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Urban experience takes an informational turn: mobile internet usage and the unevenness of geosocial activity

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Abstract Coinciding the widespread deployment of handheld information and communications technologies (ICT) there has been a rapid emergence of mobile Internet applications. Notably, these applications are designed to perform within operating systems that are not only Internet-connected but that are also location-aware and decoupled from any single point in space—design characteristics that enable instantaneous integration of users' everyday 'real-world' experience with an array of Internet-based services. As a consequence, the experience of urban space can be mediated by digital information in ways that have not before been possible. In this article I explore the convergence of ongoing discussions about the digital divide, the nascent class of mobile ICT, and the urban communities that have been most adversely impacted by uneven technological landscapes. Building on this convergence, I argue that it is increasingly important to consider the impacts that pervasive mobile information have on the composition of everyday urban life.

Keywords Geosocial media · Location-based services · Digital divide · Informational turn · Urban imaginary · Urban geography

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Introduction

Beginning in 2007 with Apple's introduction of the first generation iPhone and the later 2008 introduction of Google's mobile Android operating system, the US consumer market became flooded with location-aware and Internet-connected mobile devices such as smartphones and handheld tablet computers. Predictably, the appearance of a new platform to facilitate the transmission of data between users and the Internet was followed by a rapidly evolving and ever-growing marketplace for mobile applications (apps). At the time of writing, there were several hundred thousand unique apps available in both the primary Apple (iPhone, iPad) and Google (Android) app stores. It is notable that these apps were designed to perform within an operating system that not only enabled interaction with Internet-based data, but that also facilitated voice-to-voice communication, SMS (short message service), and geospatial (GPS) processing. So although software housed on personal computers is spatially static, mobile apps are decoupled from any single point in space—and as a function of this decoupling, they can be designed to integrate (in real-time) a user's everyday 'real-world' experience with a seemingly infinite array of Internet-based services, communities, and databases. The pervasive nature of the mobile app in combination with the emergence of several generations of cellular data standards (i.e., 3G, 4G and LTE) means that users can remain tethered to the Internet in a way that has not before been possible.

It also means that the experience of urban space can be mediated by digital information in ways that were neither possible nor imaginable in the recent past.

In this article I cast light on the convergence of evolving discussions about the digital divide (Clark et al. 2004; DiMaggio et al. 2004; Gunkel 2003), the nascent class of mobile ICT (information and communication technology) hardware and software (Goodchild 2007; Greenfield 2006; Hall et al. 2010; Wilson 2012), and the urban (place-based) communities that were most adversely impacted by uneven technological landscapes in the 1990s and early 2000s (Hampton 2010; Haythornthwaite and Kendall 2010; Roe 2006). More specifically, I am interested to explore how, as a function of this convergence, socio-economically distressed urban communities are impacted by an *informational turn* that has become characteristic of the ever-evolving digital divide (Hampton 2010; Steyaert and Gould 2009). I draw on recent scholarship that has focused both on Internet behavior patterns (Brandtzæg et al. 2011; Meyen et al. 2010) and the consequences of certain types of mobile Internet activity (Brighenti 2012; Hudson-Smith et al. 2009b; Kelley 2013; Wilson 2012) to suggest that as conventional concerns about access to ICT are supplanted by investigations into the consequences of differential ICT usage within urban space, it is increasingly important to consider the role that pervasive mobile information plays in the composition of everyday urban life. And I argue that this is a timely moment to begin orienting a conversation about the consequences of differential ICT usage within urban space around questions related to the mobile production and consumption of digital socio-spatial information.

Geosocial media and the production/consumption of the local

At present, there is a set of apps (e.g., Foursquare, Banjo, Localscope, localmind, and Yelp) that are referred to alternately as *location-based services*, *locative new media*, or *geosocial media* in both popular and scholarly literature (Bennett 2011; Brighenti 2012; Kelley 2013; Wilson 2012). While recognizing that there are subtle differences in the usage of these terms, in this article I use the referent geosocial to signify those apps which are socially-oriented and designed to perform little else than the two relatively simple tasks of enabling users to (1) produce information about their experiences, perceptions, or interactions at any given location in space, and (2) query and consume information about a particular location (or region) in space. In essence, geosocial apps facilitate the production, sharing, and consumption of digital information that is reflective of the socio-spatial dimension of urban space (Lefebvre's 1991) notion of *spatial practice*) that has been theorized by scholars such as Martin (2003) and Jessop et al. (2008). Generally, such apps are situated in the hybrid space between the virtual and the material in order to produce, host, and serve crowdsourced place-based information that, in the words of one geosocial service, enables users to "always be a local" (aloqa.com), and, to "discover your locality" (cynapse.com/localscope). Geosocial information is also, at present, primarily concentrated in those places with high population density and vibrant commercial activity—it is less likely, though not implausible, that one would consistently encounter clusters of geosocial information in rural or suburban landscapes. Instead, in those places where the production of user-generated content is less pronounced, information accessible via locative services is dominated by sponsored content such as coupons and real estate listings. But, to be clear, this is not to suggest that the production of geosocial information is a necessarily urban activity; rather, it is recognition that because this is an emergent technology, the earliest of adopters are inhabitants and habitués of urban space.

