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The Essential Internet: Digital Exclusion in Low-Income American Communities

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Abstract

As the Internet, and broadband in particular, becomes a platform for social and political engagement, researchers investigate more carefully both the factors that drive broadband adoption and the barriers that constrain it. This paper reports on one of the only large-scale qualitative studies of the barriers to broadband adoption in the United States, where 30% of the population lack broadband access. The primary research question asks: how can we qualitatively understand barriers to broadband adoption among low-income communities? The study's community-based approach, undertaken in four regions of the country, reveals the complex equilibrium of broadband adoption. Drawing from 170 interviews with broadband non-adopters as well as community access providers and other intermediaries, this study finds that price is only one factor shaping home broadband adoption, and that libraries and other community organizations fill the gap between low home adoption and high demand for broadband. These intermediaries compensate for shortages in digital skills that also constitute barriers to adoption in a context where broadband is essential for gaining access to jobs, education, and e-government. These three main findings suggest that low-income people like our research participants are playing roles as actors in an ecology of broadband access games (Dutton et al. 2004). In particular, they are overcoming barriers to being online in order to participate in accessing services and gaining education. This is part of the process of defining broadband as an infrastructure for e-democracy. The paper recommends a renewed focus on factors that sustain home access rather than drive demand, as well as support for community intermediaries in provisioning public broadband access within a context of skill shortages. It recommends further qualitative research to

better understand the role of diverse populations in framing the value of broadband access.

Keywords: broadband access, digital divide, public internet access, policy

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Introduction

The social function of the Internet has changed dramatically in the past several years. What was, until recently, a supplement to other channels of information and communication has become an increasingly basic requirement of social inclusion and economic participation. This has exacerbated the divides between the "digitally included" and the "digitally excluded." In the past, such "digital divides" were described as being binary states where some members of the population were Internet users and the rest were not (Bimber 2000). Now, research on digital exclusion has begun to examine the nature of inclusion and exclusion: how it maps on to other areas of social inequality (Hargittai 2008) and the way that status, education, and disability cross-cut other factors such as age and income to create a complex picture of digital equality and inequality. Bryne (2006) has examined the way that digital divide research, by focusing on the process of digital inclusion, has created "zones of silence" that fail to account for the experiences of people perceived as digitally "excluded." Attending to the experience of the "excluded" is an essential precursor to developing effective policy for digital inclusion.

In the United States, some inequalities in access to the Internet have declined, such as those based on gender and age (DiMaggio et al. 2004). Yet skill (Hargittai 2008), geography (LaRose et al. 2008), income (Pew Internet 2009), and other existing forms of social exclusion (Warren 2007) still impact the extent to which access to the Internet reduces social and economic inequality. Access now often refers to broadband Internet (Middleton), which is quickly becoming the expected baseline for access. Indeed, in this paper we discuss Internet access as synonymous with broadband access, except where we specifically refer to "dial-up" Internet access. Recently, the literature on access has become more nuanced, measuring the uptake of broadband Internet but also beginning to account for people who are stopping broadband services, categorizing them as "ex-users" of the Internet (Dutton, Helsper, and Gerber 2009). Yet people are not simply dropping broadband services once, never to return. As we discuss below, low-income Americans participate in a cycle of "un-adoption," in which they adopt broadband connectivity at home, and then drop it for financial or other reasons, only to re-subscribe again when conditions warrant.

In this paper, we engage with this increasingly complex landscape of inclusion and exclusion, using qualitative methods to understand, from the perspective of the digitally "excluded," the nature of barriers to and strategies for access, with the aim of influencing the development of

broadband access policies in the United States.[1] Our work approaches digital inclusion from the perspective of marginalized people who have difficulty in gaining and maintaining access to broadband, and whose efforts to gain access to employment, education, and government services—either online or offline—are not well understood or represented in policy debates. We attempt to address this lack of representation by identifying the factors that make broadband access hard to obtain and to maintain from the perspective of low-income Americans. We also argue that low-income people are stakeholders in broadband adoption "games," arenas of competition and cooperation where the actions of different stakeholders compete to shape the importance of broadband. One of the key framings at stake in broadband games is the idea of digital inclusion, which implies a connection between access and use of broadband and a more just and democratic society. We argue that low-income people and other people struggling to adopt or maintain broadband connectivity have a stake in these broadband games: as we will see, their access to services and their social and economic participation depend on the outcomes of broadband policies; yet they do not often have the opportunity to participate in establishing those policies. As we explain in this paper, they want to be online, often find ways to go online regardless of the financial and personal difficulties that this entails, and most importantly need to be online in order to maintain basic social and economic participation. As more government services move online, this participation becomes understood as being essential for many key aspects of life.

Our study also reveals that barriers to access are both social and technical. In many cases, the social infrastructure supporting broadband access for low-income people is more precarious than the physical infrastructure. To support full participation of low-income people within broadband access games, the social infrastructure, which includes people and organizations that provide technology and social support to those at the margins of broadband adoption, must be better understood.

[1] The study described in this paper was commissioned by the U.S. Federal Communications Commission (FCC) to contribute to the Commission's National Broadband Plan.

Context: The U.S. Telecommunications Policy Environment

Roughly 65% of Americans have home broadband access, but this varies significantly across demographic categories. This contrasts with landline telephone access, which stood at 95.7% in 2008; television ownership, which is at 98.9% (NTIA 2010); and mobile phone adoption, which is at 89% (FCC 2009). The Federal Communications Commission (FCC) released its National Broadband Plan in early 2010, outlining its strategies for increasing availability and adoption of broadband, including among low-income and other marginalized groups. Among households with incomes lower than $25,000, only 35% have adopted broadband.

