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Toward Meaningful Connectivity: Using Multilevel Communication Research to Reframe Digital Inequality

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Digital inequality, or unequal access to the Internet and technologies that connect to it, has preoccupied communication scholars since the Internet's introduction into popular culture. The relationships between digital and broader social inequalities suggest that meaningful digital connectivity — that is, having the technical skills necessary to engage technology and mobilize information resources to address everyday needs — can empower socially disenfranchised individuals, families, and communities to address challenges related to those disparities. In this essay, we overview the arc of communication research on technology engagement and its consequences. On this foundation, we argue why multilevel research that accounts for individual-, family-, and community-level influences on meaningful digital connectivity is the best path forward for research on digital inequality.

Digital inequality, or unequal access to the Internet and technologies that connect to it, has preoccupied scholars across the social sciences since the Internet's initial introduction into popular culture (DiMaggio & Hargittai, 2001; Sassi, 2005; van Deursen & van Dijk, 2014; Warschauer & Matuchniak, 2010). These concerns emanated, at least in part, from the early, widespread recognition that unequal access to digital technologies maps closely onto other persistent forms of social inequality, including disparities related to income, education, age, gender, and geography (Anderson, Bikson, Law, & Mitchell, 1995; Courtois & Verdegem, 2014; Hargittai, 2002; Horrigan, 2014; Loges & Jung, 2001; Lopez, Gonzalez-Barrera, & Patten, 2013). The potential for digital inequalities to exacerbate broader social disparities has been a prominent

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feature in this literature, which has recognized digital inequality as "one of the most damaging forms of exclusion in our economy and in our culture" (Castells, 2002, p. 3).

Within the field of communication, scholars' interests in the social and cultural implications of new technologies long preceded the advent of the digital age. Early theorists in this area were primarily concerned with mass media effects across different social groups, given that those were new communication technologies at the time. Rogers' (1962) diffusion of innovations theory provided an influential early framework for explaining how new ideas and new technologies infiltrate a social system. Research in this tradition established that time and communication channels (e.g., mass media and social networks) are important mediators of technology adoption; an innovation is more likely to be embraced when uncertainty regarding its impact has been reduced (Rogers, 1995; Valente, 1995). In a related line of inquiry, Tichenor, Donohue, and Olien (1970) bridged theories of adoption and media effects with their explicit focus on knowledge inequality between groups with different socioeconomic status (SES). Their knowledge gap hypothesis details how higher-SES individuals garner greater benefit from access to informational resources than lower-SES individuals, resulting in knowledge disparities that lead to disparate social outcomes.

Building on these early frameworks of adoption and effects, communication scholars shifted focus to inequalities related to digital technologies (i.e., the Internet and devices that connect to it), as they rapidly became indispensable for accessing information resources in the 1990s. Research on the "digital divide,"[1] the term coined to describe the gap between the "haves" and "have-nots" in the Internet age, grew concurrently with the broader literature on communication and technology (Goslee, 1998; Loges & Jung, 2001; Norris, 2001). And yet, almost immediately, communication scholars began moving away from the digital divide's simplified, binary orientation by working to develop more nuanced conceptualizations of how best to theorize, evaluate, and address digital inequality and its social consequences (Courtois & Verdegem, 2014; Hargittai, 2002; Sassi, 2005).

We begin this essay with an overview of these efforts to accurately conceptualize digital inequality and its effects on everyday life. We argue that because most of the research linking digital and social inequalities has been conducted at the individual level of analysis, researchers have given limited attention to the complex communication processes that underlie persistent inequalities. We then provide an overview of communication research that has taken more expansive approaches by considering how family- and community-level factors influence an individual's technology engagement. On this foundation, we advocate for multilevel research designs, which account for individual-, family-, and community-level influences on technology adoption and engagement, as the best pathway for future digital inequality research. We conclude by discussing how multilevel approaches not only deepen scholarly discussions of digital inequality and offer intriguing new challenges related to measurement, but also reveal opportunities to support individuals and communities as they use these technologies as tools for self-determination.

Tracing connections between digital and social inequality

Contemporary scholars of digital inequality remain concerned with traditional questions related to technology access and adoption, but they have increasingly shifted toward examining barriers to meaningful technology engagement. In our work, we view individuals as having *meaningful digital connectivity* when they possess the requisite technical skills to engage new communication technologies and mobilize information resources, to be able to address a range of everyday goals and concerns. We are primarily interested in how meaningful digital connectivity can empower socially disenfranchised individuals, families, and communities to address the broader social disparities that they are disproportionately likely to experience (Katz & Gonzalez, 2016). We draw on a growing body of research that documents how digital and social inequalities are intertwined and, therefore, how digital inequality negatively impacts an individual's chances of thriving—as opposed to merely surviving—in her local environment (Hilbert, 2011; van Deursen & van Dijk, 2014; Wei, 2012; Wei & Hindman, 2011).

