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THEORIZING DIGITAL AND URBAN INEQUALITIES

Critical geographies of 'race', gender
and technological capital

Contemporary research on disparities in access to and use of information and communication technologies (ICTs) – what is commonly referred to as the digital divide – is limited in terms of its ability to explain the interrelationships between digital and urban inequalities. Drawing upon critical geographical conceptualizations of the relationships between power, place, and scale, and a Bourdieusian conceptualization of technological and social capital, this article proposes a model of the interconnections between urban and digital inequalities from the vantage point of the everyday experiences of economically marginalized urban residents in the United States. On the basis of this model, the author suggests a future research agenda that examines the empowerment or disempowerment of people related to ICTs in relation to their own frameworks for ICT use; how technological capacity is related to technological and social capital embedded in particular places; and how technical capacity is developed across multiple spaces and multiple arenas situated in a broader analysis of inequality.

Keywords digital divide; urban; inequalities; information and communication technology; technical capital; gender; race; Bourdieu

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Introduction

Due to the increasing pervasiveness of information and communication technologies (ICTs) in many areas such as e-government, political information, healthcare and provision, and employment and educational opportunities, the concern is that digital inequalities have profound implications for economic, political, and social

stratification in the United States. Yet, despite this fundamental awareness and thus documented need for action, our current state of information on the digital divide is profoundly limited. How do poor people living in inner-city neighborhoods in the United States experience ICTs in their everyday lives? What are their frameworks for ICT use? How are their experiences related to ICTs shaped by the neighborhoods in which they live? Which economic, political, and social processes and which institutions affect access to and the use of ICTs? Operating at what spatial scales? How do individual characteristics such as education, family structure, and interests affect ICT access and use? How do place-based social networks affect access to and use of ICTs? How does the use of ICTs in one area of daily life such as employment affect the use of ICTs in other areas such as healthcare? These are among many questions that remain insufficiently explored by contemporary research on the 'digital divide'. Rather, much of the contemporary research on the 'digital divide' has remained at the descriptive level in terms of differentials in access to and use of ICTs and therefore unable to provide answers to the questions posed above and particularly beyond individual-level characteristics. More importantly, digital divide research has not posed the above questions as inter-related. We have not conceptualized how digital and urban inequalities are mutually constituted.

In this paper, I will argue that 'digital divide' research needs to be situated within a broader theory of inequality – specifically one that incorporates an analysis of place, scale, and power – in order to better understand the relations of digital and urban inequalities in the United States. For that purpose, I am proposing a model that shows the interconnections from the vantage point of the daily activities and experiences of economically marginalized urban residents. The model allows us to explore how individual actors, situated within a particular constellation of power relations, develop (or fail to develop) social networks and technological capacity in their daily lives. Furthermore, we can explore how the development of social networks and technological capacity are facilitated, constrained, and mitigated by the technological and social capital or resources embedded at the community and neighborhood scales. The nature and extent of such community resources, in turn, is determined by processes constituted at the urban, regional, national, and even global scales.

This scalar interactive model draws on a number of theoretical concepts from critical geography, particularly feminist, anti-racist, and political economy analyses of the relationship between power and space, and a Bourdieusian understanding of capital. This new model consequently expands our understanding of digital inequalities by providing a place-specific context that enables us to better grasp substantial local variations in the experiences of disenfranchised, impoverished urban residents, their technology needs, and their readiness to use ICTs. Such a holistic agency-based perspective on digital inequalities, in turn, allows us to view digital inequalities beyond the rather static parameters of technological capacity/skill and access to ICTs and thus also considers how digital inequalities are mutually constituted through urban inequalities. The ultimate goal of this new

theoretical framework is to facilitate future research and policy formation in light of a more nuanced understanding of digital inequalities than is currently the case.

In order for me to introduce this model, it is necessary to first provide an overview of the current discourse on digital inequalities in US cities and introduce two strands of research that will allow us to reconceptualize the notions of digital inequalities and situate them in a more holistic understanding of inequality in post-industrial cities.

