in the urban (Dave, 2007; McCullough, 2007), broadband development in the city (Townsend, 2007), mobility (Dodge and Kitchin, 2004), and the digital augmenting of sociality in urban space (de Souza e Silva, 2006; Paay et al, 2007). In their work on air transportation, Budd and Adey (2009) suggest that the interplay between the real/present and the digital/virtual demands our rethinking of software practices, that the code-work of everyday life is both physical and immaterial. These new technologies saturate everyday experience as contended by proponents of ubiquitous computing futures (Dodge and Kitchin, 2007; Kinsley, 2008; 2010).

Thus, the 'everyday' is a recurrent theme among geographies of technology. Dourish and Bell (2007) point to the "simultaneous layering" of virtual computing networks upon and among existing physical landscapes, through which the spaces of the everyday are experienced (page 428). Code/space is a concept that Dodge and Kitchin (2004) use to describe the insinuation of software code into life, where spaces are dependent on code. Within the space of the Western home, they write (2005a; 2009), coded objects are already common with RFIDs, DVRs, and telecommunication and monitoring systems that permeate our everyday domestic practices. These sorts of everyday software practices should give us pause, Graham (2005) and Dodge and Kitchin (2005b) argue. Code-work constitutes difference (Chun, 2004; Crang and Graham, 2007; Graham, 2005; Kittler, 1995; Thrift and French, 2002). Codes enable the stratification of urban life, and furthermore, they enable new forms of governmental control.

However, the increasing iteration of these digital technologies across daily life begets a conceptual-methodological issue—of how to trace these materialities as multiplications. Here, I follow the lead of Dodge and Kitchin (2005a), to enroll the concept of the transduction of space—the unfolding of space through reiterative coding practices. Dodge and Kitchin draw upon Mackenzie (2002), who writes of "thinking transductively", using the concept of transduction,

> "in tracking processes that come into being at the intersection of diverse realities. ... [These realities] entail a knotting together of commodities, signs, diagrams, stories, practices, concepts, human and non-human bodies, images and places" (Mackenzie, 2002, page 18).

Accordingly, in the code-work of urban assessment, digital objects create spaces. Mackenzie uses history to narrate the contingencies of this "knotting together", that technology "must be seen as historically sedimented, and as instituted iteratively and through differences" (2002, page 54). Taking code-work "seriously", Mackenzie (2006) writes, requires our understanding of the processes and practices through which code becomes "ordinary or obvious" (page 6). And so, to be defamiliarized, according to Mackenzie, geographies of technologies should proceed by returning to the interplay of the material and mattering, to take up the "matters of concern", as Latour (2004) argues. The materiality and mattering of coding technologies is a function of the practices that assemble bit and byte, software/hardware, subjects and objects, the 'real' and the 'virtual'. In the remaining sections I discuss the practices in which these coding technologies produce data, to understand more fully not only the saturation of data in urban life but, more importantly, the textured code-work in which urban space unfolds, transductively. I situate this discussion in the indicator development practices of a nonprofit in Seattle, USA.

Situating indicators

Each of the ten participating neighborhoods in Sustainable Seattle's survey program was involved in a series of meetings to discuss neighborhood sustainability, to train residents as surveyors, and, in limited cases, to report back on the collected measures. Sitting in the converted City Light control room of the Uptown neighborhood center building, I listen in on one of these meetings as a local business owner rallies the community surveyors to be vigilant of litter on the sidewalks. Uptown, a neighborhood that rebranded itself from being called 'Lower Queen Anne' in 1998, includes the mainly commercial community surrounding Seattle Center—the location of the Space Needle. The discussion in the room turns to the problem of outsiders, to those who enter into the neighborhood, adding to the problem of littering and loitering. Another long-time resident becomes incensed by the public telephone booth in the neighborhood. For him, the phone booth acts as a magnet for particular undesirables in the community—insinuating that those bodies that use the public phone do so to engage in illegal drug activity or prostitution. A number of his neighbors agree; the phone booth attracts urban decay, in the form of graffiti, litter, and loitering youth. In these code-work sessions, the objects of the built environment connote a bodily and urban imaginary. The presence of litter and the public telephone booth become the entry point for discussion. These object-oriented discussions emerge from questions of data—of how to collectively assess the quality-of-life of an urban environment.