To accomplish the task of crowdsourcing socio-spatial information, geosocial apps offer the same range of functions that characterize the social media landscape. Users maintain a profile that contains a variable amount of personal information, are able to form or join groups of friends, and can usually connect their geosocial activity to other social media accounts through intermediary scripts. But in a departure from non-locative social media applications, participation hinges on the integration of a user's location with her/his digital activity—meaning that full participation in geosocial media is contingent on the user connecting interaction (the production and consumption of content) to real-world locations. Geosocial apps enable the user to track her/his location by utilizing the mobile device's internal GPS receiver, triangulation via cell-towers, or address-matching. Location is,

therefore, always coincident with digital participation—from personal communication to an existing social network, to reviewing a restaurant, or leaving a tip for other users to avoid a particular place (Bennett 2011; Kelley 2013; Wilson 2012). Data returned by queries to a geosocial database are also coincident with the user's location, representing the spectrum of available information within a pre-defined geographic radius (one mile, for instance) of the precise location around which the query was performed—a snapshot, in a sense, of the hyperlocal datascape.

Evidenced above by the Aloqa and Localscope tag lines, the *local* concept is woven into the marketing of geosocial apps using language that promises persistent access to some form of insider socio-spatial insight about a place. It is important, though, to remain aware that geosocial services are established in a competitive marketplace in order to generate profit—they are not developed and provided to the public out of a sense of altruism or love of place. The commodification of the local, and the subsequent development of software to facilitate the production of *localness*, are not neutral activities. Corporations that fund and develop locative technologies have interest in increasing their Internet traffic, selling sponsored advertising space, and generating interest among investors. Geosocial information is, in short, a valuable commodity, and services depend on the data that are produced by their users to improve and grow their business activities. So, those individuals who we might otherwise classify as consumers of a particular technology (user = consumer), are enlisted to function simultaneously as consumers and producers (prosumers) of geosocial information. Dodge and Kitchin recently (2013) examined the crowdsourcing of geospatial data within capitalist societies, and spent considerable time framing it as 'prosumptive' practice (drawing largely on work from Ritzer and Jurgenson (2010)). Prosumption is a trend in a host of industries "toward putting consumers to work" doing things such as "pumping one's own gasoline… serving as bank teller at the ATM machine… using electronic kiosks to check into a hotel." (Ritzer and Jurgenson 2010, p. 18). Thus, an individual who consumes, as well as produces, geosocial information is characterized as a prosumer. It is important to remember, however, that although all producers are also consumers, the reverse does not hold true—all consumers are not necessarily producers. It is also interesting to note that prosumers are not compensated for their productive activity, electing, rather, to participate in the production of information for other reasons—often, as I discuss in a subsequent section, simply because an application has been designed to encourage productive participation by awarding digital badges or titles to highly productive users. Prosumers can, therefore, be characterized as a distributed network of geosocial sensors (to borrow from Goodchild's (2007) discussion of citizens as sensors) which have been placed in the field to gather/produce insight about any and all socio-spatial experience, perception, and interaction.

Somewhat ironically, the data that are served by geosocial services can be characterized as 'local' only in-as-much as they represent stories that have been told by users about particular sites in space. There is no way to know, for certain, the connection between users and the geographies where they actively produce geosocial information. Productive users are just as likely urban explorers or out of town travelers as inhabitants or habitués (and in some cases, I argue below, more likely the former than the latter). The geosocial architecture opens, in essence, a virtual space within which all users are encouraged to *perform* as insiders by producing socio-spatial information about space which then becomes a *durable* part of an archive that houses place-based locative information. Information drawn from this archive is served by geosocial apps back to users as *authentic*—representing, in other words, the real-world experience, perception, and insight of insiders. From a critical standpoint, we must question both the concept of *localness* that is on offer in the geosocial marketplace as well as the composition of those users who participate in geosocial media as producers (most simply rely on the software for information discovery). For, the insight contained by any given geosocial service is representative only of the subjectivities of those users who elect to produce. At best, this is a partial representation of reality that, nonetheless, gains authenticity because it is digitally archived and distributed via sophisticated software. And although insider insight may imply some degree of local knowledge, there is little guarantee that what is made visible by geosocial information is anything more than a happenstance accumulation of urban explorers' first impressions of neighborhoods, restaurants, public spaces, marketplaces, etc.

The flip-side of producing geosocial information is that, of course, the geosocial architecture also opens a virtual space within which users are encouraged to *become* locals through the consumption of information. Localness is presented as an attainable, singular state of being—a product transferable from one set of users to the next. Among the various critiques that might be levied at this proposition, I emphasize here that there simply is not, and cannot, be a singularly local state of being for any place. Places are, after all, produced through the interaction and everyday life of countless diverse groups of people—a heterogeneity of socio-spatial experience that belies the singular local archetype. There are many different ways to be local, and each carries with it an amalgam of insider insight. The concern that I raise in this article, however, is that though there is a clear heterogeneity of experience in urban space, it is not contained by the archive of geosocial information. So regardless of the growing ubiquity of smart mobile devices in urban space, participation in geosocial media does not imply that new information is more reflective of the local condition. Finally, because one outcome of geosocial activity is a growing digital archive of user-generated locative content, I suggest below that the body of geosocial information for most locations in urban space will increasingly contribute to the production and transformation of socio-spatial urban imaginaries (an argument fleshed out in Kelley 2013). I discuss in more detail the notion of an imaginary in the following section, but I underscore that the impact of geosocial information on the urban imaginary is likely to be significant. Because given the durability and accessibility of geosocial information, the outcomes of urban geosocial activity can have a far greater reach, and impact, than the information typically contained by urban imaginaries. Neighborhood scale geosocial information, for example, intensifies negative stereotypes—especially in places where productive geosocial user activity converges on unfamiliar social and cultural terrains. In socio-economically distressed urban neighborhoods this is particularly likely, as many users' experiences are likely predicated by the cultural anxiety and bias that has long-defined such places. So as cultural biases permeate the geosocial datascape, they become amplified in the imaginaries of distressed neighborhoods (due largely to the durability and accessibility of geosocial information)—and the amplification of this one dimension of socio-spatial information has considerable potential to diminish countless other dimensions of the urban imaginary.