Disparate discourses on the digital divide

The 'digital divide' is commonly used to refer to unequal access to and use of ICTs. There has been a considerable amount of research that has demonstrated unequal access due to socio-economic status, race, ethnicity, gender, age, and geographic location (Alvarez 2003; Jackson *et al.* 2003, 2008; Kennedy *et al.* 2003; Lenhart & Horrigan 2003; Losh 2003, 2004; Priege & Hu 2008).¹ In the context of the United States specifically, poor people, racialized minorities – particularly African-Americans and Latinos – women, inner city and rural residents, and the elderly are all groups that are disadvantaged in relation to ICTs (for a review, see Mossberger *et al.* 2003; Gilbert *et al.* 2008). Much of the research on the digital divide lacks a dynamic, critical analysis of the importance of 'race', class, and gender by essentially treating these concepts as pre-given static categories. While such primarily quantitative research has and continues to be immensely useful in describing the existence of unequal access to and use of technology, it remains precisely descriptive. A number of academics (DiMaggio *et al.* 1991; Kennedy *et al.* 2003; Gilbert & Masucci 2004, 2006; van Dijk 2005) have argued that digital divide research remains largely at the descriptive level, emphasizing demographic statistics in terms of access and usage. It describes who has less access and who uses the internet less in terms of demographic statistics, but does not explain how and why different groups have different levels of access and usage. Furthermore, descriptions of geographic variations in levels of access and usage cannot be explained.

To give an example of the limitations of even the most methodologically sophisticated of such research, I will use the research of Mossberger and her colleagues. Mossberger *et al.* (2006) conducted a national study to examine the effects of concentrated poverty on technology access and use. The authors used hierarchical linear modeling to compare individual – and community – level characteristics in a national random sample to examine if living in neighborhoods of concentrated poverty affected technology access and use. The study demonstrated that African-Americans' lesser access to ICTs is better explained by location in a high-poverty census tract than 'race' *per se*. But the authors point out that they cannot explain the causal mechanisms due to the nature of their data and methodology.

In a subsequent study, Mossberger *et al.* (2008) compared three cities in North East Ohio that vary by race and income to examine the influence of 'neighborhood-level' context on people's access to computers and the internet. The authors argue that '[T]he most striking part of our survey is the extent to which residents of very poor African-American neighborhoods make an effort to compensate for a lack of home and work access' (Mossberger *et al.* 2008, p. 484). The study found that when they focussed on people who had to seek out internet access because they lacked internet access at home or work, 'community characteristics became a statistically significant predictor of Internet usage' (Mossberger *et al.* 2008, p. 481). Specifically, they found that a higher percentage of African-American residents and a higher percentage of college graduates in the immediate environment had a positive and significant impact on access (p. 485). Again, they hypothesize that it is the context of institutional resources, social networks, and norms that are what is important about the neighborhood context.

This is not an argument against quantitative methods, but rather to demonstrate the theoretical limitations of analyses of the digital divide that largely fail to address the 'have nots' as differentiated, possessing agency, or embedded in place, while simultaneously failing to address the crucial importance of intersecting relations of power and inequality operating at and through multiple scales. There is a fundamental disconnection between the use of 'race', class, and gender as discrete, predetermined variables in digital divide research and how these factors are actually experienced in people's daily lives at the community scale. Simultaneously, this research neglects how such community contexts are determined by 'race', gender, and class inequalities and exclusionary practices at multiple scales.

There is a growing body of research that seeks to understand how access is embedded in and reinforces social, economic, and political inequalities (DiMaggio *et al.* 2001; Gordo 2003; Warschauer 2003; Barzilai-Nahon 2006; Kvasny & Keil 2006; Gilbert *et al.* 2008). In particular, a number of researchers (Kennedy *et al.* 2003; van Dijk 2005) have argued that digital divide research suffers from a lack of a more general theory of inequality. Using this argument as my starting point, there are two areas of current scholarship that offer insights into digital inequalities that provide a conceptual basis for my model: feminist/anti-racist scholarship on the digital divide and critical geographical scholarship on the digital divide.