Previous research on the U.S. telecommunications policy environment reveals some gaps in understanding broadband adoption among specific groups, especially minority populations and low-income populations. Researchers including Myers (1977) and Abraham (2006) have reported on the shortcomings of the telephone surveys upon which many policy scholars rely. These surveys can under-represent low-income people or minorities (potentially because of lower telephone ownership) or fail to differentiate between different cultural groups within broad ethnic categories. Qualitative research that describes specific contexts may help to complement these quantitative methods. It may also help to explain the reasons for widely different reports on broadband adoption: an FCC phone survey conducted in 2009, for example, found a 59% broadband adoption rate among African Americans while Pew (2009), in contrast, found a 50% adoption rate. Furthermore, as Hargittai (2008) notes, studies of broadband use have now moved beyond describing dichotomies of use and non-use, suggesting instead that broadband use must be placed in context. This includes the contexts of use and skill as well as the technological context of a converged telecommunications market. Similarly, Hampton (2010) moves away from the individual perspective to argue that local contexts are significant in influencing the kind of social benefit the Internet might produce. He argues that, contrary to previous research where the benefits of the Internet are understood as accruing to those who already have social benefits, the Internet can increase collective efficacy in ecological contexts of "structural disadvantage" resulting from economic and social pressures such as segregation. Thus, an understanding of the specific contexts within which marginalized groups of people seek to gain access to education, employment, and government services is important for contextualizing both the benefits of and the barriers to broadband adoption.

While non-adoption of broadband may be a result of economic barriers, it can also result from skill shortages, including basic literacy as well as competency in using a computer. People with low skill often use broadband services by proxy, within personal, domestic practices that are contingent on the help, support, and capacity of others (Bakardjieva 2003). Broadband adoption is thus a process that operates within many different contexts that include availability, skills, and social support for different tools (Barzilai-Nahon 2006; Hargittai 2007). Qualitative approaches take into account that the functions of communication tools are converging, so that the value of a communication tool that one is adopting is more dependent than ever on its context and meaning. The process of adopting a communication tool—among other things—depends on what it can be used for, how easy it is to use, and how accessible and valuable it is perceived to be. Such approaches have previously been used to understand the places, spaces, skills, and relationships that influence the adoption of new technologies (Hearn and Foth 2007; Hampton 2007; 2010).

One way of developing a more contextual understanding of the barriers to broadband access is by using a qualitative research approach consisting of analysis of findings from observations and individual and group interviews, which permits a clearer and more nuanced understanding of "complex behaviours, needs, systems and cultures" according to Ritchie and Spencer (1994). Qualitative research complements the quantitative research strategies more commonly used in policy research by helping to investigate experiences or phenomena that are not easily captured by surveys or sampling, and by providing context and greater detail about the experiences of adopting and maintaining broadband that are specific to certain marginalized groups. This provides clarification of the complexities that can be elided in quantitative research approaches such as phone surveys, and can help policy researchers make recommendations based on the experiences of the people whom the policy is attempting to serve: "What qualitative research can offer the policy-maker is a theory of social action grounded on the experiences—or the worldview—of those likely to be affected by a policy decision" (Walker 1985). Our primary research question is thus:

1. How can we qualitatively understand broadband use in low-income communities?

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Participation in Ecologies of Games

As explored above, various players are still negotiating to frame the importance of broadband. Dutton (1999) and Dutton et al. (2004) develop a conceptual framework that outlines the "ecologies of games" whereby different players compete to establish policy framings for new technologies, such as broadband. The competing demands of these actors are a kind of "serious game" according to Dutton (2009), where each of the stakeholders represents the infrastructure in a different manner. Thus, the actors in a broadband ecology of games hold a variety of sometimes competing views on the value of broadband access. A variety of relevant actors contribute to this ecology of games: governments, policymakers, equipment manufacturers, standards-makers, and consumers. The results of broadband games impact how systems are designed and their relevance understood. Some actors in games are fundamentally concerned with how access to broadband connects with inclusion and self-determination: Fiser (2009) has investigated how Canadian First Nations (aboriginal) communities frame access as a determinant of full participation in Canadian society, and leverage this framing to control the governance of their own broadband systems. Dutton et al. (2004) note that a variety of broadband Internet "games" shape broadband outcomes by setting the terms through which broadband is discussed and the parameters around which policy decisions are made. We argue that there is a "digital inclusion" game, where governments and regulators attempt to extend broadband access as broadly as possible. The actors in this game include regulators such as the FCC, local and state governments, broadband providers, social and community services, and of course providers of social services and low-income people themselves. Yet despite the fact that low-income people can experience significant changes to their daily lives as the result of digital inclusion policies, their voices are not as prevalent in broadband policy debates as are those of the other actors in this broadband game. This paper acts as a means of addressing this gap and examining how low-income people manage the relationship between their economic, social, and digital exclusion, all while attempting to become more included by using broadband to gain access to employment and government services. Our secondary research questions address these frames:

2. How do low-income Americans negotiate the social and technical barriers to broadband access?
3. What relationships between digital, social, and economic exclusion do their efforts reveal?

Methods

This paper reports on selected findings from research commissioned by the U.S. Federal Communications Commission (FCC).[2] The research was conducted through extended visits to four regions of the United States between November 2009 and January 2010. The work included site visits in the Mid-Atlantic (Philadelphia), the Midwest (Minneapolis and St. Paul, MN), the Southwest (Albuquerque, NM, and the Native American Pueblos of Isleta and Zia), and the Northeast (rural Greene County, NY). Within these four regions, the research team conducted 13 focus groups, 33 interviews, and 14 group conversations. Of the resulting pool of 171 respondents, 92 were non-adopters and, of these, 22 were "un-adopters"—people who had broadband at home but lost it.