Urban imaginaries and geosocial information

There is a well-developed literature of the imaginary that can be traced from early works such as Raban's *Soft City* (1974) and Anderson's *Imagined Communities* (1991) through more recent reflections on urban and socio-spatial imaginaries that are foundational to the arguments I make here (see, for instance, Cinar and Bender 2007; Devadason 2010; Donald 1999). In general, this article builds on characterizations of imaginaries that recognize the role that they play in the production of everyday life—situating them not as mirror to social reality, but as constitutive elements of reality. For instance, Taylor (2004) broadly theorized the social imaginary as entailing "the ways people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations." (p. 23) Imaginaries, he argued, enable 'common understanding' and are, therefore, catalysts of 'common practices.' (p. 23) Searle (1995) proposed similarly that "there are portions of the real world, objective facts in the world, that are only facts by human agreement" (p. 1)—not facts tied to natural laws, but facts tied to human relations which are, therefore, elements of the social imaginary. Thus, as individuals negotiate their everyday lives they are in constant conversation with the imaginary; reasoning through social and spatial decisions by reflecting on 'facts' about common practices, norms, expectations, etc.

Boudreau (2007) described this interplay between individual action and the social imaginary by suggesting simply that imaginaries are "collectively shared internal worlds of thoughts and beliefs that structure everyday life." (p. 2596) In related work, Cinar and Bender (2007) offered that "the very practice of daily urban life emerges as the means through which the collective imagination that conjures up a city takes place" (p. xiv). Imaginaries cannot be disconnected from social and spatial practice because they are, in large part, the catalyst for the forms that social and spatial practice takes. But the impact of the imaginary

on everyday life is not limited to individual experience, as the structure of the city itself—the built environment—is produced largely as a consequence of how individuals live in and move through urban space. In other words, as Prakash and Kruse (2008) suggested, the city "is constituted by the interplay between its spaces and its imaginations"… "[t]he brick and mortar do not exist apart from representations, nor are our ideas without material consequences…" (p. 7). We might characterize imaginaries, therefore, as significant and meaningful (though quiet) components of everyday life which are central not only to the planning and design of urban spaces, but also the experiences that individuals have within those spaces.

In a classical sense, imaginaries are "carried in images, stories, and legends" (Taylor 2004, p. 23)—passed along through social interaction and exposure to media and popular culture. Though they function, in part, to guide and inform human activities, imaginaries are not analogous to governing documents such as municipal codes or bylaws because they have not and, arguably, could not be codified. They are, unlike codes or bylaws, living artifacts that react and conform to social currents in real-time—particularly given the contemporary digital/networked landscape. And as the datascape has been more seamlessly, and cleverly, woven into lived space, it is not surprising that the images, stories, and legends that have long constituted our imaginaries are becoming increasingly Internet-based. New forms of information are also likely to gain purchase in the composition of social imaginaries—an unsurprising symptom of technological change. For instance, the body of socio-spatial experience, perception, and interaction that constitutes geosocial information is a particularly significant addition to the urban imaginary as it makes visible a host of norms and expectations that would not otherwise be publicly accessible. Reflecting on the emergent potency of urban imaginaries that are composed in part of geosocial information (particularly in regards to casual Internet users who can increasingly access geosocial data via established and trusted sources such as Google Maps and Bing Maps) Kelley (2013) argued that "geosocial-based imaginaries inform the ambient collective intelligence that structures how we come to know, experience and behave in particular places—a point that is made salient by Foursquare's promises to 'unlock your city' and 'guide [your] real-world experiences'" (p. 2).

Foursquare is, of course, only one of a host of apps that are designed to influence, guide, or otherwise inject a certain amount of socio-spatial insight into the user's experience of urban space—to serve, in other words, as the source for a new dimension of the urban imaginary. To encourage the production of unique place-based information, geosocial apps are oriented to several different, yet ultimately coincident purposes that include social networking, user review and recommendation, and social gaming. For instance, while recommendation services such as Yelp were developed with the aim to crowdsource the production and distribution of user reviews and recommendations about established brick-and-mortar venues, other services such as Foursquare and Gowalla were initially developed to simultaneously encourage the production of information about places and facilitate the expansion or maintenance of social networks (though, as Wilson (2012) noted, these aims have shifted considerably). Other geosocial services, such as SCVNGR and Gbanga, employ social gaming which adds layers of user-generated information to real-world maps in order to encourage participants to visit and experience places in a particular way as a part of an ongoing competition among users. SCVNGR described itself, for example, as "a game about going places, doing challenges and earning points" (scvngr.com/press) and Gbanga has billed itself as a "game where you walk in the real world to play mixed-reality quests." (gbanga.com)