Critical race, gender, and geographical studies

Research from feminist and the critical race theory approaches to examining the intersection of inequality and technology is at the forefront of situating the digital divide research within a broader theory of inequality (Kolko *et al.* 2000; Green & Adam 2001; Lawson-Mack 2001; Nelson & Tu 2001; Nakamura 2002; Wajcman

2004, 2007; Leung 2005; Gilbert & Masucci 2006). Significantly, this research does not focus solely on the digital divide *per se* but theorizes the relationships between technologies and gender and/or 'race/ethnicity' from feminist and the critical race theory. Common themes include the role of technology in the politics of identity; 'race'/gender and technology as mutually constitutive; the connections among institutionalized racism/sexism in education, the economy, and cultural institutions; the intersections of technology and everyday life; and women/racialized minorities as technology users, producers, and innovators not just victims of the digital divide.

The key points for the purpose of my argument are that gender and 'race'/ethnicity are conceptualized as socially constructed, mutually constituted, and intersect with other forms of power and inequality such as class and sexuality. The 'have nots' are differentiated, have agency, and need to be examined from the perspective of their own ICT frameworks grounded in daily experiences. Technology itself is seen as socially constructed and mutually constituted through power relations, which, themselves, are spatial processes that have been more aptly discussed in separate discourses within the field of critical geography.

A second strand of research focusses on how place, space, and scale are important factors in (re)producing digital inequalities and is informed by discourses associated with critical geography. While research on the digital divide from a geographical perspective is limited (Crampton 2003, for a review see Gilbert *et al.* 2008), it highlights the embeddedness of ICTs in everyday life *in particular places*. An important point of departure in critical geography more broadly is the understanding of how particular places and life in such places is affected by processes occurring at the metropolitan, regional, national, and even international scales and ultimately related to the broader political economy and thus the production of urban space (Warf 2001; Crampton 2003). Local and economic histories, political cultures, and race and class histories – to name just a few – all constitute particular places.² While it is beyond the purview of this paper to engage in a more elaborate discussion of scale, it is crucial to understand that place-specific contexts – including the provision of, access to, and utilization of ICTs – are the product of the interrelatedness of social, economic, and political processes occurring at multiple scales.³

This, in fact, has allowed critical geographers to better understand the geographic context of inequalities in labor and housing, and the provision of public services – crucial factors that ultimately determine the context in which people can or cannot gain access to ICTs.

Toward a critical geography of race, class, and gender

Recent research that brings together critical race, feminist, and geographic perspectives has reframed the digital divide from the perspectives of those least empowered (Gilbert & Masucci 2004, 2006; Gilbert *et al.* 2008). Specifically,

they argued that the digital divide is better conceptualized in terms of '(a) the specific places in which people gain access to computers, the internet, and training; (b) the manner in which people may rely on place-based and non-place-based social networks; and (c) how specific social policies and institutions may shape their view of the importance of information recourses in addition to the ways in which they may obtain access to computers and Internet resources' (Gilbert *et al.* 2008, p. 916). Importantly, this research demonstrates that 'the have nots' are highly varied in their frameworks for ICT use precisely because of the manner in which people are differentially embedded in particular social, economic, and political processes, and geographic location.

