Urban Internet Myths and Realities: A Detroit Case Study

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Abstract

This study challenges conventional expectations around Internet use in distressed urban neighborhoods. Based on the findings of a survey of 525 Detroit, Michigan, residents and focus groups conducted between October and December 2017, this research indicates that Detroit communities are more connected, more interested, and more instrumental in their use of the Internet than suggested by stereo-types of residents in urban low-income communities being offline, uninterested in the Internet, and focused on access to entertainment. In countering these myths, our paper offers a more realistic assessment of key digital divides in Detroit, namely a divide between those with an ISP contract and those are overly dependent on mobile phones to access the Internet, which limits valuable uses of the Internet.

Keywords: digital divides; urban digital divides; marginalized communities; policy; surveys; focus groups

Introduction

Digital divides and inequalities have been a topic of research since home computers and the Internet have become widely available to the general public across high income countries. As the Internet has become widespread, research has shifted its focus from first-level digital divides (Norris, 2001), concerned with access, to second-level digital divides, focused on digital skills (Hargittai, 2001; Hargittai & Hinnant, 2008), and to third-level digital divides, which shift to differences in outcomes due to variable levels of access and skills (Helsper, van Deursen, & Eynon, 2015). One common finding over time has been an urban-rural divide, in which urban households generally have better access to the Internet than those in rural areas (Hindman, 2000; LaRose, Gregg, Strover, Straubhaar, & Carpenter, 2007). However, less research has focused on divides within urban and suburban areas, even though significantly fewer households have home Internet access in distressed urban areas, leading residents to be more dependent on mobile devices and public Internet access, such as through public libraries (Mossberger, Talbot & Franko, 2013; Servon & Nelson, 2001).

Our paper addresses issues surrounding digital divides in urban, low-income communities by examining survey data and focus group discussions, collected in Detroit, Michigan, in November and December 2017. We asked Detroiters if they use the Internet, if they are interested in the Internet, and how they connect to information online. We examine levels of interest, trust, access points, breadth of use, and mobile phone dependence. The following section discusses literature on urban digital divides and broadband access, before moving to the context of Detroit, our methodology, and the findings.

Literature Review

The concept of the urban digital divide refers to ways in which information and communication technologies (ICTs) are unevenly distributed within an urban environment (Crang, Crosbie, Tracey & Graham, 2006). Digital divides are socially significant because they generally follow and reinforce social and economic inequalities (Reisdorf, Hampton, Fernandez, & Dutton, 2018). Research on urban digital divides includes different speeds and uses between the cosmopolite elites, such as centralized economic hubs, and the marginalized households in close proximity (Crang, et al., 2006). Findings suggest that marginalized communities are generally under-connected, that people in these communities are uninterested in or afraid of using the Internet (Jackson, Gardner, & Schmitt, 2001; Stanley, 2003), and that once online low-income communities tend to use the Internet for entertainment and leisure purposes (Toyama, 2011). Relative to studies examining urban-rural divides, digital divides in metropolitan areas are under-researched, particularly studies that evaluate outcomes of digital inclusion initiatives, which can help inform decisions on how to narrow or eliminate broadband adoption gaps (Rhinesmith, 2016). This lack of research, in combination with assumptions surrounding Internet use and adoption, could create a practical and ethical barrier to meaningful interventions aimed at narrowing urban digital divides.

Broadband Access

In the United States, as of 2016, all urban neighborhoods have some level of access to broadband Internet infrastructures, either through fixed lines or mobile (FCC, 2018). Nevertheless, as of 2018, only about 67 percent of U.S. adults in urban communities reported having broadband at home (Pew Research, 2018). Pew reports a more modest 57 percent home broadband adoption rate among African American households and 45 percent among households

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making less than $30,000 (Pew Research, 2018). [1]

Targeted programs in the United States, such as AT&T's Access and Comcast's Internet Essentials, offer low-cost contracts for low income residents, such as those who qualify for public housing assistance or school lunch programs. Still, many residents who qualify do not have home Internet access. For example, only about 6 percent of parents who qualify for Comcast Essentials signed up for the services nation-wide (Rideot & Katz, 2016).

In addition to income levels, broadband adoption by households is lower for racial minorities, older adults, rural residents, and those with lower levels of education (Pew Research, 2018). A lack of competition in low-income areas, with some providers not offering broadband services in those areas that have a large number of households living below the poverty line, has also been cited as a factor relate to lower levels of access (Callahan, 2017; NDIA, 2017).

Reports related to broadband subscriptions and computer ownership, as compared to access alone, are even lower. Census data reports nearly 73 percent of U.S. households use the Internet at home, while only 62 percent of American households have "high connectivity," meaning they have a desktop or laptop, a handheld computer or smartphone, and a broadband Internet subscription (Ryan & Lewis, 2017).

Urban Digital Divide

The urban landscape is not homogeneous, but characterized by distinct pockets of wealth and pockets of poverty, often in close proximity. As compared to suburban communities, both rural and urban communities in the United States have a disproportionate number of low-income

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[1] Changes in use and adoption over time might be misleading, for example, Pew notes that several different question wordings to identify broadband users in recent years, which may account for shifts in broadband adoption rates in recent years. Thus, the extent of the digital divide in urban areas and across socio-economic classes varies, depending on the measures used and the method for data collection.

households. The poverty rate for people living in urban areas is about 16 percent and 13.3 percent in rural communities (U.S. Census, 2015). While income inequality is high among urban households the digital divide between affluent and distressed urban communities remains unclear.

For underserved communities, broadband adoption is more varied than simple residential subscribership to high-speed (Siefer, Bates, & Rhinesmith, 2016; Rhinesmith, 2016). Studies of urban broadband access have pointed to differences between simply having access to the Internet and achieving meaningful broadband adoption, defined as "daily access to the Internet at speeds, quality and capacity necessary to accomplish common tasks; with the digital skills necessary to participate online; and on a personal device and secure convenient network" (Rhinesmith, 2012: 8) and arguing that a sense of safety and respect are essential precursors for adoption (Rhinesmith, 2012: 25-29).

Attitudes about the Internet

One explanation for disparities in adoption in low-income communities and communities of color is a lack of interest. A Pew survey found that 34 percent of non-Internet users had no interest or did not think the Internet was relevant to them (2013). Similarly, a study of racial digital divides linked a lack of digital literacy to perceptions that the Internet not being perceived as useful or valuable (Jackson et al., 2001). From this perspective, an increase in awareness of the value and importance of computer use and trust in technology must occur for greater uptake and usage among urban residents. This argument is related to van Dijk's (2005) sequential model of Internet access, which posits that potential users need to overcome four barriers to access: motivational, physical, skills, and usage access. Without the motivation to use the Internet

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potential users will not pursue physical access or obtain the skills necessary to be to effectively use the Internet.

Seeing the Internet mainly as a problem generator is another possible explanation for a widening gap, particularly between white and black communities. One study suggests that African Americans are less trusting of government officials and the monitoring of web activities by authorities than white or Asian Americans, potentially leading to slower adoption rates among black communities (Araque et al., 2013; Payton, 2003). Another study of non-adopters of broadband Internet found that non-adopters are often concerned that household access could have a negative impact on their family's values, culture, and home life (Powell, Bryne, & Dailey, 2010).

Utilization and Breadth of Use

Research also suggests that distressed communities lack digital literacy and consequently make poor use of their access to the Internet even when opportunities become available. Such studies assert that low-income communities primarily use the Internet for entertainment, such as watching movies, playing games, or consuming adult content (Toyama, 2011; Wamuyu, 2017). Findings suggest that distressed communities might adopt, but be less likely to utilize the Internet, as defined by the FCC (2010) to refer to "the intensity and quality of use of that connection to communicate with others, conduct business and pursue online activities" (p.169). If true, such patterns could validate the idea that interventions to improve access and adoption are in vain, considering underserved communities will not leverage the potential of the Internet.

Beyond the academic literature in the area of urban digital divides, stigma and popular beliefs add to assumptions and (mis)perceptions that fuel bad policy and disrupt opportunity for connecting under-connected neighborhoods. For example, Comcast publicly announced the

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biggest barriers to low-cost Internet program adoption is based on ignorance of the Internet or fear of the government (Tuttle, 2012). Similar beliefs are reflected in FCC policy documents such as the agency's National Broadband Plan which points to a lack of relevance as one of the most significant barriers to broadband adoption (FCC, 2010). This aligns with early research that focused attention on people choosing not to use the Internet (Dutton, Shepherd & di Gennaro, 2007). However, attitudes shaping choices are often structured by social and economic factors, such as income and one's local context.

Culture of Disconnection

Distressed and urban areas nation-wide suffer from access gaps between the well-to-do business centers and low-income residential neighborhoods, such as in cities like Detroit. Despite recent economic redevelopment in downtown Detroit, many neighborhoods across the city remain distressed and underserved by the Internet. Among households with incomes below $35,000, about 63 percent of Detroit households have no in-home Internet access (Wheeler & Clyburn, 2015). According to the FCC, Detroit's digital divide is among the most extreme in the nation (Kang, 2016).

While there are attempts to connect cities like Detroit, a number of barriers remain. In Detroit, service maps indicate that service covers nearly 98 percent of the city, and online service competition maps indicate at least two providers for each zip code within the city. Yet, 70 percent of school aged children have no Internet access at home (Grimes, 2016), despite neighborhood-level efforts to connect households to the Internet (Rogers, 2017). A number of reasons for this lack of adoption have been suggested, such as Detroiters are just not being interested in the Internet, or not being fully aware of the benefits of the Internet and lacking the knowledge to connect or navigate the Internet. Our study explores the extent to which these

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assumptions and findings hold true, and sets the stage for a more critical look at the urban digital divide. Within this larger question of use and adoption we ask a series of sub-questions including:

(1) Are Detroiters interested in connecting to the Internet, and can negative attitudes explain existing gaps in connectivity?