Our research focused on a number of chronically underserved communities—African Americans, Latinos, Native Americans, rural Whites, and non–English speakers. Our sample included young people and those with disabilities. These groups have been recognized as being at the bottom of the adoption curve for new communications technologies (DiMaggio et al. 2004; Dobransky and Hargittai 2006; Jaeger 2006; Livingstone and Helsper 2007; Spooner and Rainie 2000; Warren 2007). Rather than seek a representative sample of members of these communities, we sought out community members who were outside, or at the fringes of, home broadband adoption, including non-adopters and "un-adopters" (who had lost broadband service). These people might have subscribed to broadband at one point and dropped their subscription due to a lack of funds, a technical issue, a hardware failure, or a number of other problems, and might use a variety of strategies to gain broadband access, including using it in public places or by proxy through friends and family.

The study examined working-age Americans: only 4% of our respondent pool was over 65. This research design was intended to complement a telephone survey commissioned at the same time by the FCC, which also had the goal of describing the U.S. broadband adoption landscape (Horrigan 2009). The qualitative work was intended to mitigate the traditional limitations of survey methods—notably the difficulty of reaching members of marginalized communities and the challenges of clarifying causes and effects of complex phenomena. The research design assumed that these people had a variety of communication needs that they were meeting using a set of technologies and relationships that is sometimes described as an *information ecology* (Nardi and O'Day 1996) or a *communicative ecology*

[2] More detailed findings are presented in Dailey et al. (2010).

(Altheide 1995). Part of such an approach is an acknowledgement that broadband access comprises both technical and social elements (Clement and Shade 2000). While physical infrastructure includes carriage facilities, physical devices, software tools, and content and services, social infrastructure includes service providers or organizations that provide network services and access to users, social facilitation that establishes the skills needed to take advantage of information and communication technology (ICT), and governance and decision making about the development and operation of broadband access infrastructure. Social infrastructure varies significantly; this study examines the details of the social infrastructure available in selected low-income communities in six U.S. regions, especially for school- and work-aged Americans.

Thus, the study was also concerned with the contexts in which low-income people gained access to broadband and to other communications resources. As the American Library Association (ALA) reports (see Davis, Bertot, and McClure 2009), over 71% of libraries in the United States provide the only source of free Internet access in their communities. Community-based organizations can also play important roles as third spaces, especially in promoting digital inclusion. We spoke to 74 of these intermediaries, who included librarians (N=23) as well as community organizers, technology center directors, human service workers, teachers, health workers, and others involved in supporting digital literacy and broadband use in their communities.

Analytical Frame

In order to understand how the low-income people in our sample understood broadband and negotiated access to it, we constructed an analytic frame that represented intersecting aspects of utility, affordability, usability, and availability, which serves to structure the following sections of this paper. The frame is drawn from Bryne and Clement's (2007) desiderata of elements underpinning broadband in the public interest.

The research team investigated each interlocking element in detail to establish how low-income Americans within the studied communities framed their experiences of the barriers and drivers of broadband access. For instance, within the availability theme, we expected broadband to be available in all urban areas where physical access has been robustly built, but results indicated that providers would not, or could not, extend broadband access to all locations in urban areas, for example public housing.

The usability theme revealed the difficulty many people had in acquiring skills, and their reliance on the skills of others. The affordability theme reiterated the high cost of broadband service in the United States[3] and revealed new information about the priority that low-income consumers assigned to broadband service among other communications services, and the importance of clear billing by providers. The utility/value theme revealed that low-income Americans understood broadband Internet as being essential for employment, education, and e-government access. Figure 1 and Table 1 illustrate some of the most common drivers and barriers reported by the study participants. These barriers and drivers emerged from focus groups and interviews in response to questions about the most significant aspects of broadband connectivity.

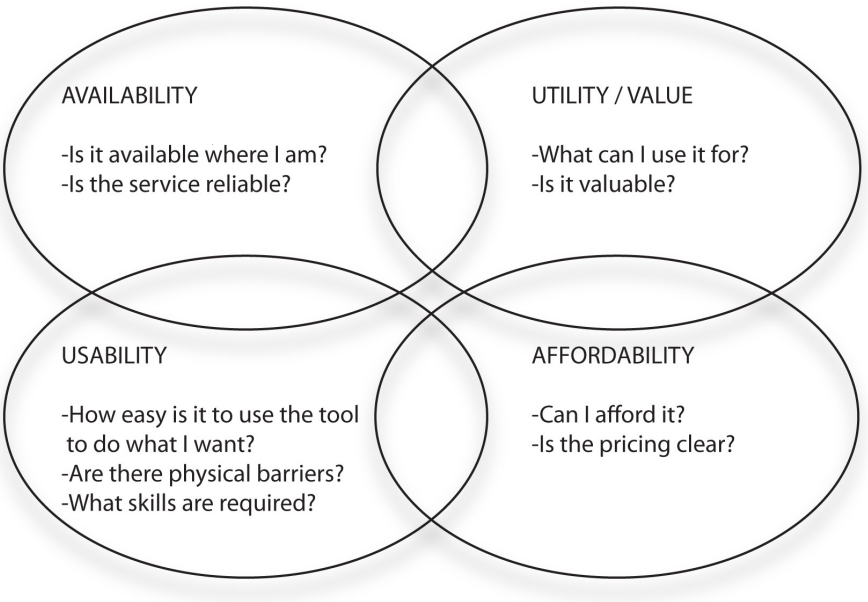

Figure 1. Common Drivers and Barriers to Broadband Access

[3] In 2009, the United States had an average monthly broadband subscription cost of $49.00 per month, the 11th most expensive service in the OECD (OECD, 2009). The minimum subscription cost for the United States, according to the same statistics, was $19.99, the 22nd most expensive. The UK's minimum monthly cost, by contrast, is US$7.57.