Part of the difficulty in bringing together the two strands of research on the digital divide is how to conceptualize the interconnections between an individual's frameworks for ICT use, situated within a constellation of power relations, and the wider political, social, and economic processes operating at multiple scales and experienced in particular places that are structuring ICT frameworks and use. I argue that Bourdieu's conceptualizations of social and technical capital prove useful in this context (for a detailed discussion of Bourdieu's concept of social capital relative to neighborhood context see Carpiano 2006). Bourdieu (1986) conceptualized social capital as the actual or potential collective resources of groups that can be drawn upon by individual group members. He argued that we need to focus on the existence of community social networks, the resources possessed by the network, and the individual's ability to draw upon those networks. Later Bourdieu (2002) conceptualized technical capital in a limited but suggestive way relative to ICTs. Here, I want to suggest that we conceptualize technological capital in relation to ICTs as the actual or potential collective resources related to access to, use of, and knowledge related to ICTs.

The foregoing discussion of the current state of research on the digital divide suggested clearly that our contemporary understanding is too narrowly conceptualized and seriously lacking an understanding of multiple, interactive processes that determine digital inequalities in a broader context of inequality. Specifically, I argue that understanding the causal mechanisms interconnecting digital divides and urban inequalities would need the following three components. First, rather than looking at relative access in terms of demographic characteristics such as race, gender, and income, we need a more developed conceptualization of power and inequality. Specifically, we need to understand race, class, and gender as processes of inequality that while analytically distinct, are interconnected in shaping people's lives. So it would be more useful to examine how people are situated in particular constellations of power relations and how this impacts their access to and use of ICTs. For example, instead of describing the different patterns of ICT access and use of men and women, we could ask: how does the gender division of labor in the household and labor market shape men's and women's access to and use of ICT? How is this different for people of different racialized or economic groups?

Second, we need a much more sophisticated conceptualization of place and scale. A critical geographic conceptualization of place and scale allows us to see how inner-city poor neighborhoods are situated within social, economic, and political processes constituted through multiple scales. It highlights the connections between inner-city poor neighborhoods and other places, thereby enabling us to move beyond a focus on individual characteristics disconnected from analyses of power relations and a particular context. It also suggests that we need to examine the spatial extent of people's daily lives rather than assuming that census tracts capture the context of their daily lives. Instead of documenting geographic variations in ICT access and use, we can ask questions such as how do local labor markets, the quality of schools, or the availability of public services such as libraries explain variations in access and use of ICTs?

Finally, we need to conceptualize the relationship between an individual's ability to access and use ICTs and related information flows and the community context. I am using the term technological capital, which is part of social capital as conceptualized by Bourdieu (1986, 2002). The advantages of this conceptualization are threefold. First, it allows us to make the connection between an individual's social networks and technical capacity, and the social and technological capital embedded in particular neighborhoods. Second, it allows us to stress how digital inequalities are not the result of predetermined social categories but are (re)produced through people's everyday experiences embedded in places, power relations, and structures of inequality. Finally, it opens up a line of inquiry in terms of how technological skills developed in one arena (or field as defined by Bourdieu) might be related to experiences and opportunities in other arenas. So we can ask questions about how a person's place-based social networks connect (or fail to connect) them with social or technological capital embedded in place? How is technical capacity shaped by employment opportunities in specific labor markets intersecting with occupational segregation by race and sex? Does technical capacity developed in the workplace or through one's children translate into other realms such as healthcare, community engagement, or consumer spending?

Re-conceptualizing digital and urban inequalities

Based on the aforementioned critiques, I am proposing a new model for conceptualizing digital divides in the context of broader societal inequalities and how they are constituted by processes operating at multiple scales, from global to the scale of lived experience (Figure 1). Specifically, I show how processes constituted through the global and national scales and associated with broader economic restructuring, occupational segregation, and welfare state restructuring, shape and are shaped by the nature and extent of labor and housing markets, as well as public services and non-profits at the regional, metropolitan, and intra-urban scales.

