The Dissertation Committee for Christopher Lee McConnell Certifies that this is the approved version of the following dissertation:

Digital Inclusion and Techno-Capital in Austin, Texas

Committee:

Joseph Straubhaar, Supervisor

Lecia Barker

Wenhong Chen

Shanti Kumar

Sharon Strover

Digital Inclusion and Techno-Capital in Austin, Texas

by

Christopher Lee McConnell, B.A.; M.A.

Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

December 2014

Dedication

To the memory of Gary Chapman, who led the way in using computers for the good of all.

Acknowledgements

I relied on the guidance and support of many people throughout my schooling and particularly in producing this project. I am unable to specifically thank everyone who helped and supported me during my journey through graduate school.

First, I thank my supervisor Joe Straubhaar, without whose patience and guidance the project almost surely would not have come to fruition. Thanks also goes to the rest of my dissertation committee. Sharon Strover encouraged me to return to graduate school and broadened my horizons by employing me for years in the UT Austin | Portugal Digital Media Program. Lecia Barker provided enormously helpful feedback on the proposal for this project, and working with her on projects for the National Center for Women & Information Technology expanded my thinking on digital-inclusion issues related to gender. Wenhong Chen played a key role in this project, generating the statistical weights used for analyzing the survey data and providing insight into invalid analyses. Finally, Shanti Kumar was a great help at the outset, giving guidance about balancing interests in theory with quantitative analysis, and as the project concluded, helping me navigate the institutional roadblocks.

Members of City of Austin's office of Telecommunications and Regulatory Affairs, particularly Rondella Hawkins who took a sincere interest in my work, deserve thanks for their efforts in collecting the data used for this study.

My parents Georgiana and Gerald have furnished me with encouragement and support in the critical times through graduate school, particularly during the completion of this project.

I would not have started, let alone finished, a dissertation if it weren't for the support of my friends. I owe immense thanks to Susan McLeland, whose support and guidance was invaluable throughout graduate school. Prentiss Riddle was one of the first people I met when I moved to Austin and has been a great friend and colleague throughout my time in and out of school. Jane Fleming provided realistic perspectives on this project and its attendant complications. Don Turnbull nudged me to keep going long after I had lost my enthusiasm for graduate school and provided valuable career insights both inside and outside academia. Chip Rosenthal of Open Austin and formerly of the Austin Community Technology and Telecommunications Commission was an important external observer of city-related technology issues with whom I have had many fruitful conversations.

Particular thanks goes to Joanna Williamson of UT Recreational Sports whose guidance and encouragement helped me find a healthier path and the focus I needed to complete this project. More broadly, the UT Recreational Sports staff and my fellow instructors provided a fun – and distracting – workplace while I completed this project.

The consultants at UT's Department of Statistics were an immense help as I analyzed and reported data. Regardless of how ridiculous my questions were, they always took my queries seriously and replied quickly with helpful answers.

Finally, teachers earlier in my education merit mention here. My early coursework with Janet Staiger gave me confidence to pursue graduate school, and her coaching at the dissertation defense was invaluable. My initial interest in media studies was piqued in undergraduate classes with professor Joanna Rapf at The University of Oklahoma, who wisely told me not to go to graduate school, but still wrote a recommendation letter for me anyway. All of the teachers who inspired my studies are too numerous to thank here, but they have my gratitude.

Digital Inclusion and Techno-Capital in Austin, Texas

Christopher Lee McConnell, Ph.D.

The University of Texas at Austin, 2014

Supervisor: Joseph Straubhaar

Concerns about the ability of marginalized groups to use the Internet in a meaningful way have factored in discussions of both the social impact of the Internet and technology policy since the 1990s. Although mainstream policy has emphasized the costs of using the Internet, such as hardware and Internet service, additional barriers to meaningful use persist. These barriers can include language, familiarity with computer systems, a lack of social support, and limited knowledge of services available online. Although these higher-level and cultural barriers have often been framed in terms of skills or literacies, this study situates its results and analysis in Bourdieu's notions of field, habitus, and multiple forms of capital, specifically extending the notion of capital to the technology field with the concept of techno-capital. By using Bourdieu's conceptual framework, this study endeavors to situate Internet use in its broader social context, arguing that inequalities in Internet use are the product of deep inequalities in social power, which extend to access to education, government services, and information.

This project explores how a richer theory of social inequality, based on Bourdieu's concepts of habitus, field, and multiple forms of capital can be used to frame a secondary data analysis of a survey conducted by a local government. Based on data collected by the City of Austin in 2010, it first provides an overview of differences in Internet connections and use among segments of society before moving on to more complex analyses related to techno-capital. In particular, it examines the relationship between the social contexts of use and the ability to make meaningful use of the Internet, finding that techno-capital is linked with access at institutional sites such as work and school. The study then turns to comparing techno-capital between demographic groups, by users of specific technologies, and by use in social contexts. Finally, it uses multivariate analysis to identify which factors may be most critical in developing techno-capital. Broader social factors such as institutional use and educational attainment appear to have more power nurturing techno-capital than availability of an Internet connection, questioning dominant assumptions about digital inclusion.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Inequalities in technology use are often framed as the digital divide, a broad chasm between members of society who use the Internet and those who do not. The mass adoption of the Internet in the past two decades and the increasing reliance of governments, schools, and other bureaucratic organizations on Internet communication justifies concerns that people who cannot use the Internet face significant obstacles in life. Despite the penetration of Internet use into many facets of daily life, inequalities in use are still often framed in the binary terms of the digital divide. Studies assess whether or not households can get or afford access or whether or not individuals can use the Internet. Although the digital divide provides an appealing metaphor for these inequalities, the reality is less stark. People integrate Internet use to varying degrees into their lives, and access takes place in varying contexts and varying availability of access.

Research that acknowledges how Internet use is situated in a broader social context of inequality and striated terrains of power can expand the understanding of how social inequality intersects with technology use. Isolating Internet use ignores the other barriers and challenges disadvantaged members of society face, and may lead to interventions and policy prescriptions that ignore the complicated realities non-users and challenged users experience. The digital divide persists after nearly two decades of attention from regulators and researchers (National Telecommmunications and Information Administration, 1995, 1998, 1998), so efforts to discover what factors discourage individuals from going online can perhaps help address the needs of the digitally excluded and how privileged members of society may reinforce their social power through Internet use.

PROJECT OVERVIEW

This project explores how a richer theory of social inequality, based on Bourdieu's concepts of habitus, field, and multiple forms of capital (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984, 2002) can be used to frame a secondary data analysis of a technology-use survey conducted by a local government. It repurposes survey items to operationalize computer and Internet abilities as "techno-capital," a subset of what Bourdieu terms "informational capital" (Bourdieu & Wacquant, 1992). As digital-inclusion research moves from identifying and describing inequalities in meaningful access to the Internet to offering explanations of how these inequalities emerge and persist, some researchers have turned to Bourdieu's theories of social reproduction of class to frame the digital divide (Brock, Kvasny, & Hales, 2010; Kvasny, 2006a, 2006b; Robinson, 2009, 2011a, 2011b; Rojas et al., 2012; Rojas, Straubhaar, Roychowdhury, & Okur, 2004; Schradie, 2011, 2012; Straubhaar, Tufecki, Rojas, & Spence, 2012). This theory provides a richer framework for interpreting data and offering explanations for social inequality relative to technology and introduces new questions and considerations for thinking about digital inclusion than other conceptualizations based on economics, abilities, or a broader framing of access. Although Bourdieu himself used quantitative methods in his analyses of French culture (Bourdieu, 1984), operationalizing concepts like cultural capital and the concept of techno-capital presents significant challenges, particularly in a secondary data analysis where the initial survey was not designed for research questions based on this theory. Regardless, using the approach yielded results related to the lived experience of using technology that may have not been revealed with more conventional approaches to conceptualizing access and use.

Problem Statement

Digital divide and digital inclusion research often emphasizes whether members of society have access to an Internet connection in their area and if they can afford a connection and the hardware. Early digital divide research, as discussed in Chapter 2, implicates economics and geography as causes of the digital divide. This strain of research tends to frame Internet access as an economic issue: whether households have the economic resources to go online and whether it is profitable for carriers to provide service to particular areas, such as economically disadvantaged areas of cities or rural areas with a low housing density. Although many digital inclusion researchers (DiMaggio, Hargittai, Celeste, & Shafer, 2004; Eszter Hargittai, 2002; S. Livingstone & Helsper, 2007; Sonia Livingstone, 2005; Rojas et al., 2012) have moved past purely economic framings of Internet access, the presence of an Internet connection is still often foregrounded as the sole critical component of Internet use (Federal Communications Commission, 2010). Further research has moved to thinking about Internet use in terms of skills or literacies (Correa, 2010; Deursen & van Dijk, 2010; Hargittai, 2002; Livingstone, 2007, 2007), but much of the existing research still identifies and describes digital divides, but does not endeavor to explain their persistence, even as the costs of Internet use have come down for much of the population.

Internet use is only one of many social practices. It draws on a variety of resources including education, familiarity with computers, and social support. Skills-oriented approaches complicate understandings of whether an individual can access information and services online, but often treat Internet skills and access in isolation, not considering how Internet use fits – or does not fit – into the lives of individuals (Deursen & van Dijk, 2010; Hargittai, 2008; Hargittai, 2002). This study aims to situate Internet use in its broader social context to better understand the barriers people face in making meaningful use of the Internet.

Internet use is not an isolated social practice, and neither is it a uniform social practice. A plethora of use patterns have emerged from the vast variety of content and services quickly available online. Moreover, specific norms of behavior emerge from different communities of practice online: a set of fairly specific behaviors such as hashtags has emerged from Twitter use, while the audiences and affordances of services like YouTube have created a different set of norms and expectations. Moreover, different communities rooted in offline experiences (such as youth or communities of color) deploy symbolic tools like hashtags differently (boyd, 2007a, 2007b). While each social-media service likely has its own specific subset of informational capital and studying this behavior is interesting, this study focuses on abilities that are common to a variety of online tasks and are used for common activities like applying for a job, accessing government information and services, and engaging in community discussion. This basic techno-capital is likely a pre-requisite for more specific forms of capital, such as promoting a hip-hop record on Twitter, so the results of this study should have broad relevance to Internet use in contemporary US society.

Inequalities of technology use have largely reflected broader social inequalities in the United States. Chapters 5 and 8 outline the persistent relationships between technology use and disadvantaged groups. Economics is frequently implicated in why individuals do not use the Internet: conventional wisdom suggests that people do not go online simply because they cannot afford computers and connections (Dijk, 2005; National Telecommmunications and Information Administration, 1995, 1998, 1999; Wyatt, Thomas, & Terranova, 2002; Wyatt, 2005). Although the consequences of economic inequality are severe – children from poor households face limited opportunities if they lack access to computer systems – but economics is hardly the only factor. People of color face significant challenges in education and employment, and the effects of racism are not just cultural. Although neighborhood and school segregation were banned over fifty years ago, vestiges of the Jim Crow past persist around Austin, affecting the quality of education and access to services in what have historically been neighborhoods of color (Spence, Straubhaar, Cho, & Graber, 2012). For example, zoning laws encouraged "undesirables" such as industrial facilities and people of color, particularly African-Americans and Hispanics, to East Austin, which is still known as the heart of these communities of color. These neighborhoods still lack resources for going online and lack social support for Internet use when few members of the community use the Internet. Immigrants and Hispanics who may lack strong English skills also face obstacles to Internet use – whether or not they live in minority neighborhoods – since Internet content in Austin and the US tends to be English-first with translations in Spanish or other languages added as an afterthought (Fox & Livingston, 2007; Livingston, Parker, & Fox, 2009; Norris, 2001). Persons with differences in ability such as blindness may be in any part of the social strata, but lower-income or less-educated persons may be further excluded since using the Internet with these challenges requires economic resources and social support for adaptive technologies and other affordances that aid them (DiMaggio & Hargittai, 2001; Selwyn, 2004; Warschauer, 2003a, 2003b). The obstacles disadvantaged groups face in using the Internet is not simply a symptom of social and economic inequality, however. The importance of the Internet in contemporary society means that these obstacles may further perpetuate and deepen these inequalities.

Although this project engages with policy issues such as broadband regulation – and the survey data was collected to guide local policy – it itself is not about policy. Instead, the project complicates understandings of how the digital divide persists by highlighting realities of technology use in Austin. By better understanding what factors discourage or inhibit individuals from being able to use the Internet to achieve life goals, research in this vein can better inform policy makers about the roots of digital exclusion and perhaps adjust policy proposals to meet the needs of excluded groups. The results of this study suggest there is a disconnect between the actual barriers the types of policy interventions, particularly those that emphasize the economic barriers to access. Many of the barriers are rooted in the lived experience of excluded groups and relate to time and other non-economic resources in their communities, rather than the simple cost of hardware and connectivity.

Technology use is just one of many social practices in contemporary society, and it is one that is embedded in inequalities of social, economic, and political power. Framing technology use within the concepts of habitus, field, and capital can better account for the social barriers that limit the ability of many members of society to make meaningful use of the Internet and how inequalities in power feed the persistence of inequalities in technology use. It is unrealistic to expect broad social inequality to dissipate – although some argue that the Internet could upend existing power relations (Shirky, 2008) – but incorporating issues of social power into the analysis of digital inclusion can help researchers, policy-makers, and advocates be more sensitive to the needs of excluded groups. By situating Internet use in the context of broad social inequality, it hopes to improve understanding about barriers to use.

PROJECT RATIONALE

As the United States and other most-developed nations become information societies, use of the Internet and other networked computing systems become increasingly central to daily life. Although access to the Internet was often seen as a luxury or a diversion for computer enthusiasts (Irving, 2001), today many institutions such as governments, schools, and employers rely heavily on the Internet for communication and information processing, making it difficult to receive government services, education, or even work without some ability to effectively use the Internet. With the emergence of social media and coordination systems like neighborhood email lists, those without meaningful access to the Internet may even face barriers in their personal lives. Sen (1995) identifies pursuing an education, finding employment, and participation in the life of the community as core functionings each member of a society should be capable of attaining, and the reliance on the Internet by many institutions and social formations makes barriers to access to the Internet barriers to full participation in societies like the United States (Kleine, 2013). Effective access to the Internet is no longer a luxury or an entertaining diversion, but now a necessity to fully function in the contemporary world.

Fields of Digital Life

Bourdieu uses the metaphor of a field on which sports are played to describe the situations where individuals compete for relative social advantage (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984). Multiple fields in society exist and intersect; this study does not propose that there is a unitary field of Internet or technology use. In fact, it acknowledges that there are multiple fields and subfields online and off where participants jockey for attention and social advantage. For example, journalists and would-be pundits on Twitter deploy hashtags and syntactic constructions to gain attention related to a particular topic and event while youth on Tumblr use reblogging and other features to gain followers and fame on that service. Arguably, each of those services has its own set of techno-capital specific to the platform. While acknowledging multiple fields exist online, this study concentrates on tasks necessary for core capabilities, particularly obtaining government information and services, pursuing education, and finding work. Indeed, one of the primary non-profits supported by the City of Austin, the DeWitty Center, run by Austin Free-Net, focuses on meeting precisely these needs. The capital needed for these basic capabilities – interacting with bureaucratic organizations in the contemporary US – are likely pre-requisites for participation in Internet-specific fields such as social-media promotion, so they offer a base from which an individual can develop more rarified Internet strategies and tactics. Following are some of the principal activities where barriers to Internet use present barriers to achieving meeting needs.

Employment

In the contemporary US, individuals who are unable to use the Internet are often excluded from participating in activities once conducted offline. For example, it is common practice today for job seekers and employers to conduct the job-application process online. From the perspective of seasoned Internet users, moving this online increases efficiency by eliminating mailing resumes or making visits in person, and hiring managers can organize application materials with computerized systems. This move to an electronic application process makes sense for white-collar, information-processing jobs where using computer networks are a core part of the job, but online applications have extended well beyond the office. It is often the case today that retail jobs and temporary labor also require applicants to submit application materials electronically (Stevenson, 2009). Although these jobs do not necessarily require Internet skills, the online process presents a barrier to those who cannot easily access the Internet. Simply finding job opportunities can be daunting without Internet access. One of the primary services of Austin Free-Net is assisting blue-collar workers who are often members of minority groups in applying online for jobs and unemployment benefits (Austin Free-Net, n.d.). While in the past prospective applicants might have scanned the classified ads of newspapers for openings, commercial online services such as Craigslist, Monster.com, and Indeed.com have absorbed much of the advertising market for job listings and online job boards have absorbed the role of public notice. Even old-fashioned word-of-mouth has been absorbed to some extent by services such as LinkedIn, a social-networking system specifically designed for employment purposes.

Those out of work often get a double helping of these challenges as more state services move to an electronic application process. Although e-government services are often touted as making government more accessible, it can in fact present a barrier to many citizens. The state of Texas relies heavily on its WorkinTexas.org website for the administration of unemployment benefits. While the unemployed can apply for benefits over the phone, the Texas Workforce Commission points potential recipients to apply for benefits via its website. Once a worker has been approved for benefits, the state expects recipients to apply for at least five jobs per week and keep records of the applications (Texas Workforce Commission, 2011b). The Workforce Commission can audit the recipient and deny benefits if there is insufficient documentation of a job search. In reality, though, the commission monitors user activity on the WorkinTexas.org site – if recipients log on to the site three times a week, according to employment counselors, recipients are excluded from job search audits[1] (Personal Communication, see note). While this provides a convenient means for recipients with Internet access and skills to avoid further government monitoring, for those who do not have effective access, it increases their chances of an audit and even losing their benefits. Although a system of

[1] This was communicated to me by Workforce Solutions staff when I was receiving unemployment benefits in 2008.

[2] Hargittai's conception of "competencies" is somewhat similar to the notion of conceptualizing the digital divide through a notion of "capabilities" based on the work of Amartya Sen (1999). Although this

state grants provides for local job search centers where users have access to public computers for accessing the website and sending job applications, (Texas Workforce Commission, 2011a) transportation to the centers can present an inconvenience, particularly if recipients need to log on three times a week. Through this reliance on online services, the Texas Workforce Commission further disadvantages those offline and out of work.

Unemployment benefits are hardly unique among social services provided by Texas and other states. To lower paperwork costs, many public-assistance programs have moved to electronic systems, and prospective recipients are often encouraged to apply for benefits online. As with unemployment benefits, applicants unable to effectively access the Internet face difficulties applying for these benefits. In addition, state agency websites are often difficult to navigate. Sites are often structured in ways that reflect the organizational structure of the agency, (Nielsen, 1997; Ryan, Field, & Olfman, 2003) rather than how a layperson might look for information, and outdated pages found on search engines can link to dead pages (Coleman, Lieber, Mendelson, & Kurpius, 2008). While a more seasoned Internet user might attempt a variety of strategies for finding the information, users hampered by time or skill constraints could simply give up or assume that information is not available online. Businesses like the Austin-based Aunt Bertha have sprouted up to ease the discovery of state services and the application paperwork, (Omar Gallaga, 2011) but the current state of state services online creates significant hurdles for those with limited Internet access or skills, and these people who often need these services the most. As a results, understanding the gap between material access to an Internet connection and access to the ability to make meaningful use of the Internet is crucial for understanding how the move to computer-based services may further marginalize the marginalized.

Education

Access to education is another related field affecting life chances where those without fluent Internet abilities face significant hurdles. While schools and libraries are important sites for computer and network training, many of these institutions have moved to computer- and network-based administration and teaching, perhaps leapfrogging students' and parents' ability to effectively engage with the educational system, as well as creating challenges for students. Many school assignments call on students to use computers for research and presentations. Primary and secondary students may be instructed to find sources such as newspaper articles online or use online databases to find articles in journals and periodicals (Schradie, 2011). This task requires a relatively complex raft of skills including how to use a browser, develop appropriate search engine or database queries, and understand the output of the queries. The ability to locate information is one set of skills, but as Deursen and van Dijk (2010) argue, evaluating the quality of information requires developing an additional level of skills. Once students have located relevant materials, they need to be able to evaluate the quality and viewpoint of information sources.

At the primary and secondary levels, students may find that deliverables require some Internet use, either for research or production, while parents may find online access to grade reports afford advantages such as monitoring that paper records do not. As students get older, colleges and universities often encourage or require applicants to submit materials online using a web-based form. The US Department of Education's Free Application for Federal Student Aid (FAFSA) can only be submitted as an online form. Once at college, students with little experience using the Internet face further hurdles in a culture that depends on email for communication, online research for projects, and often courseware for assignments and class communication. From elementary school to college, the Internet has become an important tool in today's education.

Public Services

Whether it is applying for social services, paying a utility bill, or getting an education, Internet use affords members of a society distinct advantages and conveniences. This extends beyond basic services: the Internet is increasingly central to public participation and redress from the government. The City of Austin is increasingly reliant on Internet communication between residents and both city agencies and city council. Although the 311 non-emergency service is named and originally developed for telephone use, Austin and other municipalities have broadened the means of access to those services on the Internet. Austin residents who access 311 with the web interface are afforded more context about what kinds of complaints are handled by the system, such as what information is helpful and what departments handle particular kinds of complaints (City of Austin, n.d.-b). For those who can type, it can be faster and more convenient than speaking to an operator on the telephone line. Not only does computer use exclude potential users of this convenient system – use requires a high degree of Internet familiarity. In Spring 2012 when this study commenced, querying the Google search engine for "Austin 311" led to a dead page with no content. Users needed to go to an AustinTexas.gov page and click on the 311 button., which leads to a page hosted by the service provider for the city Motorola. By July 2014, the Google search engine had improved its indexing to rank an informational page at austintexas.gov first, but this page does not offer the ability make a 3110 request; users must still click through to the page hosted by Motorola. Although the Austin Police Department's online retrieval system leaves much to be desired, searching its database online is certainly more convenient than filing a request at a station.

Interaction with elected officials is also smoother for Austinites with Internet access and skills. The city's website offers an email address that will copy the mayor and each city council member with a single email. Compared to calling each office or sending seven paper letters to each member, this affords greater convenience. Even speaking up about an issue in person at city council requires some degree of computer skills. Speaker appointments are handled by an online system. Those who want to speak can send an email or use the web interface from a kiosk in the lobby of city hall to sign up for a speaker's slot at a city council meeting (City of Austin, n.d.-a). Although the city provides accommodations for those unable to use these systems, these systems clearly privilege the network-savvy over those with less skill. Internet use has begun to pervade many facets of public participation, and a lack of ability may exclude individuals not just from career or educational opportunities, but also from acting in the public sphere.

The Value of this Approach

Much of US digital-inclusion policy emphasizes matters of material access, whether an Internet connection is available in a particular area and whether segments of the population can afford the hardware and subscription costs to go online. While material access – whether at home or in another context – is necessary to use the Internet, material access does not guarantee use, particularly meaningful use (Dijk, 2005; Robinson, 2009). As described in Chapters 8 and 9, results of this study indicate that the presence of a home broadband connection has no statistically significant link to techno-capital. Instead, behaviors like using the Internet in social environments outside the home such as work, school, or a coffee-shop seem to enhance techno-capital and perhaps social and cultural capital as well (see Chapters 8 and 9). The emphasis on broadband connections may be a tacit form of technological determinism that suggests the availability of a connection means the resources the Internet can provide are available. Multiple factors determine whether someone can find and use online information and services, of which a connection is just one. This study attempts to identify and explain some of the other factors.

Central Research Questions

To examine the broader social context of Internet use, this study investigates research questions framed around the notion of techno-capital, the ability to use the Internet to achieve life goals. Before turning to complex issues of how technology use intersects with social inequality more broadly, it examines the material conditions of access. First, it asks which demographic groups use which forms of access. This identifies which groups, such as people of color or persons of age, use particular technologies such as cable modem or mobile Internet, showing concrete differences in material access. The second question delves more deeply into the social practice of Internet use by asking "in what social contexts do members of particular groups use the Internet?" The results of this question describe how Internet use is integrated into the lives of Austinites and which members of society do not access the Internet at work, school, or other places outside the home. Turning to the concept of techno-capital, the third question asks how techno-capital is distributed among demographic groups. Although techno-capital emerges from the practice of using the Internet and relationships within communities, for the purposes of this study it is situated within individuals and measured with a quantitative index. The fourth question examines what relationship techno-capital has with particular access technologies. How an individual goes online is not just a function of their economic and social resources, but likely also a reflection of their techno-capital with more savvy individuals choosing faster or more convenient access technologies such as home broadband or mobile Internet. Similarly, the fifth question explores the relationship between techno-capital and the places where people use the Internet, asking how techno-capital differs among users and non-users in particular contexts such as at work or school. Finally, the sixth question asks which factors are most significant in non-use and techno-capital, using multivariate analyses to see which factors enhance techno-capital or create barriers to meaningful use. These questions are intended to link differences in access and differences in techno-capital with the broader social context, making steps toward understanding the persistence of inequality in Internet use.

OVERVIEW OF METHODS

For this study, I performed a secondary data analysis of a citywide survey conducted by members of the City of Austin's Telecommunications and Regulatory Affairs staff and a research team at UT Austin. Described in further detail in Chapter 4, the survey was intended as a broad assessment of technology use in Austin and made a particular effort to get responses from Hispanic residents through oversampling and, later, weighting. The survey included items specifically designed for research questions proposed by the initial research team from UT Austin, but the bulk of the items were general technology-use questions developed to get a broad sense of who uses which computer and Internet technologies in Austin.

Techno-capital index

The research questions of this study were formulated well after the survey was conducted. In order to address the research questions, many variables were recoded or combined into measures relevant to the research questions. Most notably, a battery of items where respondents evaluated their confidence with computer tasks were averaged into an index. This index serves as a proxy for techno-capital and forms the core of the analyses presented in Chapters 7, 8, and 9. This proxy is hardly a perfect measure of techno-capital, the ability to use technology to achieve life goals, but given that this existing survey is re-used to address research questions after it was administered, respondents' confidence with common computer tasks is likely a reflection of their techno-capital. Moreover, species of informational capital are difficult to operationalize in a quantitative study since they lack directly observable manifestations: for this study, cultural capital is operationalized as the average educational attainment of respondent's parents, a typical proxy measure for cultural capital, but hardly reflects the information and symbolic resources an individual might possess. Although the techno-capital proxy would have been stronger with questions tailored to the measure, it was capable of identifying differences in the ability of groups to make meaningful use of the Internet.

Strengths and Limitations

Although a more robust measure of techno-capital would have been possible with these research questions in mind, secondary data analysis of a survey administered by a local government has some advantages. Most obviously, a project like this spares the researcher the economic and non-economic costs of administering a survey at this scale. In addition to the avoiding the costs of distributing the questionnaire and entering the data, the survey drew on the expertise of city staff including members of the Telecommunications and Regulatory Affairs staff and the city demographer, who have a plethora of tacit knowledge about the city and how residents might perceive the survey. Comparative studies of cities may only be feasible through secondary data analysis, and open government trends may make this easier going forward, as Austin and other cities publish data from cities like these online. Finally, the survey fits the topic of this study: the ability of Austin residents to access government information and services. To a major extent, the items on the survey reflect what abilities the local government views as important, so the data reflects the priorities of the study.

OVERVIEW OF RESULTS

The results of this study largely indicate that while Internet access is available to most residents of Austin, many still face barriers to using it effectively. While connections may be available at the homes of Austinites, it is not always integrated into their lives outside the home, and, at home, it may be used as an entertainment service, rather than a tool for achieving life goals. The results suggest that individuals from high-education environments, whites, and the affluent possess substantial advantages in using the Internet, which may further establish their social position.

Material Access

Digital inclusion policy has tended to emphasize material access to the Internet, and, particularly, broadband to the home. Although home broadband is far from universal, the results of this study, presented in Chapter 5, indicate that it is mainstream and perhaps normative. More than two-thirds of Austinites had home broadband in 2010, and the cost of a subscription does not appear to be a barrier for all but the poorest residents. Instead, cultural capital is the demographic variable that is most frequently statistically significant in analyses related to material access. Despite the availability of broadband access, non-use of the Internet and a lack of a home Internet connection still reflect broader inequalities. African-Americans and Hispanics are less likely to have a home broadband connection and are less likely to use the Internet at all, suggesting that

Internet use may not be a part of the lives of many members of those communities. It may be the case that people in these communities who want to use the Internet may not have friends and acquaintances they can turn to for informal support or guidance on finding information, making it more difficult for marginalized people of color to get online.

Sites of Access

The places where people use the Internet may be more important than how they access it. Chapter 6 compares groups' access to the Internet in key locations, at homes, at work or school, and at coffee shops, which for Austin have emerged as an important site of access. Although the majority of Austinites have Internet access at home, a smaller proportion access it at work or school, places where the Internet is more likely to be used to complete tasks, rather than for entertainment. Moreover, these places are where individuals may develop the ability to use Internet and computers to solve problems and accomplish goals through informal learning and peer support; this may be where Internet use really becomes part of the habitus and techno-capital is formed. The analyses in these chapters indicate sharper social divisions in who has access to the Internet. For example, the data indicates 69.5% of whites access the Internet at work or school while only 31.2% of African-Americans and 38.9% of Hispanics have institutional access to the Internet. The majority of persons in these racial/ethnic categories have access at home or at the home of a friend or family member, so this difference in access can explain, in part, why the Internet comprises part of the habitus for whites (and Asian-Americans) while it is not part of the repertoire of practices for many marginalized people of color.

Techno-capital

In this study, techno-capital, the ability to use the Internet to achieve life goals, is operationalized using an index of responses to questions where respondents rated their confidence with common computer tasks. The initial comparison of demographic groups in Chapter 7 generally confirms the broad hypothesis that privileged groups such as whites or the more educated have more techno-capital than marginalized people of color or the less educated. One notable exception is that these results suggest that the "digital natives" hypothesis where younger people who grew up with the Internet are far better equipped to use technology. The results of these analyses indicate that the youngest Austinites, in fact, have less techno-capital that somewhat older adults in their late 20s and 30s. The comparison of techno-capital by where people access the Internet, in Chapter 8, offers explanatory power. Institutional access at work or school appears to have an important role in forming techno-capital. Persons who use the Internet at work or school have a significantly higher average techno-capital index than those who do not. In contrast, there is no significant difference in techno-capital between those who use the Internet in home environments and those who do not. Since younger Austinites have had less exposure to Internet use in the workplace and perhaps the classroom, it may be the case that they have not yet had the chance to develop the techno-capital of office workers and students pursuing higher education.

Chapter 9 presents multivariate analyses of some key issues related to digital inclusion. The analyses incorporate the demographic and access categories used in the previous chapters to see which factors are most significant in whether or not an individual uses the Internet and in developing techno-capital. Although it was not a consideration at the outset of this study, the place where people use the Internet, particularly institutional access at work or school, appears to have a great deal of importance in forming techno-capital. Institutional access has the strongest effect on techno-capital in the multivariate regression for techno-capital and was one of the most robust variables in the analysis. Educational attainment and age are also powerful factors in the analyses that used demographic variables, suggesting that the degree to which Internet use is incorporated into daily life and the habitus is more important than simply having access to an Internet connection.

This effort to apply a broader theory of social inequality to an existing data set encountered some significant challenges, but makes steps toward thinking about digital inclusion in a broader social context. The following chapters present data about technology use in Austin in a way that considers how social power affects individuals' ability to go online and achieve life goals in a society where the Internet is an increasingly central to the way institutions operate and many members of society live their lives. It is the hope that these inquiries can take some steps toward a more inclusive and democratic society.

Chapter 2: Background

Since the 1990s when the Internet and the World Wide Web emerged as a mainstream media technology, concerns have been raised about the relationship of these technologies and social stratification. Much of the public discussion about the concept and existence of a digital divide in the United States began with the National Telecommunications and Information Administration (NTIA) 1995 publication “Falling Through the Net.” It and the succeeding reports (NTIA 1998, 1999, 2000) presented data about computer ownership and telecommunications services on a household basis. These reports suggested that the United States was becoming a nation of haves and have-nots: those with access to the Internet and those without. These reports emphasized two factors. First, whether a household had the economic means to own a computer, and, secondly, if Internet services were available to a household. This framed the digital divide as a matter of income and geography (Epstein et al 2011). For many, notably Bush administration policy makers after 2000, the problems of the digital divide could be explained away with the assumption that market forces would lead to cheaper computers and Internet providers with broader geographic penetration.

This framing did not account for non-market social issues such as education and training in technology, class-based attitudes toward technology, and the prevalence of Internet use in communities. The NTIA reports also arose from established policy positions that foregrounded business interests. As DiMaggio and Hargittai note, this framing of the digital divide is “consistent with a federal-government policy paradigm dating back to the Eisenhower administration, and based on the experience of the telephone --- a paradigm that focused exclusively on access (defined in a binary fashion) at the household level, with special concern for inequality between rural and urban areas." (2001). Lievrouw (2000) offers a similar critique of comparing Internet service to telephone service, arguing that universal-service polices for voice emphasize the conduit of communication, rather than the content. For Internet access, content matters, she contends, particularly for social participation. By framing the issue of access in terms of economics and geography, it was easy to think that the gaps in material access could be addressed through existing policy regimes such as Universal Access for telephony or specific initiatives like rural electrification.

Today, this emphasis on material access is derided by some as a "trickle-down" approach to thinking of the digital divide (van Dijk, 2005, Epstein, et al 2011). Others such as Eubanks (2007) implicate it in the construction of a deficit model that suggests non-users are somehow lacking. Epstein, et al (2011) contend there are two dominant frames for thinking about the root causes of the digital divide, the access frame and the skills frame. The access frame, which emphasizes issues of infrastructure and material access, still looms large among policy makers at the local, national and international levels. The 2010 National Broadband Plan is a prominent example of the access frame continuing its dominant circulation in the US. Although some sections do acknowledge the role of skills and literacies in Internet use, ("National Broadband Plan - Chapter 9: Adoption and Utilization," n.d.), most of the concrete policy goals relates to material access to the Internet such as rural broadband and inexpensive subscriptions for low-income users.

Eubanks (2007, 2011) extends these criticisms of dominant policy discourses in two important ways. First, she argues that ICTs pervade the lives of everyone in the United States through systems like electronic payment systems at the supermarket, computerized school or employment records, or systems at the workplace for maintaining inventory or keeping timesheets. Because of this pervasiveness, Eubanks contends that even "non-users" are affected by networked computing in some way; what differs is the degree of agency an individual has in using these systems. Bourdieu might argue that even non-users are involved in an important field of competition involving the acquisition and use of networked resources (1984). Secondly, Eubanks argues that an emphasis on computer ownership and Internet subscriptions creates a "deficit model" that emphasizes what members of society lack and implicates them in their own challenges. Eubanks believes that reframing digital-inclusion discussions away from emphasizing deficits and deficiencies would make steps toward resituating people in discussions of the social effects of Internet use. Both of these critiques find substantive problems with framing digital inclusion around material access since they neglect the broader social context of Internet use.

MOVING BEYOND MATERIAL ACCESS

As the later NTIA reports note, disparities in material access to the Internet began to narrow around the end of the twentieth century, but many noted disparities in use of the Internet. DiMaggio and Hargittai (2001) contended at the time that the standard policy model comparing Internet use to telephony was weak. Although using the telephone requires some cultural capital such as knowing the appropriate greeting when answering the line, effective Internet use requires a much broader complement of skills such as reading, the ability to use computers, and an understanding of information seeking and retrieval. In addition, the range of potential communication practices afforded by the Internet are far broader than the voice conversations afforded by plain old telephone service, so DiMaggio and Hargittai argue for conceptualizing the digital divide as a series of dependencies where material access is only one. Also countering the phone analogy, Selwyn (2004) makes a similar argument against both the “trickle-down” understanding of the digital divide and the policy goals of universal service. He draws a distinction between formal or material access and effective or practical access to the Internet, going on to argue that examining the social context in which ICTs are used is necessary to understand the digital divide.

After material access, skill comprises a second dependency for effective access to the Internet. Hargittai undertakes an empirical study of the Internet skills in “Second-Level Digital Divide: Differences in People's Online Skills,” (2002). In this study, the investigators assigned study participants a series of tasks to be conducted online, and then measured the length of time it took the participants to complete the tasks. Her results suggested that younger users and users who have been online for several years had a greater level of skill in performing these tasks based on their average completion time. The amount of experience and exposure mattered greatly even when a user had access to a networked machine, suggesting that exposure to computers and networks in daily life greatly influence whether an individual will make good use of the Internet.

Clement and Shade (2000) similarly reject the notion that Internet access can be compared usefully to phone service in the context of policy discussions. Rather than a binary conception of haves and have-nots, Clement and Shade advocate for conceptualizing Internet access as an “Access Rainbow” of users of differing levels of material access and skills have different shades of access. This metaphor of access as a rainbow is a step toward recognizing the complexity of Internet use as a social practice contingent on multiple conditions.

Other early observers of the digital divide also questioned the binary construction of material access. A strain of literature situates the emerging Internet media of the 1990s within the broader mass media and business environment of the late 20th century, asking what will be the social implications of mass Internet use and the consequences for those left behind? Schiller (1996) expresses deep skepticism about the potential of the Internet to provide more equitable access to information. Noting the deregulation of telecommunication interests, he sees more opportunities for control by private actors because the balance of power is tilted in their direction and away from civil society. He predicted the emergence of two classes of information haves and have-nots where persons with substantial economic and cultural capital are better able to access and use information than an underclass dependent on educational and information systems controlled by corporate interests. Although Schiller’s pessimistic predictions of an increasingly informationalized society relies on a binary conceptualization, his work situates computer and Internet use within broader political-economic circumstances suggesting that widespread ICT use has the possibility of further entrenching social inequality rather than liberating the masses.

Gandy (2002) raises similar concerns about the regulatory environment related to Internet access and content regulation. In "The Real Digital Divide," he highlights the shift among policy-makers in perceiving media users from that of citizens to consumers. In his account, earlier discussions of the public-service role of media emphasized the desirability of having an informed and active populace, conversations of the public interest turned toward an emphasis toward what is popular among audiences and profitable for media organizations. Writing in 2002, Gandy contends that the adoption of new media such as the World Wide Web will only accelerate this shift from citizen to consumer as audiences become increasingly fragmented. Because media outlets may choose to ignore audiences with lower incomes or are more difficult to reach, Gandy sees this shift from citizens to consumers as "the real digital divide," asserting that this shift is not driven by the affordances of the technology, but by policy decisions and the imperatives of commercial media. Although the Internet can provide a relatively low-cost means for producing and distributing media and information, these possibilities often do not come to fruition. In addition to the costs of production, distribution, and retrieval, media related to specific communities or interests are often crowded out by the commercial media and services that circulate online.

ADDRESSING ACCESS AND TRAINING ISSUES

Whether viewed as a matter of market failure or a symptom of broader social inequality, interest groups and some governments made efforts toward alleviating barriers to material access. From the 1990s on, one approach was the establishment of tele-centers, facilities that provided public access to Internet-capable computers and sometimes training in computer use. Servon and Nelson (2001) conducted an early study of community technology centers or CTCs, which provided computing services to potentially excluded groups. Through a mail survey administered to affiliates of a network of CTC administrators, the investigators developed an overview of the roles these centers play in communities. Servon and Nelson categorized CTCs in two ways. First, the authors distinguished between standalone technology centers and broader organizations that have taken on technology access and education. Secondly, the researchers determined whether a CTC emphasized just access, basic computer skills and literacy or went beyond and provided guidance with online content, both in terms of access and content production. While the CTCs appeared to fill a critical role in many communities since they provided the sole point of access for many users, many respondents indicated that the centers suffered from a lack of funding and human resources. In a study of CTCs in East Austin, Lentz, et al, (2000) identify several issues in their implementation. The authors lauded the centers' efforts to provide information services to disadvantaged groups, but note how the projects often neglected human factors such as instruction and support. While the computers and network connections were present, there was often little effort to train potential users how to use the Internet and in some cases staff members themselves lacked the ability to maintain the machines or demonstrate how to operate the software. In a study of recipients of a Texas state technology grant, Strover, et al (2004) found similar problems with CTCs. A lack of appropriate technical and administrative support at many of these sites hampered appropriate use by the public – in some cases the problem was so dire that the computers were never turned on. This study concludes that efforts to bridge the digital divide need to be sure that communities and sites have adequate resources to integrate technology in meaningful ways. All of these studies seem to suggest that access and exposure to technology is necessary but not sufficient for many to make good use of computer networks. Kvasny (2006a, 2006b) conducted similar studies of CTCs and found that the approaches and outcomes of training programs were often out of line with the expectations and lived realities of the people the CTCs served. Training programs had demands that were too rigorous for low-income users, and the users' expectations of developing marketable job skills were not met by the instruction in basic computer use. She contends:

Designers of future initiatives should define the digital divide more broadly as an unequal ability to achieve life chances that include, but are not limited to, access to ICT. The divide is not with technology per se; the divide is one of longstanding inequities in access to basic life chances such as education, safety, housing and healthcare. Therefore, programs should assume a holistic approach by providing technical skills as well as strong linkages to existing social services such as workforce development programs, adult education programs, child and elder care pro- grams, and transportation services. (177)

Fuentes-Bautista and Inagaki (2006) examined a different approach to addressing Internet access issues, the rollout of open-access Wi-Fi services in Austin, Texas. At the time, emergence of inexpensive and relatively robust Wi-Fi equipment was greeted as a potential solution for providing inexpensive Internet connections to the public. Some thought that Wi-Fi could be used to offer access to communities that might otherwise lack the material resources for individual Internet subscriptions. The study surveyed and then interviewed individuals involved in providing these Wi-Fi services to the general public, in part producing a social-network analysis of a loosely bounded community of practice. The investigators asked respondents to identify the reasons that led them to provide Wi-Fi. Although many of the respondents indicated somewhat self-serving reasons like attracting customers, the adoption of the technology created a public good: free Internet service for the public. The authors have measured enthusiasm for collaboration between business, non-profits, and municipal government as a promising model for further development of public Internet services, but note that its commercial orientation limits service in areas such as East Austin that may not be perceived as profitable for commercial providers or establishments that might provide free Wi-Fi.

Epstein et al (2011) and Selwyn (2004) argue these efforts such as CTCs and public Wi-Fi reinforce the formulation of the digital divide as a matter of access, rather than skills, although many of the projects did include skills-training aspects. Eubanks (2007) critiques what she calls the “distributive model” in community-computing projects, arguing that it still situates the digital divide as a matter of commodity distribution, often ignoring the persistent inequalities in US society. Moreover, she argues that by using this model to frame the issue, it closes off discussion about the role of technology in citizenship and treats all issues of technological equity as matters of access (Eubanks, 2007).