Our conception of meaningful digital connectivity is rooted in prior efforts by communication researchers to capture the multidimensional nature of technology engagement. DiMaggio and Hargittai (2001) were among the first to suggest that the "digital divide" was not binary, but rather consisted of multiple dimensions of inequality related to technical concerns, autonomous use, range of uses, support networks, and personal skills. Jung, Qiu, and Kim (2001) had similar motivations for developing the "Internet Connectedness Index," which moves beyond measuring device ownership or time online, to assessing the centrality and scope of an individual's Internet use. Similarly, Bunz, Curry, and Voon (2007) measured differences between an individual's perceptions of his capabilities with computers, e-mail, and web searches, and his observed abilities to complete tasks using these technologies. And in an effort to examine online skill-building longitudinally, Livingstone and Helsper (2007) argued for considering digital inclusion/exclusion as a continuum, to better understand how and why individuals engage in increasingly complex online activities over time.

Other scholars have used nuanced ways of measuring digital connectivity in order to document its social consequences. For example, Ito, Baumer, and Bittanti (2009) and Watkins (2010) explored how higher-income young people better integrate learning activities across different social contexts (i.e., online and offline, at school, and in other locations), such that they experience more "connected learning" than their lower-income counterparts do. Likewise, Hargittai and Shaw (2013) found that young people's Internet skills and use of social networking sites create pathways for a range of civic outcomes, including volunteering, donating, and contacting public officials.

Although communication researchers have made great strides in documenting digital inequality and its very real consequences, their tendency to conduct studies solely at the individual level of analysis has constrained the field's development. Hampton's (2010) examination of Internet use and concentrated social disadvantage provides an excellent review of how researchers have focused on individual-level

characteristics, behaviors, and outcomes in their studies of digital inequality. By decoupling technology engagement from the features of local environments where those activities take place, Hampton argues, we lose the ability to identify contextual factors which are critical to the reproduction of social and civic inequalities. Extending Hampton's charge, Friedland (2016) examines the work of four influential theorists — namely, Manuel Castells, Claude Fisher, Barry Wellman, and Robert Sampson — to argue that the narrow focus on individuals has also constrained how researchers have studied personalized social networks. Friedland contends that communication scholars have focused on how social networks can transcend physical spaces, and have done so at the expense of considering the very real impacts that local environments have on technology use and social change.

Multilevel approaches to studying digital inequality

Communication scholars' efforts to move beyond simplified understandings of digital inequality have advanced the field by developing frameworks to explain how limited digital connectivity affects individuals' social opportunities. We argue that it is time to push forward still further, by applying multilevel approaches to the study of digital inequality. By moving beyond the individual level of analysis to consider also how family units,[2] situated within their local communities, manage everyday challenges, researchers can better account for the contextual factors that most influence meaningful connectivity.

Family dynamics and meaningful connectivity

To date, researchers have generally focused on either adults or children as individual technology users. Indeed, researchers have often compared adults' and children's online activities as if they are binary as well, by referring to adults as "digital immigrants" and their children and adolescents as "digital natives" (Helsper & Eynon, 2010; Prensky, 2001). We argue that by examining individuals within their family contexts, communication scholars can more fully interrogate the dynamic relationships which are central to how individuals assess the utility of digital tools for addressing their needs, as well as how they acquire the skills and confidence necessary to use and integrate them into their daily routines.

Communication scholars concerned with children, adolescents, and media often work at the intersection of individual and family levels of influence on technology adoption and use. Much of this literature is unidirectional and top-down, in that, under the broad umbrella of parental mediation research, scholars have documented how parents guide, limit, and otherwise influence their children's interactions with digital devices and content (Nathanson, 1999; Valkenburg, Krcmar, Peeters, & Marseille, 1999; see Nathanson, 2015, for a recent overview). Within this work, scholars have revealed considerable variation in the nature and frequency of parents' mediation strategies, based on their SES, race/ethnicity, and nativity, among other factors (Clark, 2012; Elias & Lemish, 2011; Livingstone & Helsper, 2008). Livingstone and

Helsper (2008) note that parents' own technological abilities — or lack thereof — are crucial to how capable they are of mediating their children's online activities.