Wilson (2012) suggested that participation in these activities is not simply a matter of, for instance, 'checking-in', but rather of "making conspicuous one's mobility: one's movement, significance of that movement, and the potentiality (both economic and social) that is present in the iterativeness of 'checking-in.'" (p. 1272) The data that are produced when participating in a geosocial experience (checking-in, for instance) are revealing of considerably more than that user X has visited venue Y—they are, rather, bound-up in the "bodied sensations of being in-place or in-movement, that enables the visioning of and the behavioral reaction to the prospect of a new location." (Wilson 2012, p. 1272) So beyond the particular aim of any given geosocial app, there are common moments when the sharing of user experience, perception, and interaction guides individual socio-spatial activities and produces place (in an incremental way). That urban imaginaries exist is not, of course,

notable—but the emergence of digital dimensions of those imaginaries is both significant and troubling when they are interrogated from a *divide* perspective that considers the potential unevenness of socio-spatial representation within archival geosocial data. I concur, therefore, with Wilson's suggestion (drawing on the work of Kinsley (2010) and Anderson (2010)) that location-based services (a broader set of locative mobile software) are anticipatory technologies which foster "new possibilities for investment—and competition—as companies scramble to occupy the online gameboard." (2012, p. 1272) It is precisely this aspect of geosocial media that has much potential to amplify lingering fractures in the urban landscape that never fully recovered from the first-order digital divide in the 1990s. Because if user reviews and recommendations from Yelp, check-in data from Foursquare, and challenge data from SCVNGR are all constitutive of a collective body of information that has become (is becoming) a new dimension of an ever-more fine-grained socio-spatial imaginary, then it is imperative to remain critical of the nexus of hardware, software and users that is generative of that information.

An imaginary divide?

Arguably, therefore, we might begin to unpack how urban imaginaries that are composed in part of geosocial data can be implicated in the reproduction of damaging and divisive narratives about socio-economically distressed urban communities. For if pervasive mobile ICT are being designed to facilitate the everyday experience of urban space, then this particular outcome of geosocial media can be linked to ongoing consequences of social exclusion brought on by digital divide phenomena (DiMaggio et al. 2004; Hargittai 2002; Roe 2006). To this end, it is useful to draw on the literature that has framed research of the digital divide over the last two decades. Divide literature has largely focused attention on issues of technological access and literacy (Compaine 2001; Kruger 1998; Mossberger et al. 2003) while exploring ways to narrow apparent fractures through public/private investment in digital infrastructure, computer ownership, and skills development at public libraries, community technology centers, and other neighborhood scale institutions (Cotten et al. 2011; Kvasny 2006; Kvasny and Keil 2006; Servon 2002). While these efforts have proven somewhat successful at 'bridging' the particular divides of access and literacy, researchers have begun to adopt the perspective that the divide was never as simple a problem to overcome as they might have hoped the case to be (Stevenson 2009; Warschauer 2003). The conversion, for instance, of a digital 'have not' to a 'have' does little more than place a computer and Internet connection in the possession of an individual who may have only a limited ability (technical competency) to effectively utilize them. Instead, the core of the divide has been recast as an issue of *differential* access, literacy and *usage* (Brandtzæg et al. 2011; Crang et al. 2006; Meyen et al. 2010). I discuss this in more detail in the next section, but the introduction of differential technological usage as a concern for digital divide researchers brings into focus questions not only of who can participate in the digital age and whether or not they have the necessary skills, but also what, exactly, they will do once they become participants.

The notion of differential usage is particularly relevant here because I ultimately argue that the socio-economic and cultural outcomes of emerging consumer oriented mobile ICT (such as geosocial media) are better-understood as consequences of pre-existing technological landscapes and differential usage patterns than as evidence of a new/different or growing divide. Though countless efforts have been made to 'bridge the access divide' and improve the technological literacy of individuals who have been excluded from full participation in the information age, the outcomes of technological innovation are such that entire urban communities can be marginalized by relatively simple (yet immensely powerful) ICT. How this marginalization is manifest in the social, cultural, and economic fabrics of urban communities depends largely on how firmly the emergent class of consumer-oriented mobile ICT takes root.

Assuming that mobile Internet connectivity continues its rapid growth (Cisco 2011), mobile devices become even more ubiquitously locative (Crook 2011), and geosocial media continues the growth in popularity that was experienced during the first several years of its existence (Heine 2011; Wasserman 2011; Wilson 2012), we can expect that imaginaries of even the smallest urban community will be available for public consumption on the Internet. But if we consider these trends in concert with recent digital divide scholarship that has detailed differential ICT usage

patterns relative to socio-economic and cultural conditions, then these same conditions will become constitutive of a similar subtext in *mobile* ICT participation. So, although rates of access to mobile ICT should continue to improve, this improvement is likely to correspond with uneven spatial and demographic patterns of mobile ICT usage—the *consumption* of geosocial information, for instance, may be a popular activity, but only a fraction of all mobile ICT users will ever participate as *producers* of this information. I argue below, therefore, that in places where inhabitants have been marginalized by the technological landscape for the past 20 years, public imaginaries that are constituted, in part, by geosocial information may be less representations of insider insight than mirrors to the experiences, biases, and perspectives of urban explorers.

A roadmap of the divide

Contemporary technological landscapes began taking shape during the 1980s and 1990s as digital infrastructure, skills, and (access to) computer hardware were manifest unevenly in most US urban areas. For socio-economically distressed communities, this era was characterized by lower than average levels of computer literacy and ownership (Barzilai-Nahon 2006; Hampton 2010; Rodino-Colocino 2006). With the popular emergence of the Internet in the late 1990s, the landscape was further divided into a range of communities with varying capacities (i.e., capital, infrastructure, education, technical skills) to access virtual information (Servon 2002). These digital divides of access, literacy, and skill appeared along the same social and economic fissures that have long plagued urban areas; and while the early 2000s were witness to significant efforts to bridge various divides, the diffusion of digital information and communication technologies (ICT) in cities remained irregular (Kruger 1998; Kvasny and Keil 2006; Tapia and Ortiz 2010).