By examining the experiences of high-tech workers in low-paying jobs, Rodino-Colocino (2006) and Tupfecki (2012) make similar arguments about the framing of the digital divide as a matter of access. Although the workers they examine work in high-tech fields, the workers have de-skilled, low-status jobs, belying the idea that mere access to computers and networks offers a route to social advancement – in many cases these high-tech jobs are still dead-end jobs. Eubanks (2011) similarly notes how all members of US society are in some way subject to digital communication networks, and, moreover, persons who may be non-users may even operate networked digital systems such as cash registers but often lack agency in how they interact with the systems or in how they may use the systems to achieve life goals. In the view of these authors, interactions with ICTs is not necessarily empowering; for many the experience of using digital systems may be one of control, surveillance, or just monotony. However, one of the things that this study will investigate, and find, is that access to the Internet at school and work seem to be associated with learning a more empowering level of use.

Skills

Concern about issues of computer skill emerged independently and, in some cases, before the widespread adoption of Internet technologies. Communication and educational researchers of the 1980s recognized the increasing importance of computer skills in the job market. This new importance led to concerns about and research into computer literacy. Marvin and Winther (1983) identified computer skills as an important “literacy” as US society moved forward. As the authors investigated what competencies computer and communication professionals considered to be core to computer literacy, suggestions that these skills may not be distributed equitably through society emerged, even if computing were to come down in price or becomes more accessible. At that time, computer skills were largely taught in elite institutions such as research universities, and it seemed unlikely that computing might penetrate broader segments of the educational system. Although the emergence of the personal computer greatly expanded the contexts where computing was taught and practiced, exposure to computing remained inequitably distributed for decades afterwards in the United States and around the world. Like Marvin and Winther, Herbert Schiller turned his attention to the role of technology in education. In *Information Inequality,* Schiller (1996) suggests that the dual penetration of business interests and technology into the classroom could lead to the emergence of two classes of information haves- and have-nots where persons with substantial economic and cultural capital are better able to access and use information than an underclass dependent on educational and information systems controlled by corporate interests. Writing in the 1990s, Schiller expresses deep skepticism about the potential of the Internet to provide more equitable access to information because it would become largely a medium for advertising-supported content and business transactions., a prediction that has largely borne out in today’s online media.

More mainstream observers of technology also emphasized the importance of computer skills in the education environment. In the National Academy of Sciences 1999 report *Being Fluent with Information Technology,* the authors argue for the necessity of comprehensive computer training for young people in the United States. This document lays out a list of "ten essential skills" for life in the computer era. While some of these skills may seem outdated ("Setting up a personal computer") and other unrealistic ("Using a spreadsheet to model simple processes or financial tables"), others like "connecting a computer to a network" or "using the Internet to find information and resources" are more relevant today than they may have been in the late 1990s. The report generally emphasizes concrete technical skills in its description of what comprises fluency in information technology, but makes does space for communication and research skills such as "Using the Internet to find information and resources" as mentioned above and "Using a computer to communicate with others." Although the report focuses on the importance of computer skills in technical and scientific careers, it nods toward the kinds of skills that would become necessary for participation in a network society (Castells, 2000). Today, the International Society for Technology Education provides a set of standards for both students and educators intended to help schools foster the kinds of skills necessary for this participation (International Society for Technology in Education, 2007). Custard (2012) examines the creation of the NETS standards for education and, more broadly, the role of ICTs in primary and secondary education. Although she acknowledges the good intentions of ISTE's efforts to standardize the integration of technology into classrooms, she criticizes the implementation, arguing that without more equitable distribution of technology resources – both non-human and human – the standards themselves do little to standardize technology education.

Conceptualizing Access Divides

As several of the studies discussed above mention, material access to the Internet is only one of several conditions necessary for an individual to make effective use of computer networks. As research into the digital divide became more sophisticated, investigators began to identify different factors of Internet use that are significant for users. In *The Deepening Divide,* Jan van Dijk (2005) presents an influential typology of barriers to digital inclusion. Although the word "access" is typically used in discussions of the digital divide to refer to both infrastructure and economic barriers to Internet use, van Dijk expands the meaning of the term to describe a raft of issues that include economics and culture. He identifies four different types of access, motivational access, physical access, skills access, and usage access.

Although many assume material access is the first prerequisite to Internet use, van Dijk posits that a desire to use the Internet is also a necessary condition for Internet use. He terms this "motivational access," whether a potential user perceives Internet use to be valuable to his or her life. In his formulation, motivational access is the most fundamental form of access since potential users are unlikely to use the Internet if they see no reason to use it. Barriers to motivational access can be emotional, rational objections, or the lack of a wired group of peers. In this view, simply lacking the knowledge of what information and services the Internet can offer could comprise a lack of motivational access. Although van Dijk does not apply Bourdieu's (1984) concept of dispositions, his formulation of motivational access bears many similarities to it since both concepts look to attitudes and knowledge for explaining individual behavior. Van Dijk argues that a potential user's environment affects attitudes toward the Internet and technology more broadly, and an environment where Internet use is absent or viewed with suspicion can lead to a lack of motivational access.

Van Dijk's notion of "physical access" roughly parallels the more conventional understanding of access divides - whether an Internet connection is available to users and whether they have the economic resources to use it. Van Dijk complicates this conventional notion of access somewhat by adding temporal resources, time, to the bundle of factors included in physical access. In addition to geographic infrastructure issues, van Dijk argues that time constraints can play a role in the physical ability to access the Internet. A community access center may provide free Internet access, but if a potential user works long hours or dedicates much of their time to child-rearing, he or she may lack the time to travel to the center. Similarly, many public access users depend on libraries that limit access to one or two hours at day, or even less (Lentz, et al 2012). Although physical access is the type of access typically implicated in policy and popular understandings of the digital divide, van Dijk claims that this is only one part of what can prevent people from going online.

Even if a potential user has motivational and physical access to the Internet, a lack of skills can prevent a user from making meaningful use of the Internet. This is what Van Dijk terms "skills access." Unfamiliarity with computers or a lack of dexterity can make using a computer frustrating for many potential users, particularly older people. Included in skills access are basic skills such as using a mouse or navigating the Web, which van Dijk calls “operational skills.” Complicating the concept, van Dijk also includes higher-level skills related to critical thinking and evaluation of content. Van Dijk describes these as information skills – the ability to evaluate the quality of information from a variety of sources – to be another facet of skills access. This addition to the concept of skills access is similar to how Hargittai, (2002, 2005) conceptualizes “competencies.” Simple material access does not guarantee effective Internet use – a raft of skills is necessary in order to access and produce information online. Finally, van Dijk includes a set of what he calls “strategic skills” in his broad conceptualization of skills access. Strategic skills relate to how to use the Internet to accomplish personal or professional goals. These include how to find information, how to conduct transactions online, and how to interact with others. Skills access includes a spectrum of competencies that range from basic computer skills to relatively sophisticated strategies for computer use.

At the top of his conceptual stack, van Dijk examines the importance of what he terms “ usage access,” whether or not a user finds the Internet useful. For example, a user may have the desire to go online, an Internet connection, and the requisite skills to use a computer, but turns to a print newspaper to look up movie screenings or weather forecasts. According to his data, usage access accounts for more of the different levels of use among industrial societies than physical access or skills access. The simple breadth and depth of Internet use determines much of the character of how effective users are at using the Internet in van Dijk’s conception of usage access. He argues that usage access divides may persist the longest in the way that Internet use deepens existing social inequalities. Van Dijk briefly situates his concept of access in the context of Bourdieu's (1986) theory of multiple forms of capital. He agrees with theorists of capital that these skills are unequally distributed through society and that they accumulate with individuals. He argues that the more neutral term "resources" can describe them, contending that "capital" lacks explanatory power.

Van Dijk's analysis identifies multiple factors, which if studied, provide a more nuanced picture of who goes online and who does not. Although it is tempting for policy-makers and Internet businesses to reduce Internet use to a binary matter of material access – which can be mitigated by universal-service policies and lower prices – or consumer choice, van Dijk and later scholars have argued that Internet use is contingent on multiple factors, some of which are related to issues of culture, education, and situation in social networks. Like van Dijk, Dutton, et al (2004) argues for definitions of access that go beyond the simple availability of an Internet connection to potential users. These authors emphasize how Internet use catalyzes the formation of social networks among its users. They advocate for a multilayered approach to providing broadband service to communities that not only addresses issues of infrastructure, but also addresses issues of economic opportunity and social support.

COMPETENCIES

Van Dijk's formulation of "skills access" is only one of a few ways of conceptualizing how abilities, literacies, or competencies affect Internet use. Drawing on her early work on the digital divide, Eszter Hargittai has conducted extensive research on the tools users deploy when using the Internet, which she terms “competencies.”[2] In an early study on skills titled “Second-Level Digital Divide: Differences in People's Online Skills,” (2002) she posits that Internet skills comprise a more significant difference between users than a binary separation between users and non-users. This study, described above, suggested that the persons who had the greatest amount of skill using the Internet were those who had been using the Internet the longest or the youngest participants. The amount of experience and exposure mattered greatly even when a user had access to a networked machine. In a later study (2005) that compared self-reported measures of Internet competence with the same set of tasks in the study above, Hargittai found that the responses, while better than a simple measure of time spent online, is not a particularly reliable way to measure Internet ability. Instead, she found that a seven-item vocabulary quiz better predicted competence among her study group. Although this study makes no conclusions about differences in competence among different population groups, it provides a useful approach to measuring competency, by using understanding of vocabulary terms as a proxy for competence. This kind of vocabulary knowledge, or literacy, could also be seen as another aspect of a larger concept of techno-capital.

Although this early work on competence relied on fairly homogeneous groups of subjects – Hargittai admits that her 2002 study drew largely on affluent, educated users –

[2] Hargittai’s conception of “competencies” is somewhat similar to the notion of conceptualizing the digital divide through a notion of “capabilities” based on the work of Amartya Sen (1999). Although this formulation has a great deal of rhetorical power, it’s limited in how it can be operationalized for a study of this type.

later work began to explore differences among demographic groups. Hargittai and Shafer (2006) turned to a potentially gendered digital divide in a study that asked participants to find useful information online. The topics included career and lifestyle information, voting and tax tools, and local culture. The investigators compared these results with the participants' self-assessment of their online skills. While there was no significant difference between men and women's ability to complete the tasks, in this study, men tended to rate their level of skill higher than women. Instead of finding relationships between gender and actual skill, they found that age, education level, and experience with the Internet were more likely to predict the level of skill of study participants. The authors note that while material access to the Internet does not guarantee the ability to use the Internet, and because women are more likely to underestimate their skill level, they may self-select out of using it. Hargittai and Hinnant (2008) conducted further research on the importance of skill in whether users engage in “capital-enhancing activities” online. This study used a different way of measuring Internet capabilities. This telephone survey of US residents between 18-26 measured Internet capabilities with a vocabulary quiz of Internet terms. The researchers presumed that respondents who could correctly identify the vocabulary terms were more capable of using the Internet. The results of this quiz were compared with whether users access news websites, government services, or health information, outlets that the authors believe improve the capital of users. Although the sample size was too small to be conclusive about specific demographic groups, it suggested a link between level of reported Internet skill and the use of capital-enhancing services. Moreover, the strongest predictor in this study of who would not use the Internet was having a low level of education; persons with low education also tended not to use the Internet. A similar study (Hargittai, 2010) surveyed first-year students at a public university about their backgrounds and Internet habits. Looking for cues about information-seeking and capital-enhancing activities, the study found that the students with the most autonomy of use, the most free interrupted time online, had the greatest level of skill and were the most likely to engage in capital-enhancing activities. An examination of student use of social-networking websites (Hargittai, 2008) suggested that students' choice of social networking sites were often influenced by their social-economic background. Students whose parents had a low level of educational attainment were more likely to use the MySpace service, while students with more educated families tended to use Facebook, a conclusion found earlier by boyd (2007). In addition, students with more autonomy of use were more likely to use social-networking services, presumably because they had more unrestricted time with the computer. Across these studies, time spent online, especially unrestricted time online, were the most important factors for developing useful online skills.

Literacy

Applying the print concept of literacy to the use of networked computing provides another way of framing digital inequalities. This framing offers a more expansive understanding than just material access or skill development since it situates computer and Internet use within its cultural context. In its traditional understanding, "literacy," of course refers to the ability to read and write or, more broadly, the ability to participate in a written, rather than oral culture (Hartley, 2002). Notions of literacy has expanded to include a broad range of cultural practices and artifacts, so scholars and educators have proposed a variety of literacies including media literacy, visual literacy, computer literacy, and information literacy (Tyner, 1998, Bawden, 2001, Warnick, 2003). In contrast to an approach emphasizing skills, literacy differs in two ways. First, a literacy is part of a broader set of cultural practices typically gained through education and participation in a culture (Kellner, 2000, Hartley, 2002). Secondly, it emphasizes an individual's ability to interpret cultural artifacts, whether those artifacts are books, films, card catalogs, or computers. In the case of conventional print literacy, literacy extends beyond the ability to read to include skills such as reading comprehension, the ability to situate texts in broader sets of texts, and the ability to interpret texts. Expanded literacies such as media literacy and information literacy then apply this metaphor to other cultural practices such as media reception or information retrieval. Despite this culture-oriented understanding of literacy, in practice, institutions such as governments and schools often reduce literacy to a set of skills possessed by an individual (Tyner, 1998, Bawden, 2001, Marcum, 2002, Livingstone, 2008).

The notion of computer literacy predates mainstream Internet use, emerging in the 1980s as personal computers entered the workplace, the classroom, and the home. Marvin and Winther (1983) made an early case for conceptualizing the rising importance of computing as a type of literacy. Anticipating later concerns about the digital divide, they described how computing skills were largely taught in elite institutions, a situation where many students would be unable to acquire skills that would be valuable in the workplace. Computer literacy standards were gradually incorporated into educational standards, making computing a skill taught in primary and secondary schools (Tyner, 1998).

A related concept of information literacy dates back even further than computer literacy. It gained currency among library and information professionals starting in the

1970s as the discipline began to move out of its traditional role in print-based libraries. Bawden (2001) situates information literacy in the context of other literacies including print literacy, computer literacy, and library literacy. These expanded literacies, according to Bawden, are largely the result of the adjustment of the library field to the introduction of computers and electronic services, as well as the recognition in the private sector of the value of information skills. This construction of information literacy carved out a role for persons with library and information science training outside conventional library environments. Notably, Bawden traces the use of "information literacy" to a 1973 submission to the US National Commission on Libraries and Information Science. Paul G. Zurkowski, then the president of the US Information Industries Association, was interested in transforming the practice of librarianship into private-sector information services (Bawden, 2001). This was an effort to set a policy agenda to meet the information needs of the private sector and establish a role for librarians in enterprises with significant information needs.

Interest in the notions of computer literacy and information literacy continues to this day, although the definitions are fluid and often overlapping. Tyner (1998) endeavors to find common ground with a number of putative literacies, particularly media literacy, information literacy, and visual literacy. Although literacy advocates in the United States often promote literacy agendas with specific instructional standards and goals that often advance their professional interests, Tyner argues for a broader notion of literacy, "a democratic education that improves the life chances of all children." (196) Tyner's call for literacy conflicts with the bullet-point educational standards advanced by organizations like the National Academy of Sciences (1999). Like Tyner, Marcum (2002) argues that the then-current understandings of information literacy were too limited in their scope. As practiced, information literacy consisted of a series of skills related to library use and information retrieval, while its advocates imagined it as an all-encompassing learning enterprise. He questions the utility of using the word "literacy" to describe the range of technical and critical skills he believes should be advanced. In addition, the multiple names given to technology-related literacies can produce confusion. Comparing different forms of literacy, Bawden (2001) identifies six different expansions of the literacy concept: information literacy, computer literacy, library literacy, media literacy, network literacy, and digital literacy. Bawden notes that these overlapping definitions often reflect the professional goals of the organizations that advanced the definitions.

One group currently advancing digital-literacy standards is the International Society for Technology in Education (ISTE). Its NETS for Students project outlines standards for digital literacy among students. These standards fall into five categories: creativity and innovation, which involve interpreting information; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; technology operations and concepts. (International Society for Technology in Education, 2007) In contrast to the National Research Council's 1999 proposed standards, it is notable that none of the standards list specific computer skills such as how to use a browser and that all but the last category emphasize issues of interpreting and sharing information, rather than technical skills. Custard (2012) appreciates the fluidity of ISTE's standards since they can be adapted for a variety of educational contexts, but also criticizes the standards for assuming well equipped classrooms as the default. Under van Dijk's (2005) typology, these standards are informational skills and, particularly, strategic skills. What van Dijk calls operational skills is encompassed in the final category, "technology operations and concepts," and even here the standards are broad; for example, one standard calls on students to "understand and use technology systems," while another asks students to "troubleshoot systems and applications" (ISTE, 2007). Acknowledging that integrating technology into the classroom poses challenges for educators, ISTE also outlines standards for teachers, administrators, coaches, and computer-science educators in primary and secondary schooling. Swain and Pearson argue that implementing standards that emphasize higher-order thinking have the potential to provide equivalent learning experiences for students, thus lessening the digital divide (Swain & Pearson, 2002). By emphasizing these higher-order thinking skills in educational standards, programs such as NETS for Students can foster positive dispositions toward technology among students and integrate computing in the educational habitus.

Livingstone (2004, 2005) uses the notion of media literacy as a point of departure in her examination of the concept of computer literacy or network literacy. She suggests that this is an imperfect comparison because of the greater opportunity for ICT users to create content - the range of interactions go beyond reading what is on the screen and being able to decode and encode information. In addition to the skills and competencies associated with literacy, Livingstone, following Hartley (2002), posits that literacy is situated within networks of power.

> First, literacy is a form of knowledge with clear continuities across communicative forms (print, audiovisual, interpersonal, digital). As regards the inter- net, this knowledge poses a phased series of challenges, from initial hardware difficulties of access through to more complex interpretative and evaluative competences regarding con- tent and services that are distinctively afforded by (or socially inscribed into) the technology or text. Second, literacy is a situated form of knowing that bridges individual skill and social practices that is enabled (or impeded) by (unequally distributed) economic, cultural, and social resources (or capital). Crucially, this emerges from the interaction between individual activity, technology or interface design, and institutional shaping, and cannot be under-stood solely as "a neutral technical skill." Thirdly, literacy comprises a set of culturally regulated competences encompassing both that which is normatively valued and that which is disapproved or transgressive. "Internet literacy" in

> particular may be distinguished from other forms of literacy to the extent that the specific skills, experiences, texts, institutions, and cultural values associated with the Internet differ from those associated with print, audiovisual, or other forms of communication. (106-107)

Livingstone has used literacy to conceptualize several empirical studies of Internet use, particularly among children. Livingstone and Bober (2004) conducted a survey of UK youth aged 9-19 and their parents to assess their use of the Internet. The study found a significant gap between young users who used the Internet for educational purposes and those who used it for broader communicative tasks such as chatting with friends. The authors conclude by suggesting this signals further inequality online, dividing those who have rich, personal Internet experiences and those who only occasionally use it for instrumental purposes. As might be expected, youth who engaged with the Internet on a personal level were more likely to be middle class, have a home broadband connection, or be the child of an Internet user. In a qualitative study of Internet use among youth, Livingstone (2007) contrasts the experiences of a handful of youthful interview subjects. Although one subject Ted is more affluent than another subject Anisah, according to Livingstone, he is less curious about the online world and has thus not developed some of the skills she has. Livingstone suggests that the home and school environments have some structuring effect on the youths' skill, pointing to an understanding of literacy as an operation in the cultural environment of the youth. Although she does not use the term, her analysis of how the youths' school and home environments influence attitudes toward technology bears some similarity to Bourdieu's concept of habitus. In this conceptualization, however, it is literacy that is rooted in the home and educational environment.

Applying the concept of literacy to networked computer use and information seeking has considerable power, particularly in policy discussions. Members of the public and policy makers have a good idea of what they think "literacy" means, and it carries positive connotations. For example, the FCC proposed in 2010 the creation of a National Digital Literacy Corps, a computing-training organization modeled after the Peace Corps or Americorps. (Epstein, et al 2010) The literacy conceptualization is not without its flaws, however. Although it is intended to broaden analysis to the cultural realm, its embrace by policymakers has flattened its nuance. While Livingstone advanced the notion of information literacy as a suite of computer-related skills, in later work (Livingstone, Van Couvering, & Thumim, 2008) she begins to be critical of the use of the term, arguing the word had become instrumentalized by governments to simply represent a set of educational standards. These standards then create an invidious distinction between those who meet the standards and those that do not, creating a framing of individual blame, rather than situating issues of technological abilities within the broader cultural framework. Livingstone writes:

> But literacy also occasions considerable concerns. The term is widely incorporated into processes of governance, being built into educational curricula, part of the skills required for a competitive labor market, co-opted as part of the legitimation of neoliberal market deregulation (''empowered consumers'' need less protection or regulated provision), and contributing to the discourse that excludes certain segments of society (as ''illiterate'') as well as that which includes, and further privileges, the already information rich. Moreover, a fair body of research, often uncritically supportive of instrumental and administrative goals, has been developed within the academy to furnish evidence to establish standards and measure progression in relation to ''information literacy,'' for example, or inform the curricula of training programs for information, communication, and technology (ICT) literacy in the workplace…(Livingstone, et al., 2008, 56)

"Literacy," then, becomes both an opportunity for private-sector influence over education and training programs and a potential point of individual blame – individuals who are "illiterate" are responsible for their own misfortunes as workers and citizens. Here

Livingstone echoes Eubanks' (2007; 2011) critique of framings that imply deficit models. Moreover, literacy tends to isolate the decoding and encoding practices in the immediate context; it acknowledges literacy is contingent on the broader culture, but literacy tends to be outcome-oriented. Although literacy offers more nuance to understanding digital inequality than the skills approach, to understand the power relationships embedded in the use of networked computers, an even more expansive conceptualization can be useful. For this expanded conceptualization, Bourdieu's concepts of habitus, field, and capital can provide a way of understanding how Internet use fits into the broader social context.

HABITUS, FIELD, AND CAPITAL

Bourdieu (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984, 2002, 2005) advances several theoretical concepts useful for situating issues of digital inequality and inclusion within broader social contexts. These concepts extend the social significance of using technology, media, and other cultural artifacts beyond the specific use case and into the broader range of life experiences. His concepts of habitus, field, and capital provide one way of explaining how social advantages and disadvantages are reproduced in societies, linking differences in behavior to their embeddness in broader social relations. Bourdieu uses the word *habitus* to describe an individual's set of dispositions or attitudes learned through lived experience, particularly in the home and educational system. This set of dispositions influences an individual's life choices and the strategies he or she may use to pursue personal goals. Bourdieu imagines spheres of social activity – such as education, government, and media – as *fields* of competition. In these fields, individuals compete for relative social advantage using strategies formed from the habitus. Bourdieu contends that fields and habitus are mutually constitutive: an individual's experience in a given field will affect his or her dispositions, and, collectively, the habitus of a group of participants in a field constructs the strategies and rules of a field. Bourdieu uses an expansive notion of *capital* to describe the accumulation of resources individuals or groups can use to gain advantage or power in a field. In addition to economic capital, which is how "capital" is typically understood, Bourdieu describes a number of other species of capital. The classic formulation adds social capital, the accumulation of social contacts, and cultural capital – a complex set of knowledge, thinking skills, and behaviors – which allow an individual to interpret and synthesize symbolic systems as well as gain prestige within a field. Together, these concepts describe a social world where individuals and groups compete for power and advantage on the basis of complex tacit rules and expectations. Although Bourdieu paid little attention to technology, (Sterne, 2003) these concepts can be applied to technology use in the contemporary age to offer a more nuanced understanding of what leads to digital inequality and its consequences.

Habitus

The concept of habitus offers some explanatory power for why individuals make particular life choices. Bourdieu's formulation posits that the life experiences of an individual creates a lived history which forms the basis of later attitudes and approaches toward life. Bourdieu (2002) advances this notion in part to counter theories of rational choice such as those advanced by Becker (1976), which emphasize economic and utilitarian explanations of human behavior and decision making. Rather than based on rational optimization, Bourdieu contends that behavior is molded by life experiences and based on the dispositions that these experiences create. For Bourdieu, habitus explains why individuals do not always act in their own best interests, but make decisions based on affective or attitudinal reasons. Bourdieu (1977) posits that two of the most significant sites where habitus is formed are the home and the educational system. Examining how class differences are perpetuated between generations, he concludes that attitudes toward schooling are often transmitted in the home by parents, in part based on their social class, and then reinforced in the school system. This is why, according to Bourdieu, working-class students often do poorly in school: parents transmit negative dispositions toward teachers and the educational system, which leads to oppositional attitudes among children and antagonistic relationships with educators. These working-class children are not acting as rational actors, as Becker might suggest, but make decisions informed by the dispositions they have accumulated through their lived histories or received as part of a familial trajectory rooted in collective habitus.

Field

Education is one of many fields in society, although it is a significant one for Bourdieu. (1977, 1984, 2005) For him, a field is a site of competition between agents such as government, the media, or particular industries. Each agent occupies a particular position on the field and the sum of the relationships of these positions constitutes a field. He defines a field as “a space of objective relations between positions defined by their rank in the distribution of competing powers or species of capital.” (1992; 114) In a field, agents, whether they are individuals or social formations like businesses or schools, compete for relative advantage from particular positions. Some fields such as the art world, Bourdieu says, are relatively autonomous, while others such as the political field and the news media frequently overlap. Politicians may attempt to exert their social or economic capital over reporters and editors to affect news coverage, while journalists endeavor to accumulate enough prestige or cultural capital to maintain their independence from political influence. Particular fields permit only particular types of strategies – the habitus of actors influences how they will attempt to gain advantage on a field such as an industry, the military or educational field. Similarly, Bourdieu says that the rules of a field are constructed through the historical interactions that have taken place in a field. What actions and strategies have worked in the past to exert dominance in a given field become part of the rules and repertoire of the field going forward. The concept of the field is particularly important because Bourdieu contends that capital, in his formulation, is a product of a field.

> The forces that are active in the field. – and thus selected by the analyst as pertinent are those which define the capital. A capital does not exist and function except in relation to a field. It confers a power over the field, over the materialized or embodied instruments of production or reproduction whose distribution constitutes the very structure of the field, and over the regularities and the rules which define the ordinary functioning of the field, and thereby over the profits engendered in it. (1992:101)

For example, knowledge and understanding of visual art – cultural capital pertaining to art – is contingent on the existence and broader recognition of the art world, the field of high art. Although this art knowledge may confer advantages in other fields, its status as capital depends on the prestige, or symbolic capital, of the artistic field. In a broader case, educational credentials such as university degrees are a product of the educational field, both at the level of an individual school or the broader system of schools, educational standards, and accrediting bodies. The comparative advantage of a bachelor's from Stanford compared to one from Texas State University is dependent on the relative positions of those universities in the United States educational systems, as well as the secondary schools that provide those universities with students. A Stanford degree confers the graduate with a greater degree of symbolic capital – and likely cultural capital – than one from Texas State would because of their relative positions in the educational field. Clearly, university degrees confer status in a number of fields outside education, but this status hinges on the educational field and its relative position to other fields in society.

Capital

Although capital is typically associated with economic power such as money or the ability to borrow money, Bourdieu extends the idea of capital as social advantage to a broad array of non-economic assets. Individuals are able to use their capital to gain advantage in a field or in the broader society. In his simpler formulations, Bourdieu (1984; 2002) describes three primary species of capital: economic capital, social capital, and cultural capital. Economic capital is access to money; this is, of course, the way that the concept of capital is typically understood. Social capital consists of friends, acquaintances, and other useful contacts. Cultural capital encompasses a broad swath of knowledge and thinking skills for interpreting and rearticulating symbolic systems. In *Distinction* (1984), Bourdieu largely limits his discussion of cultural capital to fluency with high and middlebrow culture since his analysis turns largely on how upper social classes use cultural taste to establish social position. In later works, Bourdieu (2002, 2005) broadens cultural capital to encompass a more diverse array of cultural knowledges including technological skills. Bourdieu (1977, 1992, 2005) often adds a fourth type of capital, symbolic capital, which is the institutionalized form of other types of capital – possession of the symbols alone can confer advantage. For example, advanced degrees, military rank, and government offices afford their holders power on the basis of the institutional recognition of their capital. Although the three-species formulation of capital is most frequently cited, Bourdieu often added additional forms of capital to his theory, such as linguistic capital (1977), technical capital (2005), and academic capital (2002). Although the boundaries of these species of capital may be fluid and sometime non-specific, (DiMaggio, 1979) the capital metaphor provides a useful analytical tool for understand how individuals can accumulate resources that offer the ability to obtain social advantage and power.

APPLYING HABITUS, FIELD, AND CAPITAL

One of the most valuable insights of Bourdieu's theories is an explanation of how social hierarchies are reproduced. It has found applications in education, the humanities, and critical technology studies. Although it is a complex theoretical construct, it is rarely applied rigidly to new contexts. This loose application is often attributed to the complexity and specificity of the French society Bourdieu gave much of his attention. Brubaker (1993) says some of the ontological confusion around Bourdieu's concepts is both deliberate and useful:

> Bourdieu's work, it now seems to me, is particularly ill suited to a conceptualist, theoretical, logocentric reading, one that treats it as the bearer of logically interconnected propositions framed in terms of precise, unambiguous concepts. In the first place, the core concepts are not - and not supposed to be - precise and unambiguous. When I first encountered Bourdieu's work, I collected a dozen or so defninitions - or what I took to be definitions - of "habitus" in an attempt to pin down its precise meaning. Only later did I realize that the attempt was not only vain but misdirected, that Bourdieu was not in fact defining but rather was characterizing the concept in a variety of ways in order to communicate a certain theoretical stance or a posture, to designate - and inculcate - certain sociological disposition, a certain way of looking at the world. The same could be said of the other fundamental concepts: interest, capital, strategy, field, and so forth. (217)

Bourdieu’s most famous work, *Distinction,* investigated French society of the 1970s, so the theoretical outcomes of that work are in some ways specific to the society Bourdieu researched. However, his concepts are still relevant to the informationalized and often globalized (Castells, 2000) societies of the contemporary age; some adjustment and expansion is needed for them to be analytically useful. Adapting his theories to accommodate the role of computers, the Internet, and ICTs is a core role or task for today’s analysts.

Bourdieu has been roundly criticized for ignoring the role of technology in society, at least for most of his career. Calhoun (1993) argues Bourdieu's notion of capital does not adequately explain the interactions of members of society in what he terms "impersonal systems" such as information technology. Asserting the explanatory power of the concepts of habitus and field, he suggests capital could be further refined to provide an account of how relations are mediated through systems such as markets and IT. He argues, "The roles of information technology, very large-scale administrative organizations, and impersonal markets are all important, both in their own right and as factors militating for basic changes in habitus and field." (84) In Calhoun's view, the introduction of IT into fields such as business and government changes relations within those fields substantially. As will be examined in this dissertation, technological access, knowledge and skill becomes a field that is crucially interlinked with those fields, so that success in other fields now comes to depend on gaining capital in the field of technology. On the one hand, ICTs expand the reach of organizations by affording distributed organizations tighter coordination, and, on the other, the increasing reliance of the organizations on network-based systems introduces new strategies for navigating these organizations. Individuals who have the ability to use search engines, email, or web applications often hold advantages when negotiating fields that use information technology extensively. Sterne (2003) argues that although Bourdieu treated technology in abstract ways, the theory of habitus, field, and capital offer a fruitful way of thinking about the social roles of technology. Sterne contends that technologies are crystalized versions of the habitus, reflecting the dispositions of the persons who shaped them and pull users into that habitus. Although information technology occupied a marginal role in the societies and eras analyzed in Bourdieu's major works, its centrality today leads many to argue that it plays a significant role in shaping social fields and the habitus of individuals.

As digital-divide researchers moved from binary deficit models to more nuanced analyses of how technology is situated in society and among marginalized groups, many turned toward the concept of habitus for an explanation for what leads some people to refuse to or reluctantly adopt networked computing. Kvasny (2006) argues that habitus is a useful concept for understanding differing attitudes toward technology and explaining the persistence of the digital divide. In a study of low-income urban users of community technology centers, she finds that institutional discourses shape the reasons these users seek technology training or opt out of these community resources. She argues that technology initiatives need to be mindful of the role that they play in shaping the technological dispositions of the people they serve. Rojas, Straubhaar, Roychowdhury, & Okur (2004) conducted interviews with twelve East Austin families to gauge their attitudes toward technology and their uses of it. They found that indifferent or hostile attitudes toward technology were prevalent among low-income, minority families, particularly among boys, who perceived computing as an area of feminine work, at least for people of their social class and ethnicity. The authors situate these findings within Bourdieu's notions of habitus, field, and capital, suggesting that cultural attitudes had as much to do with decisions related to technology use. This leads the authors to suggest a relatively bounded set of cultural capital resources lead to meaningful access.

Kvasny (2006) conducted an ethnography of a CTC in a low-income neighborhood in order to understand how its clients responded to technology training. Although most of the clients came to the center to develop job-specific skills, she found that few were able to develop network-computing skills sufficient to find work. What she did find, however, is that the surrounding culture had a strong defining role in the outcomes – the management of the center did not adequately address the needs of the clients such as childcare or missing classes for work. This resulted in clients being dropped from courses. She contends that using Bourdieu's cultural approach to thinking about skills acquisition could better inform the planners of future CTC projects. If CTC administrators adjust programs to the habitus of the communities they serve, Kvasny contends the programs could do a much better job of expanding access. Although the concept of habitus is difficult to operationalize, qualitative empirical research suggests that the broader life experiences influence technology-use decisions among advantaged and disadvantaged individuals.

The concept of habitus can provide a bridge between research that emphasizes the idea of literacy in its broadest understanding and research that emphasizes capital. Zillien and Hargittai (2009) invoke the concept in their quantitative analysis of Internet use contexts. Finding that the context often influences the content users access, they argue:

> …that differences in Internet use cannot be attributed simply to individual variation in motivation, interest, or will; rather, just like with research on the knowledge gap, scholars of digital inequality must take into account that forms of Internet use are determined by age, gender, the quality of the technical access digital experience, topic-specific interest, and something status related that we—following Bourdieu (1984)—can perhaps call habitus. (Zillien & Hargittai, 2009: 45)

North, Snyder, and Bulfin (2008) draw connections between the family lives of teen interview subjects and their attitudes or dispositions to technology. The teens in their study with home environments that emphasized education tended to approach technology as educational tools, while those with more stressful or less scholarly home environments used computers primarily for entertainment such as games or music. This leads them to conclude that the set of dispositions acquired in the home influences computer use. Robinson (2009) applies the concept of habitus in her study of the Internet habits of youth in a central California town. She notes a broad gap in the skills and habits between students with broadband access at home and those who rely on public-access centers or dial-up for Internet use. While the high-access youth are able to explore the Internet at their leisure, engaging in what she terms "serious play," the physical and time constraints of dial-up and public access lead low-access users to focus their time online on schoolwork and other necessary activities. The effect is that the low-access users were unable to develop a broad complement of Internet skills. She explains, "In this feedback loop, 'playing seriously' and developing a 'taste for the necessary' create opposing forms of information habitus that engender further disadvantage." (492) Because the low-access users had necessary tasks to perform online and limited time to complete them, they developed dispositions that discouraged them from open-ended use of the Internet. For them, the Internet was not for fun or entertainment, but for work. In contrast, high-access users were able to develop greater fluency with the Internet by engaging in open-ended, fun activities online. By broadening the analysis of computer use to the greater cultural context, digital-divide research can offer better explanations of the social phenomenon.

Updating Capital for the Contemporary Information Age

Bourdieu's expanded notion of multiple capitals can also provide insight into differences in ICT use. Empirical studies have explored differences in cultural capital to explain how differences in life circumstances influence differences in computer use. Emmison and Frow (1998) argue for extending the notion of cultural capital to include the ability to use information technology. In an analysis of Australian household data, they find that computer ownership is linked to higher levels of education and occupational prestige, suggesting that computer use has become part of the upper-middle class and upper class habitus in Australia. They argue that:

> Bourdieu’s original formulations of the term are sufficiently flexible to embrace systems of knowledge not generally considered to be part of the core dimensions of the concept. A familiarity with, and a positive disposition towards the use of, the burgeoning technologies of the information age can be seen as an additional form of cultural capital bestowing advantage on those families which possess them and the means of appropriating their full potential. (*Emmison and Frow*, 1998, 45)

In a quantitative study of Greek children's cultural capital, Vryonides (2007) attempted to assess the importance of exposure to cultural products on school success. The results suggested that the class status of parents was the most significant determining factor in school success. This would seem to confirm Bourdieu's notion of a class habitus nurtured in the home. Parents reproduced a set of attitudes and dispositions that gave their children advantages in school. Tondeur, et al (Tondeur, Sinnaeve, van Houtte, & van Braak, 2010) examine if different patterns in network use, skills, and device ownership can be explained as differences in cultural capital. Critiquing researchers who used simple computer ownership as a proxy for cultural capital, (Broos, 2005; Roscigno & Ainsworth-Darnell, 1999; Vryonides, 2007) they argue that computer ownership is a mark of economic capital - the owner has to be able to use it for it to be cultural capital. Using path-modeling techniques to analyze survey data collected from Belgian schoolchildren, they conclude that computer ownership and positive attitudes toward computer use strongly correlate with socio-economic status. This leads them to argue that the professional status of children's parents influences the children's attitudes toward computer use and skill development, reflecting differences in cultural capital. Applying the notion of cultural capital, along with habitus, to ICT use situates it in the broader environment of an individual and offers the potential for a more nuanced explanation of digital inclusion and exclusion.

Several digital-divide researchers have argued the case that another species of capital related to the use of information technology exists (Emmison, & Frow. 1998, Hamelink, 2000, Rojas, et al, 2004). Bourdieu himself suggested cultural capital should be expanded to “informational capital” to encompass the entire range of information-related resources in a society (1992) and later posited the existence of “technical capital” which relates to the ability to use technology and interpret information for social advantage. (2005) Hamelink (2000) discusses Bourdieu’s formulation of capital and argues that it should be expanded to better account for technology use.

> To these forms of capital, the category of 'information capital' should be added. This concept embraces the financial capacity to pay for network usage and information services, the technical ability to handle network infrastructures, the intellectual capacity to filter and evaluate information, but also the motivation to actively search for information and the ability to translate information into social practice. Just like other forms of capital, informational capital is unequally distributed across societies. Its more egalitarian distribution would require an extensive programme of education, training and conscientization. To just have more 'surfers' on the Web does not equate to the equal possession of information capital. (Hamelink 90-91)

The concept of informational or information capital has been applied in some empirical studies of the digital divide. Robinson (2011) compares the information seeking habits of highly motivated students she terms "Strivers." Contrasting their use of networked computers, she attributes the students' varying levels of success to differences in informational capital. Students who had unfettered access to the Internet and other information sources were able to develop better informational capital than those who were dependent on public-use computers or machines at school. This difference in informational capital was linked to the educational and occupational status of the children's parents. Rojas et al. (2012) argue for the category of “techno-capital,” which encompasses the abilities and resources to use a variety of computing and electronic devices including computers and mobile phones for strategic resources. They view this is as a particular subspecies of cultural capital, which enables individuals to compete for position on a technological field.

The broader social context of technology use is often ignored, as the prominence of the “trickle-down” approach to digital inclusion suggests. The concept of techno-capital offers a framing that re-situates technology use in this broader social context, including inequalities in social power. Although much of the research that applies notions of habitus and capital to technology use is qualitative, it can be operationalized for the analysis of quantitative data, as Schradie’s (2011, 2012) work suggests. This concept can enable quantitative research to move beyond identifying simple gaps in use among demographic groups to generating research questions that situate networked computer use in the lived experiences of computer users. This study endeavors to apply this concept to an analysis of data gathered in Austin, Texas. As the methods section describes, it uses an available survey dataset to examine how technology access and use differs among several key demographic markers, including age, educational background, and racial/ethnic categories and then indicate how techno-capital may have some value in explaining inequalities in technology use.

Chapter 3: Research Questions

The central question of this study asks how does techno-capital, the ability for users to make meaningful use of the Internet, differ among specific demographic groups and categories of users? It works from the premise that capitals of all types are distributed unequally through society, and these distributions often fall along demographic lines such as race, age, gender, and social class. Given the body of research on the digital divide and digital inclusion, it is expected that techno-capital among marginalized groups will be lower than among groups that have traditionally held power in US society (Kvasny, 2006a, 2006b; Robinson, 2009, 2011; Rojas et al., 2012; Rojas, Straubhaar, Roychowdhury, & Okur, 2004; Straubhaar, Tufecki, Rojas, & Spence, 2012).

This study will first identify how categories of users relate to different demographic groups. These categories are based on types of network connection, the location of use such as home or library, and the types of devices used. This analysis parallels conventional digital-divide research that emphasized issues of material access (Epstein, Nisbet, & Gillespie, 2011; National Telecommmunications and Information Administration, 1995, 1998, 1999). It will foreground the questions that investigate how ICT use relates to the broader social context of users. Secondly, the study examines how techno-capital, measured by an aggregate index, differs among users identified on the basis of characteristics like age, gender, ethnic identification, education, income, and immigration background. The habitus of individuals is strongly influenced by one's class position, and in a racist society like the US, by skin color and other ethnic markers

(Robinson, 2009; Rojas et al., 2012, 2004; Straubhaar et al., 2012). It may be the case that the type of access and device an individual uses also plays a role in developing techno-capital (King, 2011; Robinson, 2009). The third question asks what relationship exists is between the forms of access and techno-capital. In the context of this study's approach, it would be expected that types of access and techno-capital would be mutually constitutive: individuals with positive dispositions toward technology would seek out advanced and multiple forms of access and accumulate techno-capital (Kvasny, 2006b; Robinson, 2009; Rojas et al., 2012, 2004). Finally, this study will examine how multiple factors may affect techno-capital, looking specifically at whether demographic factors that reflect particular social experiences or types of technology have a greater influence on this measure of techno-capital. Analyzing the data through these questions can provide some insight into how the broader social context may offer some members of society greater opportunities to make meaningful use of the Internet while posing barriers to others.

QUESTION ONE: HOW DO THE TYPES OF ACCESS VARY AMONG DEMOGRAPHIC GROUPS IN AUSTIN?

As noted above, this has been one of the primary questions of digital-divide research since it began in the 1990s. This question grew out of concern that lower-income individuals and members of marginalized groups lacked the material resources and, later, educational resources to take advantage of the Internet and other networked communication technologies (NTIA, 1995, 1998, 2000). Later research by organizations such as the Pew Research Center's Internet & American Life Project suggested groups like ethnic minorities and older members of society were less likely to have broadband access or Internet access at all (Fox & Pew Internet & American Life Project., 2004). The most recent Pew research suggests that home broadband use is most common among whites, men, and the young. Broadband use also rises with income and educational level (Zickuhr & Smith, 2012). Based on this descriptive literature, the following hypotheses posit that broadband use will be more common among whites, the affluent, and the well-educated. Similarly, research suggests that immigrants to the United States, particularly from Latin America, are less likely to have broadband connections to the home (Lentz et al., 2012). Conversely, community technology centers and public-access facilities like the ones in libraries are often set up to serve communities who would otherwise lack access to networked computers. The research suggests that persons of color and low-income persons may be more likely to use these (Lentz, Straubhaar, LaPastina, Main, & Taylor, 2000; Lentz et al., 2000; Servon & Nelson, 2001; Strover, 2004). Although mobile Internet use exploded shortly after this survey was conducted, research at the time strongly suggested mobile use was more common among privileged groups, although users who used mobile devices as their primary Internet device tended to have lower incomes and come from marginalized groups, excluding older users (Smith, 2012, 2010). The following hypotheses are based on this existing research. The results of analyses related to this question are presented in Chapter 5.