Scholars concerned with digital inequality have also started investigating the possibility that children facilitate digital skill-building among the adults in their families. For example, Eynon and Helsper's (2015) analyses, based on a representative survey in Britain, indicate that although children do have influence, the age and education of adults are more predictive of their Internet-related skills and engagement. In a similar vein, Correa (2014, 2015) investigated child-driven technology adoption and engagement among families in Santiago, Chile. She found that children's influence is strongest among low-income families and is stronger for mothers and for parents who report more fluid parent–child interactions. That children influence their parents' technology use does not contradict the longer research tradition that documents parents' influence on children's use. Rather, as Clark (2011) argues in her reformulation of mediation theory for the digital age, the interactivity afforded by new communication technologies opens new possibilities for intergenerational exchange and skill-building within families.

Although scholars have clearly established the importance of considering parents' and children's technology adoption, skill-building, and engagement within a family context, few studies have contextualized these dynamics within the places where families live. Researchers who have considered place have focused primarily on national-level differences. Livingstone's EU Kids Online projects are an influential example; through multiple waves of research, she and her colleagues have compared how children and families in 33 countries use technology (Livingstone & Haddon, 2009; www.eukidsonline.net). Elias and Lemish (2011) also took a cross-national approach by comparing family media engagement among immigrants from the former Soviet Union in two receiving countries, namely Israel and Germany. Their findings demonstrate that national-level differences matter in terms of the cultural expectations that parents and children develop and enact related to technology use, as well as the variety of content that they can access. By contrast, studies of family technology engagement that account for community-level factors on digital behaviors are conspicuous by their near absence from the literature (cf. Katz, 2014a; Katz & Gonzalez, 2016; Lane, 2016).

Community features and meaningful connectivity

Approaches that account for an individual's everyday experiences, in the context of the features of her community that support or hinder her activities, have a long history in communication research and in the social sciences more broadly. Using the city as a social laboratory, Chicago School sociologists believed that ecological models contextualized human nature and were therefore most appropriate for studying social conditions (Blumer, 1969; Hughes, 1958; Katz & Hampton, 2016; Park, 1925). These scholars considered a broad range of media, and how a range of social groups (including immigrants) engaged them, crucial to understanding their interactions in local spaces (Park, 1922).

Communication infrastructure theory (CIT) is one contemporary framework that explicitly draws on the earlier work of the Chicago School and has spawned a considerable body of research on residents within their community contexts in the United States and Asia (Ball-Rokeach, Kim, & Matei, 2001; Jung, Toriumi, & Mizukoshi, 2013; Kim & Kang, 2010; Matsaganis & Golden, 2015; Wilkin, 2013). By studying key storytellers (i.e., residents, community organizations, and locally available online and offline media) in specific neighborhoods, CIT explains multiple levels of influence on residents' social outcomes related to civic participation, neighborhood belonging, and collective efficacy (Kim & Ball-Rokeach, 2006a). Guided by CIT and other similarly ecological frameworks, communication scholars have documented how local communication environments influence the behaviors and interactions that residents have in those settings, including activities related to their health, civic engagement, and family wellbeing (Chen et al., 2013; Dutta-Bergman, 2006; Friedland, 2001; Katz, 2014b; Kim & Ball-Rokeach, 2006b; Matsaganis, Katz, & Ball-Rokeach, 2011; Wilkin, 2013).

Emerging scholarship in this tradition contributes both theoretical and methodological perspectives to the study of localized engagement in the digital age. For example, Ognyanova et al. (2013) operationalized community-oriented, online participation as residents' local information gathering and online discussion about their community, and found that such participation predicts broader civic engagement activities. In the aftermath of a major earthquake in Japan, Jung et al. (2013) found that conversations with neighbors, membership in community organizations, and Internet connectedness promoted civic action locally during that crisis. Examining different linkages between digital connectivity and civic engagement, Hampton, Lee, and Her (2011) found that heavy Internet users have more diverse social networks, visit public spaces more frequently, and are more likely to belong to voluntary groups, as compared with those who use the Internet less often.

This growing body of work documents how accounting for where individuals live deepens scholars' understandings of digital and social inequality. The social infrastructures of communities influence how residents engage with digital resources in their local environments, as well as their motivations for doing so. Structural factors in communities, including the cost and speed of Internet connectivity, free access to the Internet and Internet-capable devices (e.g., via open WiFi networks and public libraries), and opportunities for skills training and support, all impact residents' opportunities for meaningful digital connectivity as well (Dailey, Bryne, Powell, Karaganis, & Chung, 2010; London, Pastor, Servon, Rosner, & Wallace, 2010; Rains, 2008).