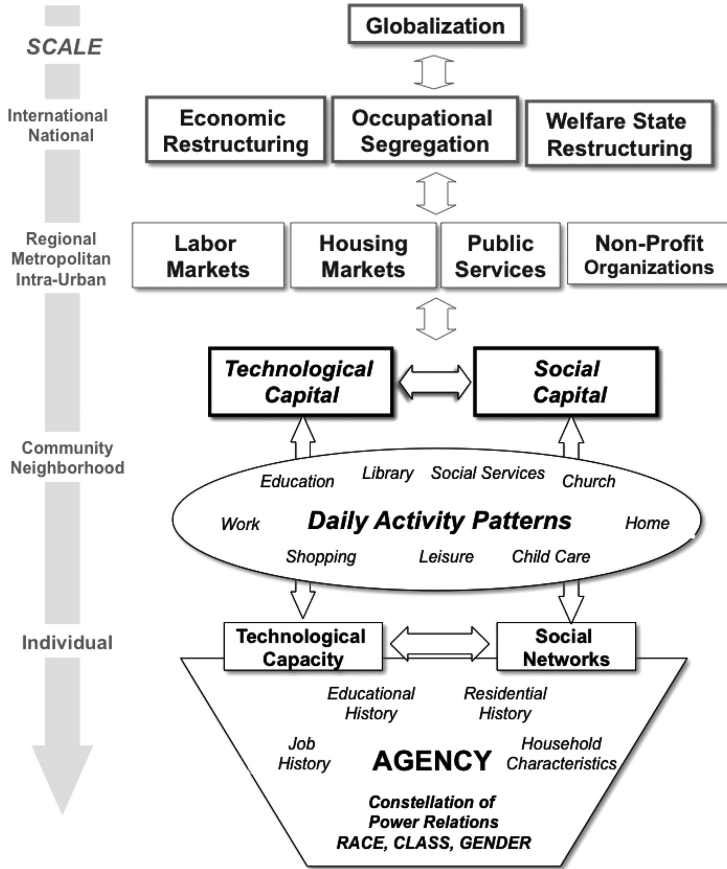


FIGURE 1 Model for examining urban inequalities and digital divides.

This broader urban context, in turn, shapes and is shaped by the technological capital and the social capital available to urban residents and thus the ICT use context. The ways in which individuals can or cannot access and use such technological and social capital, however, depends on an individual agent’s technological capacity and their social networks, which are dependent on an individual’s biography and thus their employment, residential, and educational history, for all of which ‘race’ and gender, understood as processes of power and inequality, are paramount in shaping one’s life course. Furthermore, an individual’s technological capacity and social networks are shaped by an individual actor’s daily activity patterns that revolve around specific, often place-based tasks revolving around work, home, shopping, childcare, education, and social service provision. In devising this holistic model, we are able to dissect the digital divide and its embeddedness in broader inequality and thus lay bare its constituting dimensions. Each of these dimensions, in turn, must be examined

in terms of how broader 'race', class, and gender inequalities affect each factor and thus allows us to formulate more specific research questions that take power relations, variability, different local contexts, and very different individual factors into consideration. In the following, I discuss the various processes operating at different scales in turn, starting with the macro-scale which provides a broader context of inequality more generally.⁴

(Inter)national inequalities: the economic and political context of urban inequality

Globalization and the ascendance of neoliberal ideology sets the context for contemporary forms of urban inequalities, and at the same time, cities have a strategic role in the remaking of the contemporary political economy (Brenner & Theodore 2002; Peck 2004; Harvey 2005). Many have argued that we have entered a new economy (see Perrons 2006; Perrons *et al.* 2006). Castells (2000) has argued that there is a new technological paradigm around microelectronics-based ICTs and genetic engineering. He also argues that the development of the internet has profound implications for the organization of economic activity and increasing productivity (Castells 2001). Others (Beck 2000) focus on the relationship between technological change, deregulation, and globalization. It is also important to remember that technological choices are a result as much as a cause of economic and social changes (Tilly 2006).