Stepping back from this moment, it is helpful to situate these data practices in the broader development of indicators. Sustainable Seattle came to international recognition as it created indicators to measure regional sustainability, published in three reports in the 1990s. The organization captured the attention of other nongovernmental organizations and governmental agencies, triggering a series of indicator projects in the region (Holden, 2006a; 2006b). However, at the turn of the century the organization encountered some difficulty in demonstrating how these regional sustainability indicator reports were creating actual change. The organization shifted its focus towards neighborhood indicators, believing that by engaging residents in questions of sustainable neighborhoods (which largely became inquiry into local quality-of-life) the resulting sets of measures would have more explicit, actionable objectives. Sustainable Seattle began to seek out ways in which residents could produce measures of their local neighborhoods, such that these data could be acted on, by or in partnership with municipal government.

Handheld computers—personal digital assistants (or PDAs)—became the obvious coding technology for the organization. Combining a multi-user database system and touch-screen friendliness, Sustainable Seattle could involve residents in the collection of community-based, geographic information. While the importance of geographic information technologies for community organizing has been well documented (Elwood, 2002; Ghose, 2001; Leitner et al, 2000; Ramasubramanian, 1999), the dynamics of mobile computer handhelds used to collect geographic information has been less understood. Handheld computers allow the individualized collection of indicator data about neighborhood quality-of-life. With these kinds of mobile technologies, data about urban life can be captured in situ.

Indicators collected by handheld computers are an assemblage of assessment protocols and mobile technologies. As such they work to produce space through difference—by measuring differences from collective, imagined urban ideals. Indicators code observations, exposing a desire for a particular urban environment (eg, well-kept sidewalks, facades free of graffiti) while underlining the lack inherent in the observed space. A further tracing of indicator systems is needed, to witness the situatedness of their materialization (Haraway, 1997; Wilson, 2009). In the next section I discuss how data

transduce space—recognizing that surveyed spaces are iteratively created through every indicator, in every record that is coded into the handheld computer.

Legitimacy through object-making

> "Obsessed with the capture of movement, imbued with the values of precision and caught up in its own representations, the visual is clearly the chief register through which the governance of the city is registered." Amin and Thrift (2002, page 121)

At the conclusion of neighborhood meetings, residents would be trained to use a handheld computer to gather data about their neighborhood's quality-of-life [see Wilson (2011) for discussion of this geocoding training]. The software on these handhelds was called ComNET, short for computerized neighborhood environment tracking. During these surveys of Seattle neighborhoods, objects of the street were digitally encoded, such that they could be connected to municipal agencies. These practices furthered an imagination of the city as a series of information inputs and outputs, a digital "city of flows" (Kaika, 2005). This digital flow of information begins in the street. Residents with handheld computers move through their neighborhood, visually inspecting the streets that they live on, walk on, meet friends on, consume on, and now survey on. The acts of gathering information, of uploads and captures, occur on the street, electronic device in hand.

Objects become the focal point in these surveys. Residents walking down their neighborhood streets enter into their handheld devices the conditions of things in or on the street. Interviewee 'Ruth Olson'[(5)] at the New York City (NYC) foundation responsible for developing ComNET describes this process to me; she says (2008): "It's all about the stuff that you see. Your feeling is that the city is not working right. It's a cue!" Cues, for Olson, are those objects of the street that signify a lack of attention by the municipal government. Residents, unaware of the multiple agencies that govern street conditions, can focus their energies instead on the objects or cues. They enter the object and describe its condition or, in other words, they geocode. From here, the newly formed data flow into the central storage of the ComNET system. This is an imagined, ideal urban governance—where citizen concerns are tracked as discrete packets of data throughout a system of connected municipal agencies—an imagination consistent with the anticipatory logics of the ubiquitous computing movement (Kinsley, 2010).

The transduction of space by data began before the surveys were started, in the development of the data categories themselves. Here, as I enroll transduction to be the reiterated digital practices that create space anew, I underline the importance of categorical development, following Bowker and Star (1999). Categories remake the world by constituting the ways in which that world is expressed, interpreted, and accessed. The classification system used by the ComNET program works to transduce the space of the urban street as a particular computational space. The categories of the system emerged out of clean-up-the-streets movements in NYC as applications of broken windows theory (Silverman and Della-Giustina, 2001). This system was also a way of visioning the street. Residents participating in the street survey would describe the street through these classifications, in terms of features and their conditions. For instance, upon seeing a graffiti tag on a signpost at a street intersection, the resident would enter into their handheld device the *feature* (the object of their gaze): a 'signpost'. Then they would enter the *condition* of the feature: 'graffiti'.

[(5)] Pseudonyms are used for all interviewees.