(2) To what extent are Detroiters connected or under-connected, and why?

(3) What do Detroiters do online, and how does the use of mobile phones impact online behaviors such as work, information seeking, producing original content, and entertainment uses?

(4) How affordable and accessible is the Internet to Detroiters?

Methodology

A survey was designed on the basis of targeted interviews among stakeholders, such as young residents, non-profits, and community centers, as well as focus groups with low-income residents across the three neighborhoods. A telephone survey of three Detroit neighborhoods, Cody-Rouge, Milwaukee Junction and 7/8 Mile and Woodward, was then conducted. These three neighborhoods were chosen to reflect variations in the socio-economic make-up of the city. Targeted interviews with stakeholders were conducted in September and October 2017. These interviews were crucial in the development of the focus group and survey instruments.

The Survey

The phone survey was conducted from November into December of 2017 in collaboration with Wayne State University's Center for Urban Studies' Survey Unit. To recruit survey participants, residents in the three neighborhoods were sent a postcard that explained the

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focus of the study and offered a $10 CVS gift card and opportunity to win one of five $100 Visa gift cards. To participate residents were instructed to call to complete a survey in the language of their choice, including Spanish, Arabic, and Polish. Despite this offer, all interviews were completed in English.

A database of fixed and mobile phone numbers, which were associated with addresses within each area, was used in parallel to contact residents to complete interviews. The final sample included 525 completed phone interviews, which is about a 12 percent response rate—a response rate typical for phone surveys, and above expectations for a low income, distressed urban area.

TABLE 1: Survey Response Rate by Neighborhood

	Cody Rouge	7-8/Woodward	Milwaukee Junction	TOTAL
Postcards mailed, less invalid addresses	3218	533	581	**4332**
Completes	344	97	84	**525**
Response Rate	10.7%	18.2%	14.5%	**12.1%**

Sample

The resulting samples in the three districts are 'opt-in' samples, based on those individuals who chose to respond to a postcard or responded to phone invitations. Randomizing respondents across and within households was not considered to be feasible. The resulting sample is predominantly female (81 %) and skewed toward higher age groups. The age range is 18-96 years (mean=53.1), with about half of the respondents (50.2%) 55 years of age and older. About 37 percent report a disability or a health problem, which is related to the older average age

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of our sample. The sample is predominantly African-American (88%), 8 percent white, and 3 percent mixed. Almost the complete sample (99%) speak English at home.

TABLE 2: Sample Demographics as compared to Neighborhood Composition

	Cody Rouge		7-8/Woodward		Milwaukee Junction	
	Sample	Census	Sample	Census	Sample	Census
Total population	344	12,486	97	2,648	84	3,201
AGE						
18 to 24 years	4.7%	10.3%	3.2%	15.1%	0.0%	14%
25 to 34 years	11%	13.4%	10.8%	12.8%	12.2%	12.1%
35 to 44 years	14.8%	10.4%	21.5%	12.2%	12.2%	12.7%
45 to 54 years	18.4%	13%	21.5%	15.3%	20.7%	13.9%
55 to 64 years	24.9%	13.1%	18.3%	9.4%	26.8%	19.5%
65 years and over	26.1%	9.36%	24.7%	13.5%	28.0%	8.7%
SEX						
Male	14.7%	47.3%	28.7%	57%	24.4%	52%
Female	85.3%	52.7%	70.2%	43%	75.6%	48%
RACE						
White	3.7%	3.8%	21.3%	11.9%	10.4%	7.9%
Black	92.9%	93.1%	73.0%	78.8%	85.7%	90.9%
Asian	0.0%	0.4%	0.0%	4.8%	0.0%	0.0%
Native American	0.6%	0.7%	0.0%	0.0%	2.6%	0.1%
Mixed	2.8%	1.9%	5.6%	4.5%	1.3%	1.2%
Hispanic/Latino (of any race)	3.8%	0.8%	7.2%	2.15%	1.2%	0.8%

A quarter of the sample have a high school degree or less, 41 percent have some college experience or an associate degree, and about another third (34%) have a university degree. Only 35 percent of the sample has children in the home, and about 30 percent of the homes currently consist of two adult partners who are spouses or in a committed partnership.

More than a third is employed either full-time or part-time (34%), 28 percent are retired, 10 percent are not employed for pay, and nearly one-fifth (19%) of our sample report that they

are not working because of a disability. Six percent are self-employed and 3 percent report being students. Almost half (49%) of the respondents report their annual household income to be below, or far below, the Detroit average of $26,000. Less than 5 percent say their annual household income is far above this average.

Focus Groups

Three focus groups were conducted with a total of 30 Detroit residents between late October and early November of 2017. The first focus group represented community stakeholders; all participants were female, ranging in age from late 20s to 60s. Participant occupations included: director for the local community center, community engagement coordinator, manager from the mayor's office, community development specialist, youth coordinator and former high school teacher. The second focus group included youth, ranging in age from 15 to 17-years-old with an even split of male and female participants. All participants were full-time high school students. The third focus group represented job-seeking adult residents ranging in age from 24 to 38 years. Seven of the eight participants were male and all participants had children in the household. Each focus group lasted about one hour, organized into four sections: Uses, Barriers, Motivations and Plans/Services. The focus groups were audio- and video-recorded and summarized for major themes. Focus group findings were crucial to understanding the survey results and provide contexts for many of the themes and patterns discovered in the surveys.

Measures and Analyses

The analysis of the survey data is based on the relationship among six key sets of explanatory factors (Figure 1): demographics, neighborhood attributes, participant attitudes and

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beliefs about the Internet, social networks, broadband and access issues (such as perceived

affordability), and patterns of Internet use (or non-use). These factors are viewed in our

framework as conditioned by business, technology, governmental, and civil society strategies.

FIGURE 1: A Framework for Analysis of Internet Use in Detroit.
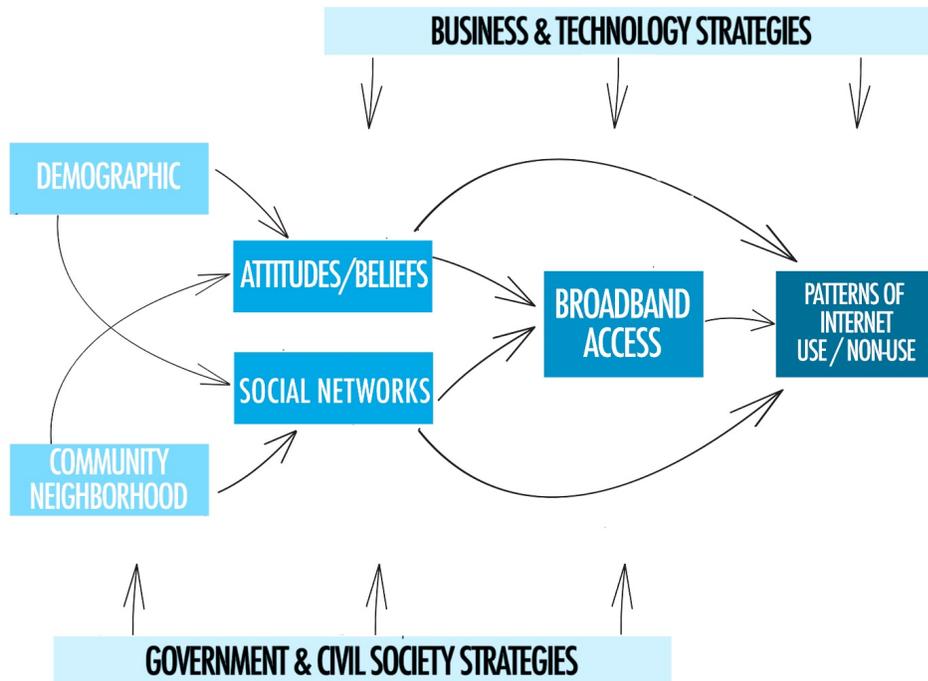
Demographic variables, such as age, were included to incorporate key factors shaping

access, use, and attitudes. We conducted principal components analyses (PCAs) using varimax

rotation and Kaiser normalization to identify dimensions among the attitude variables that

yielded similar results as previous work in this area (e.g. Dutton & Blank, 2015; Dutton &

Reisdorf, 2017; Reisdorf, Blank, & Dutton, forthcoming). The PCA of attitudinal items resulted

in three dimensions that were created from the factor loadings: efficient, costly, and problems

(see Table 3).

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TABLE 3: Operationalization of Variables[2]

Variable	Operationalization
Age	Age in years (range: 18-96)
Female	Gender (male 0; female 1)
Education	Educational qualification (scale of 1-8; no high school to doctoral degree)
Partner	Being in a committed partnership (no 0; yes 1)
Children	Children living in home (no 0; yes 1)
Disability	Disability or health problem getting in the way of everyday tasks (no 0; yes 1)
Income	Household income in comparison to Detroit average (scale of 1-5; far below average to far above average)
ISP contract	Has ISP contract (no 0; yes 1)
High mobile dependence	Scale of 0-3 with 3 indicating highest dependence on mobile phone; constructed from three items (no 0; yes 1): primarily use mobile phone to go online; no ISP contract; no laptop/desktop/tablet computer in household
Efficient	Created from factor loadings of principal components analysis of 14 attitudinal items (Q1)*
Problems	Created from factor loadings of principal components analysis of 14 attitudinal items (Q1)*
Costly	Created from factor loadings of principal components analysis of 14 attitudinal items (Q1)*
Breadth of use	Scale of 0-15 based on 15 possible Internet uses
Breadth of access	Scale of 0-4 with 4 indicating highest breadth of access, constructed from four items (no 0; yes 1): access from home; access from work or school; access from library or public place; access from anywhere else (Q16)
Know-Who	Scale of 0-9 with 9 indicating highest instrumental capital: created from first component found in principal components analysis of 18 social capital items (Q41; Do you know anyone who…; no 0; yes 1): knows a lot about computers; owns a second home; can give advice on conflict; knows about finances; plays an instrument; can help move; can recommend a hotel/restaurant; can lend a tool; can lend a vehicle/give a ride).