Although contemporary divide literature is fairly consistent in the call for a differential approach to digital inequality (Broos and Roe 2006; Crang et al. 2006; van Dijk and Hacker 2003), early policy-oriented digital divide projects were not as nuanced (Servon 2002). For some community advocates, it was expected that a bridge over the digital divide would serve as a sort of silver bullet in the ongoing fight against urban socio-economic distress. Kruger (1998) reflected on this approach to the divide by observing that "[i]t has become one of the orthodoxies of the late 1990s that the ICT revolution potentially offers one way of tackling almost every social ill." (p. 7) Others have also cast light on the techno-determinism of early approaches to the digital divide by referencing a 1995 US Department of Commerce statement that "while a standard telephone line can be an individual's pathway to the riches of the Information Age, a personal computer and modem are rapidly becoming the keys to the vault." (see, for instance, Rodino-Colocino 2006, p. 490) And reflecting on digital divide scholarship from the late 1990s, Jung et al. (2001) suggested that the use of a "binary measure (access/nonaccess)" (p. 509) to identify socio-economic inequalities between communities was "not sufficient when discussing the social consequences of the technology's diffusion." (p. 509)

Wider social diffusion of ICT during the early 2000s led to a series of more focused examinations in the digital divide literature of the impact that digital technologies can have on distressed urban communities. In an investigation of early 2000s Internet-based employment tools, Lindsay (2005) found that it was not necessarily access to ICT infrastructure, but rather limited technical skills and the lack of a strong (local) technical culture that constrained participation among unemployed inhabitants of distressed urban communities. In another project, Jennings and Zeitner (2003) explored the correspondence between Internet access and civic engagement, finding that access to the Internet is not singularly sufficient to increase levels of engagement. And though positive connections have been found to exist between access to the Internet (broadband, in particular) and the amount of civic participation in a community (Mesch and Talmud 2010), technical literacy remains the limiting factor for many individuals who do not participate (Campbell and Kwak 2010; Sylvester and McGlynn 2010). So, broadening participation in emerging technologies (particularly for socio-economically distressed communities) depends on the diffusion of technical skills that may be taken for granted in more advantaged places. As I detail below, these skills are, in large part, components of a tacit technical literacy that is increasingly achieved through simple everyday interaction with ubiquitous technologies such as mobile

phones and home computers. We should expect to find, therefore, that participation rates gradually improve as ICT hardware becomes more ubiquitous across all socio-economic landscapes. Participation is not, however, a homogeneous phenomenon, and though aggregate rates of ICT usage have increased over time, scholars have become engaged with questions about patterns of usage—how, why and when are technologies employed? And more importantly, do existing forms of social exclusion and social inequality coincide with these differential patterns of ICT usage?

Differential digital inequality and an 'informational turn'

Once we have established that the digital dimension(s) of urban imaginaries are increasingly contingent on the productive usage of pervasive mobile ICT (resulting in, for instance, geosocial information), then we can begin to think about the consequences of crowdsourcing an archive of information that is facilitative of our everyday experience of urban space. Placing pervasive mobile ICT into context with ongoing digital divide scholarship is particularly effective as recent divide research has been focused more specifically on how differential ICT usage patterns can correspond to socio-economic and cultural difference (Anthes 2011; DiMaggio et al. 2004; Miller 2011; Steyaert and Gould 2009). Critical concerns about these technologies should be less driven by considerations about how to provision for better access to mobile device hardware or connectivity in urban space than by interest in the ways that mobile devices are employed in everyday life. By asking questions, for instance, of *why* and *when* mobile ICT and mobile informational networks are engaged in urban space we might better understand the origins, biases, and gaps in the archives of geosocial information. In essence, if we assume a divide perspective then interest in the ways that geosocial information impacts the urban imaginary is largely connected to the proposition that there is a *consumer* class of geosocial users and a *producer* class of geosocial users, and that these classes have the potential to correspond with relatively classical socio-economic and cultural divisions that were evident in early digital divide research. As noted above, the class of producers is a subset of the consumer class—so, all producers are also consumers (prosumers), but not all consumers are producers.

So although the issue of access to mobile ICT has been complicated (but not entirely overcome) by differential, and less expensive modes of connectivity; when investigating a class of mobile ICT such as geosocial media, differential use patterns are only beginning to appear. Casual consumers of information produced via geosocial activity are a markedly different type of user than the active (engaged) producer of information—in one case, the user is drawing on information to guide her/his experience of urban space, while in the other the user is acting as urban guide to the casual geosocial consumer. It is likely, therefore, that geosocial-based, imagined landscapes of urban space will conform to existing and uneven topographies of socio-economic distress and advantage. Differential production and consumption of geosocial information are illustrative of the informational turn that the digital divide has taken, and though I illustrate below that this is a relatively recent phenomenon, the consequences of a socio-economically and culturally biased urban imaginary are immense.