A number of people have pointed out that the knowledge economy produces increasing inequalities as well as put new strains on work–family balance (Carnoy 2000; Reich 2001; Perrons 2006). At the same time, neoliberal welfare state restructuring has shifted market risks away from employers and the state and onto individuals and families. One aspect of this is that poor women with children in the United States have had to find jobs in exchange for time-limited public benefits (for an overview, see Abramowitz 2006; for a discussion of the relationship between labor market and welfare policy, see Peck 1996). Interestingly, recent research has shown that former welfare recipients employed in jobs that have irregular schedules, little opportunity for wage growth or menial tasks, or experience frequent job turnover have detrimental effects on their children precisely because of work–family balance issues (Johnson *et al.* 2010).

Geographic variations in welfare policy by state and local government means that how such policies affect an individual's relation to ICT access and use will vary. To give one example, Gilbert and Masucci (2004) found that welfare policy at the state level in Pennsylvania which mandate a 'rapid attachment' strategy to employment presented a significant barrier to women's participation in employment–training activities at a Community Technology Center (CTC). Most of the women could not find the time to participate in programs of the CTC because they were participating in welfare-mandated

programs, accessing services and raising children. The women wanted the CTC to create programs to help their children with homework and provide a safe place for the children.

While the goal of welfare reform is to move women off of public subsidies and into employment, occupational segregation by sex and race ensures that many women will work for wages below the poverty line. Gender, racial, and ethnic divisions of labor have been extremely persistent in the United States despite the large numbers of women in workplace and the changing institutional framework of overt racism and sexism (for an overview, see McCall 2001; Blau & Kahn 2006; Tilly 2006). Occupational segregation by sex and race accounts for a large portion of the continuing gap in pay between white males and other groups (Hartmann *et al.* 2006; Leicht 2008).

Occupational segregation by sex and race has significant implications for access to and use of ICTs.⁵ Research has shown that occupational sex segregation helps to explain differential use of computers and the internet (Losh 2003, 2004). Evaluating several nationally representative surveys to track gender differences from 1983 to 2000, Losh (2003) found that ‘Although women with baccalaureates or more advanced degrees have opportunities for jobs that use computers and the Internet for synthesis, simulations, diagnostics and information searches, women who lack a four year degree generally continue in the far less interesting “pink collar ghetto” of word processing or data entry’ (pp. 65–66).

How the new economy challenges and reinforces occupational segregation by sex and ‘race’ is complicated, but there are a couple of aspects related to access to and use of ICTs that I would like to point out. First, the conceptualization of the new economy that emphasizes ICTs and high-status employment also depends on a range of lower-level jobs in distribution and consumer services (Perrons 2006). Second, the lower-levels jobs in distribution and consumer services may afford some workers opportunities to work with ICTs (Perrons 2006). Third, there are now increasing numbers of IT user jobs in data entry and retail services (Chapple 2005).

Metropolitan inequalities

As we move from the international/national scale to regional and metropolitan processes, we know that the nature of the economy is shaped by regional economic processes as well as particular racial/ethnic mix of an area and many other factors (McCall 2001). The racialization of the labor market as it intersects with the new economy will be different in various local labor markets. Furthermore, research has demonstrated that the dynamics of global capitalism play out differently for various groups of people depending on the nature of local labor markets (McCall 2001). Local labor markets vary significantly in terms of the particular mix of occupations and industries that are available, including high-technology

industries (Chapple *et al.* 2004). Therefore, the particular mix of occupations and industries available to people varies depending on where they live. Furthermore, the detrimental effects of residential segregation on economic opportunities is well documented (Turner 2008). This may provide opportunities that enhance or limit the development of people's technical capacities.

At the level of metropolitan processes, the spatial patterns of uneven development in the United States are striking. Residential segregation is profound and the resulting educational disparities have important implications for access to and use of ICTs (for an overview of the impacts of residential segregation on economic, housing, social networks, and education, see Carr & Kutty 2008; for a discussion of residential segregation and education, see McCoy & Vincent 2008). The relationship between educational opportunities and access to and use of ICTs includes examining how people attain basic, computer, and information literacies (e.g. Warschauer 2003). But it also requires a broader analysis of educational disparities resulting from education policy at the federal, state, and local levels.