See Table 5 for the rotated component matrix of attitudinal dimensions.

Multivariate regressions were run using SPSS to identify the key factors that shape

outcomes, such as having an ISP contract (or home Internet access), dependence on mobile

(mobile digital divide), attitudes (e.g., efficiency and perceptions of costs), and variety and

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[2] The survey instrument is available at http://quello.msu.edu/research/broadband-to-the-neighborhood/.

breadth of Internet use. Analyses included a comparison among these neighborhoods to determine if different patterns of use emerged. Path analyses were run using SmartPLS to test the goodness of fit for moderating and outcome variables. Only those models that proved to have a good fit are reported.

Results

In the sections below, we discuss our findings regarding our four research questions. The first examines attitudes toward the Internet that help explain use. Second, we explore if and to what extent the digital divide exists in terms of home Internet Service Subscriptions and reliance on mobile phones. Next, we explore if mobile only is enough to narrow urban digital divides. Fourth, we examine assumptions of accessibility and barriers to use.

Attitudes about the Internet

Based on the survey responses, Detroiters are surprisingly well connected to the Internet, with 98 percent of respondents saying they use the Internet, suggesting that interest in the Internet is high. However, only about 62 percent report having a contract with an Internet Service Provider (ISP) for home access. We will explain this apparent anomaly in the next section.

Detroiters generally feel positively about the Internet rather than negatively. Based on a five point Likert scale, mean values for items related to the benefits of the Internet universally rank considerably higher than the costs and risks. As depicted in Table 4, the vast majority perceive the Internet as an efficient way to get information (M=4.25, SD=.82), say it saves time (M=4.12, SD=.81), and it allows people to stay in touch (M=4.22, SD=.73). Comparatively fewer people report regarding it as a generator of problems, such as worrying about privacy

(82%, M=3.93, SD=.97) and exposure to bad material (70%, M=3.66, SD=1.13). Generally, participants have higher levels of agreement among items expressing positive sentiment such as efficiency and time savings as compared to risks and costs.

TABLE 4: Means and Standard Deviations of Positive and Negative Attitudes towards the Internet

Attitude	% who strongly agree	Mean	SD
Many of my friends and family use the Internet	92.2	4.29	0.82
Going online is an efficient way to find information	93.1	4.25	0.82
Going online allows people to keep in touch with each other	93.5	4.22	0.73
Going online is valuable for finding and applying for jobs	89.3	4.14	0.79
The Internet helps save time	91.0	4.12	0.81
The Internet helps people do things they like to do	89.4	4.07	0.82
The Internet makes life easier	83.4	4.02	0.91
It is easy to use the Internet	82.1	3.94	0.95
Going online puts people's privacy at risk	82.3	3.93	0.97
It is difficult to protect personal information once it is online	76.5	3.81	1.07
There is too much bad material online	70.4	3.66	1.13
When people are online they don't feel lonely*	62.2	3.45	1.06
The Internet is just one more thing people are trying to sell me	45.6	2.92	1.25
Going online costs too much	36.1	2.86	1.18

N=525; Scale 1-5 (strongly disagree to strongly agree); *this item also loads on the "Costly" component in Table 5 below, indicating that it is not regarded as a positive thing.

To understand the role of attitudes in Internet connectivity, we performed a Principle Components Analysis to distinguish the various types of attitudes based on the items listed above. This analysis revealed three factors related to attitudes toward the Internet, perceived efficiency, perceptions of problems, and perceptions of cost.

TABLE 5: Results from Principal Components Analysis of Attitudes

Attitudinal items	Factor loadings		
	Efficient	Problem generator	Costly
The Internet makes life easier	.690	-.104	.043
Going online allows people to keep in touch with each other	.662	.042	.039
The Internet helps save time	.648	.125	.024

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The Internet helps people do things they like to do	.613	-.181	.066
Going online is an efficient way to find information	.587	.250	-.097
It is easy to use the Internet	.545	-.033	-.043
Many of my friends and family use the Internet	.529	.210	-.340
Going online is valuable for finding and applying for jobs	.473	.092	-.226
Going online puts people's privacy at risk	.179	.751	.019
It is difficult to protect personal information once it is online	.130	.628	.135
There is too much bad material online	-.124	.613	-.007
Going online costs too much	-.085	.132	.713
Internet is just one more thing people are trying to sell me	-.200	.313	.633
When people are online they don't feel lonely	.286	-.269	.548

Rotated component matrix with Kaiser normalization. Factor loadings above .400 shaded gray.

We then ran regression analyses, which found that attitudes have an impact on connectivity, as measured by having a home ISP.[3] Using an ISP contract to measure connectivity allows us to measure adoption of home use served by a stable and reliable connection to the Internet as compared to connections from a mobile device or an open network. The first model includes only control variables, the second model includes attitudes.

TABLE 6: Standardized Coefficients among Factors Contributing to an ISP contract

Variable	Demographics Only	Attitude Model
Age	.04	.10*
Gender (F)	.05	.04
Children in Household	-.12*	-.08
Living with Spouse or Partner	-.07	-.07
Disability	-.01	-.03
Education	.14**	.12**
Income	.25***	.18***
Efficient	----	.21***
Problems	----	.05
Costly	----	-.24***
Adj R^2	.11	.22
N	481	466

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[3] As the vast majority of our sample reported being Internet users, we were unable to run a regression on Internet use.

*$p < .05$. **$p < .01$. ***$p < .001$.*

The adjusted R^2 improves with the addition of attitudes, suggesting that attitudes are important to better understanding home Internet adoption. Individuals who believe the Internet is a means to do things more efficiently are significantly more likely to have a contract with an ISP, and those who are more concerned about costs are significantly less likely to have an ISP contract. There was no significant relationship between perceived problems and having an ISP contract, indicating that perceived problems of being online does not create a barrier to adoption. Overall, attitudes about cost and efficiency are the two biggest predictors of having an ISP contract, followed by income, education, and age.

Positive attitudes among Detroiters outweigh negative attitudes. This sentiment was echoed throughout focus groups. Across the groups one point was crystal clear: Internet access is essential. Adults said they need it to communicate with educators, keep up with current events, get directions, and check facts. One participant observed *"notices about my child are only sent via email, so without it there is no way to communicate with teachers or the school."* Another participant pointed out that using the Internet is needed for their own education and researching job opportunities emphasizing, *"I gotta have it. That's it."* Another participant added that *"shopping online helps with social anxiety, to avoid crowds and be more productive."* The youth participants regarded Internet access as absolutely essential as well. They said they needed it to submit homework and to remain reliable for those with a social media following. Young people expressed a fear of falling behind without Internet access by missing out in the development of necessary skills needed to be successful in the future.

Focus group participants also illuminated specific concerns. Youth participants believe that those who are online should spend less time online because it leaves young people

vulnerable to trouble. They mentioned that people get bolder, and start conflicts in front of an audience while online, and this often moves to offline trouble. They also said that people they know will often post too much personal information, which can create problems. One youth participant said *"fewer people should go online -- to stay out of trouble. I know a kid who got 'popped' because of an Internet beef. People should be more careful of what they post."*

Adult participants mentioned that home Internet access can take away from family time, cause distractions, and become an addiction or create more pressure to work when they should be relaxing. One participant who uses her phone to access the Internet explained that a home Internet connection would have both costs and benefits: *"life would change for better and worse because [the Internet] can be a distraction, but my family right now has to plan in advance to do homework before coming home, at the library or grandma's house."*

Extent of Detroit's Urban Digital Divide

Most Detroit residents are online and use the Internet. Almost all respondents (98%) report using the Internet, suggesting conventional wisdom that Detroit residents are disconnected from the Internet and not interested in being online is a myth (Reisdorf et al., 2018). Even those who do not have home Internet access find a way to get online. Focus group interviews suggest that many Internet users connect devices by other means, such as by turning their cellphones into hot spots or using their neighbors' Wi-Fi. Many participants said they go to friends or neighbors to access the Internet, particularly for high speed service.

Still, two variations of the digital divides are evident. The first type of divide is in the form of those with an ISP contract and those without. About 22 percent of our survey respondents say they do not have home Internet access, and 38 percent report that they do not have a contract with an ISP. In other words, 16 percent of the respondents are accessing the

Internet at home without an ISP. As such, a paradox emerges: people report having home Internet access, but are lacking the benefits of a stable and reliable connection through an ISP.