The extant literature also shows that considering individual residents as embedded in their primary deliberative units — that is, within their families — is crucial to understanding how they make decisions about locally available opportunities for technology adoption and engagement. Examining individuals within their families is also key to documenting how residents of different ages develop digital skills. We provide our own recent work as an illustration of how multilevel communication research that

accounts for individual-, family-, and community-level influences can support efforts to address digital inequality in ways that are culturally relevant and sustainable.

Integrating three levels of analysis

Drawing on the theoretical and methodological frameworks described above, we developed a study capable of evaluating how low-income families respond to digital inclusion programs that offer them discounted broadband Internet and Internet-capable devices. Through a multilevel, communication-centered research design, we investigated how individuals and families in different communities interpret these incentives, and how they engage digital technologies on their own terms and for their own purposes. We were interested in how these technologies are integrated into domestic activities that influence family media literacy and skill-building, local knowledge development, and children's learning.

We conducted interviews with 336 parents and children of Mexican heritage in three demographically similar communities located in Arizona, California, and Colorado. All respondent families qualified for digital equity programs for low-income families. Our goal was to qualitatively assess three levels of influence on meaningful digital connectivity. Separate interviews with parents and children captured the individual level. Analyses of where parents' and children's accounts were convergent or contradictory captured the family level. We assessed community-level influences by interviewing school administrators who were responsible for rolling out the programs and by comparing community-level features on families' technology adoption and engagement, in the three localities.

The full details of our research design and analyses are beyond the scope of this manuscript, but have been published elsewhere (Katz & Gonzalez, 2016). Briefly, our bottom-up approach to assessing top-down digital equity programs revealed how parents and children influenced each other's technology adoption and engagement. Children and parents often made adoption decisions collectively and agreed on what sacrifices were necessary to afford them, such as forgoing Christmas presents to maintain broadband connectivity. We also found that immigrant parents were particularly likely to depend on their children to *broker* their connections to digital devices and to translate content as needed (see also Katz, 2010, 2014a). These experiences facilitated technical skill development and varied forms of learning for parents and children alike, increasing their collective abilities to address everyday needs and concerns in the process. These dynamic exchanges emerged as the key elements to understanding how members of low-income families had developed meaningful digital connectivity.

Furthermore, our results indicated that demographically similar families make different choices in different local environments. We found that families' assessments of risks and rewards offered by technology reflected salient, broader threats and opportunities in their communities. For example, in our Arizona site, intensive local surveillance related to stringent immigration enforcement heavily influenced families' technology adoption decisions. Some Arizona families opted to pay for digital devices and home broadband because doing so allowed them more time in the safety

of private domestic space, as opposed to going to libraries and other public locations to get online. In our Denver study site, the salience of mass shootings in local schools and movie theaters (i.e., the Columbine and Aurora tragedies, respectively) affected parents' assessments of relative risks to their children's safety, and online risks looked less dire by comparison.

Multilevel research approaches, including our own, answer Hampton's (2010) and Friedland's (2016) collective call to move the field forward by locally contextualizing technology engagement. The utility of these frameworks also has potential for impact beyond the academy. By identifying families' assets, apprehensions, and constraints related to technology adoption and engagement within the realities of their local environments, we were able to offer school districts concrete, community-specific suggestions for partnering with families to develop digital initiatives relevant to them and their neighbors. In one study site, our recommendations have prompted the district leadership to enlist families' help to develop a mobile application for parents to connect with resources and information from their children's schools. So far, district metrics indicate that the application has had greater acceptance and more frequent, intensive use by parents than similar efforts previously developed by the district.

Conclusion

Since the advent of the Internet, scholars have feared that unequal digital access would exacerbate existing social inequalities. On the other hand, the demonstrable links between digital and broader social disparities have also given rise to hopes that meaningful digital connectivity can ameliorate other forms of social marginalization. By accounting for multiple levels of influence on an individual's technology adoption and engagement, communication researchers can better identify and explain both the antecedents and consequences of digital connectivity. Our discussion above demonstrates how such efforts expand and advance current scholarly debates on these topics in a variety of ways.