There are also substantial variations between urban areas with regard to the nature and extent of public service provision which, increasingly so, also involves ICTs such as the increased dissemination of government information through the internet or the ability, willingness, and resources to mount city-specific programs with regard to computer literacy and use. Considering fiscal constraints, non-profits are playing an increasingly important role in service provision which may, or may not, involve ICT readiness, job training, and other services.

Much of the research on the digital divide has looked at urban versus suburban data or data based on census tracts. But this is not the reality of most people's lived experiences nor does it reflect recent changes such as increasing poverty in the suburbs and gentrification in center cities. There has been research that demonstrates that most people's daily activity patterns regarding where they go, where they look for work, where they have social networks are at a finer spatial scale and that this impacts the kinds of jobs that people get and the resources that are available to them (Hansen & Pratt 1995; Gilbert 1998). And furthermore, the spatial extent of their daily activity patterns is shaped by, for example, residential segregation and the distribution of jobs (Gilbert 1998). All this is to say that there are substantial variations between urban areas which, albeit similar macro-processes, ultimately create different contexts in which poor people may or may not experience inequality. This, in turn, requires us to fine-tune our scalar analyses even further by entering now the community scale, the scale at which people live, work, interact, and make ends meet.

Community/neighborhood/scale of lived experience

The community or neighborhood scale is, as I have argued, perhaps the most overlooked, yet at the same time, most insightful scale of analysis. At this

spatial scale, I want to highlight Bourdieu's conceptualization of social and technological capital discussed above. Social capital is the actual or potential collective resources of groups that can be drawn upon by individual group members. The amount of social capital of someone depends on the size of the network, and the amount and types of capital possessed. We consequently need to focus on the existence of community social networks, the resources possessed by the network, and the individual's ability to draw upon those networks. Technological capital as the actual or potential collective resources related to ICTs and, as with social capital, it largely corresponds with an individual's technological capacity and thus the ability to use ICTs. So the key is that technological capital is tied to the gendered and racialized nature of urban labor markets, residential segregation, school systems, and the availability of services – public and non-profit – such as libraries and community technology centers.

Individual scale/agency

The extent to which someone has access to social capital and technological capital depends on the nature and extent of their social networks and (inter-related) their technological capacity, meaning access to, use of, and skills level related to ICT as well as their particular framework for ICT use. People develop social networks and technological capacity in particular places/contexts.

In particular, we need to pay attention to the spatial extent of an individual's daily and periodic activity patterns – where one goes – home, jobs, childcare, library, shopping, church, etc., as it is interrelated with social networks and sets the place/context for the development of technological capacity. Research in North Philadelphia in the context of a university–community partnership and creating, staffing, and running a community computer center at Harrison Place revealed that there is tremendous variation in ICT use among the predominantly African-American patrons of the facility ranging from after-school activities and learning for school-age children, job searches among young parents, to finding cooking recipes by older patrons (Gilbert & Masucci 2004, 2006). It would consequently be wrong to draw conclusions solely on the extent of use or the characteristics of the users.

Finally, we need to look at a person's residential, job, and educational histories related to the development of social networks and technological capacity. We need to look at race, age, gender, household structure, and income not as demographic characteristics but within a broader analysis of the manner in which each person sits within a constellation of power relations. For example, we need to look at an individual's household structure in terms of how the gender division of labor and the presence or absence of children impacts someone's technological capacity.

An agenda for research

This framework is intended as a heuristic device to conceptualize the multiple constituting factors of digital inequalities, how they are constituted by processes operating at multiple scales, and how they ultimately affect the very community context in which individual agents *experience* the digital divide. The latter is important because it showcases the complexity of factors that determine how an individual with his/her technological capacity and social networks can or cannot access the technological and social capital available to them. This framework, consequently, allows us to ask nuanced empirical questions about the relationship between urban inequalities and digital divides.