FIGURE 2: Percentage of Household Access and ISP Contracts
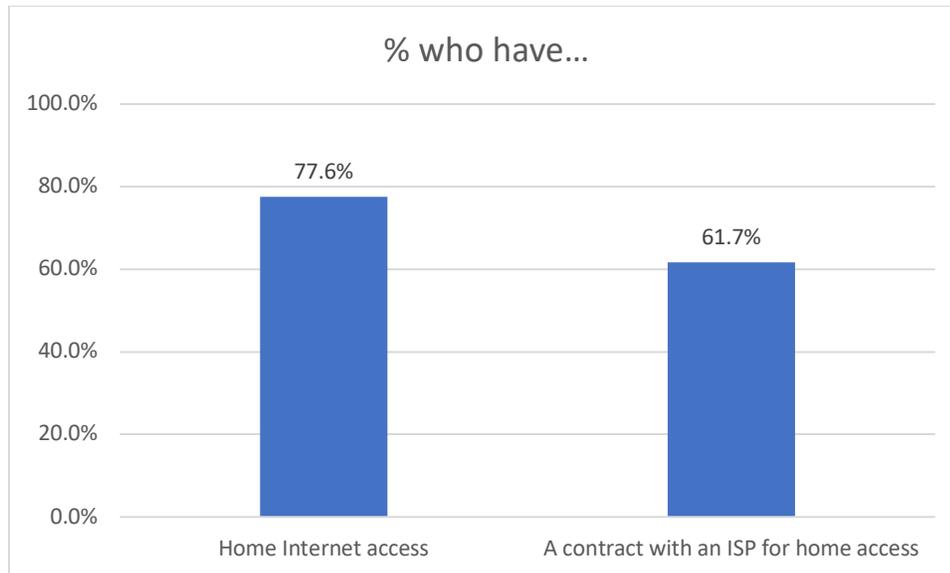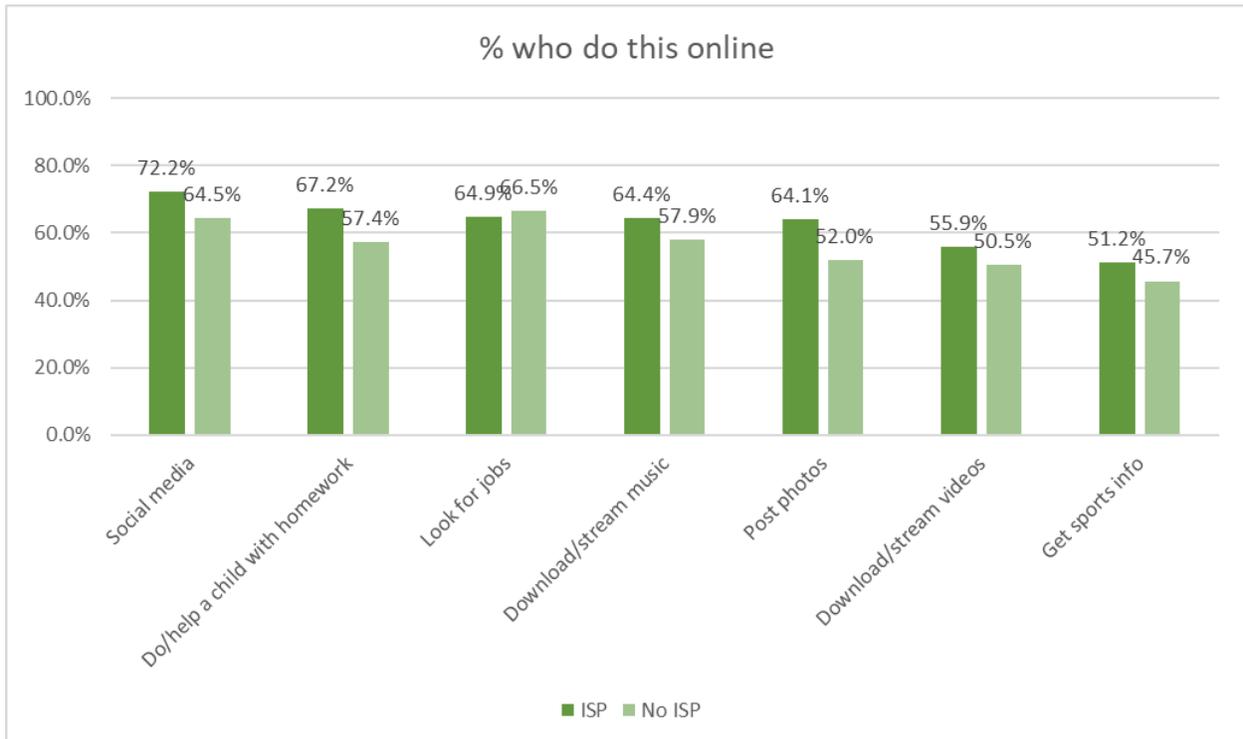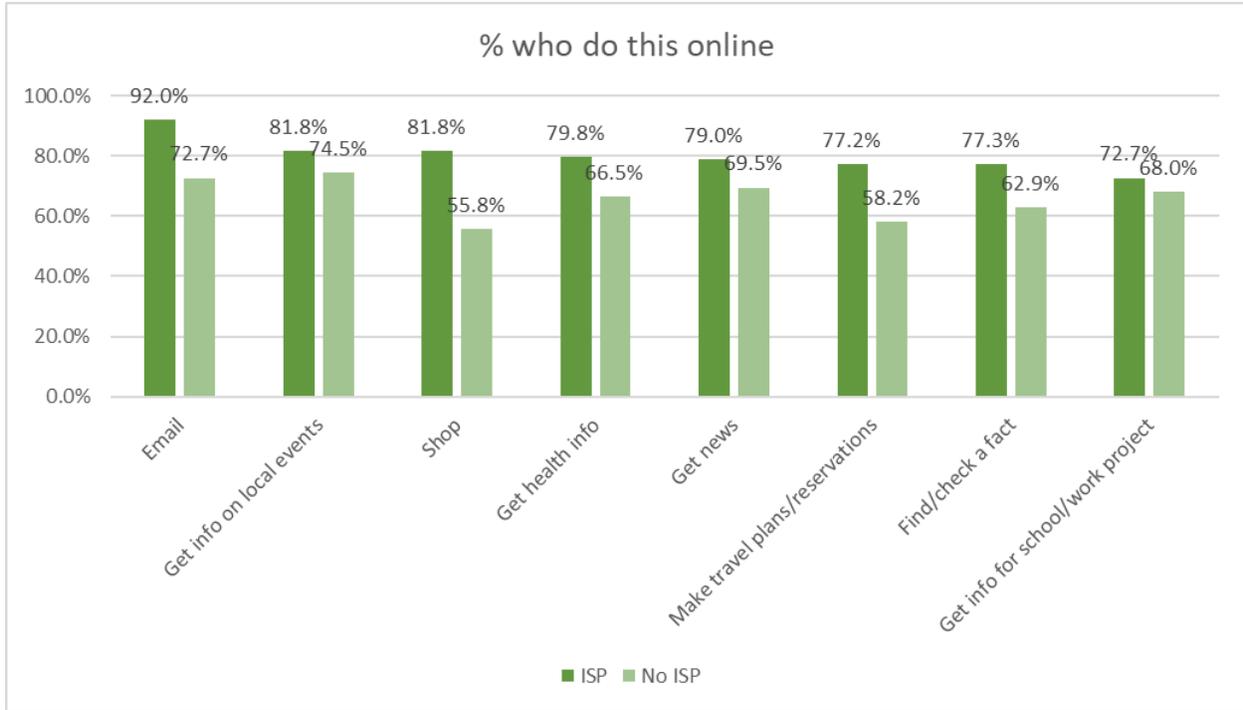

N=525

A divide between those with an ISP and those without emerges in terms of Internet use. When those who have an ISP are compared with those who do not, we see a decline in every online activity, except looking for jobs. Among our sample, those with an ISP connection report higher levels of use for information seeking, work/school, communication, and entertainment purposes. Our findings show that shopping online is most impacted by a lack of an ISP, presenting a major limitation for distressed communities lacking access to a variety of goods and services and limiting the ability to compare prices to reduce costs.

**FIGURE 3: Utilization of Internet With and Without an ISP Contract**

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% who do this online

Legend: ■ ISP ■ No ISP

Email: 92.0% / 72.7%
Get info on local events: 81.8% / 74.5%
Shop: 81.8% / 55.8%
Get health info: 79.8% / 66.5%
Get news: 79.0% / 69.5%
Make travel plans/reservations: 77.2% / 58.2%
Find/check a fact: 77.3% / 62.9%
Get info for school/work project: 72.7% / 68.0%

% who do this online

Legend: ■ ISP ■ No ISP

Social media: 72.2% / 64.5%
Do/help a child with homework: 67.2% / 57.4%
Look for jobs: 64.9% / 66.5%
Download/stream music: 64.4% / 57.9%
Post photos: 64.1% / 52.0%
Download/stream videos: 55.9% / 50.5%
Get sports info: 51.2% / 45.7%