Multilevel research on digital inequality also poses challenges and opportunities related to measurement. Developing community-level measures is a tricky business, and extrapolating community-level influences from the perceptions and lived experiences of residents can be fraught as well (Matsaganis, 2008; Raudenbush & Sampson, 1999; Sampson, 2012). Technologies such as geographic information systems (GIS) and community mapping applications show promise as ways for researchers and residents to map local features that can be constraining and enabling factors for developing meaningful digital connectivity. Communication asset mapping (CAM) is a recent, explicitly communication-centered approach to community mapping. CAM is a field research strategy for identifying spaces where residents already congregate and share resources in order to help build community capacity and leverage local resources to better meet residents' needs (Gonzalez, Villanueva, Zhao, Ball-Rokeach, & Murphy, 2013; Villanueva & Broad, 2012). Although CAM has not been applied to studying digital inequality, the approach could easily be adapted to identify community spaces

that support digital connectivity via skills training programs, locations offering free WiFi, digital storytelling projects, and so forth.

Because multilevel approaches provide textured assessments of digital inequality, such studies also have considerable utility for policymakers trying to address these challenges. One recent example is the literature review that Friedland, Napoli, Ognyanova, Weil, and Wilson (2012) developed for the U.S. Federal Communications Commission to assess whether new communication technologies, within the context of the broader "media ecosystem," were adequately addressing Americans' critical information needs.[3] Their conclusion that the system was not doing so prompted them to propose an investigation into what changes, at multiple levels, could help address the issue in locally relevant ways across the United States.

Ultimately, pressure from conservatives in Congress prevented the study being funded (see Friedland, 2014, for details), but that political backlash stands as testament to the power of multilevel research on digital inequality. The kind of contextualized inquiry into residents' lived experiences, which we are advocating here (and which Friedland et al. had proposed), provides insights into how to best arm disenfranchised communities with the tools—digital or otherwise—that they need to mobilize around their common concerns. Critics of Friedland et al.'s proposal argued that assessing whether local media ecosystems are serving Americans' critical information needs would constitute government control of the media (and would therefore violate free speech and the free market). On the contrary, these scholars had developed an empirically driven argument for ensuring the vibrancy of democracy. By ensuring that everyone can access the information resources that they need to thrive, historically disenfranchised individuals and their families can develop increased capabilities to create the changes that they wish to see in their communities.

This is one of many examples of how meaningful digital connectivity is a crucial component to addressing social disparities more broadly. Another example is the Media Mobilizing Project in Philadelphia, which trains minority and low-income individuals to use digital technologies to tell their own stories and create cross-community alliances over shared concerns (Berger, Funke, & Wolfson, 2011). Multilevel approaches to researching digital inequality help communication scholars, literally and figuratively, to meet residents where they are, thereby increasing the ecological validity of their findings. By extension, applications of those findings have greater potential to uncover the kinds of community change that residents and local stakeholders believe are important. Because residents themselves can become the change agents in these situations, these community improvements are more likely to be sustained, even after researchers have turned their attention to new projects.

Multilevel communication research on digital inequality therefore holds considerable promise for expanding scholarly conversations on these topics. They also hold promise for developing and testing new methodologies and for translating findings into policy and practice in ways that more fully address long-standing questions related to digital and social equity. In the process of conducting such work, we are

certain to uncover the next set of questions related to technology, inequality, and social change that we, as communication scholars, are best positioned to answer.

Acknowledgment

Notes

1 The term "digital divide" was popularized in "Falling through the Net" reports that were released in the United States during the Clinton Administration, by the National Telecommunications and Information Association (NTIA) in 1995, 1998, and 1999.
2 In referring to families, we do not confine ourselves only to conventional or "traditional" family structures; rather, we follow prior scholars by defining families broadly as communicative units and by emphasizing communication processes as being central to family functioning (Noller & Fitzpatrick, 1993; Wilkin, Katz, & Ball-Rokeach, 2009).
3 Critical information needs relate to emergencies and risks; health and wellbeing; local schools and education; transportation; economic opportunities and employment; environment quality and public spaces; civic information and organizations; and political information at local and more macro levels (Friedland et al., 2012, p. v).