H1: Non-use of the Internet is more common among less affluent users and members of marginalized groups.

H1a: Non-use is less common among those with greater cultural capital, measured by the aggregate of parents' education.

H1b: Non-use is more common among African-Americans and Hispanics than among whites.

H1c: Non-use is more common among migrants from other countries than among respondents born in the United States.

H1d: Non-use is more common among those with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent is more likely to be a non-user.

H1e & H1f: Non-use is more common among older users than younger users.

H1g: Non-use is more common among women than men.

H1h: Non-use is more common among lower-income groups.

H1i: Non-use is more common among those with lower educational attainment than those with greater educational attainment

H1j: Non-use is more common among respondents whose primary language is not English.

H2: Broadband Internet access in the home (using DSL or cable modem) is more commonly used by privileged groups like whites, the well educated, and the affluent, as well as younger users and those who have lived in Austin longer.

H2a: Broadband use is more common among users with greater cultural capital, measured by the aggregate of parents' education.

H2b: Broadband use is more common among whites than among African-Americans and Hispanics.

H2c: Broadband use is more common among respondents born in the United States than migrants from other countries.

H2d: Broadband use is less common among respondents with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent is less likely to be an broadband user.

H2e H2f: Broadband use is more common among younger users than older users.

H2g: Broadband use is more common among men than women.

H2h: Broadband use is more common among higher-income groups.

H1i: Non-use is more common among those with lower educational attainment than those with greater educational attainment.

H2j: Broadband use is less common among respondents whose primary language is not English.

H3: Public-access use of the Internet through the Austin Public Library or City of Austin Wireless is more common among less affluent users and members of marginalized groups.

H3a: Public-access use is less common among users with greater cultural capital, measured by the aggregate of parents' education.

H3b: Public-access use is more common among African-Americans and Hispanics than among whites.

H3c: Public-access use is more common among migrants from other countries than among respondents born in the United States.

H3d: Public-access use is more common among respondents with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent will be more likely to be a public-access user.

H3e & H3f: Public-access use is more common among older users than younger users.

H3g: Public-access use is more common among men than women.

H3h: Public-access use is more common among lower-income groups.

H3i: Non-use is more common among those with lower educational attainment than those with greater educational attainment.

H3j: Public-access use is less common among respondents whose primary language is not English.

H4: Use of the Internet exclusively through public-access services is more common among less affluent users and members of marginalized groups than among privileged groups.

H4a: Exclusive public-access use is less common among users with greater cultural capital, measured by the aggregate of parents' education.

H4b: Exclusive public-access use is more common among African-Americans and Hispanics than among whites.

H4c: Exclusive public-access is more common among migrants from other countries than among respondents born in the United States.

H4d: Exclusive public-access use is more common among respondents with recent immigration histories. If a respondent's parent or grandparent moved to the

United States from another country, that respondent will be more likely to be a public-access user.

H4e H4f: Exclusive public-access use is more common among older users than younger users.

H4g: Exclusive public-access use is more common among men than women.

H4h: Exclusive public-access use is more common among lower-income groups.

H4i: Exclusive public-access use is more common among those with lower educational attainment than those with greater educational attainment

H4j: Exclusive public-access use is less common among respondents whose primary language is not English.

H5: Mobile Internet use is more common among privileged groups like whites, the well educated, and the affluent.

H5a: Mobile Internet use is more common among people with greater cultural capital, based on parents' education.

H5b: Mobile Internet use is more common among whites than among marginalized racial or ethnic groups such as African-Americans or Hispanics.

H5c: Mobile Internet use is more common among persons born in the United States than among immigrants to the US.

H5d: Mobile Internet use is more common among persons with no recent family history of immigration than among immigrants or persons who had a parent or grandparent who immigrated.

H5e & H5f: Mobile Internet use is more common among younger respondents than older respondents.

H5g: Mobile Internet use is more common among men than women.

H5h: Mobile Internet use is more common among members of affluent households than members of lower-income households.

H5i: Mobile use is less common among those with lower educational attainment than those with greater educational attainment.

H5j: Mobile use is less common among those whose primary language is not English.

H6: Mobile-only use of the Internet is more common among less affluent users and members of marginalized ethnic groups.

H6a: Mobile-only Internet use is more common among people with greater cultural capital, based on parents' education.

H6b: Mobile-only Internet use is more common among whites than among marginalized racial or ethnic groups such as African-Americans or Hispanics.

H6c: Mobile-only Internet use is more common among persons born in the United States than among immigrants to the US.

H6d: Mobile-only Internet use is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.

H6e & H6f: Mobile-only Internet use is more common among younger respondents than older respondents.

H6g: Mobile-only Internet use is more common among men than women.

H6h: Mobile-only Internet use is more common among members of affluent households than members of lower-income households.

H3j: Exclusive mobile access is more common among respondents whose primary language is not English.

H7: Members of privileged groups such as whites and the better educated will use more forms of access than members of marginalized groups.

H7a: Younger users use more forms of access than older users.

H7b: Whites use more forms of access than African-Americans or Hispanics.

H7c: Men will use more forms of access than women.

H7d: Respondents with higher incomes use more forms of access than those with lower incomes.

H7e: Respondents born in the United States use more forms of access than migrants from other countries.

H7f: Respondents with recent immigration histories use fewer forms of access. If a respondent's parent or grandparent moved to the United States from another country, that respondent will be less likely to use different forms of access.

H7g: Users with greater cultural capital, measured by the aggregate of parents' education, use more forms of access.

H7h: Austinites whose primary language is not English use fewer forms of access.

H8: Members of privileged groups such as whites and the better educated will use more devices to access the Internet than members of marginalized groups.

H8a: Younger users will use more devices to access to access the Internet than older users.

H8b: Whites will use more devices to access to access the Internet than African-Americans or Hispanics.

H8c: Men will use more devices to access to access the Internet than women.

H8d: Respondents with higher incomes will use more devices to access the Internet than those with lower incomes.

H8e: Respondents born in the United States will use more devices to access the Internet than migrants from other countries.

H8f: Respondents with recent immigration histories use fewer devices to access the Internet. If a respondent's parent or grandparent moved to the United States from another country, that respondent will be less likely to use different forms of access.

H8g: Users with greater cultural capital, measured by the aggregate of parents' education, use more devices to access the Internet.

H8h: Respondents whose primary language is not English use fewer devices to access the Internet.

QUESTION TWO: HOW DO ACCESS CONTEXTS DIFFER AMONG SEGMENTS OF THE POPULATION? WHICH SEGMENTS ARE MORE LIKELY TO USE THE INTERNET IN WHICH SITUATIONS?

Using the Internet in one's home is often the preferred access context, and digital-divide policy and much of the digital inclusion research tends to emphasize use in the home (FCC, 2010; DiMaggio, Hargittai, Celeste, & Shafer, 2004; National Telecommmunications and Information Administration, 1999; Robinson, 2009). What research exists on non-home Internet use tends to emphasize public-access contexts (Dixon et al., 2014; Kvasny, 2006a; Servon & Nelson, 2001; Strover, 2004). However, Internet use is not an activity that is limited to the home or public-access centers. Instead, many of the instrumental uses of the Internet take place at work and school, and people often use the Internet in social settings, such as at the homes of friends and family or at a coffee shop. These access contexts may play a role in cultivating techno-capital since institutional environments such as work or school or social environments like a coffee shop offer opportunities for peer support and informal learning. This question examines who uses the Internet in what contexts, specifically examining three contexts, domestic use, institutional use at work or school, and use at a coffee shop, which is the non-domestic social space represented in the survey data. Results of analyses based on this question are presented in Chapter 6.

H9: Members of privileged groups such as whites and the better educated are more likely to use domestic sites of access either at their own homes or at the homes of friends or family.

H9a: Persons with more cultural capital are more likely to use the Internet in domestic contexts than persons with less cultural capital.

H9b: Whites are more likely to use the Internet in domestic contexts than African-Americans or Hispanics.

H9c: Internet use in domestic contexts is more common among persons born in the United States than among immigrants to the US.

H9d: Internet use in domestic contexts is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.

H9e & H9f: Younger persons are more likely to use the Internet in domestic contexts than older persons**.**

H9g: Men are more likely to use the Internet in domestic contexts than women.

H9h: The affluent are more likely to use the Internet in domestic contexts such as their homes or the homes of friends or family than persons with lower incomes.

H9i: The better educated are more likely to use the Internet in domestic contexts such as their homes or the homes of friends or family than persons with less education.

H9j: Non-native speakers of English are less likely to use the Internet in domestic contexts than native speakers.

H10: Members of privileged groups such as whites and the better educated are more likely to use institutional sites of access such as the workplace or school.

H10a: Persons with more cultural capital are more likely to use institutional sites of access such as the workplace or school than persons with less cultural capital.

H10b: Whites are more likely to use the Internet in institutional settings such as work or school than members of marginalized racial or ethnic groups such as African-Americans and Hispanics.

H10c: Internet use in institutional contexts is more common among persons born in the United States than among immigrants to the US.

H10d: Internet use in institutional contexts is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.

H10e & H10f: Younger Austinites are more likely to use the Internet in the workplace or school than older Austinites.

H10g: Men are more likely to use the Internet at work or school than women.

H10h: More affluent Austinites are more likely to access the Internet in institutional settings than those with lower incomes.

H10i: Better educated Austinites are more likely to access the Internet from work or school than those with less educational attainment.

H10j: Austinites who are not native speakers of English are less likely to use the Internet at work or school than native speakers.

H11: Members of privileged groups such as whites and the better educated are more likely to use the internet at coffee shops than members of marginalized groups

H11a: Persons with more cultural capital are more likely to use the Internet at coffee shops than persons with less cultural capital.

H11b: Whites are more likely to use the Internet at coffee shops than African-Americans or Hispanics.

H11c: Internet use at coffee shops is more common among persons born in the United States than among immigrants to the US.

H11d: Internet use in coffee shops is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.

H11e & H11f: Younger people are more likely to use the Internet at coffee shops than older people.

H11g: Men are more likely to use the Internet at coffee shops than women.

H11h: Affluent persons are more likely to use the Internet at coffee shops than persons with lower income.

H11i: Persons with greater educational attainment are more likely to use the Internet at coffee shops than those with less educational attainment.

H11j: Native speakers of English are more likely to use the Internet at coffee shops than non-native speakers of English.

QUESTION THREE: HOW IS TECHNO-CAPITAL DISTRIBUTED AMONG DEMOGRAPHIC GROUPS?

The digital divide is not so much a divide in technology use but a symptom of power differences materialized in differences in technology use. In the United States, people of color and lower-income persons have long found themselves without access to educational and career opportunities, housing, and public services. Much of the research reviewed above has suggested that access to computers and computer networks may fall along similar lines; this study will examine if the skills necessary to make use of computer networks are lacking among traditionally disadvantaged groups. While studies have suggested that there is little digital divide along gender lines (van Dijk 2002: Hargittai, 2002, 2006) this study may reveal differences in gender in terms of reported competence. There is some evidence to suggest that men rate their skills more highly than women (Broos, 2005; Hargittai & Shafer, 2006; Selwyn, 2008), so differences may be the result of culturally determined roles. Gender may also combine with other variables like education and ethnicity to show increased combined effects; this will be explored in the last research question. It is likely that older users will have lower techno-capital than younger users. Because older users did not grow up with computers or were not exposed to them at school or in the workplace, these users may not have developed the skills to meaningfully use computer networks or may not understand the metaphors used in user interfaces (Dimaggio & Hargittai, 2001Servon & Nelson, 2001, Schradie, 2011). Finally, because Austin is a city in a border state, the immigration background of respondents seems likely to play a role in developing techno-capital, based on in-depth interviews conducted by Straubhaar and a team of researchers (personal communication, 2012).

Immigrants and the children of immigrants may lack the linguistic capital, as Bourdieu would put it, to navigate an English-dominated Internet or lack the social contacts that may make Internet use a worthwhile and engaging activity. This study will ask how these demographic issues affect techno-capital in society, which is one key to understanding how some are included or excluded from participation in a society where Internet use is increasingly important. Results of analyses based on this question are presented in Chapter 7.

H12: Members of privileged groups such as whites and the better educated have more techno-capital than marginalized groups.

H12a: People with greater cultural capital, as measured by parents' education, will have more techno-capital than people with lower cultural capital.

H12b: White respondents will have greater techno-capital than respondents from marginalized ethnic/racial categories, particularly African-Americans and Hispanics.

H12c: Persons born who immigrated to the United States have less techno-capital than persons born in the United States.

H12d: Respondents with recent immigration histories will have less techno-capital than respondents with more distant recent immigration histories

H12e & H12f: Older individuals will have less techno-capital than younger individuals.

H12g: Men have greater techno-capital than women.

H12g: Users with greater cultural capital, measured by the aggregate of parents' education, have greater techno-capital.

H12h: Respondents with higher income have greater techno-capital than respondents with lower income.

H12i: Individuals with more educational attainment have greater techno-capital than respondents with less educational attainment.

H12j: Native speakers of English have greater techno-capital than persons who are not native speakers of English.

H12k: Respondents employed in information-intensive sectors have greater techno-capital than respondents employed in other fields.

QUESTION FOUR: HOW DOES TECHNO-CAPITAL DIFFER AMONG INDIVIDUALS WITH DIFFERENT FORMS OF ACCESS?

This study aims to situate networked computer use in a broader social context, and since users access the Internet in a variety of different contexts, examining the relationship between types of access or locations of access and techno-capital is an important facet to examine. Studies from the competencies approach indicated that two of the greatest factors related to Internet skill were autonomy of access, the freedom a user has to use the internet at leisure, and the number of sites at which a user accesses the Internet (Hargittai & Hinnant, 2008). Without the latitude to explore the Internet and browse at their leisure, users without home broadband may have lacked the exposure and experience online to develop a high level of techno-capital (Schradie, 2011). Public-access centers such as libraries are also an important site for computer training and basic support. Some users who have home Internet connections may also turn to libraries for assistance in for finding information and using software such as web browsers (Servon & Nelson, 2001). For this reason, this study will also ask if the techno-capital of public-access users in general is different from the broader user population in Austin. This project also investigates a second category of users, those who rely exclusively on mobile devices such as smartphones. These users may have lower incomes and can afford smartphones and data plans, but not home computers and broadband connections. A phone is a near necessity in the contemporary US, but not everyone needs a home computer; the decision to have a smartphone only is a matter of prioritizing needs and desires for lower-income users. These users may have less interest in the content and services available online and use their devices for basic communication (Smith, 2012, 2012). Or these users may be constrained by the limitations of mobile Internet devices and not developed a broader set of network skills and literacies. Because smartphone adoption in the United States is happening at a rapid rate, identifying whether this group of users enjoys the full complement of abilities is an important question. Results related to this question are presented in Chapter 8.

This research question also investigates access contexts – the situations where people access the Internet – and their relationship to techno-capital. The context of use, apart from comparing individuals who have home access and those who do not appears to be under-investigated (Hassani, 2006). Despite its neglect by researchers, Internet use often does not happen in isolation; family members, co-workers, and peers may provide informal technical support and other guidance on how to use the Internet. Places such as the workplace, schools, and settings such as coffee shops influence the habitus, and may play a significant role in forming techno-capital. An examination of the social context of where the Internet is used can also expand the social context considered in discussions of digital inclusion and help understand how the Internet is integrated into communities.

H13: Users of faster or more convenient forms of access will have greater techno-capital than persons who do not use that form of access.

H13a: Non-users have lower techno-capital than other users.

H13b: Dial-Up users have lower techno-capital than other users

H13c: DSL users have higher techno-capital than other users.

H13d: Cable Modem users have higher techno-capital than other users.

H13e: Broadband users, DSL and cable modem users combined, have higher techno-capital than other users.

H13f: Mobile Internet users have higher techno-capital than other users.

H13g: Mobile-only users have lower techno-capital than other users.

H13h: Austin Public Library users have lower techno-capital than other users.

H13i: Austin Public Wi-Fi have lower techno-capital than other users.

H13j: Users who use public-access services exclusively have lower techno-capital.

H14: Users who access the Internet in more contexts have more techno-capital than users with fewer contexts.

H14a: Persons who use the Internet at work or school will have greater techno-capital than those who do not.

H14b: Persons who use the Internet in domestic contexts such as at home or at the home of a friend or family member will have greater techno-capital than those who do not.

H14c: Persons who use the Internet at coffee shops will have greater techno-capital than those who do not.

QUESTION FIVE: GIVEN THE COMPLEX SOCIAL CONTEXT OF INTERNET USE, WHAT MEASURABLE FACTORS AFFECT INTERNET USE AND TECHNO-CAPITAL?

Many factors play a role in whether an individual uses – and can make effective use of – the Internet. The previous questions examine a variety of factors related to Internet use in isolation, but factors can interact or some may have more salience than others. (For example, differences in educational attainment may account for differing rates of access among different racial/ethnic categories.) For this reason, multivariate analyses, linear regression and logistic regression, are used to gain some understanding into what factors may affect Internet use the most. Chapter 9 describes the results for multivariate analyses related to non-use of the Internet and techno-capital.

Chapter 4: Methods

This study examines six questions related to how techno-capital, the ability to fruitfully use network technologies, is distributed in the Austin area. It asks about the relationship of demographic characteristics such as age, race, and gender to techno-capital; how types of network access may relate to techno-capital; how types of access may vary among different populations; and how techno-capital may relate to information-seeking behavior. As society continue to integrate computer networks into daily life and institutions, a lack or a possession of techno-capital may play a great role in the opportunities available to individuals.

This study relies on data collected from a survey administered by the City of Austin's Office of Telecommunications and Regulatory Affairs. In the summer of 2010, I was involved in the development of the survey instrument, and I contributed questions related to computer skills and public participation. The survey instrument was sent by mail to 15,000 homes in the city limits. The core sample was 12,000 addresses, and in an effort to ensure that Hispanic households were represented in the data set, an additional 3000 surveys were sent to homes in ZIP codes identified as having a high concentration of Hispanic households. The survey was distributed in both English and Spanish. To reach more Hispanics, survey participation was promoted in a public-service announcement on the local Univision affiliate, a Spanish-language TV station. The survey was administered in November 2010, and households received a postcard alerting residents to the survey two weeks before the survey arrived. As an incentive, respondents could enter a drawing to receive a netbook computer.

Out of the 15,000 recipients, 1,701 responded to the survey and returned a completed instrument. The simple response rate was 11.3%. Although the response rate of the survey was low, it was within established expectations for contemporary survey response rates. Compared to Census 2010 data, the survey did not perfectly represent the demographics of Austin: respondents were better educated, older and more likely to be women or white. As a result, Professor Wenhong Chen of the initial team weighted the survey data to better reflect the Austin population. Particular care was taken to see that members of ethnic minorities such as Hispanics and African-Americans were represented in the data set. The weights were based on census data provided by the city's demographer Ryan Robinson. Weighting the data allows for statistical results that will more accurately reflect the realities of Internet use in the city. The weighting was performed on the basis of four factors: gender, ethnicity, age, and education. Table 1 provides an overview of the weighting of the survey data.

Table 1 Statistical Weights Used for This Study

	Parameter	Unweighted	Weighted
Race and Ethnicity 18+			
White	53.60%	75.75%	53.65%
African American	7.50%	5.97%	7.51%
Hispanic	30.60%	12.13%	30.63%
Asian	6.40%	3.17%	6.41%
Other	1.80%	2.99%	1.80%
Gender			
Male	52.41%	41.68%	52.40%
Female	47.59%	58.32%	47.36%
Educational Attainment 25+			
Less than high school	16.00%	1.49%	15.98%
High school	16.90%	11.82%	16.88%
Some college	23.30%	20.16%	23.28%
BA	28.20%	38.21%	28.17%
Postgraduate	15.70%	28.31%	15.68%
Age 18 plus			
18-24	14.70%	1.50%	14.70%
25-34	31.70%	16.85%	31.70%
35-44	19.10%	22.32%	19.10%
45-54	15.30%	19.45%	15.30%
55-64	10.60%	20.88%	10.60%
65+	8.60%	19.00%	8.60%

The items on the survey were developed to get a broad understanding of technology use among Austin residents and how technology is integrated into their lives. In addition to general questions about whether respondents owned computing devices and had Internet service, questions dug deeper into two areas, use of technology related to government services and issues of social capital. The survey questionnaire has 105 questions that range from asking, “Do you have a cell phone?” to asking whether the respondent's father was born in United States. In aggregate, these questions can paint a fairly detailed picture of the respondents' cultural background and use of technology.

MEASURING TECHNO-CAPITAL

The core concept this study explores is techno-capital, the ability of users to effectively use network technologies. To measure techno-capital, survey items related to respondents' self-reported level of capability are aggregated into an index that will serve as a proxy for techno-capital. Question Q4i on the survey asks respondents to "Please indicate how much you agree or disagree with the following statements regarding how you feel about your Internet Skills. I feel capable of…." There are seven items which respondents rank from one to five, so valid responses range from 7-35, where 7 indicates the lowest degree of techno-capital and 35 indicates the highest degree of techno-capital. The skills asked on the survey are:

- Uploading content (ex videos, photos, music)
- Blocking spam or unwanted content
- Adjusting my privacy settings on a website
- Bookmarking a website or adding a website to my list of favorites
- Comparing different sites to verify the accuracy of information
- Creating and managing my own personal profile on a social network site
- Creating and managing my own personal website

This aggregated measure of computing capabilities likely offers a good measure of respondents' fluency with basic operations of the Internet and networked computing. Segmenting the techno-capital index may provide additional insights into the respondents' skills. Van Deursen, A., & van Dijk, J. (2010) identify four subsets of Internet skills, operational internet skills, basic skills in using computer hardware; formal skills, which relate the symbols and structure of websites and internet software; information skills, how to find and assess the quality of information online; and strategic internet skills, the ability to use the internet to pursue goals in life such as career development. In this context, two of the items on the question related to the higher-level informational and strategic skills van Deursen and van Dijk identify.

Online self-promotion has become an important tool for career advancement for many information professionals who may use social media or a web presence to establish themselves professionally. In addition, independent service professionals such as repair technicians or yoga teachers may use these outlets to advertise availability and services. For this reason, feeling capable of "Creating and managing my own personal profile on a social network site" and "Creating and managing my own personal website" can be viewed as strategic techno-capital. For this reason, these are aggregated into a second measure of strategic techno-capital, which can range 2-10. By separating out this measure of techno-capital from the broader measure, the study may provide a more nuanced view of how important technological abilities are distributed.

DEMOGRAPHIC VARIABLES

As noted in Chapter 2, concerns about the digital divide from the start centered on two groups: rural populations and disadvantaged minorities. Since the survey used in this study was administered within the Austin city limits, questions about rural users are beyond its scope. Thus, this study will first turn its attention to how techno-capital differs among specific groups, identifying them by the following characteristics:

- Age
- Gender
- Ethnic Identification

- Income
- International migration, identifying first, second, and third-generation immigrants
- Cultural capital, using education level as a proxy
- Language use, using the language of media use as proxy

The first four factors, age, ethnic identification, gender, income, and occupation are assessed by relatively straightforward questions on the survey instrument. The questions ask

- What year were you born? (Q9a)
- Are you male or female? (Q9b)
- Which of the following do you most consider yourself to be? (Q9c)
- Last year, in 2009, what was your total family income from all sources, before taxes? (Q9k)

Identifying the migration history of respondents involves aggregating responses to four questions about the place of birth for the respondent and ancestors. These questions are:

- Where you born in the United States? (Q9e)
- Was she [respondent's mother] born in the United States? (Q9m)
- What he [respondent's father] born in the United States? (Q9q)
- Were any of your grandparents born outside the United States? (Q9t)

A negative response to Q9e will code a respondent as a first-generation immigrant, any negative response to Q9m or Q9q will code a respondent who isn't a first-generation immigrant as a second-generation immigrant, and a negative response to Q9t will code as a third-generation immigrant if the respondent does not fall into one of the other immigration categories. The survey also asks respondents "If any of your parents immigrated to the US, where did they come from?" Given Austin's location in a state bordering Mexico, immigrants from Latin America comprise a significant slice of Austin's population and a group that is potentially disadvantaged in terms of access and fluency with network technologies.

It is common to use educational attainment as a broad proxy for cultural capital in survey research. The survey asked respondents about their own level of educational attainment, ranging from "less than high school" to "graduate or professional degree." The survey also asked respondents to similarly identify their parents' levels of attainment. These levels are coded in a quasi-ordinal variable ranging from 1-5. Responses from the questions related to parents' education were averaged to generate an index of cultural capital ranging from 1 to 5, where 1 indicates both parents of the respondent did not finish high school and 5 indicates both parents completed a graduate or professional degree. Of course, cultural capital can be acquired from a variety of non-school activities, but this is the best measure available from the survey data.

The survey did not ask respondents to identify their primary or native language, so an index of non-English language media use will be used as a proxy. This offers the advantage of asking respondents what language they use in an English-dominant environment rather than a direct question, which may elicit answers based more on identity than pragmatic day-to-day use. The survey asked respondents, "How often do you engage in the following media activities in a language other than English?" (Q5a) about the following activities: read a book, watch TV, watch a movie, visit a website, and listen to music. Respondents rated frequency on a scale from one to five, where one indicated "never" and five indicated "daily." For the ease of analysis, results of these variables were recoded into a single index ranging from 1 to 3, where 1 indicates, on average, the respondent never uses non-English media and 3 indicates the respondent uses non-English media on a daily or weekly basis. It is assumed that respondents who use non-English media on a daily or weekly basis are likely non-native speakers of English or perhaps bilingual.

TYPES OF ACCESS

Types of access are also a key set of variables used in this study. Most of the access types are specific technologies related to either transmission type, such as DSL, or the type of device used to access, in the case of mobile access, which at the time of the survey was largely by mobile phone. However, in some cases, such as public access, the type of access is also related to the access context. Because public access to the Internet is often considered a substitute for personal or family Internet subscriptions, this study groups it with the access types. This study examines the following types of access:

- Non-use of the Internet
- Cable modem
- DSL
- Home Broadband, which aggregates cable modem and DSL
- Mobile access through mobile phones and tablet devices
- Mobile access with no home Internet connection
- Public access through the Austin Public Library and the Austin Wireless Mesh Network, provided by the city
- Public access with no home Internet connection

For this analysis, seven new variables will be recoded from questions asked about types of access on the survey. This recoding is based on the following questions:

  - Do you use the Internet at all? (Q4a)

- How does your computer connect to the Internet at home?
    - High-speed DSL-enabled phone line (Q4f2)
    - High-speed cable modem (Q4f3)
    - I do not have access to the Internet through a computer at home (Q4f6)
- Do you use any of the following technologies to access the Internet?
    - Cell phone. (q4g1)
    - City of Austin's free public WiFi (q4g4)
- Where do you use the Internet? Austin Public Library (q4e4)

Non-users will be indicated with the question "Do you use the Internet at all?" (Q4a) unchanged. Because when the survey data was entered, only affirmative responses were recoded. Non-responses were generally left null, rather than entered as zero. This required re-coding most of the access technology variables to where null values were re-coded as zero, introducing some imprecision as to whether a zero indicates a negative response or no response to the question.

Additional variables were recoded to indicate more general access situations. A variable for home broadband was generated by aggregating affirmative responses to the questions related to DSL and cable modem. If a respondent had either DSL or cable modem, he or she was coded as a home-broadband subscriber. A similar variable for public access was created by aggregating Austin Public Library use and use of the wireless mesh network. Exclusive mobile and exclusive public access variables were generated by recoding the public-access and mobile variables to 0 if the respondent had some form of Internet connection at home.

Access Contexts

As analysis continued, results suggested that access contexts were more meaningful than was anticipated when this study was proposed. As a result, I decided to conduct an additional series of analyses related to access contexts. In addition to public access, which is both a type of access and an access context, three other relevant access contexts were identified. These were based on responses to the question, “Where do you use the Internet?” The three contexts were domestic access, access in the respondent’s home or at the home of friends or family; institutional access, access at work or school; and coffee-shop access, which was the only item related to non-professional social environments. The domestic access variable is a recode of the variables for “at home” and “at the home of friends or family.” The institutional access variable is a recode of “at work” and “at school.” The coffee-shop variable is affirmative responses to “at a coffee shop.” In all cases, null values were recoded as zero because of the data-entry issue described above.

Chapter 5: Forms of Access Among Demographic Groups

As noted in the introduction, the earliest concerns about the digital divide related to issues of material access – whether or not marginalized groups have either the economic means to get Internet subscription or if Internet service is available in places like rural areas and inner cities (Katz & Aspden, 1998; Lievrouw, 2000; National Telecommmunications and Information Administration, 1995, 1998, 1999). Later research criticized this "trickle-down" framing of the digital divide for reifying the Washington policy establishment (Clement & Shade, 2000; J. Dijk, 2005; DiMaggio & Hargittai, 2001; Selwyn, 2004). In addition, many argued investigations should emphasize factors such as skills and the broader cultural context in which Internet use takes place (S. Livingstone & Helsper, 2007; S. Livingstone, Van Couvering, & Thumim, 2008; S. Livingstone, 2007; Sonia Livingstone, 2004, 2005; Rojas, Straubhaar, Roychowdhury, & Okur, 2004; Straubhaar, 2012). Inequalities in material access do persist in the US, and the "trickle-down" model of the digital divide still has currency in policy spheres and the popular imagination.

Although the primary emphasis of this study is to examine the broader social context of Internet use in Austin, it first examines what types of access are used by particular groups. Even if there are broader social barriers to digital inclusion asking about types of access will ground this study by revealing differences in material access. This chapter asks the broader question "who uses the Internet and how do they access it?" It works from the general hypothesis that privileged groups are more likely to use the Internet and with more sophisticated forms of access while marginalized groups are more likely to be non-users. This chapter details the results of quantitative analysis of the first seven hypotheses outlined in the previous chapter.

The statistical software package Stata was used to analyze the data from the 2010 City of Austin Survey. Because most of these hypotheses are based on categorical data, most of the analysis was two-way comparisons of categorical variables. The probability weighting done by Professor Chen was used to produce results that more accurately reflect the Austin population. Unfortunately, probability weights are incompatible with more sophisticated tests like ANOVA, so the tests of these hypotheses were conducted as two-way means, which were followed by a bivariate regression that provided an F value that offers a test of significance similar to a t-test.

Apart from two indexed variables, the index of cultural capital and the index of non-English media use, the variables analyzed were either binary variables or scalar variables taken directly from the survey data. The cultural-capital index was created by summing variables that reflected the education level of the respondent's mother and father. These variables ranged from one, indicating less than high-school education, to five, indicating graduate or professional school. Cronbach's alpha for this cultural-capital scale is 0.77, which is somewhat low. However, this is a common way of operationalizing cultural capital (Lareau & Lamont, 1988) and the best measure available from the existing survey data. The survey also did not include a question directly asking respondents about their primary language. To operationalize non-English media use five variables related to media use were averaged, creating a scale ranging from one, never, to three, indicating weekly non-English media use. Cronbach's alpha for this scale is .95, indicating a high degree of reliability.

In addition to these scales, a few variables were recoded for greater analytical utility. For example, questions about the respondent's immigration history and the immigration histories of the respondent's parents and grandparents were recoded into a single variable indicating if the respondent is a first-, second-, or third-generation immigrant. Other variables were recoded into simpler categories: the question about the race of the respondent was simplified into five categories and the question on age was recoded into two different categorical variables, one based on the age of the respondent at the time of the survey and a second cohort variable based on the cultural generations categories (Howe & Strauss, 1992, 2000). These variables improved the readability of the two-way categorical tests and the Pew generations variable offered particular insight into how age cohorts use the Internet.

The majority of these tests did not return significant results, generally because of the smaller number of respondents in particular marginalized groups. This chapter will only describe the results of the tests that produced significant results. Table 2 shows the significance levels for all of the significant analyses. The results of all of the tests are available in Appendix B Full Results for Chapter 5. Following is a list of each of the sub-hypotheses tested in this analysis, with significance levels indicated for the analysis of the individual hypothesis. Results for analyses that did not have statistically significant results are not described in this chapter, but the results are available in Appendix B.

Table 2 Significance Levels for Analyses of Access Technologies

	Non-Users	DSL	Cable Modem	Broadband Aggregate	APL	Austin Public Wifi	Public Access	Public-Access Only	Mobile	Mobile Only
Cultural Capital	0.0014**	n/s	n/s		0.374*	0.002**	0.0128*	0.0002***	0.0418*	n/s
Migration	0.0002***	n/s	n/s	n/s	n/s	0.001**	0.011*	n/s	n/s	0.0016**
Ethnic Group	0.0001***	n/s	0.0128*	0.0222*	n/s	n/s	n/s	n/s	n/s	n/s
Language	0.0395*	n/s	n/s	n/s	0.030*	n/s	0.026*	0.0026**	n/s	n/s
Age	0.0371*	n/s	n/s	n/s	n/s	n/s	n/s	0.0020**	0.0127*	n/s
Education	.000***	n/s	n/s	n/s	n/s	n/s	n/s	0.0186*	0.0433*	n/s
Migration Generation	0.0001***	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0.0480*
Pew Generation	0.0013**	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0.000***	n/s
Income	0.0055**	n/s	n/s	0.0031**	n/s	n/s	0.010*	n/s	0.039*	n/s
Gender	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

H1: NON-USE OF THE INTERNET IS MORE COMMON AMONG LESS AFFLUENT USERS AND MEMBERS OF MARGINALIZED GROUPS.

This series of tests produced the most significant results of any of the hypotheses. Tests were run on the following factors: age, ethnicity, gender, household income, immigration history, cultural capital as measured by the sum of the respondents' parents education, the education level of the respondent, and non-English media use. The test for gender supports recent research that suggests women in the US now use the Internet about as much as men (Hargittai & Hinnant, 2008; Hargittai & Shafer, 2006; Zickuhr & Smith, 2012). However the other tests for this question did show a statistically significant difference in what groups go online.

H1a: Non-use is less common among those with greater cultural capital, measured by the aggregate of parents' education.

Bourdieu's theories of habitus and multiple forms of capital argue that cultural values are passed down from parents to children (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984, 2002). With that in mind, it would be expected that children whose parents had high levels of educational attainment developed an interest in technology or at least the literate culture of the Internet. Although it's difficult to operationalize cultural capital, aggregating the education of a respondent's parents provides a proxy for measuring cultural capital. Comparing Internet non-use with this measure of cultural capital did produce statistically significant results: respondents whose parents were better educated were more likely to use the Internet. Over a quarter of respondents who were at the bottom of the cultural capital scale reported not using the Internet, while none of those with the best educated parents reported being non-users.

Table 3 Internet Use by Cultural Captial

Cultural Capital of Parents	Do you use the Internet at all?		
	yes	no	Total
1	0.74	0.26	1
2	0.9223	0.0777	1
3	0.9621	0.0379	1
4	0.9659	0.0341	1
5	0.9538	0.0462	1
Total	90.43%	9.57%	1

Uncorrected chi2(4) = 120.0212

Design-based F(4.19, 5572.77)= 4.3300 P = 0.0014

H1b: Non-use is more common among African-Americans and Hispanics than among whites.

African-Americans and Hispanics have historically been groups excluded by the digital divide. (National Telecommmunications and Information Administration, 1995, 1998, 1999; Zickuhr & Smith, 2012) This is largely seen as a result of the groups' historical exclusion from many parts of society. (Lentz, Straubhaar, LaPastina, Main, & Taylor, 2000; Rojas et al., 2004; Straubhaar, 2012) As a result, many members of these groups lack access to education, employment, and, now, technology. The comparison of non-use by ethnic group revealed that non-use is quite common in these communities with nearly 30% of African-American respondents saying they did not use the Internet, and 23% of Hispanic respondents said they did not go online. By comparison, over 95% of white and Asian-American respondents said they go online, These results have a high level of statistical significance, with a p-value of .0001. The full breakdown is provided in Table 4.

Table 4 Internet Use by Racial/Ethnic Category

Category	yes	no	Total
White	95.39%	4.61%	1
African-American	70.52%	29.48%	1
Hispanic	77.11%	22.89%	1
Asian-American	97.67%	2.33%	1
other	97.25%	2.75%	1
Total	88.12%	11.88%	1

Uncorrected chi2(4) = 127.7907
Design-based F(2.47, 3447.09)= 8.2906 P = 0.0001

H1c: Non-use is more common among migrants from other countries than among respondents born in the United States.

Although many immigrants come to Austin for technology-related jobs, many others come looking for opportunities to do manual work (Rojas et al., 2004; Straubhaar, 2012; Tufekcioglu, 2001). In addition, many immigrants such as those from Latin America come to the US with limited English-language skills, which present a barrier to learning how to use computers or an Internet that’s still largely English-based. As a result, immigrants are more likely to be non-users of the Internet. The analysis comparing migrants to non-users supports this notion with a high level of statistical significance, p = .0002. Over 30% of respondents who said they were not born in the United States also said they do not use the Internet.

Table 5 Internet Use by Immigration

	yes	no	Total
US-Born	92.63%	7.37%	100.00%
1st generation	67.59%	32.41%	100.00%
Total	88.04%	11.96%	100.00%

Uncorrected chi2(1) = 124.0999
Design-based F(1, 1390) = 13.6390 P = 0.0002

H1d: Non-use is more common among those with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent is more likely to be a non-user.

Although the children of immigrants often have better access to education than their parents, it's also they case they may not grow up in an environment with a disposition toward technology. This lack of a techno-habitus may also present a barrier to Internet use. (Rojas et al., 2004; Straubhaar, 2012) This is borne out in the Austin survey data. First-generation immigrants are less likely than second- or third generation immigrants to use the Internet. And although fewer than ten percent of second- and third-generation immigrants reported not using the Internet, non-immigrants still use it at higher rates. Slightly fewer second-generation immigrants reported not using the Internet, which suggests interesting generational dynamics at play. It may be the case that the children of immigrants do grow up with dispositions to technology and education while their children are more settled in Austin. Studies from the Pew Internet and American Life Project (S. Fox & Livingston, 2007; Livingston, Parker, & Fox, 2009) and others often confirm this trend where second-generation immigrants in the United States find upward mobility – including greater use of technology – while some third-generation immigrants settle into patterns of limited acquisition of cultural, economic, and perhaps techno-capital.

Table 6 Internet Use by Immigration History

Immigration History	yes	no	Total
No recent history	93.24%	6.76%	100.00%
First Generation	67.59%	32.41%	100.00%
2nd Genertion	92.06%	7.94%	100.00%
3rd Generation	91.78%	8.22%	100.00%
Total	88.12%	11.88%	100.00%

Uncorrected chi2(3) = 125.8481

Design-based F(2.27, 3166.61)= 8.2592 P = 0.0001

H1e: Non-use is more common among older users than younger users.

Two tests were performed to investigate this question. The first one is a categorical variable coded into conventional age categories, and uses the generational cohort categories developed by Howe & Strauss (1992, 2000) and used extensively by the Pew Internet and American Life Project (Susannah Fox & Pew Internet & American Life Project., 2004). The generational categories showed there were greater differences in between the generational cohorts. In general, older respondents were less likely to be Internet users, although the results show the youngest age groups, Millenials and 25-34 year olds, also reported lower Internet use than the next older age brackets. This is likely due to young people working in low-paying jobs or not working at all. In fact, over 30% of respondents from the Millennial Generation preferred not to respond to the income item. A breakdown of income response is available in Table 9.

Table 7 and Table 8 below show the breakdown of Internet non-use by age group. The analysis of Internet non-use by the Pew categories has greater statistical power, yielding a p-value of 0.0013, while the more conventional categories had a slightly significant p-value of 0.0371.

Table 7 Internet Use by Age Range

Age	yes	no	Total
18-24	95.32%	4.68%	100.00%
25-34	86.85%	13.15%	100.00%
35-44	98.83%	1.17%	100.00%
45-54	85.39%	14.61%	100.00%
55-64	78.86%	21.14%	100.00%
65+	72.37%	27.63%	100.00%
Total	88.12%	11.88%	100.00%

Pearson:
Uncorrected chi2(5) = 80.5083
Design-based F(3.16, 4415.08)= 2.7748 P = 0.0371

Table 8 Internet Use by Generation

Generation	Yes	No	Total
Millennials	88.66%	11.34%	100.00%
Generation X	98.75%	1.25%	100.00%
Younger Boomers	83.09%	16.91%	100.00%
Older Boomers	81.37%	18.63%	100.00%
Silent Generation	87.81%	12.19%	100.00%
GI Generation	51.34%	48.66%	100.00%
Total	88.12%	11.88%	100.00%

Uncorrected chi2(5) = 108.8079
Design-based F(2.37, 3305.15)= 6.0080 P = 0.0013

Table 9 Income by Pew Generation

Generation	< $10k	$10K-$20K	$20K-$30K	$30K-$40K	$40K-$50K	$50K-$75K	$75K+	No Answer
Millennials	8.30%	6.60%	15.70%	5.10%	3.40%	12.50%	18.00%	30.50%
Generation X	4.50%	7.40%	10.10%	4.30%	8.40%	16.20%	43.00%	6.20%
Younger Boomers	9.00%	8.50%	8.90%	8.80%	7.20%	19.30%	32.20%	6.20%
Older Boomers	9.60%	4.80%	11.00%	8.30%	9.10%	17.90%	30.10%	9.30%
Silent Generation	1.90%	6.50%	9.60%	7.60%	7.20%	13.30%	24.90%	29.00%
GI Generation	13.30%	4.80%	8.20%	11.50%	5.50%	9.20%	15.60%	31.90%
Total	7.50%	6.90%	12.30%	6.10%	5.90%	14.90%	27.40%	19.00%

Uncorrected chi2(35) = 217.3556
Design-based F(17.47, 25266.63)= 3.0975 P = 0.0000

H1g: Non-use is more common among lower-income groups.

The "trickle-down" theory of the digital divide suggests that more members of lower-income groups will go online as prices go down. (J. A. G. M. van Dijk, 2006; Warschauer, 2003) Regardless the costs of equipment and subscription fees continue to present a barrier to low-income persons. The analysis confirms the hypothesis that lower-income persons would not use the Internet in greater numbers, except for one low-income group. Except for respondents who said they made between $10,000 and $20,000 in 2009, Internet use increases with income. It's likely that these low-income users are students; although the results of comparison with income and student status weren't significant, the data suggests that students make up a large chunk of respondents in the income bracket. Less than one percent of respondents who said they made over $75,000 said they did not use the Internet. This comparison of income with Internet non-use is statistically significant with a p value of .005.