N=525

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The following path model depicts statistically significant factors explaining home Internet adoption as measured by having an ISP contract. Path 1 illustrates the effects of variables, such as demographic factors, attitudinal factors, and Know-Who on ISP contracts.
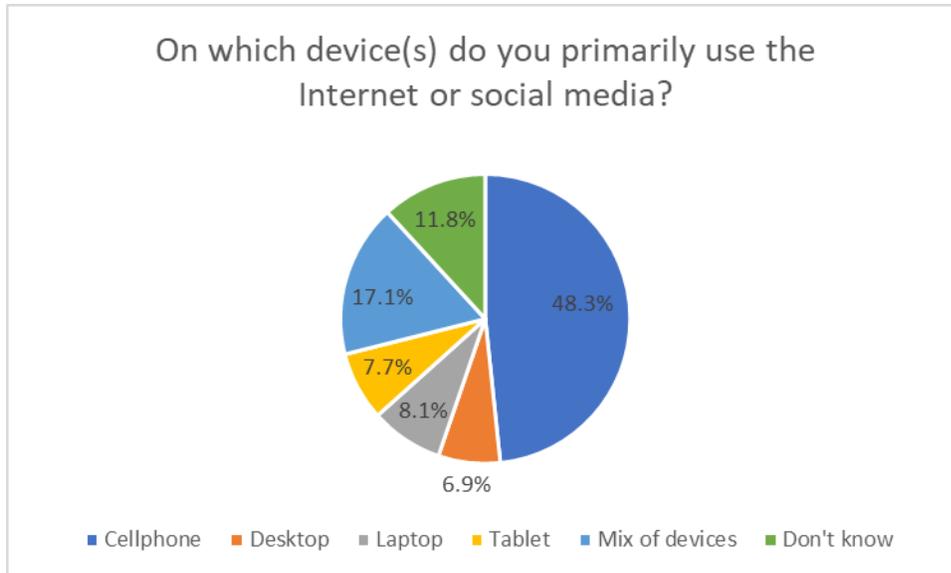
PATH 1: Factors Explaining ISP Contracts
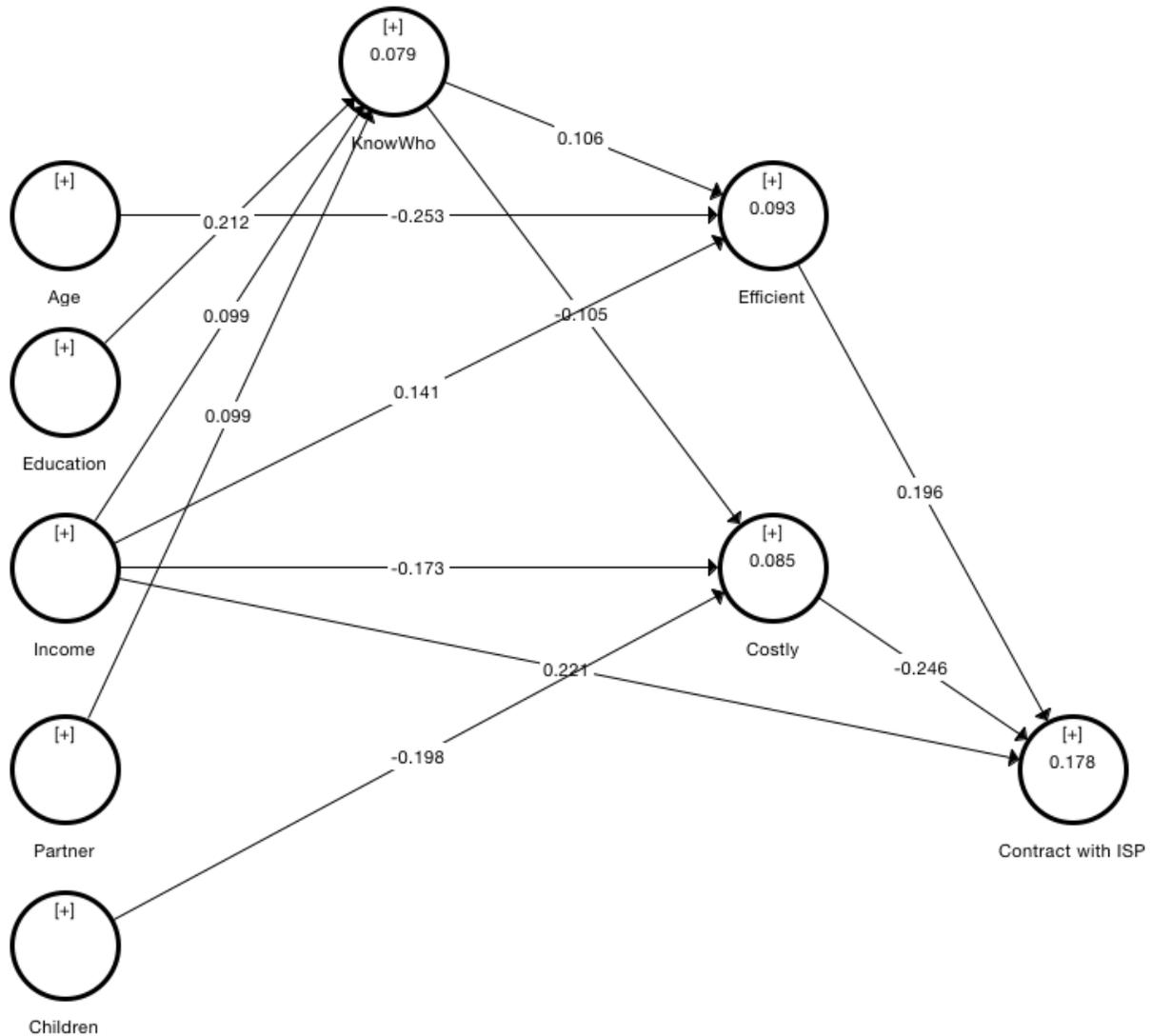
N=472

A number of demographic and attitudinal factors shape who has a contract with an ISP and who does not. Higher educational qualifications, higher incomes, and being in a committed

partnership contribute positively to Know-Who, which, in turn, contributes positively to attitudes of the Internet being an efficient means to doing things and reduces attitudes of the Internet being too costly. Having a higher income and children in the household also contribute to not regarding the Internet as too expensive, and higher income contributes to positive attitudes about the efficiency of using the Internet. Both attitudinal factors contribute strongly to having an ISP contract—efficiency positively, cost negatively—as does having a higher income. Taken together, this path model shows that traditional socio-demographic factors shape both Know-Who and attitudes, which shape digital divides in the form of having an ISP contract.

Mobile-Dependence Divide

The second divide emerges in the form of dependence on mobile phones, and the limitations of mobile devices when compared to, or used in combination with, home devices like desktops and laptops. Many residents improvise to get online without a subscription to a service in their homes. For example, 79 percent access the Internet on handheld devices, and nearly half (48%) report that they primarily use a cellphone to access the Internet. However, over-reliance on cellphones, and having data slowed as a result of reaching data caps was reported as a major barrier to Internet use in our focus groups.

FIGURE 4: Devices to Access the Internet

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On which device(s) do you primarily use the Internet or social media?

- 48.3% Cellphone
- 6.9% Desktop
- 8.1% Laptop
- 7.7% Tablet
- 17.1% Mix of devices
- 11.8% Don't know

N=491

Most Detroiters are dependent on mobile phones to get online. Mobile dependence was measured creating a scale of dependence that ranges from 0 to 3. Those who report primarily using their phone to use the Internet or social media, have no ISP contract, and no desktop or laptop are the most dependent. By this measure, 10 percent of or our sample are considered highly dependent, while 31 percent report having an ISP, having desktop or laptop and do not primarily use their phone to access the Internet.

FIGURE 5: Distribution of Mobile Dependence
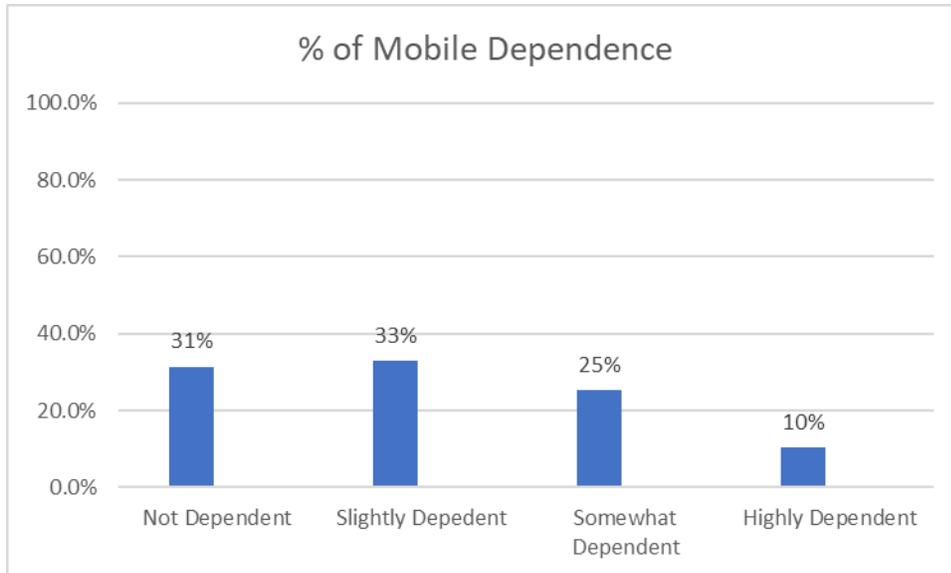
N=525

A broad array of factors are contributing to a greater dependence on mobile access to the Internet. Those who are younger, have lower household incomes, and less schooling are the most mobile-dependent. When attitudes are added to the model, the adjusted R^2 increases, indicating that the model explains more of the variance in mobile dependence. Those who perceive the Internet as more costly and those with a disability are likely to be more dependent on mobile, while those who perceive the Internet as efficient are less likely to be dependent on mobile phones to access the Internet. Age and education are the strongest factors predicting mobile dependence, followed by attitudes, income, and disability.

TABLE 7: Standardized Coefficients among Factors Contributing to Mobile Dependence

Variable	Demographics Only	Attitude Model
Age	-.16***	-.20***
Gender (F)	-.02	-.02
Children in Household	.08	.06
Living with Spouse or Partner	.05	.05
Disability	.08	.09*
Education	-.19***	-.19***

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|		
Income	-.15**	-.11*
Efficient	----	-.14**
Problem	----	-.05
Costly	----	.12**
Adj R^2	.12	.14
N	482	467

*p < .05. **p < .01. ***p < .001.*

Detroit has an Internet ecosystem anchored around mobile phone Internet access. Improvised connections and mobile devices help people access the Internet. This is not equivalent to access over devices that enable people to read and write and produce more complex or extended content. Consequently, digital divides are less centered around Internet access than previously thought. Instead, divides have more to do with barriers to having an ISP contract and dependence on smartphones. This produces a different type of urban Internet divide. The following section highlights the impact on breadth of use resulting from mobile dependence.

Utilization and Breadth of Use

Once online, Detroiters are mostly doing work or information seeking—dispelling another misperception of Internet use in Detroit. Internet use is not focused on entertainment and leisure. Instead, Detroiters use the Internet for a wide array of purposes. For example, the most prominent uses of the Internet among our sample are emails (85%), getting information on local events (79%), and getting health information (75%) and news (75%). More than two-thirds (71%) use the Internet to get information for school or work, and a majority of respondents use the Internet to look for jobs (66%). Almost two-thirds (64%) go online to do homework or to help a child with homework. Comparatively, only 54 percent download or stream videos and 49 percent get sports information. The high use of the Internet for a variety of different activities indicates the central role that it plays in daily life.