Table 1. Matrix of Analysis

AVAILABILITY	UTILITY/VALUE
Barriers	***Drivers***
• Potential variations in availability depending on income profile in neighborhoods • Cost	• Employment • Education • e-Government
USABILITY	**AFFORDABILITY**
Drivers	***Drivers***
• Availability of help with Internet skills	• Low-cost introductory subscriptions
Barriers	***Barriers***
• Changing design of online services—especially e-government services	• Unclear pricing structures

Findings

Three main findings emerged from the study that are significant to understanding how broadband is framed by low-income Americans and how they negotiate better access to it in the face of technical and social constraints. First, although these people are marginalized from Internet policymaking processes, they do not need to be convinced of the value of the Internet. Contrary to findings that suggest that some people are not interested in gaining Internet access (Dutton, Helsper, and Gerber 2009), our participants described an urgent need for connectivity. Second, numerous barriers are presented to low-income people gaining access to broadband. Third, home access is governed by a fragile cost equilibrium, with public access bridging the gap between low availability and high demand within

low-income communities, providing better social support but constraining the autonomy of use.

The Internet is Relevant to Low-Income Americans

Both the Pew Internet and American Life studies, as well as the Oxford Internet Surveys (OxIS), suggest that there is a core minority of people who consider access to the Internet to be "not relevant." The Pew (2009) study reports that 22% of Internet non-users are not interested in going online—representing approximately 7% of the U.S. population. In the UK, 61% of non-users and ex-users state that they are not interested in the Internet, or that it is not useful (Dutton, Helsper, and Gerber 2009). These statistics suggest a core of disengaged "digitally excluded" in the UK who are not interested in the benefits that the Internet provides.

Our findings suggest that this is not the case in the United States, at least among those under 65 in 2009. Participants in our study viewed broadband connectivity as being of paramount importance. Over 90% of the research participants who were non-adopters of broadband reported personally using the Internet—whether broadband in public or dial-up at home. Dial-up, however, was not considered to be of particular value, described as "not worth paying for" by one respondent. When proxy use was taken into account, this meant that nearly 100% of our participants had at some point accessed broadband, at home, in public, or with the help of someone else. Participants described access as urgently necessary for applying for jobs, gaining education, and getting access to government services. In particular, they described feeling a push towards using broadband for employment, education, and e-government, although they also engaged in many other activities online, including social networking, buying and selling goods, staying in touch with friends and family, and reading news. In this sense, digital inclusion was closely connected to social and economic inclusion. Participants rarely mentioned the explicitly democratic qualities of the Internet—such as its ability to support democratic deliberation or voting—but in Dutton et al.'s (2004) terms, they are participants in a broadband access game that associates access with social and economic inclusion. Our participants clearly stated that the Internet was a useful technology for shopping, playing, and staying in touch, but more significantly, it was perceived as essential for getting access to employment, education, and government services.

Employment

People without home connectivity looking for broadband access described in detail the importance of using the Internet for job searches and employment activities, even for unskilled positions. Finding and applying for jobs, maintaining contact with employers, training to find better jobs, and other basic aspects of employment are increasingly Internet based—leaving those without access or only intermittent access at a serious disadvantage. The corporate policy of some large-scale chain employers now directs potential applicants first to online information and resources—often emphasizing the fairness and efficiency of online applications. Some large employers will only accept online applications. Young workers described the following situation in a focus group held at a secondary school:

> **Respondent:** Half these people aren't giving out like applications, man, they're just like, they're on the Internet.
> **Respondent:** Yeah, they're like, they're like go online. Go online. I'm like, well thanks.
> **Interviewer:** *For a job application? Have you all filled out job applications online?*
> **Respondent [girl]:** That's how I got my job.
> **Respondent:** That's usually the only place. But see the only thing I can't, when I'm applying on, with my phone, I can't, it won't do that, either. Like that's one of the things that won't load, is an application for a place. You have to go in there, and they're usually like, oh you apply online, and blah blah blah.

These same students expressed that outside of school there were very few places for them to access the Internet.

Skill shortages can also be significant barriers to access impacting employment opportunities. Librarians in a focus group responded to the movement of job applications online by describing the consequences for jobseekers with low digital skills:

> **Librarian 1**: One of the most heart-wrenching things I see are men and women in their late 40s and early 50s who have worked at a job for 25 years or so. Suddenly they're out of a job and they never needed to use a computer previously, and they're in panic mode, because they now find that every job application they submit has to be done electronically, and

> they don't feel at all comfortable with that.
> **Librarian 2**: There's also a huge disconnect with minimum-wage jobs, like for Walmart jobs you are required to apply online. Those people are looking for a minimum-wage job. They don't have a computer at home. They don't have Internet access. But yet they're required to go to a public library where there are ten computers and hundreds of people waiting to use them, which they can only access when we're open.
> **Librarian 3:** This really puts pressure on libraries. For example, K-Mart doesn't keep applications on hand and they send people to us to apply online. They're shifting the cost to us. One poor lady who was trying to make a K-Mart application, and she must have clicked on something else. She was getting all kinds of pop-ups, and she was afraid she had somehow signed herself up for a cell phone with a credit card number.

The problems facing those without regular Internet access, in such contexts, are obvious, and are exacerbated by low-proficiency and limited English literacy. Large-scale employers with online hiring procedures typically recommend reserving at least 30 minutes to 1 hour to complete electronic job applications—a length of time that bumps up against typical time limits in public libraries and community centers and that can create serious difficulties for those with more limited skill sets. While the research did not specifically examine access at Workforce Job Centers, some respondents indicated that these locations were not preferred because computer use was strictly limited to applying for jobs rather than, for example, checking email or social networks.

Education

In addition to employment, the Internet was described as being essential for tasks related to education. Predictably, parents emphasized the value of broadband at home for children, especially for older children in middle school or beyond. They described the Internet in general and broadband in particular as having the qualities of a universal library, and also described access to the Internet as a symbol of social inclusion—although they might be able to serve many of their communication needs using a mobile phone, broadband connectivity and a home computer symbolized a commitment to education, and several parents talked about the Internet as a digital library or

encyclopedia. For many parents without home access, bringing or sending their children to the library was part of their daily or weekly routine. Some families expressed concern at the difficulties posed by libraries without evening opening hours.