These reiterative practices highlight the transductive work of indicators. As codes, indicators become obvious, internalizing the act of seeing an object out-of-place (eg, a graffiti tag), and enabling a vaporization of the event that produced that object (eg, a graffitist). Information about the graffitist or the conditions that situate such an actant is not stored in the computing device. Instead, the object of that event is recorded and the surveyor moves on, participating in a broader assemblage of the "technological unconscious", conditions through which spaces become standardized (Thrift, 2004). Furthermore, in vaporizing the situations through which these urban events happen, the act of surveying a street for a predefined set of objects abstracts any discussion about the bodies on and the social conditions of the street. Discussions about deteriorating social conditions and related social pariahs are tabled, through actual data tables that are uploaded to the organization's server and readied for processing. In my participant observation of these surveying practices, the distillation of these events into objects disenables more contextualized discussion. It is not until my focus group comprising survey participants meets that these discussions about the broader social conditions of the urban street emerge, as will be further elaborated below.

Data transduce the space of the street, by reformulating those lives lived on the street as objects. The ComNET system focuses on these objects—distancing any 'emotional' bias in this 'objective' measure of the condition of the street in an effort to legitimize indicators. This categorization of objects enabled neighborhood residents to code an event (the tagging of a park bench) without the presence of the event (of actually witnessing the graffiti happen). These data practices 'see' the urban in ways that draw participants away from the social and bodily aspects of 'urban decay' and instead isolate and objectify the urban experience as discrete sets of data—a transduction of space by data. I ground this discussion of the decontextualization and depoliticization of code-work in one particularly conspicuous indicator: 'suspicious activity'.

'Suspicious activity'

'Suspicious activity', one of the 'features' used in the ComNET handheld, included the following selectable 'conditions': abandoned shopping carts, alcoholic beverage containers, condoms, drug paraphernalia, and urine or feces. During my participant observation of these surveys, not a single resident questioned the existence of the 'suspicious activity' category. When pressed about the presence of the category, there was disagreement about where it originated, about how the data model underwent changes as it was adopted to the priorities of neighborhood partners. Many of these priorities had to do with how to capture data related to public safety, whether that was about issues of prostitution in the North Beacon Hill neighborhood (interviewee Roberts, 2008) or with abandoned buildings and graffiti in the International District (interviewee Caruthers, 2008). The presence of this category became an uneasy topic of discussion. That 'suspicious activity' could mean *anything* and thereby signify *anything* further displaces the implications of this kind of accounting practice.

Staff at the NYC foundation deny that the category 'suspicious activity' was an NYC category (interviewee Olson, 2008). Instead, they trace this kind of category to the initial focus groups hosted by the organization in 1995, where there were concerns about 'persons in need'. Indeed, in the original feature-conditions data model used in the 2003 pilot survey in Seattle, 'persons in need' was a category—an important, qualitative difference—with the following 'conditions' stored in the handheld: homelessness, panhandling, and other. While the coding of these 'conditions' did originate in NYC, it appears that the 'suspicious activity' category replaced 'persons in need',

and conditions such as 'abandoned shopping carts' replaced 'homelessness' as the survey developed in Seattle.

This recoding was believed by Olson to increase the objectivity of the survey practice, to avoid speaking about specific bodies. During the focus groups held by the NYC foundation, residents said that if they had seen broken glass in the street, they would have assumed that a car window had been broken. While this was certainly a question of public safety, those at the NYC foundation felt that the appearance of broken glass was "too subjective", according to Olson. Other objects of the street were better indicators of 'suspicious activity' (homelessness)—abandoned shopping carts, condoms, alcoholic beverages, drug paraphernalia—in other words, "to measure what is seen" (interviewee Olson, 2008).

Data matter

> "Hard data, where it may or may not be as important to the community members, are extremely important to policy makers and funders, who would then give resources towards the particular issues that came up."
>
> interviewee Weng (2008)

That data matter to those participating in the street-level surveys was an understatement. For many of the residents I spoke with, including 'Sandy Weng' at the Seattle Department of Neighborhoods, data were the actionable objects—the crucial move in gaining the attention of the municipal government in the concerns of their neighborhood. Graffiti is figured prominently in the data model of ComNET, and like 'suspicious activity', codes certain lives lived as objects of the street. Graffiti could be observed and recorded as it was seen on lampposts, buildings, benches, garbage receptacles, street signs, and the sidewalk itself. Graffiti emerged as one of the top conditions reported in many neighborhoods. Therefore, the coding of graffiti tags effectively prioritized this event within the communities served by Sustainable Seattle.