For socio-economically distressed urban communities, differential access to and usage of ICT has meant that although computers and Internet connections are becoming more ubiquitous, there is an increasingly complex explanation for how, why, and when technologies are employed. Meyen et al. (2010) argued as much recently when they explained that although some form of the 'digital divide' continues to linger, "[a]fter reaching near-saturation in internet usage, differences in terms of access have relocated to differences in the types of contact with the internet." (p. 881) It is exceedingly possible, for instance, to expertly navigate petabytes of Facebook pages and streaming popular culture without possessing more than a passing familiarity with cloud computing, word processing or file system organization. This scenario is illustrative of how differential access and usage of ICT can manifest as a range of possible (digitally mediated) outcomes in everyday life for any given sample of people. In other words, lingering concerns about the accessibility of ICT are being subsumed by questions about (1) how information gleaned from ICT can influence everyday life, and (2) whether that influence is variable relative to socio-economic status. Steyaert

and Gould (2009) made a similar claim when they suggested that although the transformation of the contemporary technological landscape has narrowed the access divide, there has been a subsequent widening of an *informational divide*, and that as we make strides to overcome it we must consider that "[t]he medium is no longer the most critical element; information behavior becomes the main driver of the influence of technology on social exclusion." (p. 747) And though the linkage they made between social exclusion and digital inequality is not uncommon in the literature (see, for instance, Kruger 1998; Lindsay 2005; Selwyn 2004), the tack that Steyaert and Gould took, which is emblematic of the informational turn that I reference in this paper, was an effective parsing of the complexity born from the problem of differential ICT access and usage.

Information has, of course, been a constitutive element of the digital divide discourse since the mid-1990s when the phenomenon first began to appear on policy-makers' radar (Kruger 1998). ICT hardware (i.e., computers, printers, networks, etc.) and technical competencies were not positioned as ends unto themselves, but were instead conceived as a gateway to a 'better' life. As the United States' federal government suggested, they represented 'keys to the vault' (Rodino-Colocino 2006); and though the content of the vault has always been digital information, during this era considerations about how or why to use the information were trumped by concerns that the vault itself was inaccessible to broad segments of the population. In response to these concerns, successful efforts have been made since the early 2000s to broaden access to ICTs and promote general technological competencies. Yet, social exclusion driven by digital inequality has not evaporated from the technological landscape—instead, the contemporary topography has been defined by differential issues of access and usage that are exceedingly more difficult to overcome than the relatively concrete and singular 'access divide' of the late 1990s and early 2000s (Graham 2011). Digital information, in other words, is generally more accessible than it has been in the past; and in place of questions about accessibility are new questions about differential usage given the informational turn that the divide has taken.

This was evident in Hampton's investigation (2010) of Internet facilitated civic participation in which he found that "[t]he Internet reduces the transaction costs of communication, which in turn undermines contextual constraints on social and civic involvement." (p. 1112) Access to the Internet, though important, is secondary to considerations of how the rich informational spaces of the web are employed in everyday life, with Hampton finding that "the most disadvantaged are less likely to use the Internet for social and civic engagement." (p. 1113) In two other recent reports, researchers have found that race and class can be linked to the ways that digital information is used and/or interacted with. Miller (2011) detailed racial divisions that have formed across various spaces on the web, citing a media executive who suggested that participants on the Internet are "congregating in spaces where there are people like them, or where they feel comfortable bringing people like them." (p. 15) And referring to research from the University of California, Anthes (2011) reported that a "class-based gap exists among the producers of online content, such as bloggers, Facebook and Twitter users, raters of movies, and chat room participants." (p. 20) In each case, though the limits to interaction with digital information have been relaxed, differential usage patterns and modes of access persist along racial and class-based lines.

There is not an access divide to bridge when encountering differential usage patterns—precisely because the same information and modes of accessing and/or creating the information are broadly available. Instead, the gap that Anthes referred to is symptomatic of Meyen et al's (2010) typology of Internet participation which established that "the increasing diffusion of the internet has by no means closed the digital divide within society (Roe 2006): the differences have merely shifted from disparity in internet access to disparity in the quality of its usage (Hargittai and Hinnant 2008)." (p. 873) By taking an informational turn, digital divide research has shifted the focus of scholarly attention to those moments at which Internet participants create, consume, and interact with the bits and bytes that increasingly facilitate our everyday social, cultural, economic and spatial arrangements. Socio-cultural and socio-economic difference continues to permeate the conversation, but the consequences of differential (uneven) patterns of access and usage are not yet clear. Recognizing how pervasive the impacts of differential access and usage have become, we might, therefore, begin to explore how urban communities—particularly socio-economically distressed

communities that were at the center of debates over the access-based digital divide—are being impacted by consequences of the informational turn.

Socio-economic divisions, social exclusion and geosocial information

Social, economic, and cultural conditions have been shown to affect both the magnitude and types of ICT-based activities that occur in distressed communities (Hampton 2010; Haythornthwaite and Kendall 2010; Sylvester and McGlynn 2010). For geosocial media, barriers to participation in urban areas are likely to align closely with the cultural and literacy issues uncovered by Lindsay (2005) and Sylvester and McGlynn (2010). Elwood (2010) identified a flurry of recent activity that seeks to determine how pervasive the inscription of the classical digital divide (access/competency/skill) on the *geoweb* has been. The geoweb concept has been used to refer to the agglomeration of various geospatial tools and portals on the Internet (Haklay et al. 2008). Elwood (2010) argued that patterns of inequality are beginning to appear on the geoweb, and that these patterns are likely a prelude to "new mechanisms of exclusion." (p. 352) Responding to the problems of social exclusion that can emerge from conventional applications of geospatial technologies, Klinkenberg (2007) suggested that opening up new ways to democratize the production of information can "ultimately strengthen communities through both knowledge acquisition and increased civic participation" and "subvert ignorance and misinformation, willful or otherwise, enabling a shift from an elite power base to a broad democratic (open source) base." (p. 352) Klinkenberg's observation that the democratization of information production can strengthen communities is astute—but we might also consider the potential for existing social, economic, and cultural divisions to permeate new modes of democratic information creation. Issues of access to ICT have largely given way to issues of differential usage; and it has been through the reorientation of digital divide research in light of this informational turn that we can begin to explore how social exclusion, though unintended, can emerge from the seemingly innocent archives of geosocial information.