Table 10 Internet Use by Income Range

	Do you use the Internet at all?		
Income	Yes	No	Total
< $10,000	68.13%	31.87%	100.00%
$10,000-$19,999	85.77%	14.23%	100.00%
$20,000-$29,999	74.96%	25.04%	100.00%
$30,000-$39,999	78.93%	21.07%	100.00%
$40,000-$49,999	95.56%	4.44%	100.00%
$50,000-$74,999	96.85%	3.15%	100.00%
$75,000+	99.36%	0.64%	100.00%
Prefer not to answer	83.63%	16.37%	100.00%
Total	88.23%	11.77%	100.00%

Uncorrected chi2(7) = 146.3066 p = .005

Internet non-use appears to drop off dramatically with households with more than $40,000 income in 2010. Since the median household income in Austin in 2010 was $42,000, based on these numbers, Internet non-use is largely a phenomenon among lower-income groups. It appears that people nearly all people whose income is at or above the median household rate use the Internet in some fashion.

H1i: Non-use of the Internet is less common among better-educated groups.

The education of respondents themselves also appears to play a factor in whether or not they use the Internet. Comparing education level with non-users produced statistically significant results, with very few college-educated respondents reporting being non-users. Among respondents who did not finish high school, 38.57% said they did not use the Internet. Table 11 shows the breakdown of non-users by educational attainment.

Table 11 Internet Use by Educational Attainment

	Non-user of the Internet		
Education Level	No	Yes	Total
Less than high school	61.43%	38.57%	100.00%
High School	80.93%	19.07%	100.00%
Technical School	91.99%	8.01%	100.00%
4-Year University	98.70%	1.30%	100.00%
Graduate School	98.70%	1.30%	100.00%
Total	88.12%	11.88%	100.00%

Uncorrected chi2(4) = 235.8174

Design-based F(1.60, 2233.15)= 12.1016 P = 0.0000

In the case of education, non-use of the Internet is uncommon among Austinites with any post-secondary education and rare among persons with a college degree or more. Non-users largely have low levels of educational attainment with many having less than a high school diploma. Although many respondents would have completed their educations before the Internet saw widespread use in the United States, these results further confirm other studies suggesting a link between formal education and Internet use. (Clement & Shade, 2000; DiMaggio & Hargittai, 2001; Hargittai, 2002; Robinson, 2009)

H1h: Non-use is more common among respondents whose primary language is not English.

As noted above, not speaking English presents a substantial barrier to Internet use since many of the online sites and interface items are in English. (Block, 2004; Straubhaar, 2012) In addition, non-English speakers may come from undereducated communities where a lack of techno-dispositions limits the formation of techno-capital. Since this study measures use of non-English media, the result of the analysis is not particularly dramatic. Regular consumers of non-English media are somewhat less likely to use the Internet than those who only use English media. The significance level of this analysis is also fairly low at p = .040.

Table 12 Internet Use by Non-English Media Use

Index of Non-English Media Use	Non-user of the Internet		
	No	Yes	Total
Never	94.16%	5.84%	100.00%
Rarely	92.08%	7.92%	100.00%
Weekly/daily	83.47%	16.53%	100.00%
Total	89.42%	10.58%	100.00%

Uncorrected chi2(2) = 32.9295

Design-based F(1.55, 2052.93)= 3.5729 P = 0.0395

H2: Broadband Internet access in the home (using DSL or cable modem) is more commonly used by privileged groups like whites, the well educated, and the affluent, as well as younger users.

Home broadband use such as DSL or cable modem is the most desirable way to access the Internet in the US today. Expanding broadband access has become a policy priority with projects like the National Broadband Plan (Fuentes-Bautista & Inagaki, 2006; Grubesic, 2008; "National Broadband Plan - Chapter 9: Adoption and Utilization," n.d.). Understanding who uses broadband has policy implications, as well as educational purposes such as knowing what populations may be able to access services such as internet-based distance learning. Studies have suggested that "autonomy of use" is the best predictor of who develops strong Internet skills (DiMaggio & Hargittai, 2001; Hargittai & Hinnant, 2008; Hargittai & Walejko, 2008; Hargittai, 2010). Persons with greater autonomy of use have more latitude to try new services or develop fluency with concrete tasks such as uploading a file or more tacit skills such as appropriate online behavior. For endeavors such as distance learning, autonomy of use may have a critical role since the pressures of having to share a connection or computer or use the Internet in a public place could prevent students from having a good learning experience. A home broadband connection may be a superior way to achieve this autonomy of use since it situates Internet use in the domestic sphere where there is a likelihood the user feels relaxed.[3] This hypothesis suggested that access to home broadband is a major factor in the digital divide.

For this hypothesis, analyses were run individually for DSL service and cable modem service. The demographic groups identified were the same as the ones discussed in the previous section. For DSL, none of the analyses yielded statistically significant results, although the figures hinted at divides in access. Only one of the cable-modem analyses provided statistically significant results. Cable modem appears to be more popular in Austin, but despite the differences in technology, the services are more or less interchangeable. For this reason, an aggregate variable was constructed that included both types of wired broadband service. Conducting the analyses again with the aggregate variable produced two additional significant results. The significant results will be discussed below.

H2b2: Cable-modem Access is more common among whites than among African-Americans and Hispanics.

Of all the analyses that examined cable-modem use this was the only one to yield statistically significant results. According to the data, white and Asian-Americans in Austin are more likely to have cable-modem service with 55% of whites subscribing and 61% of Asian-Americans. In contrast, 25% of African-American respondents and 36% of Hispanics said they had cable-modem service. These results, presented in Table 13, are statistically significant with $p = 0.0128$ and suggest that people of color in Austin may

[3] However, results presented in Chapters 7 and 8 suggest that home-broadband access has little statistical relationship with techno-capital, as it is measured in this study. It is likely, though, that the autonomy of use afforded by home broadband is superior to relying on public-access services or institutional environments.

face barriers to cable-modem connections, such as the relatively high monthly cost. Researchers such as Schement (1995) have studied telecommunication access in urban areas concluded that poorer populations are often averse to committing to subscriptions which incur monthly bills, since they may be worried about making ends. It is worth noting, however, that results for DSL access by racial/ethnic category were not statistically significant, and DSL also incurs a monthly bill.

Table 13 Cable Modem Access by Racial/Ethnic Category

	Home Cable Modem Connection		
Ethnic Group	no	yes	
White	44.77%	55.23%	100.00%
African-American	74.81%	25.19%	100.00%
Hispanic	63.63%	36.37%	100.00%
Asian-American	39.14%	60.86%	100.00%
other	56.14%	43.86%	100.00%
Total	52.65%	47.35%	100.00%
Uncorrected chi2(4) = 69.8829			
Design-based F(2.71, 3962.55)= 3.7779 P = 0.0128			

Because cable-modem is currently the fastest home internet connection widely available in Austin, and DSL is considered inferior (Crawford, 2013) results for cable-modem use may show who in Austin is getting the best widely available internet connection. Some households of color may be using DSL connections rather than cable modem for broadband, sticking with the earliest “always on” connection to their home since they lack motivations to switching to a potentially faster service.

H2b3: Broadband access is more common among whites than among African-Americans and Hispanics.

Comparing the aggregate broadband variable, which included positive responses for both DSL and cable-modem subscribers, also provided statistically significant results.

Among white respondents, over 70% said they had home broadband, and 83% of Asian-Americans said they had home broadband. Here the gap in broadband access comes into focus. Only 40% of African-American respondents indicated subscribing to broadband, leaving half of Austin's African-American households without consistent access to the Internet. Among Hispanic households it appears that DSL is more popular than cable modem, so the broadband gap is not as pronounced, with 58% of respondents saying they had some type of home broadband. For this analysis, the p value was .0222, which is weaker than the significance for cable modem. These results are consistent with recent Pew reports indicating that home broadband subscriptions still trail among disadvantaged groups such as persons of age, people of color, and the poor (Zickuhr & Smith, 2012, 2013).

Table 14 Home Broadband by Racial/Ethnic Category

	Home Broadband Connection		
Ethnic Group	no	yes	
White	29.42%	70.58%	100.00%
African-American	59.71%	40.29%	100.00%
Hispanic	41.64%	58.36%	100.00%
Asian-American	16.51%	83.49%	100.00%
other	20.87%	79.13%	100.00%
Total	34.46%	65.54%	100.00%
Uncorrected chi2(4) = 65.6556			
Design-based F(2.71, 3957.96)= 3.3453 P = 0.0222			

The inclusion of DSL into these aggregate figures brings home broadband access into sharper focus. Although some households without cable modem service do use DSL to access the Internet at relatively high speeds, it does not appear that African-American and

Hispanic households have a preference for DSL. Instead, the results largely suggest that while a good majority of white and Asian-American households have home broadband, only slightly more than half of Hispanic households and fewer than half of African-American households in Austin have home broadband. This indicates that sizable portions of these communities are not served with persistent connections at relatively high speeds.

H2h: Home broadband use is more common among higher-income groups.

Income is the other variable that produced statistically significant results for the home broadband analyses. As might be expected, home broadband subscriptions rose with income level since households with more income often have more money to spend after paying for housing, food, and transportation (National Telecommmunications and Information Administration, 1995, 1999, 1999; Zickuhr & Smith, 2013). However, as with the analysis of non-users of the Internet, more respondents who had income between $10,000 and $20,000 reported home broadband subscriptions than respondents in the next income bracket, $20,000 to $30,000. In fact, the 64% subscription rate among those with a household income of $10,000-$19,999 in 2009 is higher than even the next bracket up, $30,000 to $40,000, 54% of whom said they had home broadband service. Since Austin is a university city it seems likely these low-income respondents are students receiving support from family or the university. Although about half of lower-income household have broadband, it appears that this is an indication that the cost of broadband service presents a hurdle for households scraping by. In comparison, 78% of the highest-income group had home broadband.

Table 15 Home Broadband Access by Household Income

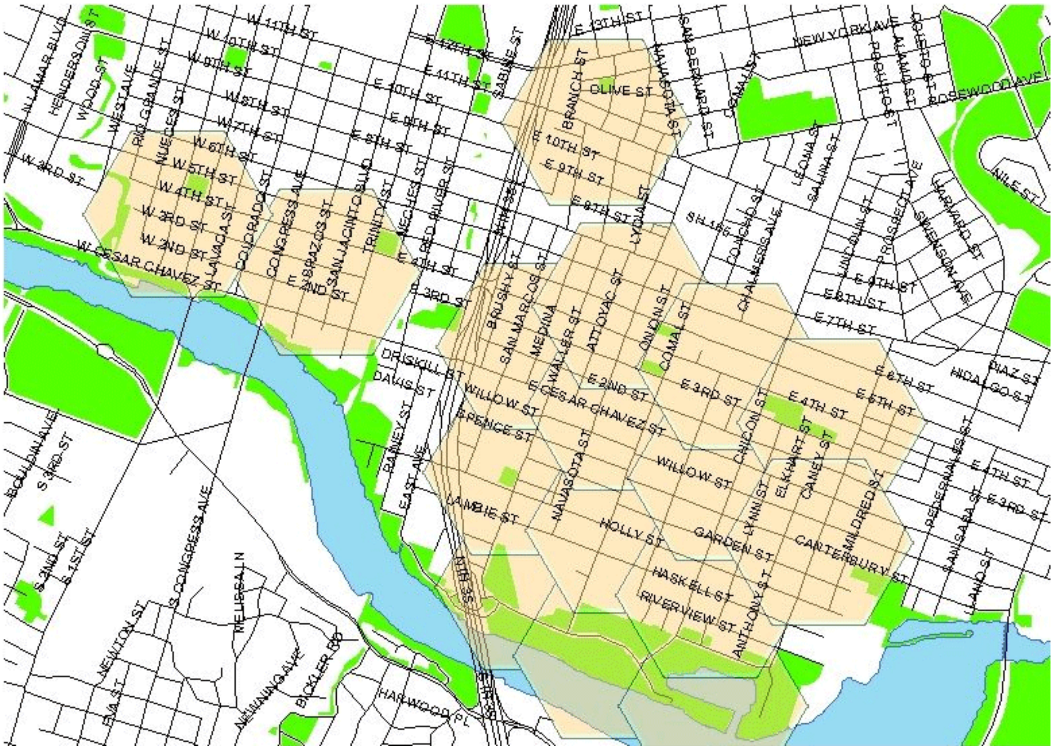
	Home Broadband Connection		
2009 Household Income	no	yes	Row Total
<$10,000	71.96%	28.04%	100.00%
$10,000	36.07%	63.93%	100.00%
$20,000	51.76%	48.24%	100.00%
$30,000	46.17%	53.83%	100.00%
$40,000	28.48%	71.52%	100.00%
$50,000	27.55%	72.45%	100.00%
$75,000	21.76%	78.24%	100.00%
No Answer	28.32%	71.68%	100.00%
Total	34.18%	65.82%	100.00%
Design-based F(3.71, 5369.06)= 4.1403 P = 0.0031			

H3: PUBLIC-ACCESS USE OF THE INTERNET THROUGH THE AUSTIN PUBLIC LIBRARY OR CITY OF AUSTIN WIRELESS IS MORE COMMON AMONG LESS AFFLUENT USERS AND MEMBERS OF MARGINALIZED GROUPS.

Public-access services to the internet such as the internet-connected machines at the Austin Public Library, as well as Wi-Fi access at the library and through the City of Austin public mesh network are often promoted as possibilities for offering internet access to populations who might otherwise lack access to it (Lentz et al., 2000; Servon & Nelson, 2001; Strover, 2004). Attention to who uses these services can further understanding of who may want access to the internet, but may lack access at home, as well as if these services are really serving people who might otherwise go without access.

As with the hypothesis on home broadband service, few of the analyses related to public-access Internet use yielded statistically significant results. The demographic identifiers that did produce statistically significant results were cultural capital and variables related to international migration. The cultural-capital index produced the greatest number of significant results for these hypotheses. Since the public-access services in Austin are largely linked to the public library system and government facilities, it is not surprising that respondents with high levels of cultural capital would be users of these systems, although these systems are often intended to provide Internet services to less privileged groups that may not otherwise have Internet access. (In particular, from its inception the free wireless network extended east of downtown, providing traditionally Mexican-American neighborhoods with Internet connectivity. Although the coverage area includes a few commercial corridors, particularly along Cesar Chavez, Sixth, and Seventh Streets on the eastside, the wireless network extends into primarily residential areas.) Similarly, public-access services were more commonly used by respondents born in the United States than among those born outside the US. Although the proportions are slim in each case, this may reflect a habitus with positive dispositions toward government services among those born in the US. The analysis of public-access use by the non-English media use revealed that a statistically significant proportion of respondents who used non-English media on an occasional basis were more likely to use either library services or public Wi-Fi.

Figure 1 Coverage Area of City of Austin Wireless Mesh Network



Although library computer use and public Wi-Fi use are somewhat different use contexts since library use – at least in theory – serves patrons without home computers and a laptop or mobile device is largely necessary to use open Wi-Fi, they are linked in policy discussions among city staff about providing Internet access to citizens. For this reason, these use cases were analyzed individually and in aggregate. Because public Wi-Fi requires a user to provide a laptop or other Internet-capable device, it does assume greater economic resources than using a computer provided by a library. However, since most of the public Wi-Fi spots are located in Austin libraries, in aggregate, these users are often drawn from the population of library patrons in Austin.

H3a: Public-access use is more common among users with greater cultural capital, measured by the aggregate of parents' education.

In general, as respondents' cultural capital index increased, use of Austin Wireless City services increased. Similarly, respondents with high cultural capital used either Austin Public Library Internet service or the city's wireless mesh network more often. A background high in cultural capital, such as highly educated parents, may lead to positive dispositions toward public institutions such as public libraries, City Hall, and public parks. It follows then that respondents who come from an educated family habitus would spend more time at these institutions and use the Internet at these locations. In addition, of course, it would be expected that these users would own notebook computers or other devices to connect to the wireless network. The results from the Austin Wireless Mesh network analysis were statistically significant with $p = 0.0024$. At the highest levels of reported cultural capital, about 14% of respondents used the city's wireless network. At the lower of the cultural-capital index, fewer than ten percent of respondents said they used the network, except for respondents who had one parent complete high school and one parent had less education. Slightly over ten percent of these respondents said they used the network.

In aggregate, reported use of public-access services is higher at the top of the cultural-capital scale, but, toward the bottom of the scale, comparatively large numbers of respondents used the Austin Public Library Internet service for access. The largest group of Library users were respondents scaled "3," indicating one parent had graduated high school and one had not, and the second largest group of Library users were respondents scaled "4" which indicated each of the respondents' parents graduated from high school. Respondents with greater cultural capital were less likely to indicate that they used library Internet services. This suggests that respondents with lower cultural capital visited the library not just to use its network connectivity, but also to use the computer hardware it provides. Analysis of library users shows that 27.7% of respondents who say they use the Internet at the library do not have computers at home with Internet connections, compared with 6.8% of all respondents. (Table 16) Similarly, 19.2% of the users of the municipal Wi-Fi service say they do not have internet-connected computers in the home. (Table 17) In contrast, respondents with greater cultural capital scores would be expected to have internet-connected computers in the home for work and educational purposes. These respondents would also be more likely to take advantage of the connectivity afforded by the Austin Public Wireless service. With this in mind, it appears that aggregating library users and public wireless users may be aggregating two user groups with very different characteristics.

Table 16 Internet-Connected Home Computers by Library Internet Use

	Internet-Connected Home Computer		
APL Internet	Yes	No	Row Total
Non-User	94.96%	5.04%	100.00%
User	72.29%	27.71%	100.00%
Total	93.22%	6.78%	100.00%
Uncorrected chi2(1) = 84.4581			
Design-based F(1, 1463) = 20.4093 P = 0.0000			

Table 17 Internet-Connected Home Computers by Municipal Wi-Fi Use

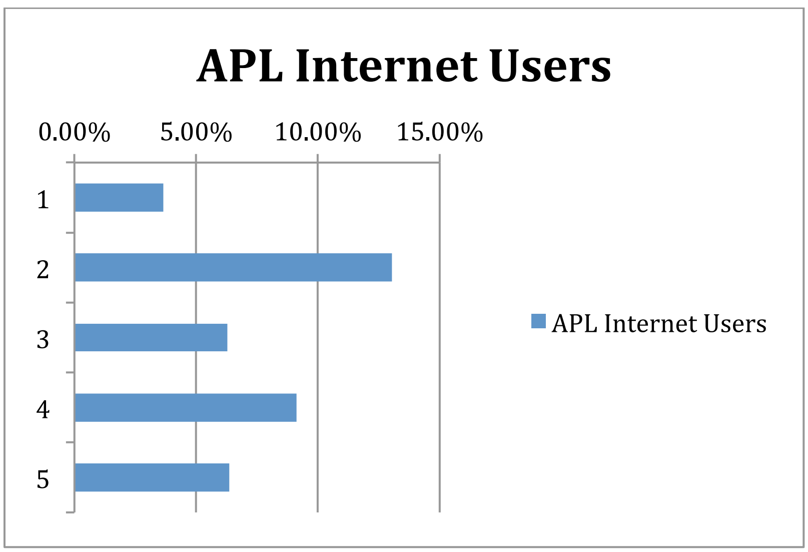
	Internet-Connected Home Computer		
CoA Wi-Fi	Yes	No	Row Total
Non-user	94.18%	5.82%	100.00%
User	80.73%	19.27%	100.00%
Total	93.22%	6.78%	100.00%
Pearson:			
Uncorrected chi2(1) = 27.5271			
Design-based F(1, 1463) = 5.9788 P = 0.0146			

Analysis of library Internet use and use of the municipal Wi-Fi network yielded statistically significant results when compared on a five-point cultural-capital scale. The results were mixed, however. Respondents coded "2," where parents' education averaged out to the level of high-school graduates, used the Internet at the library at the highest rate at 13%. The group that used the Internet at the library next most often was respondents coded "4," where the level of parental education averages out to that of a bachelor's degree. Out of these respondents, 9.12% used the Internet at the library. The groups who used the library services the least were in the category where neither parent finished high school or "3" where the parents' education averaged out to "some college" or trade school. Only 3.66% of those whose parents didn't finish high school used the Internet at the library. This would confirm the notion that those who grow up in less-educated environments are less likely to have a favorable disposition toward technology. However, the group right in the middle of the cultural capital index used library services at a low rate as well, 6.29%. This makes it difficult to draw firm conclusions about cultural capital and library use, although it does seem to suggest that public-library use declines with greater cultural capital, excepting the respondents who grew up in the least-educated environments.

Table 18 Library Use at Austin Public Library by Cultural Capital

	Austin Public Library Use		
Cultural Capital Index	No	Yes	Row Total
1	96.34%	3.66%	100.00%
2	86.96%	13.04%	100.00%
3	93.71%	6.29%	100.00%
4	90.88%	9.12%	100.00%
5	93.64%	6.36%	100.00%
Total	92.18%	7.82%	100.00%
Uncorrected chi2(4) = 21.2297			
Design-based F(3.62, 5034.51)= 2.6392 P = 0.0374			

Figure 2 Austin Public Library Internet Use by Cultural Capital



Results for the municipal Wi-Fi network were similar to the Austin Public Library where the respondents with a cultural-capital level of "3" used the wireless network at a substantially lower rate than respondents coded as "2" (high-school graduates) or "4" (college graduates). In general, though, the trend appears that respondents with greater cultural capital used the wireless network at a higher rate. In addition to having a positive disposition toward technology and possibly higher incomes – enabling them to purchase notebook computers – much of the wireless network is downtown, where many white-collar professionals are employed. Merely the location of the network may affect what kinds of people are using the system. Although the wireless network does cover a swath of East Austin, very few (0.71%) of the respondents who grew up in low-education environments said they used the system.

Table 19 Austin City Wi-Fi Use by Cultural Capital

	Austin City Wireless Use		
Cultural Capital Index	No	Yes	Row Total
1	99.29%	0.71%	100.00%
2	90.55%	9.45%	100.00%
3	96.20%	3.80%	100.00%
4	90.09%	9.91%	100.00%
5	85.36%	14.64%	100.00%
Total	92.70%	7.30%	100.00%
Uncorrected chi2(4) = 46.4222			
Design-based F(3.09, 4294.45)= 6.8500 P = 0.0001			

Because use of the wireless network generally increased with cultural capital while the group that used the library for internet access the most was on the low end of the cultural capital index, it is not clear aggregating the two services into a single “public access” variable makes sense. In the context of policy, the City of Austin and access advocates may want to treat these services very differently, given their differing user populations and use cases. Only about two-thirds of library Internet users used the municipal Wi-Fi service and vice versa. The analysis did yield statistically significant results, but mostly confirms that the respondents at the low end of the cultural-capital index used either service at a low rate, 4.01%, and that respondents in the middle of the index used the services at a lower rate than respondents in the adjacent categories.

Table 20 Aggregate Public-Access Use by Cultural Capital

	Public-Access Use Aggregate		
Cultural Capital Index	No	Yes	Row Total
1	95.99%	4.01%	100.00%
2	84.06%	15.94%	100.00%
3	90.88%	9.12%	100.00%
4	83.93%	16.07%	100.00%
5	81.73%	18.27%	100.00%
Total	87.64%	12.36%	100.00%
Uncorrected chi2(4) = 36.2896			
Design-based F(3.64, 5064.62) = 4.6710 P= 0.0014			

Although it is difficult to draw out broad trends in how cultural capital relates to the use of public-access internet services in aggregate, it does suggest that even no-cost internet services are interesting to persons who grew up in low-education environments. Because the services are free, the cash costs of internet subscriptions and – in the case of library services – computer equipment are not a barrier to internet use, although time and the ability to make meaningful use of the Internet may still be (Dijk, 2005; Robinson, 2009; Schradie, 2012; J. van Dijk & Hacker, 2003). Respondents with a slightly more educated background, those with a parent who graduated from high school, were the group that used the public library's Internet services the most. This would suggest that many in this group have some interest in going online, but lack the material resources for home computer access.

H3c: Public-access use of the Internet through the Austin Public Library or City of Austin Wireless is more common among recent migrants to the United States.

Although the initial hypothesis suggested that recent immigrants might be more likely to use free public services for Internet access, the data suggested otherwise. The initial hypothesis was based on the assumption that many immigrants in Austin may be working lower-paid service or construction jobs and lacks the material resources to have Internet access to the home. However, it appears that these groups use public-access services at lower rates than the general population – it may be the case that immigrants face a raft of obstacles to internet use that go beyond material resources such as lower education and language barriers. It may be the case as well that immigrant communities may lack positive dispositions toward technology or toward government services. (Rojas et al., 2012) These statistically significant results ($p = 0.0211$) presented in Table 21 and Table 22 indicates that respondents born outside the United States used public access services about half as often as the broader population. For the aggregate of both the Austin Public Library and the municipal Wi-Fi, respondents born outside the United States used these services at a weighted rate of 6.54%, while 13.5% of those born in the US used the services.

For the municipal Wi-Fi service only, the difference was even more dramatic. Among respondents born outside the United States, 2.26% used the wireless network, while 8.15% of the US-born used the service. ($p = 0.002$) Computer ownership does not appear to be a factor in the lower use of the Wi-Fi network among immigrants; although the results were not statistically significant, weighted results suggested that US-born respondents and respondents born outside the US owned laptops at roughly the same rate. The results for Internet use at the Austin Public Library were not significant, although it also suggested that respondents born in the United States used library services more frequently.

The difference in use of public-access Internet services between the US-born and those born outside the US does reflect the broader trend of Internet use among immigrants. Immigrants to the US were also less likely to have broadband in the home and more likely to not use the Internet at all. If Internet use is not integrated into the habits of this group, its members may be less likely to seek out public-access options for access.

Table 21 Aggregate Public-Access Use by Transnational Migration

	Public-Access Use Aggregate		
Immigration	no	yes	Row Total
US Born	86.50%	13.50%	100.00%
Born Outside US	93.46%	6.54%	100.00%
Total	87.73%	12.27%	100.00%
Uncorrected chi2(1) = 9.5116			
Design-based F(1, 1457) = 5.3310 P = 0.0211			

Table 22 Austin Public Wi-Fi Use by Transnational Migration

	City of Austin Wi-Fi Network		
Immigration	no	yes	Row Total
US Born	91.85%	8.15%	100.00%
Born Outside US	97.74%	2.26%	100.00%
Total	92.88%	7.12%	100.00%
Uncorrected chi2(1) = 11.1161			
Design-based F(1, 1457) = 9.7626 P = 0.0018			

H3j: Public-access use of the Internet through the Austin Public Library or City of Austin Wireless Network is more common among respondents who frequently use media in a language other than English.

Respondents who do not speak English or use other languages may be less likely to use public-access services since documentation and services may be offered only in English. (In particular, use of the municipal network requires clicking through a long user agreement in English.) In addition, frequent users of languages other than English may often be immigrants who are alienated or mistrustful of government programs, steering them away from public services. Because the survey instrument did not include an item asking respondents to identify if they primarily use a language other than English, analysis for language use is based on a three-point scale created from responses to questions related to foreign-language use. These responses were averaged into the scale which places respondents in the categories of "never" using media in a different language, "rarely," and using a language other than English on a "weekly or daily" basis. It was the intention of this scale to capture members of communities who speak Spanish or other languages, but it may also capture respondents with high education levels who, for example, regularly watch European art cinema or hear kirtan at yoga classes.

The analysis for the Austin Public Library item suggests that non-English media users in general use the APL internet services at greater rates than non-English media users, but the greatest rate of use are among those who "rarely" use non-English media. The rate among the "daily/weekly" users is also higher than respondents who "never" use non-English media. These results are significant at $p = 0.0303$, supporting the hypothesis. These results reinforce studies in other locations that suggest migrants are more frequent users of internet-related technologies and services since they use them to communicate with friends and family back home. However, research by Straubhaar, et al indicates Hispanic immigrants to Austin – particularly those who are less educated or older – rely on Spanish-language television for news from Mexico and inexpensive pre-paid phones for voice communication (Rojas et al., 2012).

Table 23 Austin Public Library Use by Non-English Media Use

Non-English Media Use	no	yes	row total
never	96.08%	3.92%	100.00%
rarely	89.04%	10.96%	100.00%
weekly/daily	91.09%	8.91%	100.00%
Total	92.26%	7.74%	100.00%
Uncorrected chi2(2) = 16.1405			
Design-based F(1.65, 2290.71)= 3.7898 P = 0.0303			

It appears to be the case that respondents who frequently use a language other than English used the Austin Public Library at lower rates than those who never or rarely used media in languages other than English. Repeating the analysis only for respondents who indicated they had visited a library branch in the previous twelve months showed that nearly a quarter of frequent non-English media users who did visit the library used internet services there, a higher rate than the other categories of library visitors. Respondents who rarely used non-English media also used Internet services at twice the rate of those who never used non-English media. These results are statistically significant at p = 0.0296, further confirming the hypothesis.

Table 24 Austin Public Library Internet Use by Non-English Media Use Among APL Visitors

Index of Non-English Media Use among APL visitors	no	yes	row total
never	0.9093	0.0907	1
rarely	0.8028	0.1972	1
weekly/daily	0.7671	0.2329	1
Total	0.8248	0.1752	1
Uncorrected chi2(2) = 17.7166			
Design-based F(1.72, 1225.10)= 3.7596 P = 0.0296			

This analysis suggests that the Austin Public Library's Internet services are valuable to persons who integrate non-English media into their daily lives. In addition to providing free access to computers and Internet connectivity, the APL also offers patrons support and training ("Computer Training | Austin Public Library," n.d.). In addition, libraries that serve significant immigrant populations also offer systems for language learning using software such as Rosetta Stone ("Language Learning Resources | Austin Public Library," n.d.). Using the Internet in this context may enable some patrons to make meaningful use of the Internet. However, it appears that regular users of non-English media may be less likely overall to visit the library, which may suggest that the library's services are unknown or intimidating to non-English speakers.

Analysis of language use and the city's free wireless network did not yield statistically significant results.

Aggregating both public-access services, the internet services at the Austin Public Library and the city's free wireless network did yield statistically significant results, ($p = 0.0263$) indicating that users of non-English media were more likely to use public-access services. Respondents coded as "rarely" using non-English media used public-access services at more than twice the rate of those who never used non-English media, 18.2% versus 8.66%. Frequent users of non-English media used public-access services at a slightly higher rate, 11.6%, than respondents who never used non-English media. This group was more likely to be non-users of the Internet, suggesting that a good slice of those who do go online use public-access services.

Table 25 Aggregate Public-Access Use by Non-English Media Use

Non-English Media Use	no	yes	row total
never	91.34%	8.66%	100.00%
rarely	81.83%	18.17%	100.00%
weekly/daily	88.42%	11.58%	100.00%
Total	87.67%	12.33%	100.00%
Uncorrected chi2(2) = 17.7166			
Design-based F(1.72, 1225.10)= 3.7596 P = 0.0296			

Taken together, these results would confirm the hypothesis that the users of non-English media (and presumably many non-English speakers) turn to public-access services for Internet use. In particular, this group may find services available at the Austin Public Library valuable because of the support and instructional services.

H4: USE OF THE INTERNET EXCLUSIVELY THROUGH PUBLIC-ACCESS SERVICES IS MORE COMMON AMONG LESS AFFLUENT USERS AND MEMBERS OF MARGINALIZED GROUPS THAN AMONG PRIVILEGED GROUPS.

A common rationale for offering public-access services such as those at libraries is that the services make the Internet available to members of society who otherwise would not have the resources to have Internet access. Internet services at libraries and community centers were one of the first efforts to address the digital divide, even when the “trickle-down” postulate dominated much of the policy discussion (Lentz et al., 2000; Servon & Nelson, 2001; Strover, 2004). The preceding analysis examined public-access use among all respondents. This analysis looks specifically at users who do not have home broadband and also use the Internet at libraries or through the municipal wireless network. As noted above, users of these public-access services were much less likely to have a computer at home connected to the Internet. (Table 16 and Table 17) Among library users, 27.7% said they do not have internet-connected machines at home, and 19.3% of users of the wireless network said they did not have computer access to the Internet at home. For members of the community that lack the means or the disposition to have internet service at home, these public-access services may fill in significant gaps in connectivity.

H4a: Use of the Internet exclusively through public-access services is more common among respondents with lower cultural capital.

Since non-use of the Internet is associated with lower cultural capital and home broadband generally increases with cultural capital, it was expected that public-access use of the Internet might be greater among respondents who report lower levels of parental education. Among these respondents there may be some who have some interest in using the internet – or learning to use the internet – but lack the disposition or means to purchase a computer for the home or subscribe to an internet service provider. In addition, respondents with less cultural capital may feel less confident about their ability to use the Internet and turn to public-access centers such as the Austin Public Library for support and instruction. As cultural capital increases, it would be expected that respondents consider an internet-connected computer in the home a necessity of daily life or important source of entertainment and information.

Analysis of the survey data yielded statistically significant results that indicate differences in public-access use that varied by cultural capital. It however, revealed that these differences were not clear-cut. (Table 26) Respondents with the lowest level of cultural capital, "1," indicating neither parent had completed high school, relied on public-access services at the lowest rate. After weighting, only 0.37% of respondents said they used APL or the wireless network, but did not have a broadband connection at home. Since low cultural capital is also associated with non-use of the Internet and low rates of home broadband connections, respondents in this category may often lack any interest at all in using the Internet (van Dijk, 2005; Rojas et al., 2004) In these cases, the crucial disposition toward technology necessary to begin using the Internet is lacking. In addition, respondents from low-education families may have skeptical dispositions toward libraries and other public institutions, which would steer them away from public-access services.

In contrast, the group that were exclusive public-access users at the highest rate was the group indexed "2," which indicated one or more parent graduated from high school, but no further. In these cases, parents may have just enough cultural capital to encourage a positive disposition toward technology, leading their children to seek out Internet use at the library or at school. Among this group, 10.77% reported using either the Austin Public Library or the municipal wireless network but did not have a home broadband connection. This may indicate that persons with slightly more educated backgrounds may have some interest in going online, but, again, may lack the resources to maintain home-broadband connections or desire a computer in the home. This group of users may also benefit from the additional support and training provided by the Austin Public Library.

Table 26 Cultural Capital and Exclusive Public-Access Use

	Exclusive Public-Access Use		
Index of Parent's Cultural Capital	no	yes	Row Total
1	99.63%	0.37%	100.00%
2	89.23%	10.77%	100.00%
3	97.19%	2.81%	100.00%
4	96.08%	3.92%	100.00%
5	95.31%	4.69%	100.00%
Total	95.41%	4.59%	100.00%
Uncorrected chi2(4) = 41.8996			
Design-based F(3.43, 4779.87)= 6.2060 P = 0.0002			

At the higher levels of cultural capital, which indicate one or more parent had some post-secondary education, exclusive public access use increased with cultural capital. Among respondents indexed “5,” which indicates both parents had graduate or professional degrees, 4.69% used public-access services without a home broadband connection, a rate higher than the overall rate of 4.59%. In this high cultural-capital group, those who have the cultural capital but lacked home access were more motivated to use public-access services. This may indicate positive dispositions toward libraries and other public-access services among those from educated backgrounds. It may also indicate that respondents from highly educated families recognize the utility of using the

Internet, although it is not important enough to them to subscribe to home broadband services.

Despite the higher rate of use of public-access services among respondents from the most educated families, the data suggests that exclusive public access use is most common among respondents from less-educated families. The data does not reveal a clear trend, but does suggest that the public-access services do serve respondents who might otherwise do without any Internet service.

H4c: Use of the Internet exclusively through public-access services is more common among respondents born outside the United States.

At the outset, it was hypothesized that immigrants would be more likely to use public-access services than the broader population, but as the analysis above suggested, immigrants are generally less likely to take advantage of these services. Still, since immigrants use the Internet at lower rates than the US-born, it might be the case that some without home broadband connections might turn to public-access services to some extent. This analysis, while statistically significant, showed that this is not the case. Very few immigrants use the Austin Public Library or the municipal wireless network if they do not have a home connection.

Table 27 Exclusive Public-Access Use Among Immigrants

	Exclusive Public-Access Use		
Immigration	no	yes	Row Total
US-Born	94.80%	5.20%	100.00%
Born Outside US	98.86%	1.14%	100.00%
Total	95.52%	4.48%	100.00%
Pearson:			
Uncorrected chi2(1) = 8.1299			
Design-based F(1, 1457) = 6.5404 P = 0.0106			

In addition to limited resources or a poor disposition toward technology, immigrants may be less apt to turn to public-access services because they lack the *social* capital to make meaningful use of the Internet. Although the web can provide a great deal of information, one of the draws of the Internet, particularly among new users in Austin, is the ability to communicate with friends and family. Although the Internet might provide a means to stay in touch with the home country, if a person's contacts are not Internet users, this attraction of the Internet is moot. In addition, these respondents may have negative dispositions to public institutions such as libraries and the wireless network. Although the original hypothesis was not supported, the data shows a distinct difference in exclusive public-access use among immigrants.

H4h: Use of the Internet exclusively through public-access services is more common among less affluent users.

Income did not prove to be a significant independent variable for most of the analyses related to Internet use, but for exclusive public-access, it was. This is not entirely surprising since one of the rationales for public-access services is that they offer the ability to go online to those who could not otherwise afford Internet access. Public-access services address the material costs by offering connectivity and, often, equipment to free to the public. Analyzing the exclusive use of public-access services by income does show that lower-income respondents do use these services at greater rates than respondents with greater household incomes.

Table 28 Exclusive Public Access by Income

	Exclusive Public-Access Use		
Household Income	no	yes	Row Total
< $10,000	93.59%	6.41%	100.00%
$10,000-$19,999	91.53%	8.47%	100.00%
$20,000-$29,999	89.63%	10.37%	100.00%
$30,000-$39,999	96.26%	3.74%	100.00%
$40,000-$49,999	95.07%	4.93%	100.00%
$50,000-$74,999	97.33%	2.67%	100.00%
$75,000+	98.21%	1.79%	100.00%
Total	95.38%	4.62%	100.00%
Uncorrected chi2(6) = 28.9838			
Design-based F(4.95, 6281.92)= 3.0188 P = 0.0103			

Respondents with household income less than $40,000 a year were more likely to rely on public-access services to go online. The rates of exclusive public-access use went down as income went down from $40,000, but were still higher than other income brackets. Two factors may account for the decline in use with lower income. First, these respondents with very low incomes may lack the inclination or skills to go online, so they eschew public-access services. Secondly, Austin has a high student population, so respondents in the lowest income brackets may be students who have other ways to go online (such as at the university) or can afford Internet subscriptions because of parental support. Indeed the lower income categories have higher numbers of respondents indicating that they are students.

Table 29 Student Status by Income

Student Status by Income			
Household Income	Non-Student	Student	Row Total
< $10,000	96.08%	3.92%	100.00%
$10,000-$19,999	78.80%	21.20%	100.00%
$20,000-$29,999	81.72%	18.28%	100.00%
$30,000-$39,999	97.01%	2.99%	100.00%
$40,000-$49,999	91.56%	8.44%	100.00%
$50,000-$74,999	95.57%	4.43%	100.00%
$75,000+	93.82%	6.18%	100.00%
Total	91.32%	8.68%	100.00%
Pearson:			
Uncorrected chi2(6) = 59.7371			
Design-based F(4.12, 5234.52)= 3.3007 P = 0.0096			

As shown in Table 29, about a fifth of respondents with household income between $10,000 and $30,000 a year are students, which would suggest that they either have other ways to access the internet or some parental support allowing them to afford home internet access. This could explain why public access-use decreases with income below $30,000 annually. In the sub-$10,000 bracket, many respondents are not students, but they may be older or less-educated persons who lack interest in going online. Despite the low use among respondents in the lowest income category, public access services such as those provided by the Austin Public Library and the municipal wireless network do appear to serve low-income persons in Austin.

H5: MOBILE INTERNET USE IS MORE COMMON AMONG PRIVILEGED GROUPS LIKE WHITES, THE WELL-EDUCATED, AND THE AFFLUENT.

Although mobile Internet use through mobile phones and computer adapters was a fairly mainstream technology by 2010 – Apple's enormously popular iPhone was released in 2007 – it was not used by a majority of users at that time. According to the Pew Internet and American Life Project, only 35% of respondents owned a smartphone in May 2011, several months after the Austin study was conducted (Pew, 2013). Mobile internet use carries significant costs– both in terms of hardware and wireless subscription costs – that can add up to a thousand dollars a year or more. With this in mind, it would be expected that more affluent respondents would be more likely to use mobile Internet services. Although the data from this survey suggested this general trend, it did not yield statistically significant results, However, because of the cost of these services, at this time it was likely that mobile users were those who had a strong desire to access the internet on the go, such as white-collar professionals who wanted to stay in touch with email or technophiles. These situations would be linked to higher social status such as education level and cultural capital (Robinson, 2011; Rojas et al., 2004; Schradie, 2012). In addition, younger users would be expected to use mobile Internet in greater numbers than older users both because of broader age-related trends with technology and because of different lifestyles.

To measure mobile Internet use, data from two variables were aggregated. If a respondent reported using a mobile phone to access the Internet or using a high-speed wireless service such as WiMax or 4G data services, the users were coded as mobile users in a dichotomous variable. Analyses for cultural capital, education, and age all showed statistically significant relationships between those factors and mobile Internet use, while ethnicity, migration history, gender, income, and language use did not. This suggests that in 2010 at least that mobile Internet was largely the domain of relatively elite groups of users. Two factors may suggest why income did not yield statistically significant results. First, a low response rate to the income survey item – in addition to the lack of granularity of response items at the higher end of the income scale - it topped out at $75,000 or more per year

H5e & H5f: Mobile Internet use is more common among younger respondents than older respondents.

Since Internet use in general tends to have an inverse relationship with age, it is expected that mobile Internet use would be less prevalent among older respondents. In addition to the other factors leading younger users to use the Internet more, younger users are apt to have lifestyles that take them out of the home or workplace, making the ability to check messages and retrieve information on the go attractive.

This hypothesis was borne out in the data from the 2010 survey. The difference between younger users and older users was dramatic whether age was categorized by generation or by age group. Dividing respondents by the generational categories outlined by Strauss and Howe (1992), showed a split between respondents born in the Baby Boom years and older with younger respondents. Among members of Generation X, 60.3% of respondents reported using mobile Internet, along with 57.2% of Millenials. In contrast, 36.2% of younger boomers and 23.3% older boomers, most of whom would still be of working age in 2010, reported using mobile Internet services. Very few respondents of the Silent Generation or the G.I. Generation reported using mobile Internet, at 14.8% and 5.57%, respectively.