While many survey participants quite effortlessly coded 'graffiti' into their handhelds during the actual survey, some felt uncertain about how to interpret the results, about what to do with such data. Due to the lack of opportunities to discuss the results of the survey practice, I organized a focus group with a sampling of survey participants from a selection of participating neighborhoods.[6] In what follows, I highlight aspects of this focus group discussion, to demonstrate how data came to matter for these Seattle residents.

> **Sunders:** "I remember a person on our group was so compulsive, and would count everything! And I was getting really tired. It was cold, rainy, and they kept counting every little thing, absolutely. And so [the survey] was very subjective about how compulsive the person was. It's a little hard to compare, because it wasn't like a general sense of how much graffiti there is, [instead] *there was a counting of every little piece of it*" (emphasis added).
>
> **Graves:** "Yeah and I mean, data is always interesting in that way, and [I'm] just reiterating that my projected concern is that *that particular item is going to get a lot of attention*, and there are so many other street-level components that are, you know, [important]. ... So I'm just super worried about that deal (emphasis added).

This discussion between two women from different neighborhoods (Phinney Ridge and Capitol Hill) highlights the importance of data in figuring the concerns of community residents and transducing the space of the street. 'Lisa Graves' initiates the discussion after looking at a printed table displaying the frequency of recorded feature-conditions.

[6] Thanks go to Chris Fade, who assisted with this focus group as part of her studies at Whitman College.

For her the panic surrounding graffiti has to do with a disposition towards youth. In this discussion, Graves is careful to recognize the importance of this form of data in municipal decision making. For her, it's a matter of clarifying the relative importance. 'Catherine Sunders', a long-time resident of the Capitol Hill neighborhood, points to the subjective nature of this kind of measurement, of "counting every little thing". For both, the mattering of data is at issue.

The materialization of data around the occurrence of 'tags' slips easily into the significance of that data collection event. In this slippage, the transductive force of data is apparent; the significance of these unsavory elements of the urban street is produced by the shear aggregation of the individually coded tags. In other words, the code-work of counting graffiti tags is meaningful as a counting event, and belies other (perhaps, more meaningful) discussions about the presence of graffiti. It is not until the participants are asked to speak to the results of the survey that this transductive relationship between code and meaning, data and space, is made recognizable.

This discussion points to the pervasiveness of counting in these kinds of urban data practices. As a technology of coding, counting fixates on the occurrence, while displacing the conditions of that occurrence. Counting decontextualizes. Counting does not remove meaning; as Graves and Sunders articulate above, counting matters too much. Later in our focus group discussion, 'Lisa Graves' and 'John Griffin' describe the displacement that results.

> **Graves:** "One of my theories is that graffiti, and occurrence of graffiti, is directly proportional to youth habitat and whether there is youth habitat or not, and so somehow I want to be able to *use [these data] as a tool to get youth habitat and provisions* ..." (emphasis added).
>
> **Griffin:** "So if you can't—if you don't articulate that kind of [approach] ... then the standard practice is [that] this [graffiti] is a sign of disorder, this is a sign of a problem, as opposed to this is a habitat for teens. It's a different problem. ... *This [graffiti] is a symptom of a problem.* ... And this is the thing that's so interesting with this kind of data system. ... You can get into a belief that this [data] is a real thing, ... and not to understand how this relates to other types of phenomena" (emphasis added).

Here, Graves and Griffin discuss how data about graffiti, stripped of its relationality, foregrounds counting as the primary representational mechanism. Instead, during our focus group, other narrations of the data emerge. Graves crafts an association between the lack of environments for youth activity, what she calls "youth habitat", and the presence of graffiti. For her, the 'problem' of graffiti, as it gets counted during these street-level surveys, can only be resolved by looking at the needs of youth in that neighborhood—needs which are perhaps less easily counted and coded into this indicator system.

In this data practice, the acts of counting graffiti and shopping carts and of these counts becoming data, becoming "a real thing", so easily forecloses a discussion of the underlying, structural problems that cause these objects to surface. Furthermore, these contextualizations as they emerge in the focus group, such as those offered by Graves regarding "youth habitat", cannot materialize in the data. And while the field of 'qualitative GIS' seeks a set of technical fixes to make the materializations of these contextualizations a possibility (see Cope and Elwood, 2009), the clean nodes of decontextualized data are no doubt visually privileged. The process of mapping these fixations masked other maps. Other categories or modes of explanation become invisible within the space of the database. The powerful image of the map and the database query sutured the codings of the survey onto lived experience, that, as Griffin notes above, data became "a real thing". For these participants, seeing the results of their

survey practices demonstrated for them how this mapping enacted a one-dimensional accounting of their neighborhoods. Counting objectifies; simply put, counting makes objects.