FIGURE 6: Percentages of Individual Use Items for Breadth of Use

% who do this online
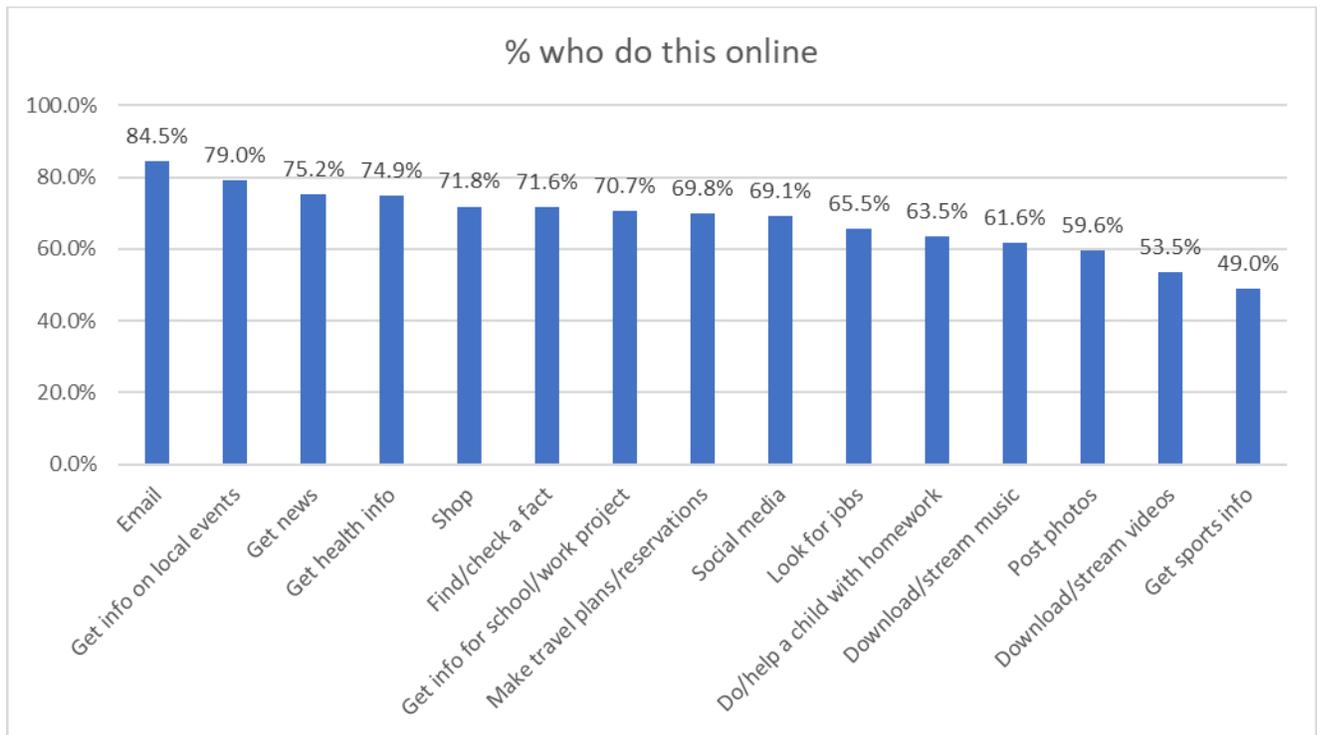
N=525

The level of mobile dependence has an effect on the number of activities that individuals report doing online and limits the types of activities people do. Breadth of use refers to the number of different activities an individual reports doing online, based on all 15 items listed above. As mobile dependence increases, breadth of use decreases.

We ran regressions to examine the relationship between mobile dependence and different types of activities. A closer examination of use items impacted by mobile dependence suggests that as mobile dependence increases, individuals are less likely to use email, make travel plans, get health information, find or check a fact, or shop online.

TABLE 8: Standardized Coefficients for Significant Relationships with Mobile Dependence

Online Use Items	Breadth of use

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Variable	Email	Travel Plans	Health Info	Find Facts	Shop	All 15 Items
Age	-.22***	-.20***	-.19***	-.21***	-.35 ***	-.48***
Gender	-.05	-.06	.01	-.02	.05	-.06
Children	-.15**	-.07	.02	-.01	-.03	-.10*
Spouse/partner	-.04	-.05	-.02	-.01	-.03	-.07
Disability	.00	-.09	.04	.01	.00	-.04
Education	.07	.13	.06	.16***	.10*	.12**
Income	.03	.07	.04	.02	.09*	.01
Mobile Dependence	-.17***	-.12**	-.12**	-.12*	-.27***	-.13***
Adj R^2	.11	.10	.03	.06	.02	.29
N	458	458	458	458	458	482

*$p < .05$. **$p < .01$. ***$p < .00$, only significant DV reported for online use items.*

Age is the strongest predictor of breadth of use, with younger people using the Internet for more types of activities. Mobile dependence is the second strongest predictor of breadth of use: those who are less dependent on mobile are more likely to use the Internet for a variety of uses. While ingenious and routine use of smartphones is pervasive among those we interviewed and surveyed, those who are highly mobile dependent, are less likely to be using the Internet in ways that can counter socioeconomic divides. For example, they are less likely to use the Internet to seek information online, such as looking for facts or health information. These patterns seem to be driven largely by access limitations, as compared to interest in or need for information. In other words, Detroiters report an interest in doing information seeking activities but have restraints because all they have is a cellphone to work with.

Focus group interviews echoed device limitations related to mobile dependence. In particular, youth expressed frustration with using a cellphone to do research for homework. All of the youth participants say they connect their phone to the Wi-Fi to reduce data use. One participant reports that Internet is not always reliable because at night the service "*will just turn on and off.*" Other participants say that home access can be interrupted if too many devices are

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connected or everyone in the house is on the phone connecting to Wi-Fi. Youth say home Internet access allows them to do their homework and have confidence that they can submit by the deadline and home Internet is essential for gaming and posting content they produce.

Across all focus groups, participants suggest that mobile access is more common than home Internet access, however, home access expands the possible breadth of online activities, particularly for specialized tasks like work. Most say they use the Internet while on the go, primarily because they are not at home all that often. One participant explained the reasoning behind his dependence on mobile, saying there is no use for Wi-Fi when the phone allows you to use a hot spot to access the Internet at home, stating "*I don't need Wi-Fi when I have Mi-Fi… I don't get Wi-Fi because I can do everything on my phone.*" He did not see the need to pay extra for home access: "*I already have four wheels, I don't need eight.*"[4]

Focus groups revealed that cost is a major barrier to having a home Internet connection and data caps and the slowing of data on their phone are a major barrier to access. Participants say that many people do not have home Internet access because they do not need another bill or are not home enough to make it worth it, and access is free in public spaces like restaurants. Adult focus group participants overwhelmingly report that home Internet use is important for work, because working on a cellphone is tricky or impossible. As such, they require devices like laptops or desktops. They struggle to apply for jobs online because applications are not usually mobile friendly.

Perceptions of Costs and Value

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[4] However, when cost was discussed during the focus group, the same participant stated he would get home Internet access, if he could afford to have both mobile access and an ISP contract.

Affordability is a major barrier to access, such as the cost of an ISP contract. While most Detroiters are using the Internet frequently, across multiple devices and on the go, 38 percent say they do not have a contract with an ISP. However, 60 percent of those who do not have home access say they would like it. Among those without an ISP contract, a lack of interest (32%) and affordability (30%) are the two biggest reasons cited. Overall, nearly half (46%) feel that the Internet is "just another thing people are trying to sell" them.

FIGURE 7: Interest in Home Internet Service
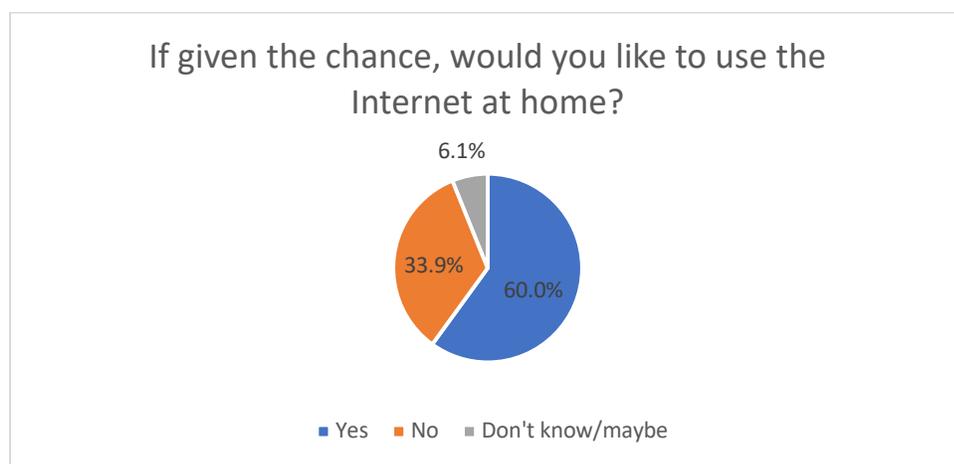
N=115

Of those who have a contract with an ISP, most chose their ISP because it was the cheapest option (38%). Yet, they are paying a disproportionate amount of their income for an ISP. For example, on average, participants report paying about $50 a month (median $40). At the same time, the average household income in Detroit is $26,000 a year, and 75 percent of our sample say their household income is average or below average, and nearly half say their household makes below or far below $26,000 a year. Only 1 in 10 respondents are subscribing to a low-cost plan that is around $10 or less, such as Comcast Internet Essentials or AT&T Access. Understandably, lower income is negatively associated with having a home subscription (see Table 6 above) and perceptions of costs.