Table 30 Mobile Use by Social Generation

Generation	no	yes	
Millennial	42.76%	57.24%	100.00%
Generation X	39.67%	60.33%	100.00%
Younger Boomers	63.79%	36.21%	100.00%
Older Boomers	76.67%	23.33%	100.00%
Silent Generation	85.17%	14.83%	100.00%
GI Generation	94.43%	5.57%	100.00%
Total	52.42%	47.58%	100.00%
Uncorrected chi2(5) = 157.3773			
Design-based F(1.91, 2789.82)= 12.6859 P = 0.0000			

Categorizing respondents by age revealed a similar split. More than half of respondents under age 45 reported using mobile Internet services, while fewer than half 45 or older used mobile Internet with use rates declining with age. Up to age 44, use of mobile internet service actually increased with age with 53.8% of respondents age 18-24 saying they used mobile internet, 59.32% of respondents 25-34, and 60.12% of respondents 35-44%. The lower use rates among the youngest respondents is likely due to lower income – with less money, these respondents were likely to subscribe to mobile internet services. Among older users, only 38.2% of respondents age 45-54 said they used mobile internet, and as retirement age approached, respondents were much less likely to report using mobile internet with 24.78% of those 55-64 and 10.9% of those 65 or older saying they used mobile internet services. This parallels findings by the Pew Internet and American Life Project that indicate older Americans are less likely to use mobile Internet services. (Smith, 2012, 2010)

Table 31 Mobile Internet Use by Age Range

Age in 6 Categories	no	yes	Row Total
18-24	46.42%	53.58%	100.00%
25-34	40.68%	59.32%	100.00%
35-44	39.88%	60.12%	100.00%
45-54	61.82%	38.18%	100.00%
55-64	75.22%	24.78%	100.00%
65+	89.13%	10.87%	100.00%
Total	52.42%	47.58%	100.00%
Pearson:			
Uncorrected chi2(5) = 154.6118			
Design-based F(1.64, 2404.08)= 4.8169 P = 0.0127			

Factors that limit technology use seem to be compounded among older respondents when it comes to mobile Internet use. In addition to perhaps having less active lifestyles, older users may be retired, giving them little reason to stay on top of work email, or the small size of the devices may make it difficult to see smaller text or manipulate touch-screen interfaces. Conversely, younger users may have work or social demands that push them to check email and other services when they are away from the home or office, driving up mobile Internet use in the younger age categories.

H5h: Mobile Internet use is more common among members of affluent households than members of lower-income households.

In 2010 when this survey was administered, smartphone use and data plans were a common amenity to wireless plans, but not as pervasive as they are today. Since smartphone handsets and data plans were and are often expensive, it is hypothesized that members of lower-income households use mobile Internet services at lower rates than higher income households. Although more recent research suggests that low-income users have turned to smartphones as a way to go online without the expense of owning a computer or paying an ISP subscription, it still seems likely that mobile Internet use would be more common among more affluent Austinites.

Although analysis produced results that are statistically significant once "no answer" responses were removed, there appears to be no particular pattern relating mobile Internet use to household income. The highest-income category, respondents with a household income over $75,000 in 2009, unsurprisingly had the highest rate of mobile Internet use at 59.65. However, two lower-income categories, households with incomes less than $10,000 and households with incomes between $20,000 and $29,999 in 2010 also had high rates of use. These results are statistically significant where p = 0.0387.

Table 32 Mobile Internet Use and Household Income

Income	no	yes	Total
<$10,000	48.45%	51.55%	100.00%
$10,000	68.69%	31.31%	100.00%
$20,000	41.88%	58.12%	100.00%
$30,000	66.63%	33.37%	100.00%
$40,000	58.48%	41.52%	100.00%
$50,000	45.16%	54.84%	100.00%
$75,000	40.37%	59.63%	100.00%
Total	47.94%	52.06%	100.00%
Uncorrected chi2(6) = 49.6991			
Design-based F(4.24, 5379.25)= 2.4790 P = 0.0387			

As noted in previous sections, the high student population of Austin may distort technology-use results by income. Respondents in these lower-income brackets with high mobile use may be relying on support from parents (or university financial aid) to fund their mobile telephony subscriptions. Also, because the survey question asked respondents about household income, some households in middle-income brackets may be households with two or more jobs (and two or more people) resulting in a higher household income with less individual spending money than persons in lower income categories. Although these results are statistically significant, they are inconclusive.

H5i: Mobile Internet use is more common among persons with higher levels of education than those with lower levels of education

As with age, there was a clear split in mobile Internet use when respondents were grouped by educational attainment. Over half of respondents with some post-secondary education said they used mobile Internet services, while substantially fewer respondents with less education used mobile Internet services. It was expected that better-educated respondents would use mobile Internet services at a greater rate than those with less education, and this is largely the case with the 2010 data. However, mobile internet use did not increase up after a point: respondents with graduate or professional degrees used mobile internet services at about the same rate as respondents with post-secondary technical training or some college. The group reporting the largest rate of mobile Internet use was those with a four-year degree only. This may be a function of the occupational roles of these respondents. Professionals and academics may have had less imminent need to monitor email and other online communication on the go, while those with college degrees may work in sales or managerial roles that require them to be away from the office.

In contrast, fewer than half of respondents with a high-school diploma or less education used mobile Internet services. Although income did not prove to be a significant independent variable in mobile internet use, income differences may have some explanatory role here: persons with less education tend to make less money, so they would have less money to spend on mobile subscription fees. In addition to the material facets of mobile Internet use, however, respondents with less education may lack a disposition toward technology use.

Breaking out respondents by students and non-students did not yield statistically significant results. It did, however, reveal some differences between respondents who indicated they were students and those were not, particularly when educational attainment is taken into account. In general, students reported using mobile Internet at a much higher rate than non-students. Slightly less than half of non-students (46.7%) reported using mobile services while the majority of students (67.7%) said they used mobile Internet. This analysis was statistically significant with $p = 0.0379$. Recategorizing educational attainment by putting students in separate, parallel categories suggested student respondents boosted mobile use rates for some categories of educational attainment. In particular, rates were quite different for respondents in the "some college" category where 77% of respondents who were students and had "some college," presumably undergraduates, used mobile Internet, while 49% of non-students in the "some college" category used mobile Internet services. Unfortunately, these results were not statistically significant, but it does suggest that mobile Internet use is greatest among college graduates or future college graduates.

Table 33 Mobile Internet Use by Education

	Mobile Internet Use		
Education	no	yes	total
Less than high school	77.51%	22.49%	100.00%
High school diploma	60.66%	39.34%	100.00%
Technical/Some College	46.38%	53.62%	100.00%
4-year university	41.61%	58.39%	100.00%
Graduate/Professional Degree	46.35%	53.65%	100.00%
Total	52.42%	47.58%	100.00%
Uncorrected chi2(4) = 93.4939			
Design-based F(1.85, 2704.77)= 3.2356 P = 0.0433			

The greater mobile-use rate among students further suggests that education is linked to positive dispositions toward technology use. Persons pursuing an education or completed degrees are more likely to have been exposed to technology for both instrumental and recreational uses and feel more comfortable using and trying new technologies. Mobile Internet, which at the time was still relatively new, is one area where technology use reflects differences in education.

H6: Exclusive Mobile Internet use is more common among less-privileged groups such as those with low incomes or education.

Although mobile Internet use was first seeing widespread adoption in 2010, it was expected that exclusive mobile Internet use – mobile users with no broadband connection at home – would be more common among lower-income and less-privileged users. This is because a mobile phone is a necessity for many people in the contemporary US, so members of groups who limited interest in using the internet would still have mobile phones, perhaps with a data plan, but not pay for a high-speed internet connection to the home. As smartphone ownership increases, the number of people using mobile devices as their primary point of access to the Internet may increase. More recent data from the Pew Internet and American Life Project indicates that 17% of mobile-phone owners primarily access the Internet through their phones (Smith, 2012). Concern about this use case has emerged because smartphones often lack the affordances of general-purpose computers; people who rely on their phones for Internet access may be constrained in what information they can access or services they can use by carriers or the limitations of the device (King, 2011).

For this analysis, respondents who reported using mobile Internet services, but reported having no home broadband connection were coded as mobile-only users. After weighting, this group represented 2.7% of respondents. In terms of raw numbers, only 26 out of 1464 respondents said they used mobile Internet services exclusively. None of these users used dial-up or another home Internet connection. Analysis for additional points of access revealed one statistically significant relationship: mobile-only users were more likely to use the internet at an Austin Public Library than other respondents. While only 7.67% of the general population uses the library for Internet access, the analysis showed that 38.7% of the mobile-only group used the library, compared with 6.83% of other users. ($p=0.0034$) No respondents reported using mobile Internet while using dial-up at home. This would suggest that many of the mobile-only users had some desire to access the Internet, but did not have broadband connections at home because of economic or other constraints.

Analyses of mobile-only Internet use were not statistically significant for cultural capital, ethnic group, age, gender, income, education, or language use. This may be due to the small number of respondents that fall into the "mobile-only" category. Analysis based on migration patterns did provide statistically significant results for both comparing immigrants to non-immigrants and a comparison of users based on generation of immigration.

H6c: Mobile-only use of the Internet is more common among immigrants from other countries than respondents born in the United States.

It was expected that persons born outside the United States would be more likely to use mobile Internet services exclusively than personals born in the United States, but this was not the case for the data collected in 2010. Only a slim percentage of respondents used mobile internet without having a home broadband connection (2.66%), and among immigrants to the US, only 0.24% of respondents said they used mobile internet services without a home internet connection. This was less than the percentage of respondents born in the US in this category, 3.18%, so the US-born were more likely to rely on mobile devices for Internet connections. These results were statistically significant at $p = 0.0016$. One explanation is that the cost of mobile-phone service is prohibitive for immigrants. The data, while not statistically significant, suggests that is not the case. Mobile-phone ownership among immigrants (91.2%) was comparable to the US-born (92.5%), as was smart-phone ownership, which was 47.5% for immigrants and 48.5% for the US-born. The nearly equal ownership rates likely accounts for the lack of statistical significance of these results. Instead, cultural factors such as a lack of interest in using the Internet or few social contacts online keep some migrants to the US from using mobile devices to go online; these potential users lack dispositions that would lead them to use the Internet on mobile devices.

Table 34: Exclusive Mobile Internet Use by Migration

	Mobile Internet Use Exclusively		
Migration	No	yes	Row Total
US-Born	96.82%	3.18%	100.00%
Born Outside US	99.76%	0.24%	100.00%
Total	97.34%	2.66%	100.00%
Pearson:			
Uncorrected chi2(1) = 7.0384			
Design-based F(1, 1457) = 10.0001 P = 0.0016			

H6d: Mobile-only use of the Internet is more common among respondents with recent immigration histories.

It was also hypothesized that respondents with recent immigration histories – those whose parents or grandparents recently immigrated to the US – would also be more apt to rely on mobile devices for Internet access. This was the case for second-generation immigrants, persons with a parent born outside the US, but not for third-generation immigrants, those whose parents were born in the US yet had a grandparent born outside the US. Second-generation immigrants were more than three times likely than most respondents to go online with mobile devices with no home Internet connection. Among second-generation immigrants, 8.26% said they accessed the Internet from mobile devices and had no home connection, while 2.65% of respondents with no recent immigration history had this use profile. In contrast, third-generation immigrants, 1.74%, were less likely to fall into this category than the typical respondent or those with no recent immigration history. These results were statistically significant with $p = 0.0480$. Although analysis for home broadband connections and immigration history were not statistically significant as a whole, a test of significance between second-generation and third-generation immigrants was successful where p = 0.05. While only slightly more than half (52.1%) of second-generation immigrants had home broadband, nearly two thirds (74.8%) of third-generation immigrants had broadband subscriptions. Because third-generation immigrants were more likely to have home broadband, it is possible that these respondents were less likely to rely on mobile devices for Internet.

Table 35: Exclusive Mobile Internet Use by Immigration History

	Mobile Internet Use Exclusively		
Family Immigration History	No	Yes	
No recent history	97.35%	2.65%	100.00%
First Generation	99.76%	0.24%	100.00%
Second Generation	91.98%	8.02%	100.00%
Third Generation	98.26%	1.74%	100.00%
Total	97.35%	2.65%	100.00%
Uncorrected chi2(3) = 25.3544			
Design-based F(1.99, 2910.09)= 3.0456 P = 0.0480			

H7: MEMBERS OF PRIVILEGED GROUPS SUCH AS WHITES AND THE BETTER EDUCATED WILL USE MORE FORMS OF ACCESS THAN MEMBERS OF MARGINALIZED GROUPS.

This hypothesis was developed with the expectation that in addition to having superior access to the Internet, such as home broadband, privileged groups would use more types of access. While some types of access are, for all intents and purposes, mutually exclusive since it is unlikely a user would subscribe to both DSL and cable modem, highly-connected users may avail themselves of home broadband, internet data on a smartphone, and occasionally use the municipal Wi-Fi network. It seemed likely that this multi-modal use would track with privileged groups; those with better education, income, or cultural capital would be more apt to connect to the Internet.

To test this hypothesis, I constructed an index aggregating affirmative results for the access technologies measured by the survey. The items were DSL, cable modem, mobile, Wi-Fi, 4G or WiMax[4], the City of Austin of wireless network, and internet service at the Austin Public Library. This resulted in a scale that ranged from zero to seven. Responses from respondents ranged from zero to five – no respondent used all seven types of access – and a weighted mean of 1.90. To test the internal reliablity of this index, I used the Kruder-Richardson coefficient of reliability (KR20) since Cronbach's Alpha is not an appropriate test statistic for binary variables. The result of the KR20 test was 0.3029, indicating that there is little covariance among the variables aggregated. This suggests that the index does not describe access use in the population. Most respondents used only one or two types of access.

In an effort to get a better index of different types of access, I created a second index, which substituted an aggregate "home broadband" variable for the DSL and cable modem variables since DSL and cable modem are nearly mutual exclusive.[5] This yielded a scale ranging from zero to six with responses ranging from zero to six, as was the case with the original scale. Testing the reliability of this index gave a KR20 coefficient of 0.4614, which is still an unacceptable value under typical index-construction practices. Further efforts to improve the reliability of the index by removing variables from the index that had few affirmative responses only slightly increased the KR20 coefficient, none of which pushed it above 0.7, which is threshold for the minimum acceptable range.

[4] The wireless carrier Sprint and its resellers sell WiMax as a 4G service.

[5] Out of the respondents, 17 indicated they had both DSL and cable-modem service at their residences. This may indicate confusion among respondents between the two technologies or the survey instrument did not appropriately address services like AT&T's UVerse, which offers both cable and broadband internet services from a telephone carrier.

Because of this lack of internal consistency, an index of access technologies does not appear to be an appropriate way to measure technology use in Austin. Means of the technology index did yield statistically significant results for analyses based on cultural capital, education level, ethnicity, age, and income. With the exception of age, each of these analyses showed that privileged groups tended to use more access technologies than less privileged groups. The analyses for age were statistically significant for both age ranges and the Pew generations with the results for the Pew Generations more clear cut. Members of Generation X used the greatest number of devices on average, followed closely by Millennials. Use tapered off with age starting with "Younger Boomers." With the explosion of smartphone use since the survey was administered it seems possible that a statistically useful index of this type could be developed.

H8: MEMBERS OF PRIVILEGED GROUPS SUCH AS WHITES AND THE BETTER EDUCATED WILL USE MORE TYPES OF COMMUNICATION DEVICES THAN MEMBERS OF MARGINALIZED GROUPS.

This hypothesis had similar motivations to the access-technology analysis described in the preceding section. Affluent respondents or better educated respondents, for example, would be expected to use more types of devices such as computers, game consoles, or smartphones than less affluent or educated respondents. In addition to having more material resources for purchasing gadgets, these groups might be more inclined to acquire and use them out of positive dispositions toward technology.

To measure this hypothesis, I constructed an index summing affirmative responses to survey items asking if the respondent owned or used various devices. There is something of an epistemological issue with aggregating these survey items, however. For example, some questions ask whether a device, such as an internet-connected game console, is present in the respondent's home. These items don't necessarily ask whether the respondent uses the device, so a father may have a game console at home for his daughter, but he may not use it himself. Because of the way the question was framed, the correct answer would still be yes. Other questions asked directly about use such as "Do you use a smartphone?" Regardless, affirmative answers for the items for internet-connected game consoles, desktop computers, laptops, mp3 players, wireline phone, mobile phone, and smartphones were summed into an index that ranged from zero to seven with seven indicating that the respondent had personal access to each of the devices.

Regardless of the epistemological issue described above, this index appears to be a poor measure of technology use for a statistical reason. As with the access-technology index, the device index also suffered from poor internal consistency. Analysis with the Kruder-Richardson formula 20 provided a KR20 coefficient of 0.4689, showing that the affirmative responses to device use had little relationship with each other. This makes the device index a questionable way to make generalizations about device use in Austin. Mean analyses for cultural capital, education, ethnicity, age, and income were statistically significant, but the unsuitability of the index for the analysis makes these analyses moot. In general, more privileged groups used more devices than less privileged groups, although there was some variation among the younger respondent groups and at the lower end of income. As with the access technologies, a more targeted series of survey items might yield a statistically useful index of device use for similar studies in the future.

DISCUSSION

In general, the results of this chapter reinforce the working assumption that members of privileged groups are more likely to use the Internet and have more ways to access it. In some ways, the results that were not significant were more revealing than the ones that were. For example, none of the analyses involving gender were statistically significant and the results suggested that women and men at least had access to the Internet at largely equivalent rates. Similarly, the income variable was not significant in many of the above analyses suggesting that those with even modest means subscribe to Internet service if their budgets allow it – it's no longer a luxury for the affluent. This, however, suggests that internet use is also integrated into the daily life of mainstream Austinites, so access to the Internet may be a necessity for participation in the life of the community, as Kleine (2013) suggests, following Sen (1992).

The premise of this study is that the cultural environment largely determines an individual's decision whether or not to use the internet, and the number of analyses where cultural capital, operationalized as an index of parents' education, played a significant role reinforces this framing of internet use and non-use. It is quite revealing, then, that the cultural capital index resulted in the greatest number of statistically significant analyses of the demographic categories used for analyzing access. Since parents' education apparently plays a greater role in internet-use decisions – even more so than the respondents' own educations – it appears that the environment in which a person grows up influences technology decisions as an adult. Other demographic factors that led to several statistically significant results might further confirm the notion that cultural environment influences technology-use choices. Transnational migration was a significant independent variable in many of the analyses, suggesting that persons who grew up outside of the technofetishism of mainstream US culture may have a different disposition toward technology use; even in the cases where the less-privileged group might have been expected to use a technology such as public-access services or mobile internet, it was generally the case that this group used the technology at a lower rate than the broader population. Ethnicity also played a significant role in many of the analyses.

Apart from transnational migration and ethnicity, however, some of the historic concerns about the digital divide such as use among women and older persons did not seem to be as much as a factor in this data. Technology use, as it was measured by this survey, was roughly equivalent between women and men, and although age was a significant independent variable in three of the analyses, gaps in use only seemed to appear among respondents who were well past the prime working years, suggesting that those exposed to internet use in daily life largely integrated the technology into their practices.

Use of particular access technologies is a fairly crude way to measure meaningful use of the Internet, though. Although these results point to some differences in Internet use based on demographics, following sections will refine the analysis to further understand the relationships between technologies, culture, and use of the Internet.

Chapter 6: Sites of Access and Demographics

Where people access the Internet may matter as much as what technology they use to access it. Using the Internet in particular places suggests particular use cases – home use suggests entertainment or use for personal business while use at work suggests use for business communication or research (Hargittai & Hinnant, 2008; Robinson, 2009). These sites of access may also have different affordances such as the amount of latitude a user has in exploring the Internet or support from peers or technical staff in learning to use the Internet. By examining the sites of use, this project further situates Internet use in its broader social context, It also complicates the question of "who has access to the Internet?", which often leads to binary formulations like "the digital divide," and instead asks "where do people have access to the Internet?" (Eubanks, 2007; Hargittai, 2002; Livingstone, 2005; Wyatt, 2005). Asking this question can provide a better sense of the habitus of Austinites as it relates to technology. It is one thing to have access to the Internet, but it is not clear that the simple presence of an Internet connection in an individual's life – even in the home – means that Internet use is part of an individual's daily life. In Bourdieu's concept of the habitus, (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984; Lash, 1993) lived experience influences both the dispositions and cultural capital of an individual. If Internet use is a core part of an individual's lived experience, he or she is more likely to develop techno-capital through repeated use of the Internet and persistent exposure to it. The presence of the Internet in multiple contexts may likely mean an individual uses the Internet for different means – if an individual only encounters the Internet at school or the library, he or she may regard it as an elaborate reference tool or if an individual only accesses in the domestic sphere, it may be seen largely as a source of entertainment. Different use contexts may lead individuals to learn multiple ways to use the Internet to achieve life goals and, further, explore the Internet as a way to achieve life goals, forming techno-capital.

The initial design of this project indicated creating an "access index," which would aggregate affirmative responses to items in the question asking "where do you access the Internet?" into a six-point scale. At the outset, the working hypothesis is that multiple sites of access were additive, in aggregate themselves comprising a type of capital, perhaps "access capital." These sites of access were:

- Home
- Work
- School or university
- Austin Public Library
- Coffee shop
- Home of a friend or family

Unfortunately, results of the Kruder-Richardson Formula 20 (KR20) used to test internal consistency indicated that this index did not have enough internal reliability to be useful. The KR20 coefficient for this index was 0.5863, which is well below the acceptable range. This is partly due to the fact that some access contexts were used by a slim proportion of the population and other sites, such as work and school, were nearly mutually exclusive. To address the issue of practical exclusivity, these sites of access were first aggregated into three binary variables that suggest three primary contexts of use. The variables were coded as a "1" if a respondent had access in any of the contexts measured by the variable and coded as a "0" if a respondent did not have access in any of the individual sites of access. For example, a respondent would be coded as "1" if she had access at school, work, or work and school. This coding scheme assumes that, for full-time students, school access is much the same as work access. These were the following:

- **Domestic**: the respondent's own home or the home of a friend or family member
- **Institutional**: access provided at work or school.
- **Public**: access provided to the public by the Austin government, namely access at the Austin Public Library or through the free Wi-Fi system.

These three binary variables were then aggregated into a three-point access index. Although the hope was that this new index would have greater internal consistency, the KR20 coefficient was actually lower, 0.4014. This led to the conclusion that an access index would not be a good descriptor of Austinites' habitus or capital as it relates to technology.

Because of the relevance of sites of access to this projects' interest in the broader social context of Internet use, I ran individual analyses for each of these use contexts, domestic, institutional, and public. These resulted in many statistically significant and interesting results about where and how Austinites use the Internet. The results for public-access contexts are presented in Chapter 5. The results for domestic and institutional access, along with results for coffee-shop use only, are presented below. These results bring the differences between the Internet use among Austinites into sharper focus, suggesting, broadly, that while the majority of Austinites have access at home, access outside the home is often contingent on social privilege.

H9: MEMBERS OF PRIVILEGED GROUPS SUCH AS WHITES AND THE BETTER EDUCATED ARE MORE LIKELY TO USE DOMESTIC SITES OF ACCESS EITHER AT THEIR OWN HOMES OR AT THE HOMES OF FRIENDS OR FAMILY.

Access to the Internet at home is often considered the most important site of Internet use (FCC, 2010; Robinson, 2009). It is in the home, it is assumed, where users would be most free to explore content online and conduct personal business such as paying bills or making travel arrangements. In this project that focuses on the broader social context of Internet use, domestic Internet use is particularly important since the domestic sphere comprises a substantial component of the habitus, the set of lived experiences of an individual (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984; Calhoun, 1993; Lash, 1993). Studies have linked the concept of habitus to technology use, indicating that the more ingrained technology into an individual's lived experience or habitus, the more likely that person is to make meaningful use of technology (Kvasny, 2006a, 2006b; North, Snyder, & Bulfin, 2008; Robinson, 2009, 2011; Rojas, Straubhaar, Roychowdhury, & Okur, 2004; Sterne, 2003; Vanden Abeele, Campbell, Eggermont, & Roe, 2012; Vryonides, 2007). An analysis of who uses the Internet at their own homes or in the homes of others likely shows a baseline integration of the Internet into daily life and leisure time.

This section compares domestic Internet use between various demographic categories. A binary variable indicating domestic Internet use was generated by aggregating affirmative responses to the choices "at home" and "at the home of a friend or family member" on the section of the survey asking where respondents use the Internet. Overall, 85.61% of respondents said they used the Internet in domestic contexts and 14.39% said they did not. Analyses based on cultural capital, race/ethnicity, age, income, and education were statistically significant for values of p less than .05. The analyses for immigration generation, gender, and non-English media use were not statistically significant.

H9a: Persons with more cultural capital are more likely to use the Internet in domestic contexts than persons with less cultural capital.

Cultural capital is an ability of an individual to interpret and articulate symbolic systems of the dominant culture, and it is likely that persons from higher-education backgrounds and more rooted in the dominant culture would be users of the Internet at home or at the homes of others. In this study, cultural capital is operationalized as the average, rounding up, of respondents' parents' education and consists of a five-point integer variable ranging from 1, indicating less than high school, to 5, indicating graduate or professional degrees. For the analysis of access technologies, it was a significant demographic variable in each of the analyses, more consistently significant than any other variable.

For the analysis of access technologies, persons with more cultural capital were more likely to be users of superior access technologies. These persons were also more likely to be domestic Internet users. At the high end, 94.95% of persons with a cultural-capital index of 5, indicating a high-education family background, used the Internet at home, while 80.62% of those with an index of 1 and 84.68% of those with an index 2 used the Internet at home. While these results are statistically significant where $p = .0326$, showing that home access and cultural capital are connected, the overall analysis largely shows that the vast majority of Austinites use the Internet at home in some fashion.

Table 36 Domestic Internet Use and Cultural Capital

	Domestic Internet Use		
Cultural Capital	No	Yes	Row Total
1	19.38%	80.62%	100.00%
2	15.32%	84.68%	100.00%
3	8.96%	91.04%	100.00%
4	7.66%	92.34%	100.00%
5	5.05%	94.95%	100.00%
Total	11.77%	88.23%	100.00%
Uncorrected chi2(4) = 6.6066			
Design-based F(2.75, 3829.12)= 3.0224 P = 0.0326			

The major point of difference in domestic Internet use appears to be between respondents whose parents had at least some post-secondary education and those whose parents had a high-school education or less. Domestic Internet use does increase with cultural capital, but not as much beyond the index value of 3, representing some post-secondary education. This pattern is similar to that seen in Chapter Five with the access technologies; the persons on the lower end of the cultural-capital index are more likely not to use the Internet at home or not use a specific access technology. Persons from the lowest cultural-capital category are roughly four times more likely not to use the Internet in a domestic setting than persons in the highest cultural capital setting.

H9b: Whites are more likely to use the Internet in domestic contexts than persons from marginalized racial/ethnic groups such as African-Americans and Hispanics.

As discussed in the previous chapter, whites and Asian-Americans had home broadband access at greater rates than African-Americans and Hispanics. Although it is possible that sharing home Internet connections with friends and family members might mitigate the lower number of home Internet connections among African-Americans and Hispanics, it was expected that a greater proportion of whites would use the Internet in domestic contexts than these marginalized groups. Results for the domestic-access index showed this to be the case. Among whites, 89.85% said they used the Internet in domestic contexts, while just 79.60% of African-Americans and 77.53% of Hispanics use the Internet at their homes or at the homes of friends or family members. Asian-Americans were even more likely than whites to access the Internet in a domestic context with 93.9% reporting some type of domestic access. These results are statistically significant where p = 0.0296.

Table 37 Domestic Internet Use and Racial/Ethnic Category

	Domestic Internet Use		
	No	Yes	Row Total
White	10.15%	89.85%	100.00%
African-American	20.40%	79.60%	100.00%
Hispanic	22.47%	77.53%	100.00%
Asian-American	6.10%	93.90%	100.00%
other	7.76%	92.24%	100.00%
Total	14.39%	85.61%	100.00%
Uncorrected chi2(4) = 44.6583			
Design-based F(2.28, 3338.82)= 3.3390 P = 0.0296			

While it might seem that these results might track those of home broadband subscribers, comparing them directly reveals some interesting differences. Only 40.29% of African-Americans said they had home broadband access, but nearly twice as many African-Americans, 79.60%, said they used the Internet in a domestic context. Obviously, there are other ways to go online at home such as dial-up and mobile phone, but connection sharing does appear to go on among African-Americans. By contrast, a greater proportion of Hispanics than African-Americans had home broadband connections, but a smaller proportion of Hispanics used the Internet in domestic contexts. Among Hispanics 58.36% said they had cable modem or DSL access, compared to 40.29% of African-Americans.

The higher rate of domestic use among African-Americans compared to Hispanics led to further analysis. With a provisional hypothesis that African-Americans are more likely to use the Internet connections of friends and family than Hispanics, I recoded two variables, one indicating respondents who said they used the Internet at others' homes but did not have a connection at their own homes and a second variable indicating those who used the Internet at others' homes and did not have home broadband themselves. In both cases, analysis for race/ethnicity was statistically significant where $p < 0.05$. Among African-Americans, 16% said they used the Internet at others' homes without having an Internet connection at their homes themselves. This is a much higher rate than among Hispanics at 3.74% and whites at 1.19%. For users who did not have home broadband, but used the Internet at others' homes, 26% of African-Americans fell into this category, and whites were actually more likely than Hispanics to use the Internet at others' homes without having home broadband, with 1.19% of whites falling into this category and 6.3% of Hispanics in this use case.

Table 38 Use at Others' Homes with no Home Broadband

No Home Internet, Uses at Others' Homes			
	No	Yes	Row Total
White	98.81%	1.19%	100.00%
African-American	84.00%	16.00%	100.00%
Hispanic	96.26%	3.74%	100.00%
Asian-American	100.00%	0.00%	100.00%
Other	100.00%	0.00%	100.00%
Total	97.01%	2.99%	100.00%
Uncorrected chi2(4) = 77.5223			
Design-based F(2.77, 4046.85)= 4.0184 P = 0.0090			

Table 39 Users with No Home Broadband, Uses Internet at Others' Homes by Racial/Ethnic Category

No Home Broadband, Uses at Others' Homes			
	No	Yes	Row Total
White	98.81%	1.19%	100.00%
African-American	73.60%	26.40%	100.00%
Hispanic	93.70%	6.30%	100.00%
Asian-American	94.71%	5.29%	100.00%
other	89.18%	10.82%	100.00%
Total	91.74%	8.26%	100.00%
Pearson:			
Uncorrected chi2(4) = 52.7326			
Design-based F(3.63, 5308.37)= 2.9503 P = 0.0229			

Of course, just because someone uses the Internet at another's home doesn't necessarily mean they rely on the broadband connections of their friends and family. Among these domestic users without any home Internet connection, 63.3% were mobile Internet users, and of those without home broadband, 70.4% were mobile users. It is certainly possible that many of these users are accessing the Internet via mobile devices when they are visiting friends or family – that is a common use case today – but it seems likely that many of these users are also leveraging their social capital to go online. If they lack the material resources to pay for broadband Internet access, they can use connections at the home of friends and family. Researchers have noted that Hispanic and Asian-American students often rely on extra-familial social networks when making post-secondary educational decisions (Arbona & Nora, 2007; Perna & Titus, 2005; Perna, 2006) and a similar phenomenon may be at play: friends and extended family offer their Internet connections to persons who lack home connectivity themselves.

Table 40 Mobile Use Among Persons with No Home Broadband Connection

	Mobile Use		
	No	Yes	Row Total
All Others	52.39%	47.61%	100.00%
No Home Broadband, Uses at Others' Homes	29.64%	70.36%	100.00%
Total	50.51%	49.49%	100.00%
Uncorrected chi2(1) = 22.9685			
Design-based F(1, 1463) = 5.6228 P = 0.0179			

The difference in domestic use between African-Americans and Hispanics, shown in Table 39, is somewhat striking. Although African-Americans are less likely to have broadband connections than Hispanics, they are more likely to use the Internet in domestic contexts and use the Internet at the homes of friends and family. This suggests that African-Americans in Austin have stronger social ties than Hispanics if many African-Americans can gain access to the Internet through personal connections. Although these analyses were not statistically significant for immigration-related variables, immigration may account for looser social bonds among Hispanics – if Internet use at others' homes is a reflection of social ties.

H10e: Younger persons are more likely to use the Internet in domestic contexts than older persons.

As noted in the previous chapter, younger Austinites, once they reach the working years, are more likely to have various forms of technological access. It stands to reason, then, that they would be more likely to use the Internet at home. One factor other than income that might mitigate domestic use, however, is that younger people often spend less time at home, so they may be less likely to use the Internet in domestic contexts. Analysis for domestic use by both age ranges and the generational categories developed by Howe and Strauss (1992, 2000) both indicated that younger users are more likely to use the Internet in domestic contexts. Older respondents were less likely to use the Internet in domestic settings, reflecting the general trend of older persons having a lower rate of Internet use and access.

Analysis based on both age ranges and generational cohorts were statistically significant with $p < 0.05$. As with many of the age-related analyses, the analysis based on generational cohort offered results that were more straightforward and had a higher level of statistically significance. Looking at domestic use by generation, members of Generation X had the highest rate of domestic Internet use at 91.7%; the younger Millennials had a slightly lower rate of domestic use at 89.9%, perhaps reflecting higher income among older Xers and the possibility that many Millennials rely on Internet connections at school for Internet use. The oldest generation identified in this study, the GI Generation, had the lowest rate of domestic Internet use with slightly fewer than half using the Internet at home or at the homes of others'. Somewhat surprisingly, the cohort of "Older Boomers" has a lower rate of domestic Internet use than the older "Silent Generation." This may reflect the fact that many older boomers would have still been in the workforce in 2010 and had access to the Internet at work.

Table 41 Domestic Internet Use by Cultural Generation

	Domestic Internet Use		
	No	Yes	Row Total
Millennials	10.07%	89.93%	100.00%
Generation X	8.30%	91.70%	100.00%
Younger Boomers	15.81%	84.19%	100.00%
Older Boomers	28.83%	71.17%	100.00%
Silent Generation	21.78%	78.22%	100.00%
G.I. Generation	53.04%	46.96%	100.00%
Total	14.39%	85.61%	100.00%
Uncorrected chi2(5) = 110.2690			
Design-based F(2.41, 3528.91)= 5.8333 P = 0.0015			

The analysis by age ranges showed less clear-cut patterns of domestic Internet use by age. The youngest group, 18-24 year olds, had a higher rate of home use at 92.6% than the next youngest group 25-34 year olds (87.8%.) Respondents in the traditional college age may still live at home or enjoy support from their parents, which may account for the higher rate of domestic use. The youngest users may also be more inclined to use the Internet at a friend's home than somewhat older persons who may socialize in other contexts such as coffee shops or restaurants. The group of users aged 35-44 had the highest rate of domestic use at 93.6% with domestic use declining with older age categories with those 65 or older having the lowest rate of domestic use at 64.9%.

Table 42 Domestic Internet Use by Age Group

	Domestic Internet Use		
Age	No	Yes	Row Total
18-24	7.37%	92.63%	100.00%
25-34	12.23%	87.77%	100.00%
35-44	6.35%	93.65%	100.00%
45-54	16.61%	83.39%	100.00%
55-64	25.12%	74.88%	100.00%
65+	35.15%	64.85%	100.00%
Total	14.39%	85.61%	100.00%
Uncorrected chi2(5) = 84.4519			
Design-based F(2.97, 4348.86)= 3.2010 P = 0.0227			

In general, older persons are less likely to use the Internet at home than younger persons. Although there may be some appeal for older Austinites to keep in touch with children or grandchildren through email or video chat services like Skype or pursue interests such as genealogy and photo-sharing, they may not see a compelling reason to have it at home if they spent most of their adult lives before the Internet became a mainstream part of US life. Older persons may also be on fixed retirement incomes, so the notion of adding a monthly bill to their budget may be unattractive and their social circles also may not have the Internet at home. The fluctuations in domestic Internet use among younger people may speak to economic circumstances – newly independent adults, particularly after the economic crash of 2008 may not be able to afford their own Internet connection – or it may reflect lifestyles that take them out of the house more frequently.

H10g: The affluent are more likely to use the Internet in domestic contexts such as their homes or the homes of friends or family than persons with lower incomes.

Material resources are necessary to have some kind of Internet connection at home – an individual needs to pay a provider to maintain service. In addition, using the Internet at home requires some hardware such as a computer or mobile device. Finally, persons with more income are probably more likely to have relevant cultural, social, and techno-capital that make using the Internet a compelling experience. Based on these assumptions, it is hypothesized that persons with greater household income are more likely to use to use the Internet at their home or at the home of friends or family than persons with lower income.

Analysis of domestic Internet use by income does indicate that persons in the highest income category, $75,000 annual household income or more, access the Internet from their homes or the homes of others at a higher rate, 92.6%, than persons with an annual household income of less than $10,000, only 74.6% of whom access the Internet in domestic contexts. In between these extremes, however, rates fluctuate; the income category with the lowest rate is persons with an annual household income between $30,000 and $39,999. Only 74.0% of this group accessed the Internet at home or at the home of friends or family. In general, those with an annual household income greater than $40,000 were more likely to use the Internet in a domestic context than those with a household income less than $40,000. These results are statistically significant with $p = .0117$.

Table 43 Domestic Internet Use by Income

	Domestic Internet Use		
	No	Yes	Row Total
< $10,000	25.43%	74.57%	100.00%
$10,000-$19,999	13.16%	86.84%	100.00%
$20,000-$29,999	16.59%	83.41%	100.00%
$30,000-$39,999	26.01%	73.99%	100.00%
$40,000-$49,999	7.09%	92.91%	100.00%
$50,000-$64,999	10.02%	89.98%	100.00%
> $75,000	7.43%	92.57%	100.00%
Total	12.82%	87.18%	100.00%
Uncorrected chi2(6) = 49.7142			
Design-based F(4.85, 6163.78)= 2.9783 P = 0.0117			

More affluent people do appear to have domestic Internet access of some form at slightly higher rates than less affluent people, but when nearly three quarters of the lowest-income households have some form of domestic Internet use, the cost of a home Internet connection may not be an insurmountable barrier keeping very low-income people from going online in some fashion. Other factors such as education, cultural capital, and language use present more eminent barriers to Internet use.

H10h: The better educated are more likely to use the Internet in domestic contexts such as their homes or the homes of friends or family than persons with less education.

The analyses for Internet access technologies indicated that better educated Austinites generally had faster and more expensive forms of Internet access. Given these results, it would be expected that persons with greater educational attainment would be more likely to use the Internet at home.

Analysis of the data confirmed this hypothesis. As the level of education increased, the rates of domestic Internet use increased. The largest jump in Internet use was between respondents who had a high-school education and those with some post-secondary education, which parallels results for other measurements. Although only 76.8% of respondents with high-school educations used the Internet either at home or at the homes of friends and family, 89.4% of persons with some college or technical training used the Internet in a domestic context. Rates increased with each level of education, although not as dramatically.

Table 44 Domestic Internet Use by Educational Attainment

	Domestic Internet Use		
	No	Yes	Row Total
Less than High School	29.13%	70.87%	100.00%
High School	23.20%	76.80%	100.00%
Technical/Some College	10.59%	89.41%	100.00%
4-year Unviersity	8.65%	91.35%	100.00%
Graduate/Professional	5.84%	94.16%	100.00%
Total	14.39%	85.61%	100.00%
Uncorrected chi2(4) = 85.4841			
Design-based F(1.75, 2562.22)= 3.8985 P = 0.0253			

Although it might be easy to point to education as a key factor in Internet use, underlying differences between persons at different levels of educational achievement may explain the differences in rates of use. For example, many of the respondents with less than a high-school education may be laborers that were educated in other countries, so they face a number of obstacles to effective access such as language, unfamiliarity with technology, and social networks who are not online. Simply pointing to education as a policy prescription for digital inclusion may not address a variety of challenges people experience going online. Education, particularly low educational attainment, may however be a good indicator for a host of social factors that impede access to the Internet and other forms of participation in society. Barriers to higher levels of education, such as working to support a family, may also prevent members of society from developing the ability to make meaningful use of the Internet.

H11: MEMBERS OF PRIVILEGED GROUPS SUCH AS WHITES AND THE BETTER EDUCATED ARE MORE LIKELY TO USE INSTITUTIONAL SITES OF ACCESS SUCH AS THE WORKPLACE OR SCHOOL.

Although telecommunication policy related to digital inclusion tends to emphasize the ability for members of society to access the Internet at home, the workplace and school are also important sites of Internet access. After all, much of the concern about digital skills is related to whether persons with limited ability to use the Internet can find employment or pursue education as the Internet becomes an integral part of society (DiMaggio & Hargittai, 2001; National Telecommmunications and Information Administration, 1998, 1999; van Dijk & Hacker, 2003; Warschauer, 2003). In addition, some persons who may not be able to afford an Internet connection at home may use Internet connections at the workplace or at a school facility for Internet access. Moreover, if the Internet is integrated into an individual's work or school life, he or she may have more opportunity to develop techno-capital. For these reasons, an investigation into institutional use of the Internet, either at the workplace or school, may provide information about the role of the Internet in society.

Although the information economy began to emerge before Internet use became mainstream in schools and workplaces, its adoption has catalyzed much of the informationalization of the economy. In the so-called "information economy" an increasing number of prestigious jobs involve manipulating or creating information and many other professions, such as those in medicine, are increasingly reliant on complex information systems (Castells, 2000). As a result, Internet use is largely integrated into occupations of higher prestige and power as well as more advanced education. It is expected, then, that persons who face barriers to further education or higher-status, informationalized jobs would be less likely to access the Internet from work or school. As Eubanks (2011) points out, people on the lower rungs of society interact with network technologies on a daily basis, such as using electronic payments at the supermarket register or placing kitchen orders as a restaurant server, but often lack latitude how they use technology. Persons in low-status occupations will not be "browsing the Internet" or "surfing the web" at work or perhaps school. In fact, the modes of simplified technology they use at work may represent deskilling of an occupation, like running an icon-driven order station at a fast food restaurant instead of a cash register (Eubanks, 2011; Tufecki, 2012). And, of course, the ability to use the Internet may be a prerequisite for many types of clerical and professional roles, so persons who lack techno-capital may never find employment at workplaces where they can go online.

With this in mind, it is hypothesized that Austinites that are often marginalized will be less likely to use the Internet at work or school, i.e. access the Internet at institutions. A binary "institutional use" variable was coded by affirmative responses to "work" and "school" on the survey item "where do you use the Internet?" The addition of educational use to this institutional-use variable accounts for the large student population in Austin, and, for younger people, their schooling is for all intents and purposes their work. On the whole, 57.8% of the weighted sample said they used the Internet either at work or school. Individually, 55.4% said they used the Internet at work, and 10.8% said they used the Internet at school, reflecting that many do both. Analyses for cultural capital, education, racial/ethnic group, age, gender, income, and language use were all statistically significant where $p < 0.05$ or better. Results for immigration-related variables were not statistically significant.