The ComNET system drew upon this discourse of objectivity—of distancing the concerns of individuals from their 'emotions', to constitute geocoding practices that were quantitative. However, during the surveys held in Seattle, staff members at the local nonprofit discussed with me the issues of maintaining that discourse of objectivity. For 'Flora Muñoz', it was a question of perception:

> **Muñoz:** "You know from a research perspective, *there's a lot of room for error, or room for differences [in the survey]*, because ... if you have one person, who like ... [codes] every single, tiny, little thing ... then that can definitely skew the data. Or if you have, graffiti, or whatever, this big hole on the ground, or whatever the issue may be, [people are] like, 'eh ... it's not that big of a deal'. So, the fact that everyone does not have the same idea about [data] ... *it's subjective, I guess, and there's a lot of variability*, and that, I think, can lead to it not [becoming] a good measure of how things are progressing" (emphasis added).

Muñoz's slippage between "error" and "difference" highlights the problematic of objectivity for the community survey program. For her, the subjective qualities of this form of data collection, what she describes as having "variability", is in opposition to this program's ability to create successful measures. Participants who seemed to code everything and those who felt certain problems were "not that big of a deal" were non-normalized training subjects, exposing, from the nonprofit's perspective, a lack of attention to the mattering of data.

Discussion: qualifications-of-life

> "Designers of classification schemes constantly have to decide what really does make a difference; along the way they develop an economy of knowledge that articulates clearance and erasure and ensures that all and only relevant features of the object (a disease, a body, a nursing intervention) being classified are remembered."
>
> Bowker and Star (1999, page 281)

The design of the ComNET system, like the classification systems that Bowker and Star analyze, creates an economy of knowledge that enables the memory of certain urban aspects. Not only are other features of urban life systematically absent from computational memory (in that they either resist categorization or that they are made into objects to code street subjects), but they are also actively made unrecognizable. Their presence is recorded as objects—to both enable their indirect coding and to distill their situatedness into discrete actions: to remove the presence of graffiti and abandoned shopping carts.

Data from quality-of-life indicators slip into related qualifications-of-life. Quality-of-life indices, used nationally to rank 'desirable' cities (McCann, 2004; 2007), are also used in neighborhoods to assist community organizations and chambers of commerce to further measurement mentalities among civically active residents. The energies focused upon the collection of data about quality-of-life have, as a result, displaced the bodies figured by this data—namely, the bodies of the homeless and the young. And this displacement, perhaps unsurprisingly, comes at the hands of those more socially and economically anchored in these communities. The objects belonging to these bodies become the concern of urban revitalization: the shopping cart and the graffiti tag. This understanding of the urban—of bodies distilled into objects—leads residents and nongovernmental organizations to realize their concerns in terms of discrete data objects which can, given their computation, effect change on the street.

This analysis has drawn out two major transductive pathways in which these data practices are made legitimate—standardization and objectification—and I lend further analytical weight to these pathways below.

Standardization

Through the standardizations of resident observations of the street, the NYC foundation responsible for ComNET sought to create indicators that were not susceptible to deficiencies in reliability or validity. To do so, ComNET standardized everyday visual cues. Objects on the street that prompted residents to phenomena such as violence, property damage, loitering, drug and alcohol abuse, and homelessness were encoded in a language of classifications. What was seen was coded as either an 'asset' or 'deficit', a 'feature' or a 'condition'. According to Olson at the NYC foundation, these observations were to be standardized in order to avoid the biases and the 'emotions' that pervaded neighborhood revitalization work. Furthermore, this standardization, through the taking up of government language, enabled, or so was believed, an easier and more legitimate transfer of information from community residents to municipal agencies.

In exploring the implications for these projects of standardization, I suggest that indicators, as a technology of coding, inevitably allow the construction of associations between social phenomena. The standardization of data enables them to be treated in isolation through the separation of street objects from their broader contexts. Data about occurrence of crime can easily be overlaid with data tracking the visibility of abandoned shopping carts and graffiti tags. Linkages can be (and, no doubt, have been) made between homelessness and crime, graffiti and youth hangouts, abandoned buildings and loitering. However, what is interesting about this street survey program is the way in which discussions about these associations were carefully avoided during the training of the resident surveyors. During the practice of coding, graffiti tags were meant to be only objects of the urban scene. Abandoned shopping carts were 'easier' to code; again, the 'emotions' of coding the actual presence of a homeless body could be avoided. And, while residents and staff members were uneasy around coding objects as indicative of 'suspicious activity', this data-based perspective enabled the possibility of such causal associations: that abandoned shopping carts indicate crime.