The ability to effectively use Internet-based technologies has been shown to be a social advantage that can affect both the personal and professional domains of everyday life (Barzilai-Nahon 2006; Meyen et al. 2010). Meyen et al. (2010), for instance, found that digital inequalities are determined more by the ways that Internet-based technologies are deployed alongside daily activities, than by the amount of time that is spent online. For young adults, the most active users of Internet-based technologies (Hargittai and Hinnant 2008), technological participation is particularly important given the increasing relevancy of digital social capital when making life transitions such as seeking employment, renting an apartment, or beginning college. But as evident in studies that have focused on differential usage of ICT (Anthes 2011; Miller 2011; Steyaert and Gould 2009), though there are clear benefits to personal and professional usage of digital technologies, varying modes of usage have led, and will increasingly lead, to new manifestations of social exclusion in material space—or, more explicitly, that geosocial information conforms to the same social, economic, and cultural biases which have for decades plagued distressed urban space. In other words, and as Elwood (2010) prompted us to ask, does the emerging class of consumer-oriented, location-based mobile technology have the potential to reproduce and/or reinforce existing (material) modes of social exclusion and division in digital space?

Exploring the landscape and consequences of geosocial information

Geosocial information is typically contained by a discrete geo-located database entry that is commonly referred to as a *check-in*, but that might also be in the form of a *tweet*, a *review*, a *tip*, or some other short string of text. Each geosocial entry represents at least two pieces of information—first, the location of the user when the information was created (a latitude/longitude pair), and second, a string of text that includes any information left by the user along with her/his screen name, date, and time. Information generated by geosocial participants is distributed by the service for public consumption, and geosocial APIs are typically released to facilitate the integration of geosocial information with other applications—resulting in a *mashup* of two or more applications and

streaming data sources (Hudson-Smith et al. 2009a; Liu and Palen 2010; Miller 2006). Geosocial information is, therefore, becoming accessible not only for the technologically savvy *Virtuosi* of Meyen et al.'s (2010) typology of Internet users, but also for the more casually literate set of *Cautious* Internet users.

Yet the issue of technological access is distinct from emergent questions about usage. Though geosocial apps have a relatively low cost of entry—in measures of skill and capital—we might expect usage in urban space to reflect the uneven landscape of the informational divide. This is significant because the temporal durability of geosocial information is immense—and as stated above, one outcome of a vast, and growing, archive of place-based information is an increasingly rich digital dimension of the urban socio-spatial imaginary. Again, although geosocial apps provide an opportunity to participate in the production of information, most casual Internet users are likely to participate only in a consumptive capacity. It is reasonable to propose that Meyen et al.'s (2010, p. 877) Internet Virtuosi, whom "can no longer imagine a life without the internet", are currently the most active producers of geosocial information. And given the pervasive urban spatiality of the digital divide, we can hypothesize, therefore, that the geosocial dimension of the urban imaginary in distressed urban communities is reflective of the experience and perception of outsiders who are among the privileged class of Internet Virtuosi. Notably, the implications of this hypothesis are at odds with claims by geosocial services (such as "Always Be A Local" (aloqa.com) and "unlock your city" (foursquare.com)) that promise access to fine-grained information which transmits a certain 'localness' via the experience, perception, and interaction of insiders.

At issue is not whether Aloqa, Foursquare, Yelp, and other geosocial services are becoming woven into the fabric of an emerging set of fine-grained digital urban imaginaries. Instead, as our spatial knowing is increasingly mediated by digital information, critical scholarship should begin to engage questions about the producer-class of this information. For example, in Kelley's (2013) examination of the spatiality of geosocial information he uncovered patterns that indicated qualitative differences between how communities were imagined by the corpus of geosocial information relative to the socio-economic status of the place. Drawing on a set of Foursquare data, he analyzed how the notion of fear was used by producers of check-ins in several distressed and not-distressed communities in an urban area: "the implication of fear and avoidance in socio-economically distressed places is, literally, *fear this place* and *avoid this place*; while these same concepts in socio-economically advantaged places are often playfully employed in scenarios where social capital is being produced or reinforced." (Kelley 2013, p. 18) And he concluded that "while geosocial data from socio-economically advantaged communities are more likely to construct the experience of place as multifaceted—e.g., *come here for dinner, and then stay for the shopping, shows, neighborhood culture, and pleasant seaside strolls*, the experience of socio-economically distressed communities is constructed as an effort to accomplish a task—e.g., *there are restaurants worth visiting, but be careful about where you park*." (Kelley 2013, p. 18)