H11a: Persons with more cultural capital are more likely to use institutional sites of access such as the workplace or school than persons with less cultural capital.

As Bourdieu formulates it, cultural capital comprises knowledge, experiences, and understanding that an individual may use to achieve life outcomes. Much of that comes from family or school settings. It stands to reason that persons with more cultural capital are better positioned to obtain higher status jobs that often involve using the Internet, and several parts of a qualitative study of Austin users reflects that (Straubhaar, et al 2012). For this project, cultural capital is operationalized by using the mean, rounding up of respondents' parents' education rated on a scale from one to five. This proxy gives some indication of the family, peer and social habitus in which respondents grew up, although Bourdieu certainly includes an individual's own education as a part of cultural capital. This proxy also accounts for younger respondents who may still be in the process of acquiring education, where their own educational differences are not yet very pronounced.

Analysis of institutional Internet use by the cultural-capital index was statistically significant where $p < .0001$ and suggests the greater the cultural capital an Austinite has, the more likely he or she is to use the Internet at work. At the high end, 81.8% of people with a cultural-capital index of 5 use the Internet at work or school. Rates of institutional Internet use decrease with cultural capital, down to 30.0% of those with a cultural capital index of 1, indicating both parents had less than a high-school education. As with several of the analyses for access technologies, the largest difference is between respondents with an index of 2 and an index of 3, the difference between those whose parents had at most a high-school education and those whose parents had roughly some post-secondary education. Of those with an index of 2, 47.5% used the Internet at work or school, while 70.2% with a 3 index had some institutional access to the Internet. Again, this reflects educational differences directly, but indicates a broader index of their cultural capital and habitus, as well.

Table 45 Institutional Internet Use and Cultural Capital

	Institutional Internet Use		
Cultural Capital Index	No	Yes	Row Total
1	69.96%	30.04%	100.00%
2	52.54%	47.46%	100.00%
3	29.81%	70.19%	100.00%
4	23.22%	76.78%	100.00%
5	18.19%	81.81%	100.00%
Total	40.45%	59.55%	100.00%
Uncorrected chi2(4) = 219.4309			
Design-based F(2.12, 2953.08)= 11.0097 P = 0.0000			

These results confirm the hypothesis that Austinites with more cultural capital will be more likely to use the Internet at work or school. It also suggests that higher cultural capital leads to life outcomes with higher status employment or at least more autonomy at work. Persons who grew up in high-education environments may have been inculcated with positive dispositions toward technology and learning generally, and, for younger people, exposure to and education about computers in the home. Since Internet use at the workplace is often associated with higher status occupations, persons with greater cultural capital (here using parents' education as a proxy) may have also developed the manners, ways of speaking, and cultural references that make landing a high-status job more attainable.

H11b: Whites are more likely to use the Internet in institutional settings such as work or school than members of marginalized racial or ethnic groups such as African-Americans and Hispanics.

Whites enjoy many social advantages, and those often involve employment and educational opportunities. In contrast, African-Americans and Hispanics often face employment discrimination and attend schools with limited resources. It is expected, then that whites use the Internet at work or school at higher rates than those marginalized groups.

Analysis for institutional Internet use by racial/ethnic category did indicate that whites use the Internet at work or school at higher rates than African-Americans or Hispanics. Among whites, 69.5% used the Internet at work or school, while 38.9% of Hispanics and only 31.3% of African-Americans had institutional access to the Internet. Asian-Americans were more likely than whites to have institutional access, with 76.7% saying they used the Internet at work or school. These results are statistically significant where $p < .0001$.

Table 46 Institutional Internet Use and Racial/Ethnic Category

	Institutional Internet Use		
	No	Yes	Row Total
White	30.53%	69.47%	100.00%
African-American	68.75%	31.25%	100.00%
Hispanic	61.08%	38.92%	100.00%
Asian-American	25.16%	74.84%	100.00%
other	20.71%	79.29%	100.00%
Total	42.24%	57.76%	100.00%
Uncorrected chi2(4) = 157.3096			
Design-based F(2.64, 3855.39)= 8.9699 P = 0.0000			

Although whites and Asian-Americans had higher rates of domestic Internet access than African-Americans and Hispanics, a majority of persons from all racial/ethnic categories had some form of domestic Internet access. With institutional access, however, differences in access come into sharper focus. Fewer than half of African-Americans and Hispanics access the Internet at work or school, while over two-thirds of whites and Asian-Americans do. It seems unlikely that differences in the ability to use the Internet account for these differing rates of institutional access to the Internet, but reflect hiring patterns and educational opportunities for marginalized minorities. As noted in the introduction to this section, policy discussions related to digital inclusion tend to emphasize access in the home, but the so-called "digital divide" appears most stark at the workplace and school.

H11e: Younger Austinites are more likely to use the Internet in the workplace or school than older Austinites.

Internet access at home tends to decline with age, so it may follow that Internet use in institutional settings does as well. In addition, older workers are likely to have established careers before the Internet became a part of office life and found careers that do not involve Internet use. Of course, older persons are less likely to be pursuing educational opportunities than younger persons, so they would be less likely to access the Internet at school (unless they work in education themselves.) It is hypothesized, then, that younger people use the Internet at work or school at higher rates than older people.

Analysis for institutional Internet use by both age ranges and the generational categories developed by Howe and Strauss (2000) were statistically significant where $p < .001$ and indicated that older people had less institutional access than younger people in Austin. One exception is for the group of 18-24 year olds who had institutional access at a lower rate (40.8%) than all other age-range categories except for those past retirement age (14.3%.) Although school use was included, in part, to account for lower employment rates among students and younger people, it did not appear to make up for the fact that the youngest adults were unlikely to be employed at jobs with Internet access. The age ranges most likely to use the Internet at work or school were those 35-44 with 76.1% with institutional access and those 25-34 with 69.9% using the Internet at work or school. Institutional access declined with each older age group.

Table 47 Institutional Internet Use and Age Range

	Institutional Internet Use		
Age	No	Yes	Row Total
18-24	59.24%	40.76%	100.00%
25-34	30.07%	69.93%	100.00%
35-44	23.88%	76.12%	100.00%
45-54	42.38%	57.62%	100.00%
55-64	52.76%	47.24%	100.00%
65+	85.67%	14.33%	100.00%
Total	42.24%	57.76%	100.00%
Uncorrected chi2(5) = 196.7072			
Design-based F(2.17, 3172.13)= 7.1503 P = 0.0005			

Although the generational age categories produced results that were more clear and statistically significant for many of these analyses, it was less useful for this analysis since there no clear cut-off for people who are beyond retirement age. Identifying age categories this way does have the advantage of showing that the so-called "digital natives" of the Millennial generation do use the Internet at work or school at higher rates than both categories of Baby Boomers. Members of Generation X had institutional access at the highest rate with 74.1% using the Internet at work or school. The so-called "digital natives" of the Millennial generation had the second-highest rate of institutional access at

60.4%, suggesting many may not be using the Internet in the workplace or at school. Institutional access declined with each generation older than Gen X with generations past retirement age having low rates of institutional access.

Table 48 Institutional Internet Use by Generation

	Institutional Internet Use		
	No	Yes	Row Total
Millennials	39.65%	60.35%	100.00%
Generation X	25.90%	74.10%	100.00%
Younger Boomers	44.48%	55.52%	100.00%
Older Boomers	51.47%	48.53%	100.00%
Silent Generation	79.63%	20.37%	100.00%
G.I. Generation	93.75%	6.25%	100.00%
Total	42.24%	57.76%	100.00%
Uncorrected chi2(5) = 143.7226			
Design-based F(2.02, 2958.37)= 9.6615 P = 0.0001			

Although Millennials had a lower rate of institutional access than members of Generation X, the results largely reflect the trend of Internet access decreasing with age. Although one might expect that Millennials to make up for a lack of access at work with access at school, school access does not make up for the gap in institutional access. The lower rates of institutional access among younger adults, particularly in the wake of the Great Recession, raises concerns that younger people may lack exposure early in their careers to business uses of information technology. This may create obstacles to finding employment in the future. On the other end, older persons of working age appear to have less institutional access, which may limit their abilities to find new work at the end of their careers.

H11f: Men are more likely to use the Internet at work or school than women.

Analyses based on gender were not statistically significant in many cases, but there is a statistically significant difference in instructional access for men and women. Dominant cultural stereotypes of technology gender it as masculine, although Straubhaar (2012) notes that among Hispanic teens, computing was regarded as women's work, at least at one point in time in the late 1990s or early 2000s. In addition to gender stereotypes of computing, men are more likely than women to work outside the home, so it may follow that men are more likely to access the Internet at the workplace. Although more women than men pursue higher education, school use of the Internet does not appear to mitigate differences in employment for the institutional-access analyses.

Based on this data, more men do access the Internet from work or school than women. About half of women, 50.09%, have institutional access to the Internet, while 64.7% of men do. These results are statistically significant with p = .0357. These results are for all adults. Limiting the analysis to respondents who said they worked full- or part-time did not produce statistically significant results, although indicated the rates were roughly equal. The difference in men and women's institutional access can be largely attributed to differences in employment outside the home.

Table 49 Institutional Internet Use by Gender

	Institutional Internet Use		
	No	Yes	Row Total
Men	35.27%	64.73%	100.00%
Women	49.91%	50.09%	100.00%
Total	42.24%	57.76%	100.00%
Pearson:			
Uncorrected chi2(1) = 32.1115			
Design-based F(1, 1463) = 4.4197 P = 0.0357			

As with age differences, gender differences in institutional use does raise some concerns about employment prospects for those who do not have institutional access. If the workplace and school are important sites of developing techno-capital – through routine use, peer support, and casual familiarity with the Internet – women may be excluded from positions that involve computing as a secondary job skill. Moreover, techno-capital from the workplace may carry over into the personal realm in areas such as political participation, interactions with government such as filing taxes, and pursuing educational opportunities. The difference in institutional access to the Internet may reflect – and reinforce – further gender divides in society.

H11g: More affluent Austinites are more likely to access the Internet in institutional settings than those with lower incomes.

As noted in the introduction to this section, Internet use in work settings is often associated with jobs with greater prestige or at least white-collar office jobs. Since jobs with greater prestige often, but not always, pay better, it is likely that that persons with greater incomes are more likely to access the Internet at work or school.

Two factors complicate these results, however. First, the institutional-access variable aggregates both school and work access, so students with low incomes may raise the access rates at the low end of income. Secondly, the survey asked respondents to indicate their household income (in 2009) rather than their personal income. In effect, this often puts low-earning multi-income households in the same category as relatively high-earning single income households. There is no way to identify these differing situations with the data that was collected, so respondents with different life circumstances may be lumped together.

In general, the data indicates a trend of more institutional access with more household income. There is a slight dip in institutional access among respondents whose household income is between $20,000 and $29,000, but it is only slightly less than respondents with a household income between $10,000 and $19,000. Among households with an annual income less than $10,000, less than one tenth use the Internet at work or school while 79.5% of those making $75,000 or more have institutional access. These results are statistically significant with $p < .0001$.

Table 50 Institutional Internet Use by income

	Institutional Internet Use		
	No	Yes	Row Total
< $10,000	90.61%	9.39%	100.00%
$10,000-$19,999	49.35%	50.65%	100.00%
$20,000-$29,999	50.15%	49.85%	100.00%
$30,000-$39,999	45.25%	54.75%	100.00%
$40,000-$49,999	37.14%	62.86%	100.00%
$50,000-$64,999	27.57%	72.43%	100.00%
> $75,000	20.46%	79.54%	100.00%
Total	38.30%	61.70%	100.00%
Uncorrected chi2(6) = 224.4179			
Design-based F(5.25, 6671.36)= 13.7706 P = 0.0000			

Despite the fluctuation in the middle incomes, it certainly appears to be the case that members of high-income households more often have access to the Internet at work or school than members of low-income households. If the workplace or school is an important site for developing comfort and familiarity with technology, low-income workers may be further excluded from participation in society or advancing their life outcomes.

H11h: Better educated Austinites are more likely to access the Internet from work or school than those with less educational attainment.

Although few people attend school to learn how to use the Internet, high educational attainment is often associated with Internet use. Common Internet activities such as reading and writing draw on skills learned in school, and persons who went to university in the 1980s and 90s likely learned to use computers in educational settings. With the analyses for specific access technologies, any post-secondary education was linked with the use of faster Internet technologies. However, persons with more educational attainment beyond that did not have particularly higher rates of technological use. Regardless, it is hypothesized that the better educated will have higher rates of institutional access.

Unlike access technologies, institutional access does seem to increase with each level of further education. Persons with graduate or professional degrees have a slightly higher rate of institutional access. What is more striking, though, is that persons with little education have dramatically rates of use of the Internet at work or school. Only 33% of those with a high-school education use the Internet in an institutional setting, and that rate is almost twice of those with less than a high school education, 16.7%. With an institutional-access rate of 79.7%, persons with graduate degrees are more than four times more likely to have institutional access than persons with less than a high-school education. These results are statistically significant with $p = .0001$, and indicate a relationship between education and access to the Internet at work or school.

Table 51 Educational Attainment and Institutional Internet Use

	Institutional Internet Use		
	No	Yes	Row Total
Less than High School	83.32%	16.68%	100.00%
High School	66.97%	33.03%	100.00%
Technical/Some College	35.27%	64.73%	100.00%
4-year University	22.06%	77.94%	100.00%
Graduate/Professional	20.32%	79.68%	100.00%
Total	42.24%	57.76%	100.00%
Uncorrected chi2(4) = 344.8370			
Design-based F(1.54, 2246.74)= 11.9032 P = 0.0001			

As with many of the indicators of access, some post-secondary education appears to be the threshold at which Internet use becomes mainstream. Although a college degree may not be necessary for some Internet-connected office jobs, having some college or technical training may be an asset when applying to Internet-connected jobs. Post-secondary education may also be a reflection of dispositions as well. Persons who have the disposition to pursue some education beyond high school may also share a relatively positive disposition toward technology. Those who end their schooling at high school or before may have negative dispositions toward education and perhaps technology. Since institutional access does not increase much with levels of education beyond some post-secondary education, it may not be the case that education has much direct influence on technology use outside of technical fields, but the relationship between education and work access may reflect linked dispositions related to technology.

H11j: Austinites who are not native speakers of English are less likely to use the Internet at work or school than native speakers.

Speaking fluent English is often a requirement for post-secondary education and high-status employment in Austin. It stands to reason, then, that persons who lack strong

English skills would be excluded from using the Internet at work or school. Since the survey instrument did not include an item asking respondents to identify their native language or preferred language, a proxy is used for investigating language issues. Responses related to non-English media use such as television, radio, and newspapers were averaged and condensed into a three-point index with respondents categorized into those who never use non-English media, use non-English media on an occasional basis, and those who use non-English media on a weekly or daily basis. The respondents who use non-English media on a weekly or daily basis are presumed to be native speakers of a language other than English, although, of course, they may be dedicated students of a language foreign to them.

Persons who fall into the category of weekly and daily users of non-English media had a markedly lower rate of institutional access (45.3%) compared to occasional non-English media users (65.5%) and those who never use non-English media (68.5%.) These results suggest non-native speakers of English are less likely to use the Internet at work or school and are statistically significant with p = .0042.

Table 52 Non-English Media Use and Institutional Internet Use

	Institutional Internet Use		
Non-English Media Use	No	Yes	Row Total
never	31.48%	68.52%	100.00%
rarely	34.52%	65.48%	100.00%
weekly	54.74%	45.26%	100.00%
Total	41.37%	58.63%	100.00%
Pearson:			
Uncorrected chi2(2) = 66.2528			
Design-based F(1.46, 2017.25)= 6.5850 P = 0.0042			

Non-native speakers of English are also likely to be excluded from the kinds of office jobs where Internet access is available or from post-secondary educational opportunities. Their relative lack of access to the Internet at work or school would seem to indicate this. Although there are subtle differences in leisure access to the Internet at home or on mobile phones, access to the Internet in the workplace or at school seems to be where differences in access become more pronounced. Since working people spend a significant amount of their waking hours at the workplace or, in the case of students, at school, much of their exposure to the Internet is there. This may have consequences that further stratify users and non-users and preventing technology from entering the habitus of workers and their families.

H12: Members of privileged groups such as whites and the better educated are more likely to use the Internet at coffee shops than members of marginalized groups

Although an analysis of Internet use at coffee shops was not originally planned for this study, Fuentes and Inagaki's research on open Wi-Fi use in Austin (2006) highlighted inequalities in access to the technology, which had the possibility of making the Internet accessible to more people. Fuentes and Inagaki concluded, however, that open Wi-Fi networks tended to serve areas of the city that were likely to already be online; the Wi-Fi networks were largely operated in commercial establishments in affluent areas of town. By 2010, Wi-Fi was an established part of Austin café culture and an expected amenity for some. The survey included an item asking about Wi-Fi given its prominence as a form of access in public and integration into social space in Austin. Preliminary analysis suggested that coffee-shop use continued to show inequalities of access among Austin residents.

Use at coffee shops is perhaps a good proxy for how Internet use is integrated into a person's social life. Although there are plenty of graduate students and freelancers in Austin who go to coffee shops to do silent work or browse the Internet alone, many coffee shops remain social spaces – technology likely pervades the habitus of someone who uses the Internet at a coffee shop. Of course, going to coffee shop requires some disposable income and leisure time, so the poorest members of society are excluded from coffee-shop Internet use for economic reasons. In addition, visiting an Austin coffee shop involves particular cultural capital – sometimes specific to the establishment[6] – that involves speaking at an appropriate volume, the type of manners used when ordering drinks or bussing a table, and negotiating the use of power outlets for laptops. Persons who are relatively cash-poor, but can use their time flexibly, such as young people and students, may turn to coffee-shop Internet as an alternative to having a home connection or using the Internet on campus or at work. It is expected that younger, better educated, and more affluent people use the Internet at coffee shops. It is also likely to be related to cultures specific to certain ethnic groups, probably more common among young white or Asian-American students and professionals.

Analysis for coffee-shop Internet use is based on affirmative responses to the item "at a coffee shop" to the survey question "Where do you use the Internet?" Analysis for variables related to cultural capital, race/ethnicity, age, income, education, and language use provided statistically significant results where $p < .05$. Analyses based on immigration background and gender were not statistically significant. After weighting 22.1% of respondents said they used the Internet at coffee shops. Coffee shop use is

---

[6] For example, some Austin coffee shops such as Flightpath appear to be work-only spaces, where conversation can be greeted with the stink-eye, while others such as Bennu provide patrons with board games to encourage socialization (and selling coffee drinks.)

therefore not a practice common to many segments of society, but it is not an unusual practice, either; it is likely the common practice of a subculture.

H13a: Persons with more cultural capital are more likely to use the Internet at coffee shops than persons with less cultural capital.

Despite coffee shops' historical association with beatniks and pretensions of the subaltern, in reality coffee shops are largely sites of the dominant culture, particularly in Austin with its embrace of hippie nostalgia. As noted in the introduction to this section, Austin coffee shops typically have expectations of particular behavioral norms such as speaking relatively quietly, silent reading, and tipping that hinge on dominant cultural capital. Someone who did not grow up with the dominant culture might likely feel alienated in a putatively social space like a coffee shop. In addition to dispositions toward technology and integration of Internet use into the habitus, broader cultural capital may be an important resource in regular Internet use at a coffee shop. It is expected, then, that persons with greater cultural capital use the Internet at coffee shops at a higher rate than persons who have less dominant cultural capital.

Using the index of parents' education as a proxy for cultural capital, it does appear that persons with more cultural capital are more likely to use the Internet at coffee shops than persons with less cultural capital. Moreover, the largest jump in use is between respondents with a 4 index and a 5 index (between people with bachelor's degrees and people with graduate or professional degrees, compared to some other forms of use where the biggest break was between 2 – high school or less and 3 – some post high school education or training), suggesting that coffee-shop use is strongly linked with high cultural capital. These results are statistically significant with $p = .0001$, the highest p-value among the coffee-shop analyses.

Table 53 Coffee Shop Internet Use and Cultural Capital

	Coffee Shop Use		
Cultural Capital	No	Yes	Row Total
1	91.88%	8.12%	100.00%
2	85.34%	14.66%	100.00%
3	72.75%	27.25%	100.00%
4	70.31%	29.69%	100.00%
5	56.46%	43.54%	100.00%
Total	76.70%	23.30%	100.00%
Uncorrected chi2(5) = 125.9353			
Design-based F(3.02, 4411.89)= 7.2251 P = 0.0001			

Although it was it expected that coffee-shop Internet use would be linked with cultural capital, these results are rather dramatic. Although open Wi-Fi networks arguably had the potential to provide access to persons facing barriers to effective access, coffee-shop Internet appears to serve those who would already have a very strong disposition based on their cultural capital to use the Internet in their daily lives. These results do reinforce the idea that Internet use is not an isolated activity, but for many in Austin, it is part of their habitus. Internet use is part of their leisure time and social spaces. While coffee-shop use does not appear to be a way to bring Internet access to disadvantaged persons in society, it may be a marker of relatively tech-savvy individuals who grew up in educated environments with positive dispositions toward technology.

H13b: Whites are more likely to use the Internet at coffee shops than African-Americans or Hispanics.

Coffee shops imply a particular type of cultural capital, and since it is the type of cultural capital associated with the dominant society, it follows that whites would use the

Internet at coffee shops more frequently than members of marginalized groups. In addition, analyses for access technologies and other access technologies largely suggested that African-Americans and Hispanics have lower rates of access than whites in general. Since accessing the Internet at a coffee shop typically requires material resources such as a notebook computer or, more recently, a smartphone, these groups may also be excluded from coffee-shop use.

Analysis of coffee-shop use by racial category did indicate that whites used the Internet at coffee shops at greater rates than African-Americans or Hispanics. Among whites, 28.9% used the Internet at coffee shops, compared to 19.7% of African-Americans and 9.45% of Hispanics. It is somewhat striking that more than twice as many African-Americans use the Internet at coffee shops than Hispanics. This may be attributed to cultural-capital issues discussed above; African-Americans may be better attuned to dominant culture (or Austin tech subculture) behavior norms than Hispanics, particularly Hispanic immigrants, or perhaps there are establishments in the African-American community that Hispanics lack.[7] Asian-Americans were the group most likely to use the Internet at a coffee shop at 32.4%. This may be a result of the popularity of coffee-shop Internet use with students. These results are statistically significant with $p = .0046$.

[7] As someone who has lived on Austin's Eastside for over a decade, I don't believe this is the case, however.

Table 54 Coffee-shop Internet Use by Racial/Ethnic Category

	Coffee Shop User		
	No	Yes	Row Total
White	71.12%	28.88%	100.00%
African-American	80.34%	19.66%	100.00%
Hispanic	90.55%	9.45%	100.00%
Asian-American	67.76%	32.24%	100.00%
other	90.90%	9.10%	100.00%
Total	77.91%	22.09%	100.00%
Uncorrected chi2(4) = 71.2128			
Design-based F(2.84, 4149.45)= 4.4729 P = 0.0046			

Although African-Americans use the Internet at coffee shops at lower rates than whites, this gap of about 10% doesn't appear as pronounced compared to the differences in institutional Internet use where whites where more than twice as likely to use the Internet at work or school than African-Americans or even domestic access where the roughly 10% difference seems more pronounced since the majority of Austinites use the Internet in some domestic setting. This may suggest that Wi-Fi does still has some potential for bringing material access to African-Americans, at least. The survey did not ask if respondents used the Internet at other venues such as churches or other community institutions that might reflect the culture of Austin's communities of color the way that coffee shops presumably reflect the culture of educated whites. Identifying these contexts for further research – or inclusion initiatives – might offer opportunities for efforts toward digital inclusion.

H13e.: Younger people are more likely to use the Internet at coffee shops than older people.

In addition to Internet use being somewhat more common among the young, coffee shops are often associated with younger persons, perhaps in part because they offer social space away from parents or cramped apartments. In contrast, somewhat older adults may not be able to get away from the house because of child-rearing responsibilities or may have more compelling domestic environments. It is hypothesized, then, that younger people are more likely to use the Internet at coffee shops than older people.

Analysis for age both on the basis of age ranges and the generational cohorts does indicate that in general younger people use the Internet at coffee shops at greater rates than older people. The analysis by age ranges, however, indicates that very young adults, those aged 18-24 use the Internet at coffee shops at a relatively low rate, 13.8%, which almost the same rate as those aged 55-64, 12.2%. With the exception of this youngest group, younger adults are more likely to use the Internet at coffee shops with 31.8% of those aged 25-34 using the Internet in that context and 29.4% of 35-44 year olds. Use declines with each age bracket with only 4.4% of those 65 or older using the Internet at coffee shops. Analysis for age brackets is statistically significant where $p = .0078$.

Table 55 Coffee-Shop Internet Use by Age Range

	Coffee Shop User		
Age	No	Yes	Row Total
18-24	86.16%	13.84%	100.00%
25-34	68.19%	31.81%	100.00%
35-44	70.61%	29.39%	100.00%
45-54	82.45%	17.55%	100.00%
55-64	87.83%	12.17%	100.00%
65+	95.59%	4.41%	100.00%
Total	77.91%	22.09%	100.00%
Uncorrected chi2(5) = 77.0674			
Design-based F(2.11, 3089.50)= 4.7256 P = 0.0078			

As with several of the age analyses, the analysis based on cultural generations yielded results that are somewhat clearer. Still, the youngest age group had a lower rate of coffee-shop use, 25.8%, than the cohort in their mid-thirties to mid-forties, Generation X, with 28.5% using the Internet at coffee shops. The rate among Millennials is still higher than that of Younger Boomers, 17.4%, and the rate of coffee-shop use otherwise declined with age.

Table 56 Coffee-Shop Internet Use by Generation

	Coffee Shop User		
	No	Yes	Row Total
Millennials	74.19%	25.81%	100.00%
Generation X	71.46%	28.54%	100.00%
Younger Boomers	82.61%	17.39%	100.00%
Older Boomers	87.23%	12.77%	100.00%
Silent Generation	94.09%	5.91%	100.00%
G.I. Generation	97.60%	2.40%	100.00%
Total	77.91%	22.09%	100.00%
Uncorrected chi2(5) = 45.8947			
Design-based F(2.41, 3521.13)= 6.2184 P = 0.0010			

The low rates of coffee-shop use among older persons are likely due to a combination of factors. First, of course, other analyses have shown that older people use the Internet at lower rates than younger people. But secondly, it seems that coffee shops may not be an attractive setting for Internet use among older people. It could certainly be the case that older people just do not frequent coffee shops as much as younger people. (The survey did not assess whether respondents frequent coffee shops.) It does suggest, though, that coffee-shop Internet access does not include many older people who would otherwise not use the Internet.

H11g: Affluent persons are more likely to use the Internet at coffee shops than persons with lower income.

Although going out for coffee is a relatively inexpensive means of entertainment and potential socialization, it does cost some money to get a cup of joe. For that reason, persons on tight budgets may eschew visiting a coffee shop in an effort to save money. In addition, coffee shops are linked with dominant cultural capital, as noted above, so lower-income people may feel unwelcome in coffee shops. Finally, persons with more income are more likely to own notebook computers, smartphones, or tablet computers to use the open Wi-Fi networks coffee shops often provide. It is hypothesized, then, that persons with more income are more likely to use the Internet in coffee shops than those with low income.

Although results for coffee-shop Internet use were statistically significant, ($p = .0062$) the results do not reveal clear trends in coffee-shop access by household income. The group most likely to use coffee shop Internet access is also the group with the highest household income, $75,000 or more annually. This group used the Internet at coffee shops at a rate of about 33.1%. This is higher than the two lowest-earning groups; those with an annual income of less than $10,000 yearly had a rate of 5.66%, and those with a household income of $10,000 to $19,999 had a rate of 10.0%. The group with the second-highest rate of coffee-shop Internet use, however, was those with a household income of $20,000 to $30,000, of which 26.9% used the Internet at coffee shops. Use rates dip and fluctuate between this relatively low-income range and the top income rate, making it difficult to suggest a clear relationship between income and coffee-shop use.

Table 57 Coffee-Shop Internet Use by Income

	Coffee Shop User		
	No	Yes	Row Total
< $10,000	94.34%	5.66%	100.00%
$10,000-$19,999	90.00%	10.00%	100.00%
$20,000-$29,999	73.08%	26.92%	100.00%
$30,000-$39,999	81.63%	18.37%	100.00%
$40,000-$49,999	73.30%	26.70%	100.00%
$50,000-$64,999	79.32%	20.68%	100.00%
> $75,000	66.91%	33.09%	100.00%
Total	76.20%	23.80%	100.00%
Uncorrected chi2(6) = 57.4521			
Design-based F(4.24, 5384.96)= 3.5019 P = 0.0062			

Two factors may account for these inconclusive results. First, as with all of the income-related results, the survey asked respondents to identify household income, which lumps households with a single income into a category with households with two or more incomes. For this reason, these income categories may be fairly heterogeneous groups of people. A second reason is specific to coffee shops. Using the Internet at coffee shops is particularly popular with students, who generally have low incomes. This may account for the high rate of use among those with a household income of $20,000 - $30,000. As with many of the analyses related to household income, the analysis for coffee-shop use does not seem to show a relationship between income and that use context, although it might bolster the argument that this use context offers an opportunity for expanding the Internet's user base.

H13h: Persons with greater educational attainment are more likely to use the Internet at coffee shops than those with less educational attainment.

Coffee shops are often places for reading, study, and, now, using the Internet, so it is likely that they attract patrons with relatively scholarly sensibility. In addition, coffee shops often have an aura of cultural capital whether real or imagined. In addition to the overall relationship between Internet use and education, these factors may lead persons with greater educational attainment to use the Internet at coffee shops and perhaps alienate those with less schooling.

Analysis of users of coffee-shop Internet indicates use of this access context increases with educational attainment. Although the biggest jump in use is between those with high-school diplomas (7.96%) and those with some post-secondary training (23.8%), similar to other use contexts noted above, persons with graduate and professional degrees have the highest rate of using the Internet at coffee-shops, 37.1%. This is notable since for many types of access there is little difference in use between those with education beyond some post-secondary attainment. For coffee-shop use, however, there is a substantial jump between persons with bachelor's degrees and those with graduate or professional degrees. To an extent, this follows the pattern identified with cultural capital earlier in this section. These results are statistically significant with $p = .0102$.

Table 58 Coffee-Shop Internet Use by Educational Attainment

	Coffee Shop User		
	No	Yes	Row Total
Less than High School	90.19%	9.81%	100.00%
High School	92.04%	7.96%	100.00%
Technical/Some College	76.23%	23.77%	100.00%
4-year Unviersity	72.24%	27.76%	100.00%
Graduate/Professional	62.86%	37.14%	100.00%
Total	77.91%	22.09%	100.00%
Uncorrected chi2(4) = 87.7007			
Design-based F(2.12, 3099.91)= 4.4593 P = 0.0102			

These results tend to confirm the notion that coffee shops are sites of cultural capital. The large difference between coffee-shop use between those with advanced degrees and those with bachelor's degrees, along with results that show that persons with advanced degrees are more than four times more likely to use the Internet at a coffee shop than persons with just a high school diploma. Some of this difference may be also attributed to habitus. Persons with advanced degrees may be more likely to carry a computer with them in their daily life, have flexible work arrangements that allow them to work away from an office, or have a need to stay on top of email or other Internet communications. Still, coffee shops do seem to highlight the differences between people who have the Internet deeply integrated into their lives and use it at a high level and those who do not.

H13i: People who are not native speakers of English are more likely to use the Internet at coffee shops than native speakers of English.

Lacking English skills can present a barrier to using the Internet in Austin and the United States, and it could also present a barrier to using the Internet at Austin coffee shops. In addition to the challenges of operating systems and documentation privileging English, communities of non-English speakers may not be online. The context of use at a coffee shop presents additional challenges. Non-native speakers may perceive coffee shops as an English-only space, counter workers may only understand English, and coffee shops may not be a space where non-English speakers gather socially. As a result it is hypothesized that native speakers of English are more likely to use the Internet at coffee shops than non-native speakers.

As with each of the language-related analyses, an index of non-English media use is used to identify likely non-native English speakers. The presumption with this index is that respondents who use non-English media on a daily or weekly basis are generally non-native English speakers and those who use it "rarely" may also be non-native speakers or have recent family immigration histories. The results for coffee-shop Internet use may highlight flaws in the use of this index as a proxy for non-native speakers since the group who uses non-English media "rarely" is also the group that uses the Internet at coffee shops at the highest rate, 31.4%. This is nearly twice the rate of people who use non-English media on a daily or weekly basis, 16.5%, but also substantially higher than those who never use non-English media, 20.1%. These results are statistically significant with $p = .0095$.

Table 59 Coffee-Shop Internet Use by Non-English Media Use

	Coffee Shop User		
Non-English Media Use	No	Yes	Row Total
never	79.95%	20.05%	100.00%
rarely	68.65%	31.35%	100.00%
weekly	83.52%	16.48%	100.00%
Total	78.33%	21.67%	100.00%
Uncorrected chi2(2) = 29.7561			
Design-based F(1.88, 2602.40)= 4.8177 P = 0.0095			

There are two likely explanations for the higher rate of use among those who use non-English media rarely. First, this group of coffee-shop users who occasionally use non-English media may be comprised of immigrants who have come to Austin to study or work in fields such as technology or education. The high rates of coffee-shop use among Asian-Americans identified earlier in this section reinforces this explanation. A second explanation relates to the broad notion associating coffee shops with cultural capital. Some people who use non-English media on an occasional basis may be highly educated native English speakers who watch foreign movies, listen to world music, and perhaps work on their Spanish by watching Spanish-language television. Given the popularity of coffee-shop Internet use among those with advanced degrees, some of these non-English media users may be native English speakers. Regardless, those who use non-English media on a weekly or daily basis use Internet at a coffee shop at a lower rate than the broader population and lower rates than people who use non-English media less often, indicating that non-native speakers likely face barriers to using the Internet at coffee shops.

DISCUSSION

Policy discussions on digital inclusion tend to frame access in binary terms such as whether or not individuals or households can get access to the Internet; if households can afford access to the Internet; or if individuals have the minimum skills necessary to use the Internet. These discussions tacitly privilege the home as the prototypical site of access. Despite the Internet's penetration into schools, workplaces, and, often, places of leisure such as coffee shops and restaurants, mainstream discussions emphasize making domestic access affordable for low-income households or reaching rural households through universal service programs. Although public-access centers such as libraries and community centers can be and often are sites of training and learning about Internet use, they are often framed as substitutes provisioned for those who cannot afford Internet access at home. The results on public-access use presented in Chapter 5 belie the perception that library Internet users are only poor or elderly – the users of the Austin Public Library's Internet services largely mirror the Austin population as a whole, except for the city's most affluent residents. The privileging of domestic use of the Internet in digital-inclusion studies may deny the broader social contexts where the Internet is accessed.

Examining Internet use at other sites, then, further situates it in the broader social context. As one might expect in a market-oriented society, concerns about digital inclusion are often framed around the employment prospects of non-users or being competitive in a globalizing information economy. From this perspective, workplace (or school) access would seem to be the highest priority, but it is often ignored. The results of this study indicate that workplace Internet access is one place where divisions in society come into sharp relief. While patterns in domestic use show some differences between less privileged demographic groups and more privileged groups, results indicate that the vast majority of Austinites have access to the Internet at home or the home of friend or family member. Social differences are more clearly demarcated in workplace use, indicating people with low incomes or low educational attainment are unlikely to access the Internet at work. Of course, it may not be obvious why Internet access would be useful in some jobs such as construction or food-service, and some of these users may be excluded from Internet-connected jobs because of a lack of techno-capital. However, the lack of access at work may present a barrier to workers advancing in their jobs or moving into different fields. Moreover, it may be the case that the workplace or school is an important site where techno-capital is developed. Workers who do not go online on the job, may face barriers when they want to use the Internet in their free time, whether they want to pay bills, participate on a community mailing list, or communicate with the government. Although domestic Internet use is widespread in Austin, the Internet does not extend into other facets of daily life for less educated individuals and marginalized groups.

Although it might seem that everyone uses the Internet at coffee shops to people who regularly visit coffee shops, this data shows that even in Austin, fewer than a quarter of the population uses the Internet there. Although coffee-shop use is one prototypical example of Internet use in a social space, it does make a decent proxy for how Internet use is integrated into social life. It is also one of the primary sites for “un-wiring” social space in the early 2000s – there was little talk of bringing Wi-Fi to churches or bowling alleys for example. It appears that coffee-shop users are among the best educated and the most situated in the dominant culture. Unlike with work and school use, where use rates increased steeply with some post-secondary education, the biggest leap in the rate of coffee-shop use was between people with bachelor’s degrees and people with graduate or professional degrees. Although coffee-shop Internet is nominally free (with the purchase of a beverage) it appears that using the Internet at a coffee shop is a relatively elite activity. The elites who use the Internet at coffee shops likely integrate Internet use into their social lives, view Internet use as a leisure activity, and have friends who use the Internet as well.

Internet use is not simply limited to the domestic sphere. Part of its social importance is its value in workplace communication, social interaction, and participation in the life of the community. If particular groups such as African-Americans or Hispanics are often excluded from Internet use at the workplace or in social settings, this may limit their ability to transfer skills at home both for their own personal use and their children's' use. Chapter 8 discusses the relationship between these sites of access and techno-capital, which further makes the case that the full range of use contexts should be taken into account in discussing digital inclusion.

Chapter 7: Techno-capital Among Demographic Groups

As discussed in Chapter 2, this project frames the ability to make meaningful use of the Internet and other information and communication technologies in terms of techno-capital. Following Bourdieu's theory of multiple forms of capital, the notion of techno-capital asserts that the ability to use technology to pursue life goals is a type of capital that reflects power imbalances in society. By framing issues of digital inclusion in terms of capital, it relates technology use to its broader social context, rather that reducing a lack of meaningful Internet use to a matter of economics, geography, or skills. This situates Internet and ICT use – and non-use – within existing social inequalities.

Although the intent of framing digital inclusion in terms of techno-capital is to avoid reductionist models and deficit models, in order to operationalize the concept for a quantitative study does require reducing it to something measureable. Moreover, with a secondary data analysis project, operationalization here is limited to survey items that were included in the instrument. Despite these limitations, aggregating responses into an index can give some indication into what abilities respondents have in using technology to achieve life goals.

The techno-capital index aggregates responses from seven questions that asked respondents to rate their confidence in completing common computer tasks. Respondents rated their level of comfort or confidence on a one to five scale with five indicating the highest level of confidence. Initially, the sum of these variables was used as an index ranging from seven to thirty-five, but for the sake of ease of analysis and reading, results are presented using the mean of responses, showing the techno-capital index as a quasi-continuous variable ranging from one to five.

The survey asked respondents to evaluate their comfort with the following items[8] on a 1-5 scale.

- Uploading content (ex videos, photos, music) to a website
- Blocking spam or unwanted content
- Adjusting my privacy settings on a website
- Bookmarking a website or adding a website to my list of favorites
- Comparing different sites to verify the accuracy of information
- Creating and managing my personal profile on a social network site
- Creating and managing my own personal website

The numerical responses to these questions were averaged to create the techno-capital index, which uses these questions as a proxy for broader comfort and fluency with computing and network technology. Overall, the average self-assessment for these questions 3.945 out of five; generally, responses tilted toward the high end of the scale.[9] The item for "creating and managing my own personal website" had the lowest average response at 3.087 and the greatest variance. "Bookmarking a website or adding a website to my list of favorites" had the highest average response at 4.47 out of 5 and also the lowest variance, suggesting that nearly all respondents felt fairly comfortable bookmarking websites. Cronbach's alpha for the techno-capital index is 0.8912, which according to standards reflects a "good" degree of covariance indicating that the scores individual items are related to each other. The table and chart below present the relative means of both weighted and unweighted data. Contrary to the broad hypothesis of this

[8] The items are listed here as they appear on the survey questionnaire.

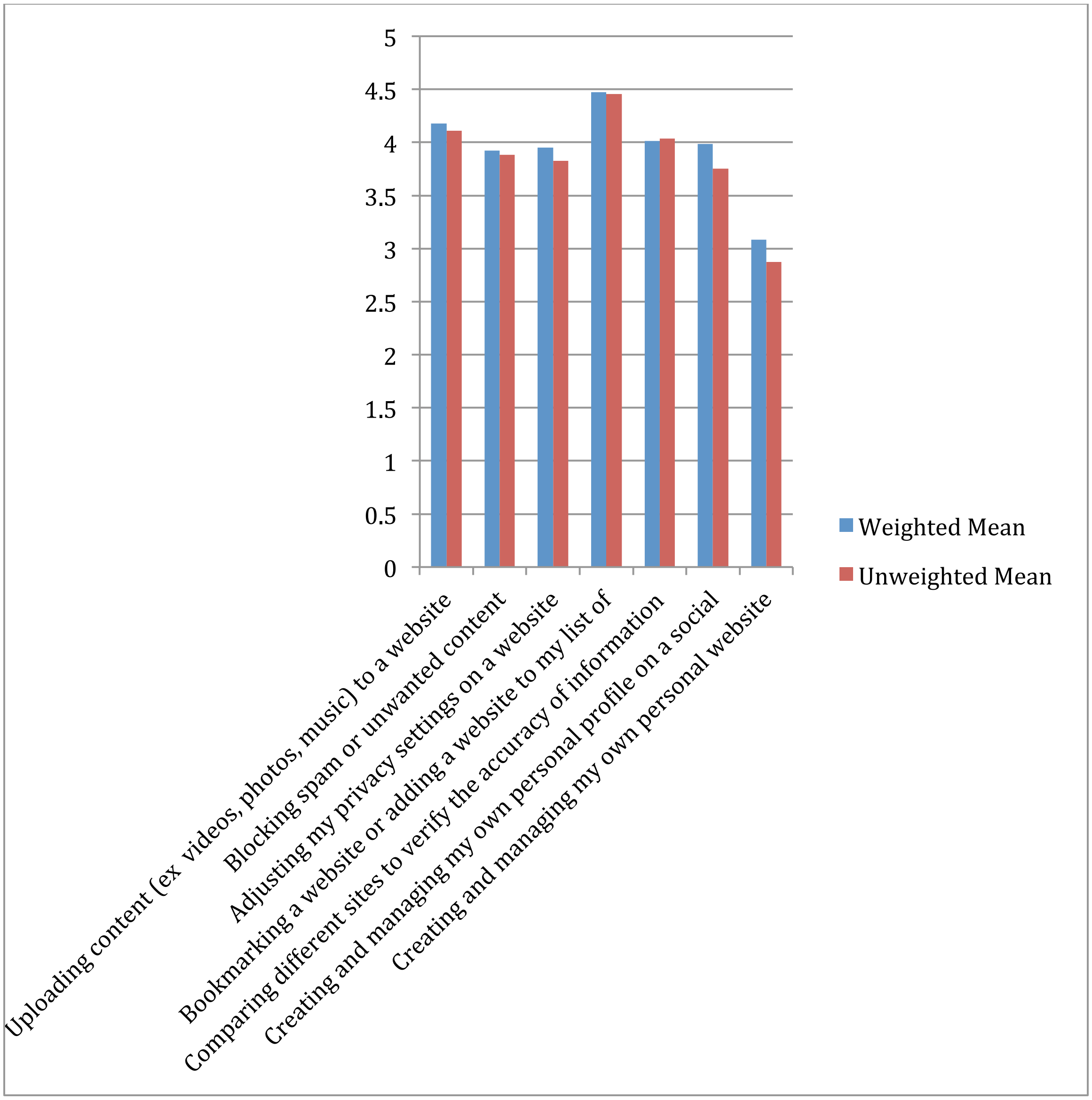
[9] Using quintile scores may have offered an opportunity to perform the analysis with a greater spread of responses, but the quintile index presented two problems. First, the top quintile was substantially larger than the bottom quintile since this index is based on integer results; it was impossible to find break points that would create quintile categories of comparable size. Secondly, the analyses run with a quintile index produced fewer significant results, limiting the analysis. For these reasons the results below use the quasi-continuous 1-5 scale, although it results are heavy toward the right.

project, weighting the data generally increased the means of the individual survey items as well as the techno-capital index. As discussed in Chapter 3, groups such as people of color, young people, and men were under-represented in the survey respondents, so the survey was weighted to better represent the broader Austin population. In particular, weights were introduced to better represent African-Americans and Hispanics, groups that have historically been excluded from participation in digital life. The higher averages for the techno-capital index and most of its constituent items after weighting is somewhat unexpected given the emphasis on representing excluded groups. The results that follow indicate that African-American and Hispanic respondents did have lower average techno-capital index scores, but the weights for other demographic factors such as age and gender likely increased the overall average.