Objectification

The visioning of the urban street and its capture in the form of data highlight the importance of studying participatory mapping practices as they confront community quality-of-life concerns. When the 'quality life' becomes encoded into databases, mediated by indicators, the possibility for discussing the implications of this urban imagination becomes tabled. The ComNET data model demonstrates this tabling; in its effort to create an efficient process for turning community concerns into objectified data, ComNET constitutes the fields that communities can be concerned about and then molds their diverse concerns to fit that model.

The predetermined categories of features and conditions directed neighborhood residents to code things in particular ways. The question of what constitutes data collecting events in my discussions with surveyors drew out the ways in which concentrating on data transduces space. Upon seeing the results of their survey during the focus group, residents began to ask, "Did every graffiti tag on the lamp-post get counted?" When space is reformulated by data in the form of pie charts and graduated symbols, this inquiry into counting matters. The slipperiness of this transduction needs to be underlined. While objectified data are indeed important for gaining access to municipal government resources, data (even locational data) underrepresents the

situatedness of community concerns.[7] And at its worst, these geocoding practices depoliticize those lives lived on the streets that can only be coded as 'deficits'. These data-based bodies are treated as broken windows to be fixed, where the first step is not to recognize the situatedness of their condition, but to code the objects of their life as suspicious and potentially criminal.

Conclusions

> **Uptown resident 1:** "A shopping cart would go under, well, suspicious activity."
> **Uptown resident 2:** "If it's stolen?"
> **Muñoz:** "If it's full of stuff" (2007).

As quality-of-life indicator systems such as ComNET continue to standardize and objectify the urban, the task becomes to "remember the technological unconscious", as Thrift (2004) writes, and work to make recognizable the materializations of these codings. I enroll transduction to conceptualize these practices as those that reformulate space—by producing data which normalize the city street. To code certain objects of the street as 'suspicious' enables the exclusion of certain bodies from the collective urban imagination, namely the homeless and the deviant. While these kinds of exclusions are increasingly common in urban geographies [see Beckett and Herbert (2009) for a discussion of this in Seattle], the ways in which data practices are legitimized and thereby produce these exclusions should draw our continued attention to code-work in the urban. Here, I argue that this code-work effectively dissolves discussion about this exclusion. Observations of the street, which cue residents to urban disorder and decay, are objectified and standardized into a database. This formalization abstracts any discussion of the affected bodies on the street into a discussion of indicators. This categorical system becomes the lens through which the urban street is viewed.

By exploring how quality-of-life indicators motivate urban neighborhood revitalization programs, I have demonstrated the importance that data serve in these practices—the ways in which the materialities of data come to matter. Furthermore, I have opened up these data practices to inspection, to argue, following work in software studies (see Chun, 2004; Kittler, 1995), that databases and data models are far from politically neutral objects. Rather, they encode fundamentally political questions about who—what bodies—are considered normal on the urban street and whose bodies are deemed 'deficits' to the collective urban imagination.

In doing so, I have emphasized the role of the technological in assessing the quality-of-life of Seattle neighborhoods. I believe this work demonstrates the importance of data-based imaginings in neighborhood revitalization projects and suggests that these imaginings constitute the elements of the urban street in specified ways that mask the broader, structural shifts in neighborhood service provision (eg lack of services for the homeless and the lack of youth facilities). Indeed, data are powerful objects that result from messy knowledge-making endeavors (Wilson, 2009). Remaining attentive to their cyborg geographies is the initial step in imagining how data-based action can be made more responsible to the focal points of their visioning. The urban *is* software, to extend Amin and Thrift (2002):

> "The modern city exists as a haze of software instructions. Nearly every urban practice is becoming mediated by code" (page 125).

It is the materialization and the significance of data that animates these urban practices for those who are close to the experience. Geographies of technology must map and

[7] It is important to recognize that the absence of data is not a better solution, and not one that I am advocating. Instead, I problematize the objectification of street life, and its composition as data.

partake in these practices, to take ontological risk, in the way that Haraway (1999) might suggest. This necessitates our getting involved in these technologies of coding, to not only trace their possibilities, but to enact new pathways and new practices that cause new abstractions for resistive and responsible data.

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