Many schools and school systems, reported our participants, have established online communications as their main link with parents. In Minneapolis–St. Paul, Minnesota, one school district has used a Campus Portal, which allows parents to view their child's schedule, class assignments, attendance, grades, and disciplinary actions, since 2003. All parents of current students are eligible to activate a Portal account, but must have access to a computer with Internet Explorer 5.0 or higher, with a recommended modem speed of at least 56k. Five years after the Portal's launch, *The Twin Cities Daily Planet* reported that of the more than 40,000 students attending St. Paul Public Schools, only 8,000 families had registered to use the system (Wasley 2008).

Students from grade school to college level reported that Internet access is critical to their studies. In general, as grade level increases, students need access more often and for longer periods of time. In some cases, students reported needing access every day or almost every day in order to complete school assignments. Among college students, access is often a daily requirement: homework, class work, quizzes, and communication with teachers are increasingly organized through web portals, and they supplement classroom instruction. For adults, online classes are an important driver of Internet use and—among our sample—regular Internet access emerged as a strong condition of success in such classes. Several respondents reported starting online classes, but failing due to lack of regular access or insufficient computer literacy. Students of all ages in our sample reported relying on computers at public libraries to complete their schoolwork.

In New Mexico, where many college students are low-wage working adults, students have lower rates of home broadband access and computer ownership than the national average.[4] In Albuquerque, we interviewed non-adopters from three public colleges and universities. In some cases, they reported waiting "all day" to obtain access in the crowded school labs. One student chose his classes based on which ones would require the least amount of online time. Another rides his bicycle 17 miles, twice a week, to the nearest public library because it is not feasible to obtain adequate computer time at school. In a focus group in Albuquerque with minority

[4] 2007 data from the U.S. Census Bureau report that 57% of New Mexicans have access to the Internet at some location, either at home or in public.

high-school students, several reported difficulty getting enough computer time at school to complete their assignments.

e-Government

In the United States, interaction with government agencies—applying for unemployment benefits, citizenship or changes in residency status, housing benefits, or childcare stipends—was once handled predominantly through visits to the relevant agency, and with paper applications and telephone calls. A growing number of agencies, however, have made downloadable forms and online application the preferred way of accessing information and services. Often, this is accompanied by diminished staff support for paper, phone support, and in-person applications—a situation our respondents often encountered in the form of difficulties in reaching or communicating with agency staff. Several respondents reported visiting or calling agencies only to be redirected to the website.

The shift to online services represents a challenge for many social service recipients, and disproportionately affects people at the low end of the socioeconomic scale. Those who most require social service support are consistently the least likely to be able to afford either a computer or home access, and the most likely to need help accomplishing tasks online. The American Library Association (ALA) reports that in five states, unemployment benefits are available *only* through submission of online forms (Davis, Bertot, and McClure 2009). Other actions, such as booking appointments with the Immigration and Naturalization Service, also require online communication with the agency. In an interview, an Americorps (a national community service organization) worker in St. Paul in charge of computer training courses at a large library noted,

> All the government forms are online. And that saved a lot of money and paper on the government's end. But a lot of times the people who most need to fill out those forms are going to be the people who are least likely to have access to a computer or Internet.

The move towards online delivery of public and social services in the United States was perceived as a "push" factor driving participants online. When we asked our participants to prioritize their communication bills, 99% ranked mobile phone bills as their first priority, and 95% ranked broadband second, ahead of landline telephones or cable TV. Yet adopting and maintaining broadband at home is constrained by a combination of limited availability

(often resulting from gaps in coverage), affordability, and skill, often leading to a cycling of "un-adoption" where Internet connectivity is dropped. The second key finding of the study suggests that price is one part of a fragile equilibrium of home broadband access.

The Home Adoption Equilibrium Depends on More than Price Availability

To date, no authoritative account exists regarding the extent of broadband coverage or the range of providers in different areas of the United States—a persistent problem that has complicated the ability of researchers to make recommendations in this area, although new FCC research hopes to address these gaps. Nonetheless, existing research on broadband availability has tended to find very high levels of coverage of communities by at least some broadband service—up to 95% of the population, with the most significant gaps in rural areas (Strover, Chapman, and Waters 2004).

Our study suggests that more detailed, systematic research needs to be conducted around these questions—especially in communities with high rates of non-adoption. We found considerable anecdotal evidence that acquiring standard cable or DSL service is more difficult for low-income residents in urban areas than many of these reports suggest. Visits to Philadelphia, Minneapolis–St. Paul, and Albuquerque all produced reports about problems of basic availability, and a variety of other obstacles that complicate access even when broadband service is, in principle, available. In addition, unresolved quality of service issues led many of our participants to drop their broadband subscriptions. Thus, technical aspects of availability continue to be relevant for low-income Americans.

Affordability

Previous research on broadband access in the United States indicates that cost is a major factor in non-adoption of the Internet (Hauge and Prieger 2009; Horrigan 2009; Prieger and Hu 2008). Recent FCC research (Horrigan 2010) finds that the average monthly cost of broadband is $40.68, representing an average annual investment of nearly $500 before setup costs, equipment, or maintenance are taken into account. Our respondents were aware that the cost of a broadband subscription is only one part of the cost of broadband connectivity. They cited unexpected costs as being reasons for dropping broadband services. They also described how decisions about

broadband adoption were made after deciding on core budget elements such as rent, utilities, and mobile phone access. At an arts high school (a limited intake school with a specialized academic program), a 16-year-old respondent explained why she thought her family does not have Internet access, even though her teachers expect all of their students to be able to access assignments and course materials online:

> **Respondent [Girl]:** Well, the Internet would be too expensive, or like buying a computer, keeping the maintenance up with it, you know? "Oh great, you know, my computer got a virus," now you have to pay like a tech guy to you know, take that out, or go buy a new computer.