Table 60 Mean self-reported scores for activities used to assess techno-capital

	Weighted Mean	Unweighted Mean
Uploading content (ex videos, photos, music) to a website	4.180763	4.109579
Blocking spam or unwanted content	3.923091	3.885057
Adjusting my privacy settings on a website	3.953976	3.82682
Bookmarking a website or adding a website to my list of favorites	4.470741	4.456705
Comparing different sites to verify the accuracy of information	4.013576	4.034483
Creating and managing my own personal profile on a social network site	3.985906	3.755556
Creating and managing my own personal website	3.086822	2.872031

Figure 3 Comparison of Weighted and Unweighted Means of Technology Activities



For the techno-capital analyses in this chapter that are based on demographic categories, analysis yielded statistically significant results for cultural capital, race or ethnicity, generation of immigration, age based on both age group and generational cohort, gender, and education. These results are discussed in the following sections. The analysis did not show statistically significant relationships between personal immigration or language use and techno-capital. The significant results confirmed the hypotheses indicated in the introduction and project proposal.

H13 MEMBERS OF PRIVILEGED GROUPS SUCH AS WHITES AND THE BETTER EDUCATED HAVE MORE TECHNO-CAPITAL THAN MARGINALIZED GROUPS.

H13a: People with greater cultural capital, as measured by parents' education, will have more techno-capital than people with lower cultural capital.

The cultural environment in which individuals grow up is often believed to play a major factor in outcomes in later life. Bourdieu suggests that in addition to economic capital and social capital, cultural capital is one of the major ways social classes distinguish themselves from one another (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 2002). The educational background of parents often shapes the habitus or lived experience of an individual affecting dispositions toward a variety of social experiences including education, media consumption, and, of course, technology. Recent research has also suggested that cultural capital may play a role in the development of skills and attitudes toward technology (Robinson, 2009, 2009, 2011; Rojas, Straubhaar, Roychowdhury, & Okur, 2004; Schradie, 2011, 2012; Tufecki, 2012). This hypothesis suggests that cultural capital, measured as the average of the education of respondents' parents, may be an indicator of a respondent's techno-capital, the ability to interpret and make meaningful use of network computing systems.

As discussed in Chapter 5, cultural capital appears to be linked with the use of the Internet and advanced access technologies such as cable modem and mobile Internet services. Respondents with greater cultural capital indices are more likely to use home broadband and public-access services. This would indicate that individuals from better-educated environments hold positive dispositions toward technology use. Accordingly, it is expected that persons from backgrounds with high cultural capital may be disposed to develop abilities with technology at a higher rate and level than persons with less privileged backgrounds.

Analysis for the techno-capital index did provide statistically significant results, and, apart from the age variables, the cultural-capital index had the lowest p-values of the demographic variables tested. This suggests there is a strong relationship between cultural capital (or at least parents' education) and developing technological abilities. Persons who grow up in well-educated families likely grew up with positive dispositions toward learning and, for younger respondents, computer technology in the home (Robinson, 2009, 2011; Schradie, 2012). This cultivated a habitus where information technology is part of lived experience and part of a strategy for solving problems or achieving life goals (Brock, et al, 2010; Kvasny, 2006).

Table 61 Techno-capital by Cultural Capital

Cultural Capital Index	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
1	3.583838	0.1927748	3.205641	3.962035
2	3.669506	0.1117195	3.450328	3.888684
3	4.133857	0.0756092	3.985522	4.282192
4	4.162954	0.0547842	4.055475	4.270433
5	4.151816	0.0924264	3.970488	4.333143
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1252) = 14.50				
Prob > F = 0.0001				

Although techno-capital tended to increase with the cultural-capital index, it appears to plateau past a cultural-capital value of "3" indicating one or more parents had some post-secondary education. In fact, respondents with parents who had one or more parent complete a graduate or professional degree had a slightly lower techno-capital index than respondents with a cultural-capital index of four. This plateau may indicate two things. First, the questions from which the techno-capital index was generated referred to fairly routine computer tasks. With the exception of creating a personal website, users tended to rate themselves highly on the computer tasks. The questions used to create the index may have been inadequate to create marked variation in results. A second reason relates more to the broader hypothesis of this project. It may be the case that high cultural capital may not increase technological abilities, but low cultural capital excludes individuals from developing techno-capital, whether it is from negative dispositions toward technology or limited material access to computing. Regardless, it appears that a link exists between cultural capital and techno-capital.

H13b: White respondents will have greater techno-capital than respondents from marginalized ethnic/racial categories, particularly African-Americans and Hispanics.

Marginalized groups such as African-Americans and Hispanics often lack the same access to education, technology, and employment that dominant whites enjoy, and, as a result, the use of technology within minority-group communities and families may be lower. (The results for access technologies in Chapter 5 further suggest this.) In addition, there are often negative dispositions toward technology in these communities, where computer use may be perceived as feminine or nerdy (Rojas et al., 2012). The habitus of African-Americans and Hispanics may often not include technology use, so it is hypothesized that respondents from these groups may rate themselves lower on the computer abilities used for the techno-capital index.

The analysis for techno-capital by racial/ethnic category did indicate a statistically significant difference ($p < 0.0001$) in the techno-capital index. As hypothesized, white (as well as Asian-American) respondents had the highest mean techno-capital index, with an average of 4.080 out of 5. This is only slightly higher than the overall average of 3.944.

Averages for all of the non-white categories (except "other") were lower than the average with African-Americans having the lowest mean techno-capital index of 3.533 out of 5. Additionally, Hispanics had the second-lowest average techno-capital index of 3.757. In both cases the responses of whites suggested that whites on average were more proficient in using computers and Internet applications than African-Americans or Hispanics.

Table 62 Techno-capital by Racial/Ethnic Category

	Mean	Std. Err.	95% Confidence Interval	
White	4.079874	0.0357148	4.009809	4.149939
African-American	3.533128	0.1954744	3.149649	3.916607
Hispanic	3.757375	0.1348907	3.492748	4.022001
Asian-American	3.880352	0.3071776	3.277736	4.482969
Other	4.515517	0.1132831	4.29328	4.737754
Overall Average	3.944982	0.0531121	3.840788	4.049177
$F(4, 1301) = 7.17$				
Prob > F = 0.0000				

Although the techno-capital index does not measure the broader habitus of respondents, results from other analyses suggest that technology is not as integrated into the lived experiences of African-Americans and Hispanics in Austin. Respondents in these categories are more likely not to use the Internet, less likely to have a computer in the home, and less likely to use a computer in the workplace or other situations. This may be evidence of a mutually constitutive situation where the absence of technology limits the ability for individuals to develop comfort and capability with technology and further limits their interest in the Internet and networked computing. In Bourdieu's terms, the habitus of these respondents limits their ability to develop techno-capital.

H13d: Respondents with recent immigration histories will have less techno-capital than respondents with more distant recent immigration histories

Although Austin is known for drawing migrants from other parts of the United States and the world to its information industries including technology firms and the University of Texas at Austin, many of its migrants come to the city for ancillary economic opportunities such as in services or construction. As a result, these migrants may lack the education or exposure to technology to develop abilities with technology. Moreover, many of these migrants come to Austin from Latin America or other regions that lack the technological infrastructure of most-developed nations like the United States. With this in mind, it is hypothesized that respondents who emigrated from another country or whose parents or grandparents were immigrants will have lower average techno-capital indices than respondents with no recent immigration history.

Comparing average techno-capital by recent family immigration history resulted in statistically significant results with a p-value of 0.0409. The results did not conform to the hypothesis, however. Second-generation immigrants, those who were born in the United States and one or more parent was born in another country, had higher a higher techno-capital mean than respondents with no recent immigration history or first- and third-generation immigrants. First- and third-generation immigrants had lower average techno-capital indices than the overall population and lower averages than respondents reporting no recent immigration history. These results suggest that the overall trend is that persons who are immigrants or grew up in immigrant households are less like to be exposed to computing. Second-generation immigrants present an interesting exception since this category has the greatest techno-capital mean in this analysis. In their qualitative study of technology use among Hispanic families in Austin, Rojas, et al (2004) note that second-generation Hispanic immigrants are often more aspirational in technology use than their parents or succeeding generations. This may explain the greater techno-capital among second-generation immigrants than those with no recent family history of immigration.

Table 63 Techno-capital by Family Immigration History

	Mean	Std. Err.	95% Confidence Interval	
No Recent History	4.038042	0.0421508	3.955351	4.120733
First Generation	3.73809	0.2302778	3.286334	4.189845
Second Generation	4.14569	0.1495152	3.852373	4.439006
Third Generation	3.769505	0.1006987	3.571956	3.967054
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(3, 1302) = 2.76				
Prob > F = 0.0409				

H13e & H13f: Older individuals will have less techno-capital than younger individuals.

Since personal computing has only been a mainstream phenomenon for the past three decades, younger groups of society often grew up with computers, while older users were exposed to computing later in life through situations like the workplace or interactions with their children. The ability of older members of society to make meaningful use of the Internet was one of the earliest concerns of digital-divide researchers who feared that age might be a factor keeping potential users from going online. (National Telecommmunications and Information Administration, 1995, 1998, 1999) Age barriers to Internet use not only included unfamiliarity and anxiety with computers, but also the lack of accessibility of computer systems to persons with different vision or motor skills. Conversely, younger users, particularly those from the millennial generation, are often portrayed as "digital natives" who grew up using computers and the Internet and therefore have a deeply ingrained set of technological abilities. With these concerns – and social biases – in mind, it is hypothesized that older users will have lower average techno-capital index than younger users.

Analyses for techno-capital by age were significant ($p < 0.0001$) for both age grouped by typical age categories and for the cultural generations developed by Howe & Strauss (1992, 2009) and used by the Pew Internet and American Life Project. The results were straightforward for analysis by these generational cohorts. The average techno-capital index declined with each successive generation, with a steep drop-off among the oldest generations, those who would have been well into their working years when computers were introduced into the workplace.

Table 64 Techno-capital by Age Range

	Mean	Std. Err.	95% Confidence Interval	
18-24	3.923947	0.1936551	3.544037	4.303856
25-34	4.286783	0.0762734	4.137151	4.436414
35-44	4.162311	0.0471695	4.069774	4.254847
45-54	3.713229	0.0787664	3.558707	3.867752
55-64	3.479435	0.1395256	3.205716	3.753154
65+	2.87996	0.185548	2.515955	3.243966
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(5, 1300) = 17.85				
Prob > F = 0.0000				

These results appear to throw the "digital natives" thesis into doubt, however; the mean techno-capital index for millennials is 4.169, while the mean index for Generation X is 4.147, hardly a huge difference. In fact, while the differences between means as a whole are statistically significant based on the regression test used for weighted survey data, the individual difference between millennials and Generation X is *not* statistically significant based on a test statistic for the null hypothesis. ($p = 0.8565$) For all intents and purposes, techno-capital among millennials and Generation X is the same. For the common computer tasks assessed by the items in the techno-capital index, millennials do not appear to be substantially more fluent with these tasks, undermining the idea that this age group features "digital natives."

The analysis for techno-capital by age groups further eroded the idea that Austin's youngest adults are "digital natives." Although the results were statistically significant, there was not a clear trend showing declining techno-capital averages with age. Instead, the youngest age bracket, 18-24 had a lower mean techno-capital index than the two next oldest groups. After the age of 24, however, mean techno-capital declined by age.

Table 65 Techno-capital by Generation

	Mean	Std. Err.	95% Confidence Interval	
Millennials	4.169589	0.1090008	3.955753	4.383425
Generation X	4.147561	0.0542993	4.041037	4.254084
Younger Boomers	3.64527	0.1048231	3.439629	3.85091
Older Boomers	3.51659	0.0871321	3.345656	3.687524
Silent Generation	2.894323	0.2580332	2.388118	3.400529
G.I. Generation	2.844808	0.1251517	2.599287	3.090329
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(5, 1300) = 26.93				
Prob > F = 0.0000				

The "digital natives" thesis often purports that today's young adults enter adulthood with a full understanding of how to effectively communicate online and a high degree of comfort with digital tools. The lower techno-capital in the youngest age bracket suggests that developing online abilities still requires time and experience. Moreover, since 18-24 roughly corresponds with the undergraduate years in the United States[10], it seems possible that many online skills - such as the ones assessed by the techno-capital survey items - are developed in the workplace rather than in high school or university.

[10] This author was nearly 24 when he graduated after five years of undergraduate study, although many young Americans finish their studies at younger ages.

Respondents who are 65 or older had the lowest mean techno-capital scores. This corresponds with the retirement age in the United States, so the majority of these respondents do not use the Internet in the workplace, although they may have had some exposure to the Internet toward the ends of their careers.

Table 66 Internet Use at Work by Generation

Generation	No	Yes	Row Total
Millennials	43.19%	56.81%	100.00%
Generation X	27.86%	72.14%	100.00%
Younger Boomers	45.88%	54.12%	100.00%
Older Boomers	52.31%	47.69%	100.00%
Silent Generation	79.91%	20.09%	100.00%
G.I. Generation	94.46%	5.54%	100.00%
Total	44.57%	55.43%	100.00%
Uncorrected chi2(5) = 132.8406			
Design-based F(2.10, 3076.83)= 9.5832 P = .0001			

The ongoing concern about older persons lacking access to meaningful use of the Internet is merited based on these analyses. With the exception of the youngest age group, it appears that older persons are less comfortable and confident with common network computing tasks. Older users did not grow up using computers and perhaps only reluctantly incorporated into their working lives. Since it was not part of their habitus, these users did not develop techno-capital at the same rates as younger age groups. Habitus may play a similar role in the lower mean techno-capital of the youngest age group. Although today's students generally use computers and the Internet to some extent in school, particularly at university, it is possible that computer use does not become fully ingrained into the habitus until persons enter the workplace (and largely in office environments at that.)

H13g: Men have greater techno-capital than women.

Although gender has been a non-significant variable in many of the analyses in this project, analysis for gender and techno-capital did yield statistically significant results. ($p < 0.0001$) Men have somewhat higher mean techno-capital indices, 4.134 out of 5, than women with 3.750. Given the statistically significant results, this hypothesis is confirmed.

Table 67 Techno-capital by Gender

	Mean	Std. Err.	95% Confidence Interval	
Men	4.133878	0.0644578	4.007426	4.260331
Women	3.749906	0.0672865	3.617904	3.881908
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 16.98				
Prob > F = 0.0000				

Some research has indicated that gendering of technology discourages women and girls from using computers or developing advanced technological skills (Hargittai, 2002; Lentz et al., 2012; Tufecki, 2012). This may account for some of the difference in techno-capital measurements between men and women in this survey. Although early digital-divide research suggested that a divide between men and women using the Internet could form, later research suggested that gender had evaporated as a factor separating use and non-use (Hargittai & Hinnant, 2008; Hargittai & Shafer, 2006). In Chapter 4, none of the access analyses were significant for gender; that is men’s and women’s access to the internet were statistically equivalent for all of the technologies assessed in this study. Of course, having access doesn’t mean a user can make meaningful use of the internet, and gender barriers may exist that discourage women and girls from developing the same abilities as men.

Another factor may be at work as well. Some research has suggested that women tend to rate their abilities lower on computer tasks than men (Cooper, 2006; Correa, 2010; Hargittai & Shafer, 2006). Although this survey has no way to compare perceived skills with actual skills, some of this difference in mean techno-capital indices may be a function of this phenomenon. Regardless, confidence with computing and Internet use is often as important as concrete skill when using network systems to achieve goals. Confidence in the ability to accomplish a task with a computer system likely affects dispositions toward technology and therefore techno-capital. If an individual feels confident that she or he is capable of using the internet to achieve a goal – such as ordering a plane ticket or finding employment - that may have a greater determining factor than whether or not that individual has the ability to perform the discrete tasks involved from the outset. The techno-capital index only uses self-evaluation as a proxy for a broader set of competencies that allow individuals to use technology to pursue outcomes. The difference techno-capital indices between men and women point to gender inequality in terms of technology use.

H13h: Respondents with higher income have greater techno-capital than respondents with lower income.

Income and techno-capital are related in at least two obvious ways. First, the oldest and most mainstream understandings of the digital divide posit that members of society with less economic capital will lack access to computing devices and network connections because of cost (van Dijk, 2005; Fuchs, 2008; Lievrouw, 2000; National Telecommmunications and Information Administration, 1995, 1998, 1999). This lack of access would create a barrier to developing abilities with network computing. Secondly, technological skills and competencies are currently valued in society – Austin promotes itself as a tech-savvy city in part to attract economic investment – so it might be expected that workers with greater techno-capital would command higher salaries, although the tasks in the survey items would hardly qualify anyone for a well remunerated high-tech position. It's likely that these relationships are mutually constitutive, although the issue of economic access remains important for policy reasons. A third relationship between techno-capital and income is that members of the dominant segments of society often enjoy higher incomes and as technology is prized by the dominant culture members of those segments cultivate technological abilities.

As hypothesized, the results show a general trend of mean techno-capital indices increasing with income, although the means level out and dip between an annual household income of \$30,000 and \$74,999. Below an annual household income of \$30,000, techno-capital gradually rises, and the top income category has the highest mean techno-capital index. These results are statistically significant where $p<0.0001$, confirming the hypothesis that techno-capital generally increases with income.

Table 68 Techno-capital by Income Range

	Mean	Std. Err.	95% Confidence Interval	
<$10K	3.426173	0.1656797	3.101103	3.751244
$10K-$19,999	3.700866	0.2500293	3.210298	4.191434
$20K-$29,999	3.779608	0.1446471	3.495804	4.063411
$30K-$39,999	4.020629	0.1252757	3.774832	4.266425
$40K-$49,999	3.848877	0.1121807	3.628774	4.068981
$50K-$74,999	4.033423	0.0705182	3.895063	4.171783
$75K +	4.161624	0.0403046	4.082544	4.240703
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(6, 1138) = 5.07				
Prob > F = 0.0000				

The dip in the middle-income categories may reflect some issues with the way the data was collected. As noted before, the survey asked respondents to indicate 2009 household income, so income categories do not distinguish between single-earner households and multi-earner households. Additionally, the top income category had the largest number of responses, suggesting that the response options may have needed more granularity at the top end of the income response choices.

Table 69 Weighted and Unweighted Proportions of Respondents by Income

	Weighted % of Respondents	Unweighted % of Respondents
<$10K	9.24%	3.78
$10K-$19,999	8.50%	5.9
$20K-$29,999	15.16%	7.4
$30K-$39,999	7.56%	8.03
$40K-$49,999	7.32%	8.34
$50K-$74,999	18.33%	22.34
$75K +	33.88%	44.22

Finally, a large slice of respondents elected not to indicate household income, making it difficult to get reliable analyses based on income. Finally, given the high assessment respondents gave themselves for the computer tasks identified in the survey instrument, it appears to be the case that these may have been too easy – including one or two more difficult computer tasks in this series of questions may have introduced more complexity to analyze.

H13i: Individuals with more educational attainment have greater techno-capital than respondents with less educational attainment.

Education is linked with nearly all forms of capital. Individuals often develop marketable skills through learning in institutional environments, enhancing their economic capital. At school, people often make friends and acquaintances that enhance their social capital. And, of course, learning the symbolic systems of the dominant culture – often through formal education – enhances cultural capital. It would be expected then that education would be linked with techno-capital, whether it's specifically through technology-oriented courses or through the routines of being a student, engaging in tasks such as answering email or retrieving information from databases.

Analysis for techno-capital and education yielded statistically significant results ($p < 0.0001$) indicating that the mean techno-capital index for better-educated groups was higher than for less-educated groups. The means of the index increased up to respondents who completed a bachelor's degree (4.202) with a lower mean for respondents who indicated they had completed a graduate or professional degree (4.086) The overall mean for the techno-capital index is 3.944 out of 5. Somewhat unsurprisingly, the group with the lowest mean techno-capital is the group of respondents indicating they did not complete high school, which had a mean of 3.453. This group also had the greatest variance in the techno-capital index, which may be a function of a low response rate among this group or that most of the skills assessed by the survey items are routine tasks that can be learned outside the classroom.

Table70 Techno-capital by Educational Attainment

	Mean	Std. Err.	95% Confidence Interval	
Less Than High School	3.452679	0.2966606	2.870695	4.034663
High School	3.636972	0.0970618	3.446558	3.827387
Technical School/Some College	4.000967	0.0846215	3.834958	4.166976
4-year university	4.201914	0.0448434	4.113941	4.289887
Graduate/Professional Degree	4.08625	0.0486792	3.990752	4.181749
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 11.77				
Prob > F = 0.0006				

The individual difference between respondents whose highest level of education is a bachelor's degree and those with a professional degree may be a result of a few social factors. First, a professional or graduate degree is often not a useful credential for many technology-specific jobs, so the most tech-savvy respondents may have finished their education with a bachelor's before finding well paid work in a technology role, while the most educated respondents may be working in non-technology fields such as law or medicine which require advanced degrees. A second factor is that younger respondents and students have higher techno-capital than older respondents and non-students. These younger tech-savvy respondents may be boosting the average techno-capital index while they pursue graduate degrees themselves or working before eventually returning to school.

Table 71 Techno-capital by Student Status

	Mean	Std. Err.	95% Confidence Interval	
Non-students	3.888344	0.054496	3.781435	3.995254
Students	4.423402	0.1493576	4.130394	4.716409
F(1, 1304) = 11.33				
Prob > F = 0.0008				

Table 72 Mean Age by Educational Attainment

	Mean Age	Std. Err.	95% Confidence Interval	
Less Than High School	38.347	5.206559	28.13388	48.56012
High School	41.62094	2.329576	37.05127	46.19061
Technical School/Some College	41.18693	1.535047	38.1758	44.19806
4-year university	38.34584	0.7574632	36.86001	39.83167
Graduate/Professional Degree	44.76517	0.8294658	43.1381	46.39223

Regardless, a test of means between respondents with a four-year degree only and respondents with a graduate or professional degree is not statistically significant, suggesting that their techno-capital is roughly equal.

The low techno-capital index means for respondents who did not finish high school or did not pursue education beyond high school suggests two things. First, that formal education appears to play some role in nurturing techno-capital, whether it is through explicit instruction on computing tasks or tacit learning through day-to-day activities in the educational system. Secondly, better-educated persons likely operate in a habitus that nurtures positive dispositions toward technology; persons with more education are more likely to view computers and information systems as tools that solve problems (or simply interesting for their own sake) rather than obstacles. It is also possible that in today's educational environment, which is often highly dependent on technology for younger members of society, low techno-capital can inhibit educational goals. Although most of the respondents to this survey would have completed their education before the rise of courseware like Blackboard and instructor reliance on email,[11] a lack of techno-capital among students of today and tomorrow may further expand inequalities in education.

H13k: Respondents employed in information sectors have greater techno-capital than respondents employed in other fields.

One might expect workers in the technology field to have more techno-capital than workers in other fields, but technology is core to a variety of fields in the contemporary US. Information industries, defined broadly, are often identified as the growth sectors in the post-industrial economy, and these fields often involve intensive computer use (Castells, 2000; Tufecki, 2012). Although sectors such as media, education, government, and some services generally do not directly involve technology, the informationalization of contemporary society and culture has created a situation where workers in these sectors often use computer and network systems to conduct their work.

Results for comparing the techno-capital by employment sector yielded statistically significant results where $p < 0.0001$. Unsurprisingly, respondents who said

[11] This author can't remember ever sending an email to an instructor as an undergraduate in the 1990s. Even computer-science assignments were submitted on green-bar paper from a line printer.

they worked in the technology sector had the highest mean techno-capital index at 4.520; it would be expected that workers in technology would have the highest level of comfort with technology. The sector with the lowest mean techno-capital index was construction at 3.884. The other "blue-collar" sector identified by the survey, manufacturing, did not have the next-lowest techno-capital mean. Instead that position is held by government, which is identified above as an information-intensive sector. The mean for manufacturing is 4.035 while the mean for government is 4.029.[12]

Table 73 Techno-capital by Employment Sector

	Mean	Std. Err.	95% Confidence Interval	
Construction	3.884221	0.3628227	3.172222	4.596219
Creative	4.05583	0.1342059	3.792466	4.319194
Education	4.050727	0.0879709	3.878094	4.22336
Government	4.029304	0.069003	3.893893	4.164714
Health	4.088401	0.107116	3.878198	4.298605
Manufacturing	4.035241	0.1478717	3.74506	4.325423
Media	4.224608	0.1943339	3.843249	4.605966
Services	4.195466	0.102069	3.995167	4.395765
Technology	4.519705	0.0617333	4.39856	4.64085
Other	4.03173	0.0923341	3.850535	4.212925
F(9, 972) = 4.75				
Prob > F = 0.0000				

The low score for government workers points to both an issue with how the data is collected and perhaps also a broader sociological issue. First, like techno-capital, the data on employment sector is entirely self-reported, so it is difficult to define precisely what belongs in these sectors. For example, an IT manager at the City of Austin might plausibly say she is either in the technology sector or in the government sector. The services and creative categories are particularly tricky. For example a musician who pays

[12] It should be noted that the difference in these means when compared directly is *not* statistically significant, although the overall results for these means are.

the rent by working in a restaurant kitchen might be properly coded as “services,” but self-reports as a “creative” worker. Moreover, since the services sector extends from restaurant dishwashers to management consultants, it is difficult to interpret this as anything resembling a homogeneous area of employment. A sociological issue, highlighted by the relatively low techno-capital for government workers, is that workers may have data-intensive jobs, such as processing driver’s license applications, but have a limited range of technology abilities. This hypothetical worker at the Department of Public Safety may spend his day entering data into state computer systems, but only know enough about computing to conduct his job, lacking broader functioning that might help him pursue life goals. Eubanks (2011) points out that it’s difficult to avoid using computer technology in the contemporary United States, using the example of a SNAP beneficiary who swipes a card at a terminal to obtain food, she contends that exposure to technology is hardly a sufficient condition for mastery of it.

Other information-intensive sectors had high techno-capital means. After technology, the respondents who said they worked in the media sector had the next-highest means, followed by “services,” which describes a variety of occupational categories. Health and Education, which are no doubt information-intensive sectors fell in the middle of the distribution, perhaps because while information plays an important role in these sectors, technology is often not integral to the daily practice of these sectors. The results of this analysis are mixed. Technology and media workers certainly have higher techno-capital than construction or government workers, but other information-intensive sectors such as health or education do not. It is difficult to say that this hypothesis is confirmed by the data.

DISCUSSION

Overall, the analysis of this data generally confirms the broad hypothesis that groups that are already privileged in society possess greater techno-capital (as measured by using confidence with computer tasks as a proxy.) Persons with better educated backgrounds, whites, the affluent, and the young report a greater degree of comfort with common computer tasks than members of marginalized groups. Although income did have a significant relationship with techno-capital, it is not clear that more money simply means that affluent people are better able to achieve life goals. Other factors such as parents' education, racial/ethnic background, and age suggest that techno-capital may also reflect the environment where people are raised. The broader social context influences interest in computing, trust or mistrust in information systems, and the acquisition of social networks connected to the Internet. All of these can influence whether an individual cultivates computer abilities.

Chapter 8: Techno-Capital and Types of Access

Not all access technologies offer the same speed and reliability – for example cable modem service is much faster than the dial-up access common in the 1990s. Similarly, some technologies such as mobile Internet on smartphones offer greater flexibility – with reduced affordances for input and viewing – by allowing users to check email and browse the web on the go. It is likely that the techno-capital, the ability to use information and communication technology to achieve life goals, of users may vary by the types of technologies used to go online. More sophisticated users may know that cable modems can offer better download speeds than DSL, and individuals who have very positive dispositions toward technology may opt to pay for data services and a smartphone because they want to be connected to the internet wherever they go. This chapter examines how techno-capital varies among users of particular access technologies, comparing the users with the broader population of Austin.

As with the previous chapter, techno-capital in the following sections is operationally defined and measured using an index created by averaging the responses to seven questions asking the respondent to rate their comfort with a variety of computer tasks on a scale from one to five. These responses were averaged into a quasi-continuous scale ranging from one to five for the sake of clarity. The overall average for the techno-capital scale is 3.944, suggesting that the average Austinite feels quite comfortable with the following common computer tasks identified in the survey instrument.

Below are the items as they appear in the survey questionnaire.

- Uploading content (ex videos, photos, music) to a website
- Blocking spam or unwanted content
- Adjusting my privacy settings on a website
- Bookmarking a website or adding a website to my list of favorites
- Comparing different sites to verify the accuracy of information
- Creating and managing my personal profile on a social network site
- Creating and managing my own personal website

Although it is difficult, if not impossible, to measure techno-capital since it emerges out of relationships and interactions with others, this scale makes for an adequate proxy of techno-capital since it links affect (comfort) with relatively concrete computer tasks.

The first part of the analysis investigated the following hypotheses:

- H13a: Non-users of the Internet will possess less techno-capital than Internet users.
- H13b: Respondents with home Internet access have more techno-capital than those who say they do not have Internet access at home.
- H13c: Respondents with DSL access have more techno-capital than respondents who do not.
- H13d: Respondents with cable modem access have more techno-capital than respondents who do not.
- H13e: Respondents with broadband access at home have more techno-capital than respondents who do not.
- H13f: Respondents who use mobile Internet services have more techno-capital than respondents who do not.
- H13g: Respondents who use mobile Internet services exclusively have less techno-capital than respondents who do not rely on mobile Internet services.
- H13h: Users of public-access services at the Austin Public Library will have less techno-capital than users who do not use the library Internet services.
- H13i: Users of the City of Austin's free municipal Wi-Fi have less techno-capital than those who do not use the service.
- H13j: Users of public-access services have less techno-capital than users who do not use public-access services.
- H13k: Exclusive users of public-access services have less techno-capital than users who do not rely on public-access services.

Results comparing the average techno-capital indices for non-users, users with no home access, cable modem, home broadband, mobile internet, City of Austin Wi-Fi, public-access users, and exclusive public-access users were statistically significant where $p < 0.05$. Results for DSL users, exclusive mobile Internet users, and Austin Public Library users were not statistically significant. In the cases of DSL users and Austin Public Library users, it is likely this is because the means of these groups of users was close to the mean of the overall population. Description and discussion of each of the statistically significant hypotheses is in the sections below.

The second section of this chapter examines the contexts where Austinites use the Internet. In addition to public-access contexts, it compares techno-capital of persons who use the Internet in homes, in institutional contexts such as work and school, and at coffee-shops, which is a prominent and once promising site of access in Austin (Fuentes-Bautista & Inagaki, 2006). The second section tests the following hypotheses:

- H12a: Persons who use the Internet at work or school will have greater techno-capital than those who do not.
- H12b: Persons who use the Internet in domestic contexts such as at home or at the home of a friend or family member will have greater techno-capital than those who do not.
- H12c: Persons who use the Internet at coffee shops will have greater techno-capital than those who do not.

TECHNO-CAPITAL AND ACCESS TECHNOLOGIES

H11a: Non-users of the Internet will possess less techno-capital than Internet users.

Given that the Internet is perhaps the central communications and information technology in contemporary U.S. society, one would expect that members of society who do not use the Internet have lower techno-capital than those that use the Internet. Whether it is a matter of cost, as discussed in previous chapters, or a matter of disposition or skills, for non-users the Internet is not directly integrated into their lives. Recent data from the Pew Internet and American Life Project suggests that non-use of broadband at home is increasingly a matter of disposition, that those who do not have by now often simply see no use for it in their lives. (Fox, 2014) Although Wyatt, (2005) notes that some persons have used the internet in the past and chosen to stop using it, it is to be expected that current users would score higher on the techno-capital index than non-users.

Analysis for techno-capital among non-users revealed that the mean techno-capital index is indeed significantly lower for non-users than the rest of the population. The average techno-capital index for non-users is 2.626, while the average index for users is 3.993. The overall average for the techno-capital index is 3.945. These results are statistically significant with $p < 0.0001$, a very strong, clear level of significance.

Table 74 Techno-capital Among Internet Users and Non-Users

Do You Use the Internet?	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
Yes	3.993758	0.052928	3.88992	4.097595
No	2.625968	0.233414	2.168042	3.083894
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1253) = 32.66				
Prob > F = 0.0000				

Although it is possible that a lack of techno-capital itself accounts for some respondents not to use the internet – the following section shows that the number of respondents without home internet is *smaller* than the number of respondents who say they don't use it – but it's likely that minimal exposure to the internet whether it is because of a lack of resources or a negative disposition toward technology leads to reduced techno-capital. Non-use of the Internet and low techno-capital are likely mutually constitutive; if an individual is unable to accomplish things online, he is unlikely to want to use it. As argued in the introduction, the importance of techno-capital extends beyond online life, however. Using the Internet is increasingly critical to finding employment, pursuing education, expressing an opinion, maintaining a network of useful contacts, or obtaining government services, so an inability to achieve life goals using technology may soon become an inability to achieve many life goals at all. Austin Free-Net, a local non-profit engaged in digital-inclusion projects, indicates that its clients view Internet use as necessary for seeking employment, getting access to benefits, and obtaining or using other government services (Austin Free-Net, 2013).

H11b: Respondents with home Internet access will have higher techno-capital than those who say they do not have Internet access at home.

As mentioned above, a greater proportion of respondents said they do not use the Internet than those who said they do not have Internet access (to a computer) at home. After weighting, 6.78% of respondents said they do not have Internet access through a computer at their homes, while 11.88% said they do not use the Internet at all. Of course, it is possible that some respondents pay for Internet access, but do not use it, but it is more likely that the respondents live in multi-member households where one or more members go online, but the respondent personally does not. This phenomenon is somewhat interesting from the theoretical frame of this project: in this case, the internet would be part of the respondent's habitus to some extent, but the respondent does not use it, which indicates that individual disposition and techno-capital are significant variables even when someone has access at home.[13]

---

[13] Of course, using the Internet is still to some extent a solitary experience. If there is only one internet-connected computer in the household, it may be the case that only one member uses the machine or sharing the machine becomes the subject of micro-social negotiations. Despite the presence of an internet-

The average techno-capital index for respondents with home internet access through a computer was 3.986, slightly higher than the overall average of 3.944, while the average index for those without home internet access is 3.408, indicating that respondents without home internet access felt less comfortable performing relatively common computer tasks. These results were statistically significant where p = .0088, confirming the hypothesis.

Table 75 Techno-capital among Persons with and without Home Internet Access

Home Internet	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
No Home Internet	3.986051	0.054869	3.878409	4.093693
Has Internet at Home	3.409537	0.21285	2.991972	3.827102
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 6.88				
Prob > F = 0.0088				

As with techno-capital among non-users, low techno-capital among those with no home internet access may be a function of less exposure to internet use or it may be the converse case where a lack of interest, or disposition, and skill using the internet discourages individuals from getting an ISP subscription. Of course, those who lack the material resources to get home Internet access may face a variety of other social barriers such as lack of access to education, racial or ethnic discrimination, or limited English-language skills. The concern, of course, is that limited technology skill will only further raise these barriers in society.

connected computer in the respondent's home, the interpersonal transaction costs of using it may not be worth the potential benefit of going online, particularly if the respondent is not particularly interested in what's online.

To return to habitus and techno-capital, even among those respondents who said they did not use the Internet but had an Internet connection at home had a higher average techno-capital index than respondents who said they did not use the Internet and did not have a connection. The average techno-capital index for non-users with access was 2.937, far lower than the overall average but still higher than those who said they did not use the internet and did not have access to the internet at home, whose average was 2.085. These results are statistically significant where p = 0.0064. Results comparing users with no home access with users with access were not statistically significant.

Table 76 Techno-capital Among Non-Users With Home Internet Access and Without Home Internet Access

	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
Non-users Without Home Internet	2.085732	0.216613	1.635261	2.536204
Non-users With Home Internet	2.937356	0.178921	2.565269	3.309443
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 21) = 9.19				
Prob > F = 0.0064				

These results suggest that even casual or “second-hand” exposure to the Internet improves the techno-capital of individuals, even if they do not go online. In these cases, Internet use is a part of the habitus of these respondents – they know about the Internet, have some familiarity with its affordances – but they choose not to use it, even if it is nominally available. This suggests that having the Internet as a part of individuals’ lived experience increases their ability to use to Internet to achieve life goals, even if it is not a tool they currently use. Moreover, if the Internet is not present in certain communities within Austin or elsewhere, these communities run the risk of being excluded from participating in the broader culture (Kleine, 2013; Warschauer, 2003).

H11d: Respondents with cable modem access will have higher techno-capital than respondents who do not.

Cable modem is the fastest home-broadband technology available today, so one may expect that its users may be among the most technologically savvy. In addition to offering faster advertised speeds than DSL, it does not require the presence of a land-line phone, making it attractive to younger consumers who may only use mobile phones for voice communication (Crawford, 2013). It is also the most common type of connection among the 2010 respondents with nearly half, 47.35%, of respondents saying they had a cable-modem connection at home. Until Google Fiber becomes available, it may be expected that consumers interested in fast and reliable access to the Internet would choose to get cable-modem service.

Respondents with cable-modem service did indeed have a higher techno-capital average than respondents who did not. The average for respondents who had cable modem at home was 4.0898, while the average for all other respondents 3.7925. These results, suggesting that cable-modem users had higher techno-capital, were statistically significant where $p = 0.0415$.

Table 77 Techno-capital Among Cable Modem Subscribers and Non-subscribers

Cable Modem	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
Non-subscriber	3.792499	0.065004	3.664976	3.920023
Subscriber	4.089772	0.071242	3.950011	4.229534
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 4.16				
Prob > F = 0.0415				

Although it appears to be the case that home-broadband users have higher techno-capital than those who do not, cable-modem users do not seem to be particularly blessed with techno-capital. The average index for cable modem users is 4.0898 while the overall average is 3.944, a statistically significant but not necessarily substantial difference. Moreover, nearly half of all respondents[14] subscribed to cable-modem service, so it perhaps is better to think of cable-modem subscription as the norm in Austin, particularly when there are few other high-speed options currently available.

H11e: Respondents with home-broadband access will have higher techno-capital than respondents who do not.

Aggregating DSL subscribers and cable-modem subscribers produced results similar to those for cable-modem subscribers alone, perhaps because cable modem was the dominant type of broadband access when the survey was administered. After weighting, 47.35% of the sample said they used cable-modem at home, while only 19.22 of the weighted sample said they used DSL at home. Together, nearly two-thirds (65.54%) of the weighted sample said they had home broadband service of some type.

[14] Slightly fewer than half of respondents after weighting subscribed to cable modem. Before weighting, 50.61% or more than half of respondents said they had subscriptions to home broadband.

Although techno-capital results for DSL were not significant, the aggregate results for the aggregate of DSL and cable modem were with p = 0.0415?.. As hypothesized, the average techno-capital index for home-broadband users was higher than those who did not have broadband at home. The average for home broadband users was 4.007, just slightly higher than the average; while the average for those who did not have broadband at home was 3.790, significantly lower than average. This suggests that those who do not have home broadband are less disposed or able to use networked computing to achieve life goals.

Table 78 Techno-capital Among Home Broadband Users and Non-Users

Home Broadband	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
No Home Broadband	3.790606	0.081645	3.630436	3.950776
Home Broadband User	4.00739	0.068012	3.873964	4.140815
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 4.16				
Prob > F = 0.0415				

Home broadband appears to be a mainstream condition for Internet users, considering both how close the average techno-capital index for broadband users is to the overall average and how prevalent broadband subscriptions are in Austin. Not having home broadband may put individuals at a significant disadvantage. In addition to lacking a relatively reliable and fast way to access information and services, not integrating fast internet in the home may limit the ability for users to casually develop familiarity and comfort with the internet, restricting their ability to accomplish things online.

H11f: Respondents who use mobile Internet services have more techno-capital than respondents who do not.

As discussed in Chapter 5, mobile Internet services were still relatively novel in 2010 when the survey was conducted. Still, about half of the weighted sample, 49.5%, said they used a cell phone to go on the Internet. Because of the way the question is worded, it is impossible to distinguish between respondents who merely checked email on a simple feature phone and those who had a richer Internet experience such as one afforded by an iPhone or other smartphone. Regardless, it is expected that mobile Internet users would be more tech-savvy and have positive dispositions toward technology than those who do not use mobile phones to go online.

The techno-capital mean for mobile Internet users was higher at 4.252 than for respondents who said they did not use cellphones to go online (3.582.) These results were statistically significant where $p < 0.0001$. Unlike the techno-capital results for home broadband, the techno-capital index for mobile users was substantially higher than the average, suggesting that mobile Internet users were more tech-savvy than the average person in Austin.