There are two facets of differential geosocial usage at play in the data provided by Kelley; one is tied, in large part, to demographic variation and the second is largely spatial. First, in concert with research outcomes from Miller (2011) and Anthes (2011), regardless of spatiality, the producer-class of geosocial information is more likely representative of a particular socio-economic and cultural class of Internet Virtuosi than the larger set of casual Internet users. And second, as Elwood (2010) cautioned, the spatiality of geosocial activity—particularly when considered as a qualitative phenomenon—closely mirrors conventional geographic biases that have long-defined urban and metropolitan places. The concern, therefore, is not simply that there is a greater magnitude of geosocial activity in less-distressed urban places. Rather, among the Virtuosi are a subset of geosocial enthusiasts who participate in services such as Foursquare, Yelp, and Aloqa both within their own communities as well as those communities which are outside of their normal activity spaces. Thus, since the Virtuosi are the predominant producers of geosocial information, they have immense influence over the composition of socio-spatial imaginaries for the whole of urban space—including socio-economically distressed communities which are typically perceived by outsiders as dangerous, foreign, unfriendly, etc (Campbell et al. 2009; Kelley 2011; Martin 2000). Differential geosocial usage across urban space is, thereby, symptomatic of an informational divide that is likely to have an ongoing impact on urban

communities that were also adversely affected by the classical digital divide.

There are a host of consequences tied to generic social media usage; ranging from the positive—such as the connection of individuals to jobs or the creation/maintenance of social capital—to the negative—such as public embarrassment over inappropriate private/personal statements, pictures, etc. But while the differential usage of generic social media applications may have consequences that are felt primarily at the individual scale, the public durability of geosocial information can impact entire communities. Kelley (2013) illustrated that geosocial information is already reinforcing socio-spatial imaginaries of socio-economically distressed urban places by conforming more closely to biased cultural perspectives than the actual experience and spatial knowledge of inhabitants and habitués. For communities that were at the center of the earlier digital divide, these newer predominately informational dimensions of exclusion are exceedingly more difficult to overcome. Our collective ability to digitally 'know a place' is predicated by information that has, in many cases, been produced from an outsider perspective but that is simultaneously masquerading as a product of insider experience. Thus, for all the potential that is bound up in the emergence of geosocial services, there dovetails a scenario in which geosocial information continues to exclude particular urban communities from the popular imagination by virtue of bias born from differential usage patterns.

Concluding remarks

At the outset of this paper I aimed to explore the convergence of (1) digitally mediated urban imaginaries (one outcome of geosocial activity), (2) the informational turn that the classical digital divide has taken, and (3) the socio-economically distressed communities that were most impacted by the classical digital divide. I suggested that there is likely an ongoing and more challenging problem associated with the crowdsourced production of digital information about place—particularly as it has been illustrated that this information is being incorporated into relatively fine-grained and publicly accessible socio-spatial imaginaries. Though the classical divide centered largely on the issues of provisioning access to technological hardware and technical skills, the informational turn is driven much more by the issue of differential usage patterns. In essence, although access to digital tools and aggregate technical skillsets are far more evenly dispersed across space and socio-economic class than they have been in the past, differential usage patterns are conforming to many of the same demographic, cultural and spatial patterns that were characteristic of the earlier digital divide. Coinciding with these trends is an increasing reliance by the broader public to draw on digital information to inform the spatial imagination—using, for instance, applications such as Google Local, Foursquare, Yelp, Facebook, etc.

For many urban communities, I argued that this new convergence of technology and place has meant that although there are growing databases of socio-spatial information available to the public, this information is not necessarily an indicator of anything other than the experience of outsiders in unfamiliar communities. So although we may draw on the digital imaginary to *know* about place, there is a host of experience and tacit spatial knowledge woven into the daily lives of insiders (from inhabitants to habitués) who do not belong to the producer class of geosocial users. And as socio-economically distressed urban communities struggle to overcome biases that have long been obstacles to community and economic development, the codification of these geosocial biases in the broader digital urban imaginary will prove an increasingly difficult complication to the process of overcoming systemic and long-standing distress.

In a flurry of recent scholarly activity (see Dodge and Kitchin 2013; Graham and Zook 2013; Haklay 2013; Wilson and Graham 2013) important questions have been raised regarding the crowdsourced/volunteered production of geospatial data. Haklay (2013), for instance, engaged claims about the democratizing potential of new geospatial technologies by arguing that increased technological access (through cheaper, consumer-oriented technologies) neither leads to broader participation among traditionally under-represented groups nor overcomes the issue of who controls the information (corporations). Geospatial crowdsourcing is, however, an increasingly significant part of the knowledge production process. So although there have been critiques levied at user-generated geospatial information, it is undeniable that it is being

woven into contemporary urban life. Because the locative web services that are used to produce and consume this information are an emergent phenomenon, there is a growing need for empirical research—particularly in regards to those services which may *not* deal in the points, lines, and polygons of volunteered geographic information (there is, by contrast, ongoing empirical research of prominent sources of VGI (*Open Street Map*, for instance)). Unfortunately, like much big data, geosocial information does not adhere to a common data model and is typically structured for use in a particular application—it is not, in other words, produced with transferability and standardization as priorities. Empirical work must engage with these constraints as it attempts to make broader sense of geosocial information. And in doing so, questions tied to differential patterns of usage (as I have detailed in the previous pages), as well as the opacity of corporate control over locative hardware, software, and information promise to seed countless investigations into both the production and consequences of the socio-spatial information made public by geosocial applications.

To conclude, I revisit the Federal government's Internet as a vault analogy, and suggest that as we move forward there is little question that the information from within the vault has been set free to a much greater segment of the population. Yet it has become clear that there was not simply static information contained within the vault, but also the power to produce new information—and though the production of new information has been simplified by consumer-oriented hardware and software, differential patterns of usage have amplified a growing informational divide that will have lasting consequences.

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