This respondent's description of the costs her family would incur in addition to monthly broadband connection fees illustrates the range of costs that regular broadband connectivity implies. Others include unexpected hardware costs, or added costs for unwanted services, often a result of "bundled" services where several services such as cable television and broadband are offered together at a slightly reduced price. For some of our respondents, computer breakdowns made home broadband unsustainable and technical support proved difficult to obtain.

Clement and Shade (2000) identify technical support as a key area where social infrastructure overlaps with technical infrastructure. For some of our participants, appropriate technical support constituted a barrier to access. For example, assistive technologies such as screen-reading and magnification software are too costly and hard to use for many low-income people with limited vision. Language barriers were important within technical support contexts as well: Spanish speakers in New Mexico reported that there were no or very few Spanish-speaking technicians working for local communications providers.

A significant proportion of our respondents (roughly 22%) were un-adopters—people who had previously subscribed to broadband but who had not maintained their subscription. Respondents cited a wide range of reasons for un-adoption, including financial challenges, technical problems, billing issues, quality of service issues, and problems with the bundling of broadband along with other communications services (see Dailey et al. 2010).

Skill

Attaining the appropriate level of skill to be proficient in using the Internet at home was also a barrier to many of our respondents. The relationship between skills acquisition and capacities to leverage the Internet to accomplish broader tasks successfully (such as job searches) is an increasingly explicit component of the literature on Internet adoption (Warshauer 2003; Barzilai-Nahon 2006; Hargittai 2009). Shortages in digital skills were often compounded by low literacy skills or language barriers. In New Mexico, librarians described meeting with older men who had worked for years as cattle herders and who struggled to learn to operate a computer and understand the operation of the Internet. Librarians and other intermediaries stressed the importance of creating low-pressure contexts for the acquisition of Internet skills, such as gaming, social networking, or shopping (Dailey et al. 2010). These activities are often regarded in policy contexts as not obviously "democratic," and are limited at some public access centers such as Workforce Employment Centers, but they can help to build the skills that are essential for effective use of broadband.

Skill barriers can be exacerbated by expectations from employers or government. As the director of an adult education program at Waite House, a community service agency in Minneapolis, Minnesota, explained,

> You can't get a job as a stocker at Target [a chain of department stores] right now if you don't know how to use a mouse and a keyboard. Because they're only taking applications through their own kiosk, that way. And for many entry-level positions you now have to actually e-mail an application to initiate the process. People don't know how to do that. There's also a fear factor, and I think people really need to keep that in mind.

The transition from in-person to e-government services has jumped ahead of the capacities of some of the constituents of those services to use them. Low skill, including a lack of facility in English, is a barrier to accessing information and services, but equally, poor design of online services itself constitutes a barrier, as our community intermediary respondents explained. Some participants we talked to believed that the increasing reliance on e-government services has been accompanied by a decrease in the quality of offline service. Users of social services reported difficulties in getting access to social service agencies via phone or fax, instead being encouraged to use the web and email. One director of a women's support network stated,

"States appear to be quickly moving services online to save costs but without needed studies on what is accessible for the population served."

The barriers posed by the design of content and services are also exacerbated by language difficulties. Staff at the Lao Assistance Center in Minneapolis described how time-consuming it can be to use computers and the Internet for the Lao community because written Lao is not supported by commonly used software and web applications. While social services that support the Lao population provide written Lao translations, online facilities do not provide the same level of support.

The design of government services also poses challenges to users at the low end of the skill spectrum. According to librarians, inconsistent design and frequent design changes of government websites create difficulties for patrons that are then reflected in greater demands on staff. One librarian reflected:

> Every time I get on the INS [Immigration and Naturalization Service] or ICE [Immigration and Customs Enforcement] site, they've changed the format and moved all the keys around. If I go on vacation for two days and come back, it's a new learning situation . . . It's absolutely maddening. Every time I get on there, the buttons are in a different place.

This reflection also illustrates the process behind our third major finding, that community intermediaries like libraries are essential for providing access when the fragile equilibrium of home access breaks down due to issues with availability, affordability, or skill.

Community Intermediaries Fill the Gap Between Low Adoption and High Demand

In low-income communities, the tension between low home adoption rates and growing demand for Internet use falls mostly on "third spaces" that provide Internet access away from home or work. Most of the participants in our study expressed a preference—normally a strong preference—for Internet access at home. The advantages of home use were obvious to our respondents, who were sensitive to the many forms of negotiation, constraint, and sometimes imposition that accompany extended use in other

settings. At a community center in rural New Mexico, one participant explained:

> Like a lot of women in our community that have small children, we can't go to a library because the children would be all over the place and they will kick us out and/or tell us to come back when we don't have the children. So that could also be a barrier, we want to go use a computer but with the babies and kids but we can't so it's better to have it at home.

Non-adopters in our study described piecing together strategies for Internet use from the various sites of connectivity in their daily lives, including school, work, and the homes of friends and family. The most prominent and pervasive locations in these strategies were the public or semipublic institutions that provide Internet access, such as libraries, employment and social service offices, or community centers. These "third spaces" (Oldenburg 1989) provided access to both technical and social infrastructure outside of work and home. Our respondents often had a very clear sense of which kinds of locations provided what kind of support, often "cycling through" several different locations: for example, taking computer classes at a Workforce Employment Center and then using a library to write a résumé and submit job applications.