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FIGURE 8: Monthly Internet Service Provider Costs

Monthly pay for home Internet service
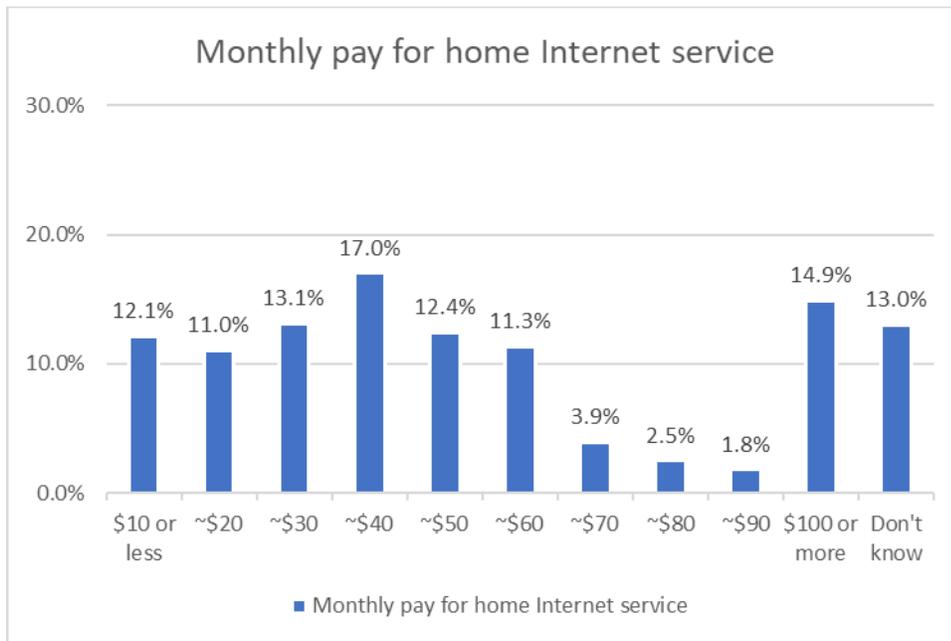
N=324

Mobile dependence is driven, in part, by affordability. Those who are most dependent on mobile, also report lower household income. At the same time, about 30 percent of cellphone users report having stopped service at some point due to cost. Among all respondents, 76 percent say their phone can connect to the Internet, however, only 65 percent are paying for a data plan on their cellphone. These trends illustrate the instability associated with mobile Internet access and highlight the importance of having multiple access points to go online.

FIGURE 9: Percentage of Stopped Cellphone Service and Data plans

% who have...
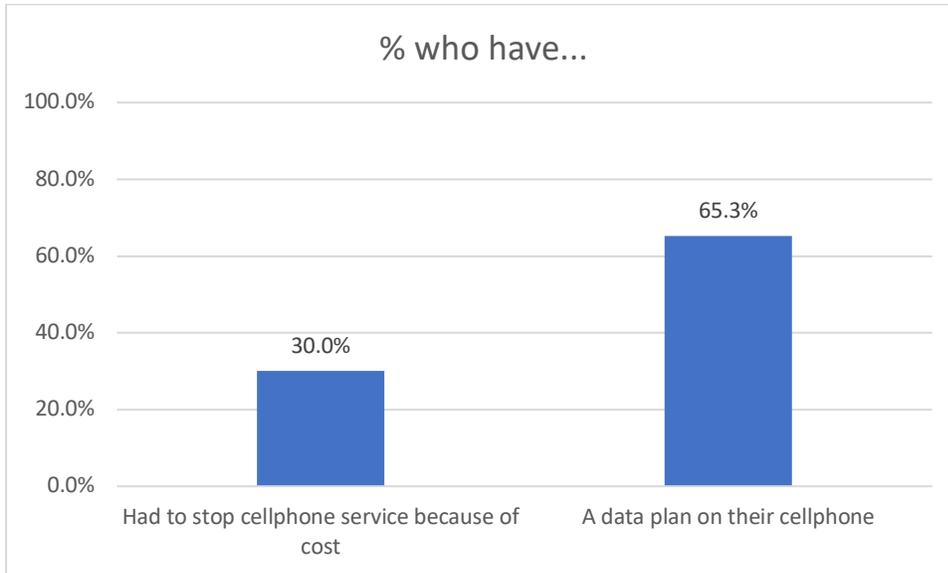
N=457 (stop service); N=507 (data plan)

To put this in perspective, focus group participants admitted to delaying, avoiding or canceling other important services and necessities in order to continue being able to pay for home Internet or cellphone data plans. Overall, participants said that cost either prevents them from having home Internet service, or the cost of home service prevents them from paying other equally important bills.

When asked how an affordable service might change their life, one participant noted that *"other bills could be paid."* One said that *"financial stress would be lifted."* Another said that money would be saved because other bills such as cable could be cut out. In other words, all participants said the Internet is essential and some are putting the cost of service before other essential services.

Two major themes were further revealed in the focus group discussions. First, participants largely believe that the cellphones are "good enough" for accessing the Internet and second, the cost of home Internet services are viewed as the major barrier to home access, but one that can be overcome. One focus group participant summarized this sentiment by explaining

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"I connect from open networks throughout the city or from my neighbors because I have to be connected -- an open network is an invitation. I have [multiple devices connected at all times] without a home Internet connection."

Breadth of Access

While broadband access is part of the affordability problem, places to access the Internet are an important part of the ecology of digital divides in Detroit. Focus groups and surveys both revealed that a lack of interest for Internet access in the household in some cases is driven by the ability to access the Internet elsewhere, such as at work or on the go. Thus, for some respondents, home Internet access is perceived as a duplication of services. However, the household remains the major location of Internet use, and most participants said they are very well aware of the benefits of Internet access.

Considering the high percentage of Detroiters who have interruptions in mobile service due to costs (30%), and the percentage of people who do not have home ISP contracts (38%), access to the Internet from multiple places is crucial. Despite the mobile nature of many people's access points, most say they use the Internet at home (76%). Qualitative survey responses about potential access points indicate that mobility is key in the daily lives of Detroit residents. For example, participants say they are using the Internet at coffee shops and restaurants, while waiting at the doctor's office, at the park, or other public spaces. Respondents also say that they use it while visiting friends, neighbors, or family. This was echoed in the focus groups.
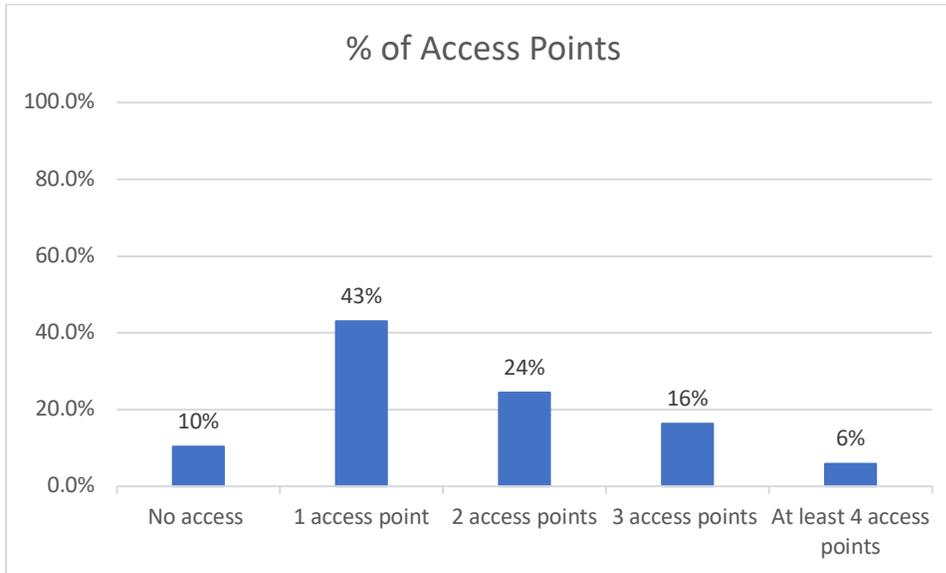
FIGURE 10: Places to Access the Internet

% who use the Internet at…
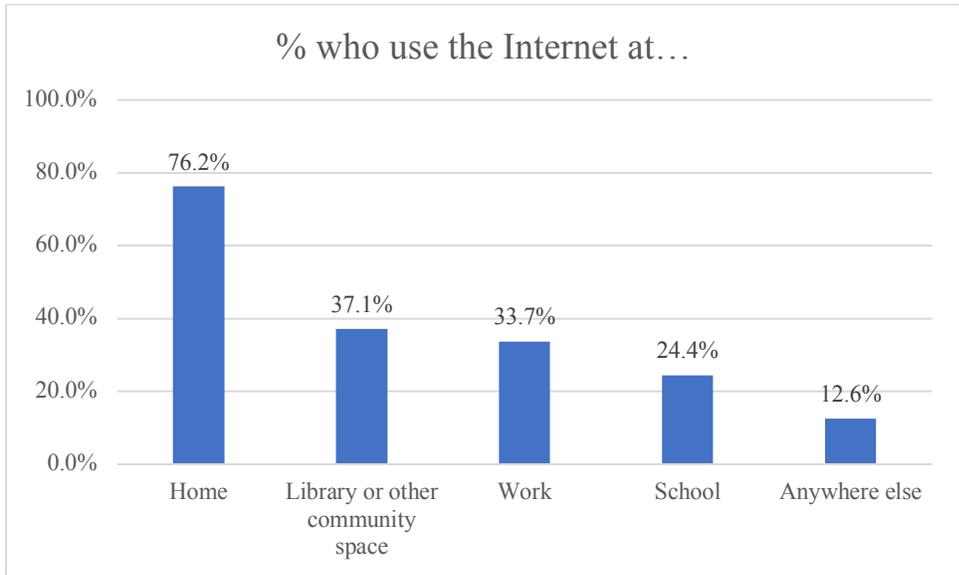
N=525

Breadth of access is another factor that impacts breadth of use. Breadth of access refers to the number of different places an individual reports using the Internet (home, library or community center, work or school, and/or elsewhere). Within our sample, 10 percent say they do not access the Internet from home, library or community center, work or school, and/or elsewhere, while about 6 percent access the Internet from all of these places. This is important because, as Table 9 illustrates, the number of places that individual accesses the Internet has a significant effect on breadth of use.