First, we need to ask how is an individual's technological capacity related to their ability to access social and technological capital embedded within the spatial extent of their daily life? And how is this shaped by the person's particular constellation of power relations? For example, how does the availability of different kinds of jobs for different people impact the development of technological capacity?

Second, this framework leads to a research agenda that explores how processes of gender, 'race', and class shape the nature and acquisition of technological capacity across multiple spaces/arenas such as the workplace, domestic sphere, and community activities. For example, does increasing technological capacity due to a particular job affect the gender division of labor in the household? Does it translate into increased use of ICTs in the realm of healthcare or consumer spending or community organizing?

Finally, we need to ask how technological capacity shapes the nature and acquisition of knowledge related to jobs, education, public services, consumer spending, and political participation. For example, how does the technological capacity that one develops (or fails to develop) in different arenas shape their access to information in different realms that they may find important. Does the technological capacity that a woman gains from a non-traditional job then translate into a better ability to gain information related to health issues she may be concerned with, or increases her ability to participate in her child's education, or to participate in electoral politics?

In conclusion, there has been little research that has looked at the empowerment or disempowerment of people related to ICTs in relation to their own frameworks for ICT use, looking at how technological capacity is related to technological and social capital, and how it is developed across multiple spaces and multiple arenas situated in a broader analysis of inequality. I am suggesting that digital divide research needs to be connected to a broader theory of inequality – specifically one that incorporates an analysis of space, place, and power – in order to better understand the causal mechanisms underlying the creation of digital divides in urban areas. We need to examine how individuals participating

in different constellations of power relations develop technological capacity across multiple arenas and in the context of particular place-based technological and social capital. We can then evaluate the relative empowerment and disempowerment of people in relation to their own frameworks for ICT use. The potential policy implications are profound. It suggests that developing policies to address the digital divide without addressing the wider inequalities between groups and places will only exacerbate the digital divide further.

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Notes

- 1 A series of reports called 'Falling through the Net' and 'A Nation Online' published by the National Telecommunications and Information Administration (NTIA 1995, 1998, 1999a, 1999b, 2000, 2002, 2004) brought national attention to differentials in household computer ownership and the use of the internet. The studies generally document that low-income households, racialized minority households, people with lower educational attainment, elderly people, women, and people living in inner-city neighborhoods have the lowest rate of computer ownership, computer use, and internet access. The results of later reports have caused some to argue that the digital divide is disappearing (e.g. Compaigne 2001), but many others have argued the opposite (e.g. Losh 2003; Robinson *et al.* 2003).
- 2 Social constructionist conceptualizations of place reject the notion that places are bounded entities. Place is not a container but rather a constellation of processes, open and heterogeneous (Massey 1993, 2005).
- 3 Social constructionist conceptualizations of scale reject scale as an ontologically given category. As such, 'scale is not necessarily a preordained hierarchical framework for ordering the world-local, regional, national and global. It is instead a contingent outcome of the tensions that exist between structural forces and the practice of human agents' (Marston 2000, p. 220). For a review of how scale has been conceptualized in geography, see Marston

(2000). For current debates over the construction of scale, see Marston *et al.* (2005), Collinge (2006), Hoefle (2006), Escobar (2007), Leitner and Miller (2007), and Jones *et al.* (2007). My intent in conceptualizing my model in a scalar framework, albeit one that rejects scale as ontologically given, is to move digital divide research away from a focus on individual's technical capacity and/or lack of access to computers and the internet to an analysis of power and inequality.

- 4 My goal here is not to privilege the macro-scale nor to suggest that processes such as economic restructuring are not constituted at the scale of lived experiences, but rather to highlight the way in which the 'digital divide' research needs to be reframed within a broader theory of inequality.
- 5 There is a much broader literature on the intersection of the sexual division of labor, gender relations at work, the social construction of gender, and technological change (Webster 1996; Halford *et al.* 2010).

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