References

Anderson, R. H., Bikson, T. K., Law, S. A., & Mitchell, B. M. (1995). *Universal access to e-mail: Feasibility and societal implications*. Santa Monica, CA: Rand Corporation. Retrieved from:
    http://www.rand.org/content/dam/rand/pubs/monograph_reports/2005/MR650.pdf.
Ball-Rokeach, S. J., Kim, Y. C., & Matei, S. (2001). Storytelling neighborhood paths to belonging in diverse urban environments. *Communication Research*, **28**(4), 392–428.
Berger, D., Funke, P., & Wolfson, T. (2011). Communications networks, movements and the neoliberal city: The Media Mobilizing Project in Philadelphia. *Transforming Anthropology*, **19**(2), 187–201.
Blumer, H. (1969). *Symbolic interactionism: Perspective and method*. Englewood Cliffs, NJ: Prentice-Hall.
Bunz, U., Curry, C., & Voon, W. (2007). Perceived versus actual computer-email-web fluency. *Computers in Human Behavior*, **23**, 2321–2344.
Castells, M. (2002). *The Internet galaxy: Reflections on the Internet, business, and society*. Oxford, England: Oxford University Press.
Chen, N. T. N., Ognyanova, K., Zhao, N., Liu, W., Gerson, D., Ball-Rokeach, S. J., & Parks, M. (2013). Communication and socio-demographic forces shaping civic engagement patterns in a multiethnic city. In P. Moy (Ed.), *Communication and community* (pp. 207–232). New York: Hampton Press.
Clark, L. S. (2011). Parental mediation theory for the digital age. *Communication Theory*, **21**(4), 323–343.
Clark, L. S. (2012). *The parent app: Understanding families in the digital age*. Oxford, England: Oxford University Press.

Correa, T. (2014). Bottom-up technology transmission within families: Exploring how youths influence their parents' digital media use with dyadic data. *Journal of Communication*, **64**(1), 103–124.

Correa, T. (2015). The power of youth: How the bottom-up technology transmission from children to parents is related to digital (in)equality. *International Journal of Communication*, **9**, 1163–1186. Retrieved from http://ijoc.org/index.php/ijoc/issue/view/11.

Courtois, C., & Verdegem, P. (2014). With a little help from my friends: An analysis of the role of social support in digital inequalities. *New Media and Society*, **16**, 1–20. doi:10.1177/1461444814562162.

Dailey, D., Bryne, A., Powell, A., Karaganis, J., & Chung, J. (2010). *Broadband adoption in low-income communities*. Washington, DC: Social Science Research Council. Retrieved from
http://www.ssrc.org/publications/view/1EB76F62-C720-DF11-9D32-001CC477EC70/.

DiMaggio, P., & Hargittai, E. (2001). *From the "digital divide" to "digital inequality": Studying Internet use as penetration increases.* Princeton University Center for Arts and Cultural Policy Studies, Working Paper Series Number 15. Retrieved from
https://www.princeton.edu/~artspol/workpap15.html

Dutta-Bergman, M. J. (2006). Community participation and Internet use after September 11: Complementarity in channel consumption. *Journal of Computer-Mediated Communication*, **11**(2), 469–484.

Elias, N., & Lemish, D. (2011). Between three worlds: Host, homeland, and global media in the lives of Russian immigrant families in Israel and Germany. *Journal of Family Issues*, **32**, 1245–1274.

Eynon, R., & Helsper, E. (2015). Family dynamics and Internet use in Britain: What role do children play in adults' engagement with the Internet? *Information, Communication and Society*, **18**(2), 156–171.

Friedland, L. A. (2001). Communication, community, and democracy toward a theory of the communicatively integrated community. *Communication Research*, **28**(4), 358–391.

Friedland, L. A. (2014). The real story behind the FCC's study of newsrooms. *Washington Post*. Retrieved from http://www.washingtonpost.com/blogs/monkey-cage/wp/2014/02/28/the-real-story-behind-the-fccs-study-of-newsrooms/

Friedland, L. A. (2016). Networks in place. *American Behavioral Scientist*, **60**(1), 24–42.

Friedland, L. A., Napoli, P., Ognyanova, K., Weil, C., & Wilson, E. J., III (2012). *Review of the literature regarding critical information needs of the American public*. Washington, DC: Federal Communications Commission. Retrieved from http://transition.fcc.gov/bureaus/ocbo/Final_Literature_Review.pdf.

Gonzalez, C., Villanueva, G., Zhao, N., Ball-Rokeach, S. J., & Murphy, S. (2013). *Health communication asset mapping: A tool for practitioners and researchers*. Presented at the American Association of Geographers Conference in Los Angeles, CA.

Goslee, S. M. (1998). *Losing ground bit by bit: Low income communities in the information age*. Evanston, IL: Benton Foundation. Retrieved from
https://www.benton.org/archive/publibrary/losing-ground/home.html.

Hampton, K. N. (2010). Internet use and the concentration of disadvantage: Globalization and the urban underclass. *American Behavioral Scientist*, **53**, 1111–1132.