Our respondents working in these organizations described sharply increased demand for Internet access and support services over the past several years—with a spike in demand in the past year as the recession has worsened. This growth has altered the nature of the tasks performed by many of these organizations, particularly libraries. As employers and government agencies automate basic services such as job applications in the interests of efficiency, some of the savings in human infrastructure and support are simply cost-shifted onto other organizations. Group interviews with librarians indicated that many spent up to half of their time helping patrons on computers, solving job and social service application issues, and helping users make appointments or fill out forms. Our findings echo other research in this respect. A 2009 American Library Association (ALA) report found that nearly 81% of library staff members provide assistance with e-government tasks—an increase from 74% over the previous year (Davis, Bertot, and McClure 2009). One librarian described the range of assistance provided to new users of the Internet:

> **Interviewer:** You mentioned technology assistance. Do you have examples, you know, of particular things someone might ask for?
> **Respondent:** Particular things, a lot of it is, people don't know how to search, or don't know, or know they need to get, let's say to the [state] unemployment site. But they've never been there. They don't know how to make a login, you know, and following the instructions. They just want somebody to walk some of those things, walk you through, maybe just in the beginning. But that's a start. A lot of help with word processing, formatting, you know, pulling up templates for resumes, those types of things.

Librarians reported helping patrons fill out applications and make appointments regarding Medicare, food stamps, immigration, social security and childcare benefits, as well as online job applications. Our study participants exhibited strong preferences for accessing government services in social contexts where they felt comfortable or where they had existing relationships. This exacerbated some of the cost-shifting to intermediaries: for example, New York State no longer provides printed Driver's Education Manuals. Electronic manuals can be printed at the Department of Motor Vehicles (DMV), but some of our study participants reported that they preferred the help of their friendly but inexpert community intermediaries—volunteers or librarians—over the expert help of state civil servants, thus shifting the cost of the printing to the library from the DMV. In rural Greene County, New York, a librarian from the county seat told us that people came in every day to fill out DMV applications in spite of the fact that the DMV is located practically across the street. Likewise, seniors may well prefer to go to the library instead of a social security office.

Because of the significant commitment of time and resources to these tasks, some librarians described themselves as the "uncompensated, de facto civil servants of all levels of government" as well as the "human resource department for low-wage chain employers." Some librarians said they refused to provide this assistance, fearing that they might be held liable for any mistakes. Still, there are obvious practical advantages to providing broadband service within libraries or other social service organizations. As a librarian and trainer at an AIDS service organization noted:

> Having computer access and training in places where people are going anyway for other reasons, for various social services, is a far better model than having them isolated.

> Public libraries are great for that too because people go to hang out in the afternoon, do homework with their kids.

Because of the many different contexts provided by the different public access points within our study, non-adopter participants often described personal strategies for gaining access based on the distinctions between these access points. These ranged from public access at libraries or community centers to semipublic access at schools (often limited to students) or access at Workforce Employment Centers, which is limited to explicit job-seeking activities. These strategies reveal that contextual access can be valuable, but that it can also limit the autonomy of those seeking broadband access.

Discussion

Including the Excluded in Policy "Games"

As Dutton et al. (2004) describe, broadband provides access to people, services, information, and technologies. The way that access is experienced in practice depends on the nature of the negotiations between different actors in an ecology of games. Dutton (2009) concedes that the outcomes of broadband games are primarily shaped by players in business, education, and government and not always by broadband users. Our study reveals that low-income and marginalized people are also players in broadband access games, especially games related to digital inclusion. Our participants, many of whom are marginalized in social and economic terms, struggle to gain and maintain access but clearly frame home broadband adoption as a necessity for their full social and economic inclusion. These expectations are implicit in the participants' enumeration of the factors that drive broadband adoption, expressed in Table 1 above. Broadband is not merely valuable for inclusion; it is essential. Yet low-income people lack control and influence over many aspects of access to broadband, particularly in situations where home access is unsustainable.

Technical infrastructure and physical accessibility is only one component of broadband access. The social infrastructure is equally important (Clement and Shade 2000). We argue that the barriers to broadband for the populations in this study are both social and technical, and that, at the core, they reveal that low-income Americans are players in broadband access games but that they still struggle to control the terms of their access—and they lack the social and economic power to influence the

policy governing this access. In the next section, we examine some specific challenges in maintaining broadband access, both among individuals and among community intermediaries.

Effective Use: Meaningful Access

Within our study of low-income Americans, expectations that the Internet is an increasingly desirable platform for service delivery (as well as a means of cutting service delivery costs) underpin the efforts of government, educational institutions, and the commercial sector to move information and services online. Yet for the people we encountered in our research, technical and social infrastructures must both be robust in order for them to experience true and beneficial digital inclusion. The communications ecologies of different groups that we observed in the low-income communities we visited demonstrated that getting access to people, information, and services using broadband was often a highly contingent process, drawing on support from many types of community intermediaries. This ecology varied among our respondents—some of whom had strong networks of family members, others of whom were part of immigrant communities or were marginalized for other reasons, including recent incarceration or physical disability, and yet others of whom were involved in providing broadband access. The common experience among our respondents was that many different social and financial resources were marshalled by people both seeking and providing broadband access, a delicate balancing act not acknowledged by policymakers designing digital inclusion programs. Despite these efforts, which are significant ways of attempting to gain better broadband access and achieve better social inclusion, few of the people we spoke to were able to control the terms of their access to broadband, what Clement and Shade (2000) would consider participation in governance of broadband access systems. This lack of control was experienced at the individual level by people struggling to maintain home broadband access and at the broader community level by the experiences of intermediaries.

At the individual level, many people complained that broadband bills were difficult to read and that it was difficult to understand the billing process. For the people we spoke to in our research, this lack of transparency makes it difficult to manage limited financial resources. Community intermediaries we spoke to also had limited influence over the governance of the systems that they were charged with providing. While libraries and public access centers were sometimes able to manage the level, time, and quality of public access, they were not always able to get access to adequate

bandwidth or to quality equipment. Several libraries in New York State described how their broadband connections slowed to almost unusable speeds in the late afternoon. Other libraries explained that expansion of computer access was limited by inadequate electrical infrastructure and by the poor state of library buildings.