FIGURE 11: Distribution of Breadth of Access

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% of Access Points

(Bar chart)

- No access: 10%
- 1 access point: 43%
- 2 access points: 24%
- 3 access points: 16%
- At least 4 access points: 6%

Factors that influence breadth of access include age, education, having a disability, and Internet skills. Older people, those with less education, those who have a disability and those with lower Internet skills access the Internet from fewer places. In short, these findings illustrate the role of social factors shaping how individuals gain access, as well as how the number of access points effects Internet utilization: as access points increase so does breadth of use (see Table 9), suggesting that having multiple points of access has an impact on what individuals do online, and can explain more variance of breadth of use.

TABLE 9: Standard Coefficients for Breadth of Access and Breadth of Use

Variable	Breadth of Access	Breadth of Use
Age	-.34***	-0.21***
Gender (m)	.03	-0.10***
Children	-.04	-0.10**
Spouse/partner	-.02	-0.06
Disability	-.11**	0.00
Education	.09*	0.07*
Income	.06	-0.02
Skills	.22***	0.31***
Breadth of Access	----	0.29***
Adj R2	.28***	.44***
N	484	482

*p < .05. **p < .01. ***p < .001.*

Breadth of access is especially important in distressed communities because reliance on any single access point will likely lead to outages or restrictions of access. Youth focus group participants explained that teachers and educators are well aware of such limitations and the lack of home Internet access among students. One participant said "*teachers are flexible when a student doesn't have Internet at home*" adding that he prefers to do hand-written assignments because "*stuff can get deleted or lost online.*" Other participants explained that even schools suffer from unstable Internet connections, one noted "*the school Internet was down for a month,*" in the previous school year. When asked if they used the library to access the Internet, one participant said "*some kids at school only go to the library to get stuff done, probably because they can't afford it [at home].*"

Many Detroiters believe that mobile-only Internet access is sufficient. However, mobile phone access limits the range of activities pursued online in important ways by constraining the use of the Internet for information seeking. Job and scholarship applications cannot be completed on mobile phones. Homework and work related spreadsheets and documents are limited, difficult or impossible to complete on a mobile phone. Creativity is stifled by the limitations of a mobile phone. In order to address these gaps, Detroiters need to recognize these limitations, and have access to home devices, particularly laptops and software to sustain work, homework, and creative endeavors.

Discussion

To date, there has been relatively little research examining the use and consequences of ICTs such as the Internet in low-income communities (Crang et al., 2006) and related outcome-based research of digital inclusion initiatives in these communities (Rhinesmith, 2012) to help

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guide initiatives and programs aimed at narrowing urban digital divides and better understand the culture of disconnection (Rhinesmith, 2016). A relative absence of high quality data on urban divides has contributed to a number of myths surrounding lack of Internet subscriptions and use in low-income urban communities, which are often communities of color. Some of those myths "justify" why these communities are not using the Internet, such as because they are simply not interested. Other myths posit that low-income communities—once they do obtain access—only use the Internet for entertainment purposes, and therefore do not use the Internet to "better" themselves, leading to questions about whether subsidized access is justifiable in those areas. Such myths are further complicated by a growing belief that widespread adoption of mobile phones has decreased digital divides. Proponents argue that access to the Internet using mobile devices is equally as beneficial as having home Internet access and is even the wave of the future, leapfrogging conventional users.

Based on the case of Detroit, this study investigates conventional wisdom suggesting that marginalized communities are under-connected, that people in these communities are uninterested in or afraid of using the Internet, and that once online low-income urban communities tend to use the Internet for entertainment and leisure purposes.

Our findings suggest that these myths are just that—myths, rather than reality. Survey respondents and focus group participants alike reported largely positive attitudes and beliefs about the Internet and discussed concerns about consequences of a digital divide. Questions about positive and negative attitudes clearly skewed toward positive beliefs such as productivity, skill development, and opportunity. These positive attitudes are also evident in the amount people are paying for an ISP relative to their household income. Arguments centered on negative

attitudes, ambivalence or disinterest as a reason for a growing digital divide are not supported by our findings.

It is important to note that those who use the Internet more and more often, on a number of different devices, and different locations get more out of it (van Deursen & Helsper, 2015; Zillien & Hargittai, 2009). The frequency of use and ability to access and complete specialized tasks using multiple devices allow for greater breadth of use and positive economic outcomes. Such findings emphasize the importance of expanding broadband services and offering affordable service for home Internet access in low-income communities.

These findings bring to the light the necessity to define what is sufficient in terms of home Internet access. Digital divides, as we typically think of them, are not necessarily reflected in Detroit. For example, 98 percent of our respondents say they use the Internet, 78 percent say they have home Internet access, but only 62 percent have a contract with an ISP. A divide exists in subscriptions to an ISP, with non-subscribers saying that cost is the biggest barrier. Our findings also suggest that digital divides emerge in a reliance on mobile-only access to the Internet. Detroiters view mobility and their cellphones as a priority and home Internet subscriptions as a duplication of service that they cannot afford. This contributes to a large proportion of users relying only or primarily on a cellphone for Internet access.

Perceptions about the nature of digital divides play a role in policy decision and initiatives geared toward broadband access in distressed communities. In other words, if the advantaged believe that that divides exist because people are uninterested in the Internet or make poor use of the Internet when access is available, the urgency to narrow divides is undermined. Thus, divides exist not simply due to the culture of the distressed, but also due to the perceptions of the advantaged. It is important to reframe the idea that marginalized and low-income

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communities do not use the Internet in ways that could potentially narrow economic and social divides.

The findings of this study counter a number of prevailing myths about urban Internet use, such as the view that that gaps in broadband adoption are a result of a cultural problem among low-income urban neighborhoods. Detroit residents are savvy and well informed Internet consumers because they have to overcome more obstacles to be online. Many residents need to improvise in getting online without a subscription to a service in their homes. Detroiters are interested and highly connected to the Internet, however, ISP subscriptions and costs associated with devices are prohibitive. Even among those who do have home Internet access, many are paying bills at the expense of other important products and services. Focus group participants admit to delaying utility bills or grocery shopping. Parents do it for their children. Working adults do it to stay competitive. Those seeking employment do it search for jobs and to receive calls if an opportunity becomes available. Detroiters are well aware of the value of accessing the Internet and most are doing whatever it takes get online.

Common assumptions related to Internet use in under-connected communities might threaten the progress of interventions aimed at connecting distressed communities. The argument that interventions that achieve higher broadband adoption will have little impact on other economic disparities, have the potential of undermining efforts to connect residents. One clear example is related to breadth of use and mobile dependence. Our findings suggest that those who are most reliant on mobile phones are the least likely to shop or compare prices online. It is estimated that Internet access helps a typical U.S. consumer save $8,800 a year because of access to bargains on goods and services (Wheeler & Clyburn, 2015). The prevalence of food deserts

and an overall lack of choice in commerce put residents at a disadvantage as they cannot participate in comparative pricing and consequently tend to pay more for low quality items.

Urban communities like Detroit have an established history of marginalization in terms of service, policy, and resources. The urban digital divide represents yet another example of such marginalization. However, the story of the urban digital divide is more complicated than access alone. Despite their desire to engage in a broad range of activities and seek opportunities online, many Detroiters have convinced themselves that Internet use from their phone will suffice— largely because of cost barriers associated with home access and the purchase of and upkeep of home devices, such as desktop and laptop computers. However, the lack of ISP contracts and accompanying devices puts Detroiters at a disadvantage. Mobile-dependent Detroiters are limited in their access to content that is not designed to be mobile-first, or even mobile-friendly, and this often includes government forms and databases. Certain file types, like PDFs, are inaccessible, or simply take too long to open. The list goes on, but the bottom line is that mobile-only access is not enough.

Limitations & Future Research

This study looks specifically at Detroit as a case study, thus, a more critical look at urban Internet use is necessary before making generalizations about urban digital divides. However, it is one of few quantitative studies that asks specifically about uses and attitudes across low-income households in distressed urban communities. Therefore, it can serve as a starting point to debunk some of the myths related to how and why urban Internet use is constrained or challenged.

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This exploratory study cannot be generalized to all urban settings. Overtime panel surveys could enhance confidence in our findings and as other research teams survey other cities there are opportunities to compare and contrast findings in ways that will reinforce or challenge the findings of this study.

This study establishes a clear expression of positive attitudes about broadband adoption and the benefits of Internet access. Future research can build on these findings by linking positive attitudes to previous work on motivations and attitudes. Positive attitudes are the first step (Reisdorf & Groselj, 2017; Van Dijk, 2005); future research on urban digital divides can move beyond assumption that people are uninterested to tackle the other barriers.

Stakeholders, non-profits, and government need to keep experimenting. Previous research has emphasized the importance and role of libraries for narrowing the divide (Powell, et al., 2010; Rhinesmith, 2016). However, our research found a number of barriers related to library use. For example, teenagers in focus group interviews emphasized the stigma associated with computer use at the school library. More specifically, students assumed that using the Internet at the library signaled a lack of Internet in the home, thereby signaling economic distress. Students also reported that their school's library experienced an Internet blackout for over a month in the previous year. Adult focus group members mentioned limitations related to work schedules, the necessity to be at home to care for children, and the lack of mobility to complete tasks at the library.

There is no magic cure to closing digital divides, such as in giving households laptop computers, as illustrated by the problems faced by the 'one laptop per child' project. But that does not mean that experimentation with initiatives to empower residents in distressed urban areas should stop. More research and experimentation needs to take place to find viable technical

and financial initiatives. These two items can be combined to offer a variety of mechanism to narrow the digital divide and measure the effectiveness of the outcomes. Some initial steps might include decreasing the cost of home access and increasing the capacity of home access. This approach can help people as we learn more about best practices.

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