Hampton, K. N., Lee, C. J., & Her, E. J. (2011). How new media affords network diversity: Direct and mediated access to social capital through participation in local social settings. *New Media and Society*, **13**(7), 1031–1049.

Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First Monday*. Retrieved from http://firstmonday.org/article/view/942/864

Hargittai, E., & Shaw, A. (2013). Digitally savvy citizenship: The role of Internet skills and engagement in youth adults' political participation around the 2008 Presidential Election. *Journal of Broadcasting and Electronic Media*, **57**(2), 115–134.

Helsper, E. J., & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal*, **36**(3), 503–520.

Hilbert, M. (2011). The end justifies the definition: The manifold outlooks on the digital divide and their practical usefulness for policy-making. *Telecommunications Policy*, **35**(8), 715–736.

Horrigan, J. (2014). *Schools and broadband speeds: An analysis of gaps in access to high-speed internet for African American, Latino, low-income, and rural students.* Retrieved from http://apps.fcc.gov/ecfs/document/view?id=60000978758

Hughes, E. C. (1958). *Men and their work.* Glencoe, IL: Free Press.

Ito, M., Baumer, S., Bittanti, M., boyd, d., Cody, R., Herr-Stephenson, B., … Tripp, L. (2009). *Hanging out, messing around, and geeking out: Kids living and learning with new media.* Cambridge, MA: MIT University Press.

Jung, J.-Y., Qiu, J. L., & Kim, Y.-C. (2001). Internet connectedness and inequality: Beyond the "divide." *Communication Research*, **28**(4), 507–535.

Jung, J. Y., Toriumi, K., & Mizukoshi, S. (2013). Neighborhood storytelling networks, Internet connectedness, and civic participation after the Great East Japan Earthquake. *Asian Journal of Communication*, **23**(6), 637–657.

Katz, V. S. (2010). How children use media to connect their families to the community: The case of Latinos in Los Angeles. *Journal of Children and Media*, **4**(3), 298–315.

Katz, V. S. (2014a). *Kids in the middle: How children of immigrants negotiate community interactions for their families.* New Brunswick, NJ: Rutgers University Press.

Katz, V. S. (2014b). Communication dynamics of immigrant integration. *Communication Yearbook*, **38**, 39–68.

Katz, V. S., & Gonzalez, C. (2016). Community variations in low-income Latino families' technology adoption and integration. *American Behavioral Scientist*, **60**(1), 59–80.

Katz, V. S., & Hampton, K. N. (2016). Communication in city and community: From the Chicago School to digital technology. *American Behavioral Scientist*, **60**(1), 3–7.

Kim, Y.-C., & Ball-Rokeach, S. J. (2006a). Community storytelling network, neighborhood context, and civic engagement: A multilevel approach. *Human Communication Research*, **32**(4), 411–439.

Kim, Y. C., & Ball-Rokeach, S. J. (2006b). Civic engagement from a communication infrastructure perspective. *Communication Theory*, **16**(2), 173–197.

Kim, Y. C., & Kang, J. (2010). Communication, neighborhood belonging and household hurricane preparedness. *Disasters*, **34**(2), 470–488.

Lane, J. (2016). The digital street: An ethnographic study of networked street life in Harlem. *American Behavioral Scientist*, **60**(1), 43–58.

Livingstone, S., & Haddon, L. (2009). EU kids online. *Journal of Psychology*, **217**(4), 236–239.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media and Society*, **9**, 671–696.

Livingstone, S., & Helper, E. J. (2008). Parental mediation of children's internet use. *Journal of Broadcasting and Electronic Media*, **52**(4), 581–599.

Loges, W. E., & Jung, J.-Y. (2001). Exploring the digital divide: Internet connectedness and age. *Communication Research*, **28**(4), 536–562.

London, R. A., Pastor, M., Servon, L. J., Rosner, R., & Wallace, A. (2010). The role of community technology centers in promoting youth development. *Youth and Society*, **42**(2), 199–228.

Lopez, M., Gonzalez-Barrera, A., & Patten, E. (2013). *Closing the digital divide: Latinos and technology adoption*. Retrieved from http://www.pewhispanic.org/2013/03/07/closing-the-digital-divide-latinos-and-technology-adoption/

Matsaganis, M. D. (2008). *Re-discovering the communication engine of neighborhood effects: How the interaction of residents and community institutions impacts health literacy and how it can be leveraged to improve health care access* (Unpublished doctoral dissertation). University of Southern California, Los Angeles, CA.