Finally, an often overlooked aspect of the everyday experience of inclusion is the ability to control the integration of broadband use into one's specific cultural context. While the vast majority of our study participants expressed interest in using broadband, some broadband non-adopters were particularly concerned about the impact that home broadband access could have on their families, culture, and home life. The people we spoke with were very clear that it was important for them to be in control of determining appropriate content and broadband services for themselves, as was the ability for communities and families to set specific boundaries around Internet usage in the home that accorded with their own cultural values. Some of these participants expressed concern that public access to broadband would not allow them this kind of control, because they would have to use default settings in public locations.

Recommendations

We have determined that the people in our study are participants in ecologies of broadband games that establish the value of the Internet as a market of digital, social, and economic inclusion. Participants described education, employment, and e-government as key drivers for their use of the technology. However, limited availability of technical infrastructure in poor neighborhoods combined with strain on the social infrastructure that supports broadband access constrains the extent to which low-income people gain the most benefit from broadband—through accessing it at home, in a reliable manner over which they have some control. The following recommendations suggest ways of better supporting inclusion in keeping with the experiences of low-income Americans. A version of these recommendations was used by the FCC in developing the U.S. National Broadband Plan in early 2010. While these recommendations are specifically oriented to the U.S. context, they also suggest more generalizable ways of including the experiences of marginalized people in the development of information policy.

- Un-adoption—the loss of home broadband service—is a serious and under-recognized problem in the larger broadband dynamic in the United States. A lack of availability in some low-income areas combined with opaque billing costs and unpredictable service costs play a role in the un-adoption dynamic, as do limited support services. Closer investigation of these practices is needed as is comparison with un-adoption in other broadband markets.
- Cost-shifting to community organizations should be met with increasing funding of these organizations. Government agencies, school systems, and large employers privilege web-based access to many services in the United States. Because many constituents of these services have limited Internet access and/or limited Internet proficiencies, these measures often shift human and technical support costs on to libraries and other community organizations. Fuller funding of these community intermediaries is the best means of supporting adoption in these communities.
- Because the transition from in-person to e-government services has surpassed the capacities of some of the constituents of those services, there is a continuing need for efficient, resilient ways of accessing essential social services in person, via telephone, and via paper correspondence.
- Investments in Internet literacy and proficiency remain critically important in low-income communities, where large numbers of people are encountering the Internet for the first time, often with low digital literacy and low general literacy and in the context of job losses and other high-pressure situations. These investments should concentrate on building skills so that broadband can be effectively used, in order to avoid compounding digital and existing social and economic inequality.
- Investments in promoting or justifying the value of Internet use to low-adoption communities, in contrast, would not appear to be necessary. We found no evidence of disinterest among our respondents. The range of activities that has moved online is simply too great to ignore. Everyone in our sample was a user in at least a minimal sense, via proxies among friends or family.

These recommendations address the broadband adoption landscape of the United States, where the number of employment and social service interactions that have moved online has created significant "push" factors for low-income citizens. Regulation of pricing models for broadband should

take into account the centrality of broadband in gaining access to basic services, as well as the priority that consumers in this study placed on it. State and federal government should invest in skills and training within existing social services contexts acknowledging the necessity for broadband use for education, employment, and e-government.

Outside of the United States, these recommendations suggest that investment in the social infrastructure that serves to maintain effective use of broadband should accompany any wide-scale movement of services online. In the UK, for example, the 8% of the total population who do not use the Internet because it is "not relevant" may be representative of the fact that many social services are not available online (and nearly all are still available offline). If these people are primarily concerned with gaining access to services, it is understandable that being online would not be relevant. With a contracting economy limiting service budgets in the UK, greater online service delivery may appear to be attractive. When determining whether and how services should shift online, UK policymakers should carefully consider the experiences from the United States.

Conclusions

This community-based study describes how low-income people understand Internet access as a precondition to, and not a consequence of, socioeconomic inclusion. The Internet was understood as having high utility, and as a necessity for gaining access to basic services and low-skilled employment. In this sense, the low-income people in our study were actively engaged in broadband games framing access as essential to inclusion.

The barriers to broadband access among these communities include the fragile financial equilibrium underpinning home broadband access, and the way that third spaces such as libraries and other community intermediaries fill the gap between high demand and low adoption. Within these general findings, barriers to effective broadband access can be understood as resulting not just from limited access to technical infrastructure but from strain on social infrastructure, including understanding and control over home communications costs, difficulties in obtaining technical support, and skill shortages exacerbated by the design of online services.

The results of this study indicate the utility of a qualitative approach for illustrating the role that marginalized communities can play in defining digital inclusion. For the people who participated in our study, digital exclusion was a lived experience that connected with social and economic

exclusion and that required significant personal and community resources to overcome it. The study's results also indicate broad similarities in experience among people from a variety of different backgrounds, in terms of both the drivers for broadband access and the barriers that they encounter, while acknowledging the specificity of experiences related to governance, skill, services, and technical support.

Digital inequalities remain, and as this research suggests, they are complex and multilayered. As Gunkel (2004) suggests, the understanding of "digital divides" will continue to evolve. The best way to bridge them is to understand the differences between varying contexts of connectivity. Future research following from this study could include detailed investigations of specific local contexts where differences in services, pricing, and community resources create specific contexts for non-adoption. Finally, comparative work examining the differences in context for marginalized population receiving public services across national jurisdictions may help to clarify the reasons for different levels of broadband adoption. As the United Kingdom, for example, moves public services online and discusses the acceptable level of universal broadband provision, similar questions of framing broadband access and expanding inclusion will need to be addressed.

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