Matsaganis, M. D., & Golden, A. G. (2015). Interventions to address reproductive health disparities among African-American women in a small urban community: The communicative construction of a "field of health action." *Journal of Applied Communication Research*, **43**(2), 163–184.

Matsaganis, M. D., Katz, V. S., & Ball-Rokeach, S. J. (2011). *Understanding ethnic media: Producers, consumers, and societies*. Thousand Oaks, CA: Sage.

Nathanson, A. (1999). Identifying and explaining the relationship between parental mediation and children's aggression. *Communication Research*, **26**(2), 124–143.

Nathanson, A. (2015). Media and the family: Reflections and future directions. *Journal of Children and Media*, **9**(1), 133–139.

National Telecommunication and Information Administration. (1995). *Falling through the Net: A survey of the "have nots" in rural and urban America*. Retrieved from http://www.ntia.doc.gov/ntiahome/fallingthru.html

National Telecommunication and Information Administration. (1998). *Falling through the Net II: New data on the digital divide*. Retrieved from http://www.ntia.doc.gov/ntiahome/net2

National Telecommunication and Information Administration. (1999). *Falling through the Net: Defining the digital divide*. Retrieved from http://www.ntia.doc.gov/ntiahome/fallingthru.html

Noller, P., & Fitzpatrick, M. A. (1993). *Communication in family relationships*. Englewood Cliffs, NJ: Prentice Hall.

Norris, P. (2001). *Digital divide: Civic engagement, information poverty and the Internet in democratic societies*. New York, NY: Cambridge University Press.

Ognyanova, K., Chen, N. T. N., Ball-Rokeach, S. J., An, Z., Son, M., Parks, M., & Gerson, D. (2013). Online participation in a community context: Civic engagement and connections to local communication resources. *International Journal of Communication*, **7**, 2433–2456.

Park, R. E. (1922). *The immigrant press and its control*. New York, NY: Harper and Bros.

Park, R. E. (1925). *The city*. Chicago, IL: University of Chicago Press.

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon*, **9**(5), 1–6.

Rains, S. A. (2008). Health at high speed: Broadband Internet access, health communication, and the digital divide. *Communication Research*, **35**(3), 283–297.

Raudenbush, S., & Sampson, R. J. (1999). Ecometrics: Toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociological Methodology*, **29**, 1–41.

Rogers, E. M. (1962). *Diffusion of innovations*. New York, NY: Simon and Schuster.

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: Simon and Schuster.

Sampson, R. J. (2012). *Great American city: Chicago and the enduring neighborhood effect*. Chicago, IL: Chicago University Press.

Sassi, S. (2005). Cultural differentiation or social segregation? Four approaches to the digital divide. *New Media and Society*, **7**, 684–700.

Tichenor, P. J., Donohue, G. A., & Olien, C. N. (1970). Mass media flow and differential growth in knowledge. *Public Opinion Quarterly*, **34**(2), 159–170.

Valente, T. W. (1995). *Network models of the diffusion of innovations*. New York, NY: Hampton.

Valkenburg, P. M., Krcmar, M., Peeters, A. L., & Marseille, N. M. (1999). Developing a scale to assess three different styles of television mediation: "Instructive mediation," "restrictive mediation," and "social coviewing." *Journal of Broadcasting and Electronic Media*, **43**, 52–66.

van Deursen, A., & van Dijk, J. (2014). The digital divide shifts to differences in usage. *New Media and Society*, **16**, 507–526.

Villanueva, G., & Broad, G. (2012, May). *Communication asset mapping: An ecological application toward building healthy communities in South Los Angeles*. Presented at the 62nd Annual Conference of the International Communication Association, Phoenix, AZ.

Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, **34**, 179–225.

Watkins, C. S. (2010). *The young and the digital: What the migration to social network sites, games, and anytime, anywhere media means for our future*. New York, NY: Beacon Press.

Wei, L. (2012). Number matters: The multimodality of Internet use as an indicator of the digital inequalities. *Journal of Computer-Mediated Communication*, **17**(3), 303–318.

Wei, L., & Hindman, D. B. (2011). Does the digital divide matter more? Comparing the effects of new media and old media use on the education-based knowledge gap. *Mass Communication and Society*, **14**(2), 216–235.

Wilkin, H. A. (2013). Exploring the potential of communication infrastructure theory for informing efforts to reduce health disparities. *Journal of Communication*, **63**(1), 181–200.

Wilkin, H. A., Katz, V. S., & Ball-Rokeach, S. J. (2009). The role of family interaction in new immigrant Latinos' civic engagement. *Journal of Communication*, **59**(2), 387–406.