Table 79 Techno-Capital Among Users and Non-Users of Mobile Internet

Mobile Users	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
Non-User	3.585215	0.067586	3.452625	3.717804
Mobile Users	4.251844	0.053302	4.147277	4.356411
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 59.98				
Prob > F = 0.0000				

In 2010, when this survey was conducted, the iPhone had been on the market for a little over three years and the first Android models had circulated for fewer than two. Given the brief history of touch-screen smartphones at this time, and the higher techno-capital index, mobile users were likely technology enthusiasts embracing new gadgets. This might have been a good way to capture a high techno-capital population at the time, but now that more than half of Americans, according to the Pew Internet and American Life Project, use smartphones, mobile users today are probably more representative of the broader internet-using public (Smith, 2012a, 2010, 2012b).

H11i: Users of the City of Austin's free municipal Wi-Fi have more techno-capital than those who do not use the service.

The City of Austin's free municipal Wi-Fi service covers parts of downtown and the nearby neighborhoods of East Austin. (See Figure 1 Coverage Area of City of Austin Wireless Mesh Network.) Although it covers parts of residential neighborhoods on the Eastside, it is largely an amenity offered at public buildings and parks in those areas, rather than a service that could be used as a primary form of Internet access.

Although Wi-Fi has been identified as a technology that could be used to fill in gaps in internet access, (Fuentes-Bautista & Inagaki, 2006) it actually tends to be serving users who are already quite comfortable using technology and perhaps have other resources to go online. Only 9.81% of the weighted sample said they used the public Wi-Fi network. For the sake of comparison, 44.2% of the weighted sample went to an Austin Public Library in the previous year. The average techno-capital index for users of the public Wi-Fi network is 4.342, the highest of any of the sub-populations identified in this chapter. The average index for respondents who did not use this service is 3.911, close to the overall average of 3.944. These results are statistically significant with $p = 0.0002$.

Table 80 Techno-capital among City of Austin Wi-Fi Network Users and Non-Users

CoA Wi-Fi Users	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
Non-User	3.911185	0.055844	3.80163	4.02074
Users of CoA Wi-Fi	4.34236	0.099271	4.147611	4.537109
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 14.33				
Prob > F = 0.0002				

Like mobile users, the users of the municipal Wi-Fi service are quite comfortable using technology and apparently use it in public places. Unlike mobile users, this group of users may not represent a broader category of technophiles since the service is geographically limited to downtown Austin and the most central parts of East Austin. However, these users are likely in the habit of carrying a notebook computer or other portable device with them and perhaps checking to see if a Wi-Fi signal is available. It seems somewhat unlikely that these users would deliberately visit a public building or a park on the Eastside to use the Internet, but instead attempt to go online expecting Wi-Fi service. Based on the results presented in Chapter 5, these users are often better educated, more affluent, and white – groups that don't typically face challenges accessing the internet – but it may be good city policy to provide the public with this service, so citizens can conduct research while at City Hall or participating in community activities at a park, or library. It is particularly a benefit to the young, technologically sophisticated population that is attracted to Austin in part because of such amenities and who form an important part of its workforce.

H11j: Users of public-access services have less techno-capital than users who do not.

Because public-access services such as free internet access at libraries and municipal Wi-Fi are often intended to fill in access gaps for those who lack internet access at home, it might be expected that these users would have less techno-capital than those who do not use these services. After all, presumably some of these users have not integrated the Internet into their daily lives, leaving the home to use the Internet at a library or community center. Moreover, these programs that offer public Internet access often involve training programs or on-site support, encouraging community members to enhance their ability to use the Internet. With these factors in mind, it was expected that users of the Austin Public Library and municipal Wi-Fi network would have lower techno-capital than the rest of the sample.

This was not the case with the 2010 data. Results for Austin Public Library Internet users were not statistically significant, although they indicated that techno-capital among library users was roughly the same as or slightly higher than as the rest of the respondents. Aggregating library users with municipal Wi-Fi users did yield statistically significant results ($p = 0.0407$) showing a higher mean techno-capital index for public-access users compared to respondents who did not use these services. The average techno-capital index for public-access users was 4.160, while the average for those who did not use these services was 3.912. For both groups of users, the overall average for techno-capital, 3.944, was in the 95% confidence interval.

Table 81 Techno-capital among Users and Non-users of Public-Access Services

Public-Access Users	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
No	3.912337	0.058147	3.798264	4.026409
Yes	4.159606	0.105769	3.95211	4.367103
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 4.20				
Prob > F = 0.0407				

It seems likely that the high techno-capital among users of the municipal Wi-Fi service buoyed the average techno-capital index for the aggregated public-access group, particularly when the techno-capital average for library users was not statistically significant from the overall average or persons who did not use internet services at the library. Since the working hypothesis was that Austin Public Library users would have less techno-capital than other members of the public, this may suggest that APL's internet services are doing a good job of instructing patrons on using the internet or offering a comfortable environment for users to develop their ability to use the internet. Of course, it may be the case that the library also attracts users who are already comfortable using the internet, but this may be good for the program insofar there may be little stigma in using APL services. However, these results may also suggest that public-access services do not do a particularly good job of getting people who wouldn't otherwise be online using the internet – persons who are not currently users may not see these services as an option for starting to use the internet. Perhaps it requires a certain degree of techno-capital and cultural capital to even be aware that these services exist, or to be disposed to use them, if aware.

H11k: Exclusive users of public-access services will have less techno-capital than users who do not.

Because public-access services are often offered, in part, as a way for those who lack material access to the internet to go online, an analysis of users who do not have home internet access, but use public-access services might reveal a set of users who have markedly different techno-capital than persons who have internet access at home. If these persons rely on public-access services to go online, they may have fewer opportunities to develop the ability to use the Internet. Moreover, a section of the municipal Wi-Fi network covers traditionally Hispanic neighborhoods of East Austin, so there may be some residents who use the Wi-Fi services as a primary means of access.[15] With this in mind, it was expected that "exclusive" public-access users, public-access users with no home connection, would have less techno-capital than non-users of public-access services.

Users who rely on the Austin Public Library for Internet access is an important group for policy and digital-inclusion purposes, so it would be good to know how APL-only users compare to the general public in terms of techno-capital. Analysis for these users was not statistically significant, however. Respondents who used APL's Internet services had somewhat lower average techno-capital scores than the broader public, but, with a p value of 0.466, these results were not statistically significant.

Analysis of the data indicated this is not the case. The techno-capital mean for exclusive public-access users is 4.311, significantly higher ($p < 0.0001$) than the rest of the public (3.902) and even higher than the average for home-broadband users, which is 4.007. Exclusive users of public-access services are generally quite adept at using the

[15] According to city staff and a member of the city's telecommunications commission have indicated that the signal strength of the wireless mesh network is insufficient to penetrate the walls of most homes and businesses in the area, so using the service as a primary internet connection is unlikely.

Internet according to analysis of the data. In Austin, it seems that exclusive Wifi only internet users are more likely to be young, tech-savvy, white and well educated, rather than poorer, Latino and less educated.

Table 82 Techno-capital among exclusive users of public-access services

Public-Access Only	Techno-capital Index Mean	Std. Err.	95% Confidence Interval	
No	3.901811	0.057765	3.788489	4.015132
Yes	4.311127	0.069091	4.175584	4.446669
Overall Average	3.944982	0.053112	3.840788	4.049177
F(1, 1304) = 20.66				
Prob > F = 0.0000				

It is a little surprising that the users of public-access services who have no home-based connection would have a significantly higher techno-capital average than the general population. It may be the case that these users are sufficiently tech-savvy that they can have their internet-use desires sufficed through public-access services (probably with a combination of coffee-shop and mobile use.) It may also be the case that these are younger users who spend little time at home, so it's difficult to justify the cost of maintaining an ISP subscription. This does raise the question of whether public-access services like the municipal Wi-Fi network fill in gaps for members of society that do not have material access to the internet or if it is perhaps in reality a subsidy for the tech-savvy downtown and on the gentrifying Eastside.

Discussion

Taken as a whole, these results largely confirm the broader hypothesis that individuals with more techno-capital use faster and more novel internet-access technologies. On its face, it seems obvious that users with more techno-capital would be drawn to faster home Internet connections like cable modem, particularly when the subscription rates are competitive with slower technologies like DSL. However, the prevalence of home-broadband use and the fact that techno-capital averages were not all that different from the overall average suggests that fairly typical users use cable modem and DSL today and in 2010. The results for home broadband use are probably more meaningful in thinking about who doesn't use cable modem – largely individuals with lower techno-capital and individuals with lower economic capital.

At the time this survey was conducted, mobile Internet use was still fairly expensive and still fairly new. It is little surprise, then, that the group of respondents using mobile Internet services had more techno-capital than those who did not. In the three years since this survey was administered, more affordable data plans and internet-capable handsets have come on the market, and smartphone use has exploded. Although results for mobile-only users were not statistically significant for this survey, if a similar survey is conducted soon, it may be the case that there are more mobile-only users since a mobile phone is a near necessity in contemporary Austin and lower-income users may opt to substitute mobile internet service for having a general-purpose computer and home internet. It may also be the case that mobile users in the near future will have less techno-capital than those in 2010 because of the expansion of mobile-internet user.

One surprise in these results is the notably high techno-capital among users of the City of Austin free wireless Internet service. One might have anticipated that these users would have less techno-capital than the broader population since it is in part offered as a way to go online without another form of Internet access. Instead, its users had the highest average techno-capital index of the user populations identified in this chapter. Its users may primarily be professionals who work downtown or tech-savvy youngsters who can have their leisure-time Internet needs sufficed by the public Wi-Fi network. Although the high techno-capital among users of the network certainly bolsters Austin's self-image of a technology-attuned city, it does raise questions if the city is merely offering an amenity to privileged residents who have other means to go online.

The low techno-capital index among those who do not use the Internet or do not have an Internet connection at home raises concerns about groups who lack material access to the Internet. A lack of material access may create substantial barriers for these people to participate in the lives of their communities or further assistance as governments and communities increasingly rely on Internet-based services. As discussed in Chapter 5, non-users of the Internet tend to be older, persons of color, and persons from low-education backgrounds. That users with less techno-capital opt out of (or lack access to) using the Internet may indicate there are pockets where Internet and technology use are not part of their family or group habitus. Merely providing these households with Internet access may not lower the barriers to meaningful use of the Internet – simply giving these non-users access doesn't mean they will find things to do online.

SITES OF ACCESS AND TECHNO-CAPITAL

As discussed in Chapter 6, the kinds of people who use the Internet in particular contexts or sites can vary by cultural capital and educational background, economic capital, and age. An examination of the relationships between sites of access and techno-capital may shed some light on how individuals integrate technology into their lives – technology in the habitus – and what that means for their ability to use technology to achieve life goals. Persons who use the internet in their working lives or their social lives may have more opportunities or incentive to develop techno-capital than those who only use the internet at home for leisure or personal business.

This section analyzes techno-capital in three specific contexts: institutional sites of access, namely work or school; internet use at the home of a friend or family member; and coffee shops, which provide a proxy for integration of the internet in social lives outside the domestic sphere, as well as function as a visible form of access in Austin particularly. Results for techno-capital in the domestic context were not statistically significant, and results for use in public-access contexts were presented in the previous section.

H12a: Persons who use the Internet at work or school will have greater techno-capital than those who do not.

A broad hypothesis of this study is that the more that Internet use integrated into a person's life the better equipped that person would be to make meaningful use of the Internet. It follows, then, that individuals who use the Internet at work or school would have more techno-capital than those who do not. The presence of the Internet in the workplace or school has additional considerations. As noted in the previous chapter, persons working in technology fields had a higher techno-capital average than those in other fields, so persons whose job or education involve technology would expected be expected to, first, access the internet in an institutional setting, and, secondly, have more techno-capital. However, in today's workplaces, Internet use is largely available to most white-collar workers since email is all but a necessity for many workers. (And it was noted that information-intensive sectors such as education and government did not have notably high techno-capital. Similarly, schools are largely equipped with computer networks for students and teachers to access email, courseware, and other resources online, regardless of whether it is a technology-oriented program or not. Internet access is not pervasive in the workplace, of course: manual laborers, food-service workers, and other persons who work away from a desk may have no access or need for the internet at their jobs. These are also often lower-status jobs performed by persons with lower cultural capital or educational attainment. With that in mind, it is hypothesized that persons who use the Internet at work have more techno-capital than those who do not.

Those who use the Internet at work do have a greater average techno-capital index than those who do not. The average index for those who use the Internet at work is 4.252, while the average index for those who do not is 3.488. These results are statistically significant with $p < 0.0001$, confirming the hypothesis.

Table 83 Techno-capital and Institutional Access

	Institutional Access			
	Techno-Capital Mean	Std. Err.	95% Confidence Interval	
No Internet Use at Work or School	3.452	0.0801	3.295531	3.609977
Uses Internet at Work or School	4.241	0.0397	4.163642	4.319245
Overall Average	3.944	0.0531	3.840788	4.049177
F(1, 1304) = 77.80				
Prob > F = 0.0000				

Given the assumptions above, it is not surprising that work Internet users have greater techno-capital, but it is perhaps surprising that the difference is that great. It suggests that using the Internet at the workplace may require or at least encourages workers to develop the ability to make meaningful use of the Internet. Workplaces and school environments are also sites at which peer learning or experiential learning may take place; if a user needs to attach a file to an email message, he or she may ask a colleague how to do so or perhaps feel enough pressure that they learn on their own. Of course, environments that are dependent on internet communication systems such as email may also exclude individuals who do not have the techno-capital to develop the requisite skills through not hiring these individuals, creating barriers to school admission, or leading these individuals to self-select out of pursuing particular jobs or educational opportunities.

H12b: Persons who use the Internet in domestic contexts such as at home or at the home of a friend or family member will have greater techno-capital than those who do not.

Probably because domestic Internet use is so common, an analysis for techno-capital by the broad domestic-access variable did not produce statistically significant results. Further analysis looking specifically at individuals who used the Internet at others' homes did produce statistically significant results, and interesting ones at that.

The domestic-use variable was created by aggregating the variables from affirmative responses indicating respondents used the Internet at their own homes and at the homes of friends or family. This did not produce statistically significant results for techno-capital. However, the types of people who use the internet at others' homes fall into two categories, people who go to the homes of friends or family to use the internet because they lack access at their own homes and people who have internet at home, but also use it at the homes of friends and family. The first category of people probably lacks the interest in the Internet or the resources to subscribe to a home Internet connection. The second category likely comprises people who really, really like using the Internet. Members of this second category also probably have positive dispositions toward technology and have integrated Internet use into their social lives. Instead of using the binary home-access variable used in Chapter 6, this analysis uses a four-category variable identifying the following categories:

1. Respondents who have home access and do not use the Internet at others' homes. (63.7% of the weighted sample)

2. Respondents who have home access and use the Internet at others' homes. (29.6%)
3. Respondents who do not have home access and use the Internet at others' homes. (2.99%)
4. Respondents who do not have home access and do not use the Internet at others' homes. (3.79%)

At the outset, the assumption was that individuals who used the Internet at other's homes would have more techno-capital than those who did not. These results were inconclusive because of the difference between categories 2 and 3 based on access at their own homes. This led to the following two hypotheses:

1. Persons who use the internet at others' homes and have access at their own homes have more techno-capital than persons who have home access, but do not use the internet at others' homes
2. Persons who use the Internet at others' homes, but do not have access at their own homes have more techno-capital than persons who do not use the Internet in any domestic setting.

Analysis confirmed the first hypothesis; the techno-capital mean for persons with home access who use the internet at others homes is 4.22 out of 5, roughly comparable to coffee-shop users, while the techno-capital mean for persons who just use the internet at their own homes is 3.86, lower than the overall average of 3.94. The results did not confirm the second hypothesis, although the results were statistically significant. The techno-capital mean for people without home access that used the internet at other homes is 3.29, which is lower than the techno-capital mean for persons who do not use the internet in any domestic context, 3.51. These results are statistically significant with $p = .0002$.

Table 84 Techno-capital and Domestic Access Contexts

	Techno-Capital Mean	Std. Err.	95% Confidence Interval	
Home Access, Does not access at others' homes	3.860083	0.065809	3.73098	3.989187
Home Access, accesses at others' homes	4.22045	0.131846	3.961797	4.479103
No Home Access, Accesses at others' homes	3.291259	0.165005	2.967555	3.614964
No Home Access, Does not access at others' homes	3.513121	0.353771	2.819099	4.207143
F(3, 1302) = 6.75				
Prob > F = 0.0002				

The results for persons who do not have home access are somewhat surprising. It is likely that many of these individuals who do not use the Internet at others' homes may use the Internet in other contexts, such as through public-access services. A quick analysis indicated slightly over half of these people used the internet at either the Austin Public Library or the City of Austin's free Wi-Fi.

Table 85 Public-Access Use and Domestic Access

Public Access Use			
	no	yes	row total
Home Access, Does not access at others' homes	93.64%	6.36%	100.00%
Home Access, accesses at others' homes	80.52%	19.48%	100.00%
No Home Access, Accesses at others' homes	87.66%	12.34%	100.00%
No Home Access, Does not access at others' homes	46.98%	53.02%	100.00%
Total	87.81%	12.19%	100.00%
Uncorrected chi2(3) = 137.4590			
Design-based F(2.91, 4260.34)= 16.0805 P = 0.0000			

Coffee shops are another potential access context for persons with no home access through a computer where they might develop techno-capital. It turns out, however, that only 11.2% of the non-domestic users used the Internet at coffee shops, while 62.2% of those who "borrowed" access from friends or family used the Internet at coffee shops.

Table 86 Coffee Shop Internet Access and Domestic Access

Coffee Shop Use			
	no	yes	row total
Home Access, Does not access at others' homes	88.75%	11.25%	100.00%
Home Access, accesses at others' homes	57.23%	42.77%	100.00%
No Home Access, Accesses at others' homes	37.78%	62.22%	100.00%
No Home Access, Does not access at others' homes	88.79%	11.21%	100.00%
Total	77.91%	22.09%	100.00%
Uncorrected chi2(3) = 215.8259			
Design-based F(2.49, 3637.12)= 16.7815 P = 0.0000			

This might suggest that public-access services do a better job of serving persons who do not have home access than commercial options like coffee shops.

H12c: Persons who use the Internet at coffee shops will have greater techno-capital than those who do not.

Although freelancers and graduate students often go to coffee shops to work, the coffee shop is largely a site of leisure. Some coffee shops do offer machines to go online, but generally in Austin one needs a laptop or mobile device to use the Wi-Fi Internet access provided by coffee shops. As a result, coffee-shop users are likely to be persons who view Internet use as a leisure activity and have invested in some internet-connected device. Therefore it is likely that coffee-shop users will have greater techno-capital than people who do not use the Internet in coffee shops.

Analysis for coffee-shop users indicates that coffee shop Internet users do have a high average techno-capital index, 4.28 out of 5. This is higher than the overall average of 3.94 and higher than the average of those who do not use the Internet at coffee shops, 3.84. These results are statistically significant with p = 0.046 and suggest that coffee-shop users are better able to make effective use of the Internet. Overall, 22.09% of Austinites use the Internet at coffee shops.

Table 87 Techno-capital by Coffee-shop Internet Use

Coffee-Shop Use				
	Techno-Capital Mean	Std. Err.	95% Confidence Interval	
Does not use Internet at Coffee Shop	3.837152	0.0632509	3.713067	3.961237
Uses Internet at Coffee Shop	4.277911	0.081009	4.118989	4.436834
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 18.39				
Prob > F = 0.0000				

Unlike use at the workplace, it seems unlikely there would be a causal relationship between coffee-shop Internet use and cultivating cultural capital. Instead, coffee-shop use is probably an indicator of positive dispositions toward technology. Coffee-shop users take their devices to public, social spaces to use the Internet or perhaps expect to reference the Internet as part of socializing.[16] Like people who use the Internet at others' homes while having a home connection themselves, coffee-shop users likely integrate Internet use into many facets of their lives.

Discussion

Examining techno-capital by the site of access illuminates some differences between users and how technology is integrated into their lives. Institutional use, particularly work use may be one of the more overlooked factors related to digital inclusion. The difference in the techno-capital index between institutional users and those

[16] One example might be looking at restaurant reviews on Yelp before deciding on a place for dinner.

who do not use the Internet at school or work would suggest that institutional sites of access might play a substantial role in cultivating techno-capital. Although some persons with low techno-capital may be excluded entirely from Internet-dependent work and educational environments, the results indicating that the youngest Austinites have less techno-capital than older, career-age persons suggest that techno-capital is often developed in the workplace. Schools are often identified as sites where digital inclusion can be facilitated, but a literacy-oriented approach to teaching Internet skills may deny the complex set of experiences that nurture comfort and effective use of technology.

Beyond institutional use, Internet use outside the home appears to an indicator of high techno-capital – individuals who like technology and feel comfortable using it integrate it into their lives – or integrating it into social lives affords opportunities to further develop techno-capital, much as attending concerts or viewing art exhibitions socially may nurture cultural capital. Although public-access users as a whole do not appear to be much different from the Austin population, the relatively high techno-capital average among public access users without home access suggests that these services may be effective in helping users develop cultural capital if they do not get access independently.

Examining Internet use by the site of access further situates it in the broader social context. It appears that people who are social in their Internet use, whether they use it at work, at a library, or at a café are better positioned to develop techno-capital. This justifies concerns that if some communities are unable or lack a disposition to integrate technology, potential users may individually lack the kind of peer support they may need to develop understandings and abilities to make effective use of the Internet.

Chapter 9: Multivariate Analysis of Internet Use

As the theoretical approach to this study would suggest, Internet use is overdetermined, arising from a variety of social factors. Some, like habitus, are difficult to operationalize or measure. The goal of this project, however, is to identify how some segments of society are excluded from online participation; multivariate models can offer some insight into which social factors affect Internet use and which factors are merely related to more significant factors. This chapter describes multivariate analyses for the following three questions:

- What demographic factors are related to non-use of the Internet?
- What demographic factors are related to techno-capital formation?
- What access types are related to techno-capital?
- What access types are related to techno-capital?
- What demographic and access factors are related to techno-capital formation? (Are demographics or access more influential?)

Many of the variables used in this analysis are correlated; for example, African-Americans and Hispanics often have low levels of educational attainment, so the binary variables for these categories are negatively correlated. In other cases, categorical variables such as income[17] did not make sense, so they were excluded from the multivariate analysis. In addition, age here is used as a continuous variable based on the year of the respondent's birth, rather than the age ranges or generational categories used

[17] Because the survey questionnaire asked respondents to place themselves in an income range, rather than report actual income, and the ranges were not of equal size, the income variable can not be treated as an ordinal variable in this analysis. In addition, the large number of "prefer not to answer" responses made this variable of dubious use, so it has been excluded from the multivariate analyses.

in the analyses in previous chapters. Table 88 shows correlations and significance levels for the demographic variables used in the multivariate analyses below.

Table 88 Correlations for Demographic Variables

	Cultural Capital	Education	African-American	Hispanic	Immigration	Age	Women
Cultural Capital	1						
Education	0.3787***	1					
African-American	-0.1016***	-0.1654***	1				
Hispanic	-0.23***	-0.2203***	-0.0903***	1			
Immigrantion	-0.0922***	0.0173	-0.0215	0.1646***	1		
Age	-0.3065***	-0.0681**	0.0761**	- 0.1375***	-0.0626*	1	
Women	-0.0084	-0.0487	0.0749**	-0.0114	-0.0428	-0.0357	1
	* p < .05	** p < .01	*** p < .001				

Some of the correlations are unsurprising. For example, cultural capital (defined here as the education of an interviewee's parents, indicating the cultural capital likely to be transmitted from them) and education are highly correlated. This would be suggested by Bourdieu's theory of class reproduction (Bourdieu & Passeron, 1977), where educated parents, with a presumed positive disposition towards education, would want to educate their children to roughly the same level while less-educated parents may lack a positive disposition to education. Similarly, being African-American or Hispanic has negative correlations with education thanks to barriers to educational attainment for these segments of the population. One object of the multivariate analyses is to determine whether education may account for differences in Internet use among these segments.

MULTIVARIATE ANALYSIS OF NON-USERS

One of the primary concerns of digital-inclusion research has been to identify which segments of society do not use the Internet at all, and why (National Telecommmunications and Information Administration, 1995, 1998, 1999; Wyatt, Thomas, & Terranova, 2002; Wyatt, 2005). Chapter 5 examined which groups have the greatest proportions of non-users of the Internet such as African-Americans, Hispanics, and the aged. For this chapter a logistic regression analysis was conducted to see what factors are related to non-use of the Internet. Each of the variables above were used as independent variables in a logistic regression (logit) analysis where non-use of the Internet was represented as a binary variable. This was based on the survey item "I do not use the Internet at all." Independent variables that were not statistically significant were removed on a case-by-case basis until only statistically significant variables remained. For this question, age and education were the only independent variables that were statistically significant.

Table 89 Logit Model for Non-use of the Internet

Number of strata = 1			Number of obs = 1464			
Number of PSUs = 1464			Population size = 1700.1885			
			Design df = 1463			
			F(2, 1462) = 15.81			
			Prob > F = 0.0000			
		Linearized				
Non-Users	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Education	-1.177789	0.256106	-4.6	0	-1.680163	-0.6754148
Age	0.0392188	0.0157483	2.49	0.013	0.0083271	0.0701106
_cons	-0.8759023	1.183453	-0.74	0.459	-3.197348	1.445543

Education was the strongest factor related to non-use of the Internet; better-educated Austinites are more likely to use the Internet to some extent than less educated residents. Although this study emphasized the role of cultural capital in Internet use, it was not a statistically significant variable in this analysis, perhaps because of the strong correlation between cultural capital and education. In this logit model, age had a positive relationship with non-use, which is perhaps obscured by the granularity of the age variable used for the multivariate analysis. While its coefficient was only 0.0392, it represents the difference for each year of age, rather than the age ranges used in the previous chapters.

What is perhaps most striking about these results, however, is what demographic factors are *not* statistically significant. Immigration history, racial/ethnic category, and gender are not statistically significant in these results. Particularly for the racial/ethnic categories, the correlation of these factors with education appear to negate much of their effect on non-use of the Internet, indicating that educational background plays a key role in whether or not an individual uses the Internet. Although older Austinites are also less likely to have attained higher levels of education, age in this data is only slightly negatively correlated with education, in part because younger respondents may not have had the time to achieve higher degrees. Here, however, age is statistically significant when age is included in the model, so older Austinites do face barriers to using the Internet, which may relate to factors such as income, exposure to computing in institutional settings, and low techno-capital.

Although age persists as a factor in whether individuals use or do not use the Internet, it is something of a relief that educational attainment is the only other statistically significant variable for Internet non-use. While barriers to education seem to increase as the years go on, this suggests first that expanding educational programs for Internet use may have some success in getting more people online and, secondly, while communities of color in Austin may face barriers to education, non-use does not appear to be specific to any racial/ethnic categories. Of course, educational attainment may be a product of the same social forces that encourage individuals to use the Internet, instead of a factor that encourages Internet use. The same dispositions that lead individuals to further education may also encourage them to go online. Furthermore, Internet access at key institutions, school and work, appear to offer substantive opportunities to learn how to the use Internet and use it more effectively, as the results of Chapter 7 indicate.

MULTIVARIATE ANALYSIS OF TECHNO-CAPITAL AND DEMOGRAPHICS

Much of this study has foregrounded techno-capital since using the Internet in general is less important than the ability to use it strategically to achieve life goals. Working from the assumption that techno-capital, like economic, social, or cultural capital is unevenly distributed through Austin, a multivariate analysis expands on the descriptive statistics in the previous chapters related to what segments of society possess techno-capital and which segments lack it, by determining which demographic characteristics are most statistically significant in a regression analysis.

As with the analysis for non-users, this analysis used the demographic variables listed at the top of this chapter as its independent variable, and the five-point techno-capital index as its dependent variable. Independent variables that are not statistically significant were removed one by one until only statistically significant variables remained in the analysis. As noted above, some of the independent variables such as the cultural capital index and education are highly correlated, so many variables would not be significant in the regression analysis. As with the analysis for non-users, educational attainment and age were statistically significant, but gender, using a dummy variable indicating women, and Hispanic identification were also statistically significant.

Table 90 Regression Analysis for Techno-capital and Demographic Variables

Number of strata = 1				Number of obs =1305		
Number of PSUs = 1305				Population size = 1501.0578		
				Design df = 1304		
				F(4, 1301) = 38.90		
				Prob > F = 0.0000		
				R-squared = 0.3036		
		Linearized				
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Women	-0.3987114	0.086099	-4.63	0	-0.5676192	-0.2298036
Education	0.1756495	0.0398837	4.4	0	0.0974063	0.2538927
Hispanics	-0.2723238	0.1067047	-2.55	0.011	-0.4816556	-0.0629921
Age	-0.0290341	0.0029047	-10	0	-0.0347324	-0.0233358
Construct	4.790946	0.2102026	22.79	0	4.378573	5.203318

Although gender was not a significant variable in most of the analyses in this study, for the regression analysis of techno-capital, it has one of the stronger effects on techno-capital; the difference between men and women is roughly the same as three level differences in educational attainment. One confounding factor is the problem of the use of self-reporting to generate the techno-capital variable. Hargittai & Shafer's (2006) study indicated that women's self-assessment of computer skill is lower than men's even when their actual skill level was roughly the same. Gender differences in confidence may explain some of the difference in the techno-capital index. However, confidence with technology may affect dispositions and how likely an individual is to use the Internet for finding work, pursuing education, or achieving other life goals. The relative significance of gender in techno-capital may point to deeper barriers women face in using technology.

As with the analysis for non-use, educational attainment had a positive effect on techno-capital. Although younger people may have had some school training with computers and Internet use, the relationship between education and techno-capital is likely largely a matter of the broader class habitus related to education. Better educated people are likely to work in information-intensive roles where computer use is part of the job or have a positive disposition toward reading and informal research, leading to the cultivation of techno-capital. It is unclear if additional education would enhance the techno-capital of persons with lower educational attainment or if Internet-specific education programs might help individuals develop more confidence and fluency with Internet use, but further studies in Austin should perhaps see what role – if any – continuing education programs about Internet use may play in nurturing techno-capital.[18]

Age also has a negative relationship with techno-capital. Older persons rate themselves lower on the computer tasks identified in the survey questionnaire. The oldest respondents may not have been in the workforce or may have been retiring when the Internet became mainstream in many Austin workplaces, but the results presented in Chapter 7 also indicate that older persons still of working age also have less techno-capital, as measured by this index. Although the results in Chapter 7 indicated that the youngest adults actually had less techno-capital than somewhat older adults, these results reflect the broader trend indicating a negative relationship between techno-capital and age.

This analysis used dummy variables to identify African-Americans and Hispanics, historically marginalized groups in Austin. Differences in education largely account for lower techno-capital for African-Americans, which raises questions about educational opportunities in Texas. Austin, notably, still suffers from the lingering effects of a segregated school system (Straubhaar, et al, 2012). However, the variable for Hispanics

[18] Kvasny (2006) describes how well intentioned computer- and Internet-training programs often ignore the circumstances of participating clients by making time demands that are difficult or impossible for participants to meet. In addition, these classes may not address the specific training needs of the client population.

was statistically significant in this analysis, showing a negative relationship between being Hispanic and techno-capital. These results may indicate language barriers to nurturing techno-capital (although language, measured by non-English media use, was not statistically significant) or this may reflect negative dispositions toward technology use in Hispanic families and communities, as identified by Rojas et al. (2012). Because education does not account for differences in techno-capital among Hispanics, the low techno-capital among Hispanics may be a matter of particular concern for persons interested in digital inclusion.

MULTIVARIATE ANALYSIS OF TECHNO-CAPITAL AND ACCESS TYPES

Much of the mainstream policy related to digital inclusion emphasizes material access, particularly broadband access in the home, but sometimes in schools or public-access centers. This approach has the tacit assumption that if individuals have access to the Internet, they will be able to take advantages of Internet services and information. A regression analysis of techno-capital and access types may provide some insight to what effect, if any, access types have on techno-capital.

Although types of access – at least in the home – and techno-capital may be mutually constitutive, that is, persons with strong favorable dispositions toward technology and high techno-capital likely seek out the fastest or most convenient access types, this analysis treats the access types as independent variables and techno-capital as the independent variable. Some access types, such as institutional access, are likely the product of a number of different factors, although persons with very low techno-capital may experience difficulties finding employment in workplaces where Internet use is part of the routine.

Table 91 shows correlations between access technologies. These are the access types discussed in chapters 6 and 8. Some types, such as mobile access and wireless mesh network access, are strongly correlated although they are independent from one another. Others such as mobile access and exclusive mobile access are strongly correlated because they are coded from responses from the same variable. Respondents coded positive for exclusive mobile access indicated that they use the Internet on a mobile device such as a smartphone and that they did not have broadband access at the home. The exclusive public access variable indicates respondents who use public-access services but do not have broadband access at the home.

Table 91 Correlations of Access Types

	Home Broadband	Mobile	Mobile Only	Austin Public Library	Wireless Mesh Network	Public Access Aggregate	Public Access Only
Home Broadband	1						
Mobile	0.123***	1					
Mobile Only	-0.203***	0.149***	1				
Austin Public Library	0.002	0.0137	0.0794**	1			
Wireless Mesh Network	-0.0075	0.141***	0.0396	0.192***	1		
Public Access Aggregate	0.0067	0.107***	0.0699**	0.731***	0.735***	1	
Public Access Only	0.0768**	0.123***	-0.0487	0.632***	0.702***	0.930***	1
* p < .05 ** p < .01 *** p < .001							

These variables were input into a weighted regression analysis for techno-capital. Independent variables that were not statistically significant were removed one by one until all of the independent variables were statistically significant. At the end of this process, home broadband, mobile use, and use of the city's wireless mesh network were the only independent variables that were statistically significant.

Table 92 Regression Analysis for Techno-Capital by Access Technologies

Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
			Design df = 1304			
			F(3, 1302) = 26.73			
			Prob > F = 0.0000			
			R-squared = 0.1576			
		Linearized				
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Home Broadband	0.232922	0.092335	2.52	0.012	0.0517806	0.4140635
Mobile	0.6470137	0.0853148	7.58	0	0.4796445	0.8143829
CoA Wireless	0.2980309	0.0987592	3.02	0.003	0.1042866	0.4917751
Constant	3.406571	0.096457	35.32	0	3.217343	3.595799

In this analysis, mobile had the greatest coefficient for techno-capital of any of the access types. Unlike the demographic variables, these are all binary variables, so coefficient comparisons make more sense. Although the average techno-capital index for users of the city's wireless mesh network was higher than that of mobile users, mobile use appears to have a stronger relationship with techno-capital, if only because the number of mesh network users was so small. Use of the mesh network did have a slightly higher effect than home broadband, but given that the majority of Austinites have either DSL or cable modem service, it is notable that home broadband is significant at all. It is likely the case that with notable exceptions, persons who have a modicum of techno-capital– and the resources to get it – subscribed to some home broadband service in 2010.

What is not statistically significant here may be more telling than what is. Although it might be expected that users of the computer and Internet services at the Austin Public Library have lower techno-capital than the broader public, use of the library's services was not statistically significant. (An additional analysis used a dummy variable to indicate library users who did not have home broadband, and this variable was also not statistically significant in regression analysis.) Similarly, exclusive mobile use and exclusive public-access use were not statistically significant variables. While these were slim slices of the 2010 respondents, the fact that library use does not seem to have a relationship to techno-capital either speaks to the effectiveness of APL's Internet-access efforts or further confirms that using the Internet at the library does not attract particularly tech-savvy or technophobic individuals, but, rather, a broad swath of the Austin population.

MULTIVARIATE ANALYSIS OF TECHNO-CAPITAL AND ACCESS CONTEXTS

The previous chapter also examined how techno-capital and the context where people access the Internet may be related. These access contexts, domestic, institutional, public access, and coffee shop were also used in a regression analysis for techno-capital. Table 93 shows the correlations of these access-context variables and their statistical significance.

Table 93 Correlations of Access Contexts

	Domestic	Institutional	Public-Access	Coffee-Shop
Domestic Use	1			
Institutional Use	0.369***	1		
Public-Access Use	0.0349	0.124***	1	
Coffee-Shop Use	0.176***	0.241***	0.286***	1

These access contexts are notionally independent of each other; the variables are all constructed from different items on the survey questionnaire, although in reality, of course, they may overlap among individuals, since many students or workers who access the Internet at school or work find there are incentives to have internet access in the home such as checking email or conducting research outside of work or school. These incentives likely account for the relatively high correlation between domestic use and institutional use.

These access-context variables were used as independent variables in a regression analysis where the techno-capital index is the dependent variable. After removing variables that were not statistically significant, the variables for institutional use and coffee-shop use were statistically significant.

Table 94 Regression for Techno-Capital and Access Context

Number of strata = 1				Number of obs = 1305		
Number of PSUs = 1305				Population size = 1501.0578		
				Design df = 1304		
				F(2, 1303) = 43.73		
				Prob > F = 0.0000		
				R-squared = 0.1940		
Linearized						
Techno-Capital Index	Coef.	Std. Err.	t	P > t	95% Confidence Interval	
Institutional Use	0.7372393	0.0936178	7.87	0	0.5535813	0.9208973
Coffee-Shop Use	0.2407024	0.0773906	3.11	0.002	0.0888787	0.3925261
construct	3.425978	0.0826644	41.44	0	3.263808	3.588147

Given the prevalence, if not normativity, of domestic Internet use, it is unsurprising that domestic access was not a statistically significant variable in this analysis. What is striking, however, is the size of the coefficient for institutional access, suggesting that using the Internet at work or school plays an important role in forming techno-capital. This reinforces the conclusions drawn from the analyses in Chapter 7 that access at school or work nurtures meaningful use of the Internet. The coefficient for coffee-shop use is likely more reflective of the enthusiasm coffee-shop users have for accessing the Internet or, at least, how central it may be to their lives. As with the previous analysis, public-access use is not statistically significant, suggesting perhaps that library users (who make up the bulk of public-access users) are largely in the mainstream of technology use.

COMBINED MULTIVARIATE ANALYSIS OF TECHNO-CAPITAL

Contemporary digital-inclusion policy initiatives such as the National Broadband Plan often emphasize technology and economics. One of the core questions of this study was whether social factors such as demographics and use contexts or access technology were more influential in making meaningful use of the Internet. This final analysis incorporates each of the independent variables used in the regression above to see which factors have the most effect in forming techno-capital. Table 95 shows correlations between the demographic variables and the access variables used in this analysis. (This table has been truncated to fit on one page. Table 88 shows correlations for demographics and Table 91 shows correlations for access types.) In some cases there are statistically significant correlations between demographic variables and access variables. For example, the correlation coefficient for cultural capital and home broadband is 0.072, indicating that the likelihood of having home broadband increases with cultural capital, or vice versa. In many other cases there was little correlation between demographic characteristics and access types.

Table 95 Correlations for Demographic and Access Variables

	Cultural Capital	Education	African-American	Hispanic	Immigration	Age	Women
Non User	-0.226***	-0.292***	0.116***	0.102***	0.0515	0.265***	-0.0054
Home Broadband	0.0722**	0.151***	-0.116***	-0.0592*	0.0315	-0.0497	-0.0925***
Mobile	0.163***	0.149***	-0.0175	0.0157	-0.0219	-0.378***	-0.0159
Mobile Only	-0.0076	-0.0207	0.0359	0.138	-0.0235	-0.0831	0.0295
Austin Public Library	-0.0092	-0.0361	0.0911***	0.0661*	0.0399	-0.0698**	0.004
Wireless Mesh Network	0.126***	0.0511	0.0333	0.0414	-0.0159	-0.135***	-0.0096
Public Access Aggregate	0.0828**	0.0351	0.0573**	0.0622*	0.0219	-0.1332***	-0.0111
Public Access Only	0.106***	0.0742**	0.0067	0.0452	0.0383	-0.131***	-0.0185
Domestic Use	0.1849***	0.204***	-0.114***	-0.0605*	0.0037	-0.233***	-0.0133*
Institutional Use	0.238***	0.248***	-0.111***	-0.0076	0.0238	-0.416***	-0.089***
Coffee Shop Use	0.186***	0.178***	-0.0781**	-0.0564*	0.0557*	-0.254***	-0.0479
	* p < .05	** p < .01	*** p < .001				

As with the previous regression analyses, this analysis used each independent variable in a regression analysis and then removed the variables that were not statistically significant until only significant variables remain. In Table 96, the variables have been reorganized by the absolute value of coefficients in descending order to show which factors have the greatest effect on techno-capital.

Table 96 Combined Linear Regression for Techno-Capital

Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
			Design df = 1304			
			F(7, 1298) = 34.25			
			Prob > F = 0.0000			
			R-squared = 0.3853			
		Linearized				
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Institutional Access	0.3515219	0.0797621	4.41	0	0.1950457	0.507998
Mobile Access	0.3090262	0.0631313	4.89	0	0.1851761	0.4328763
Women	-0.2968978	0.0676284	-4.39	0	-0.4295702	-0.1642254
Hispanic	-0.2223119	0.0907368	-2.45	0.014	-0.4003181	-0.0443058
Public Access Only	0.1756534	0.0663114	2.65	0.008	0.0455648	0.3057421
Home Broadband	0.1719948	0.0738424	2.33	0.02	0.0271318	0.3168578
Education	0.0986278	0.0347711	2.84	0.005	0.0304144	0.1668412
Age	-0.0234813	0.0025992	-9.03	0	-0.0285804	-0.0183822
Construct	4.229306	0.1673652	25.27	0	3.900971	4.55764

The demographic variables that were significant in the regression for techno-capital with only demographic variables were still statistically significant in this analysis. Introducing access variables diluted some of their importance in this analysis. In the first regression, the coefficient for education was 0.176, while once the access variables such as institutional access are included, its coefficient is only 0.099. Part of this may be due to the fact that the institutional access variable includes access at school and another part of it is likely due to the fact that better educated individuals are more likely to have jobs that involve Internet use. However, it is notable that education remains a statistically significant independent variable, suggesting that education has a positive effect for individuals who do not have institutional access or provides an advantage to individuals who have access at work or other contexts compared to less educated people. The coefficient for women was also lower, but the variable is still statistically significant when the access variables are included. In the regression analysis just using demographics as independent variables, the coefficient for women is –0.399, while in this regression it is –0.297. Gender differences in working outside the home may play some part in reducing the coefficient since there is a statistically significant difference between men's and women's institutional access in Austin.

Some of the demographic factors are largely unchanged with the inclusion of access variables. While the coefficient for being Hispanic is somewhat lower in this analysis that includes access types, it is not reduced as dramatically as the coefficients for education and women. Differences in access reduce the coefficient from –0.272 to –0.223, still suggesting that Hispanics face particular barriers to going online and making meaningful use of the Internet. These barriers may be related to negative dispositions toward technology, an absence of technology in the habitus, or a lack of online social capital. Age also remains a negative factor in techno-capital formation, and it is also relatively unchanged with the addition of institutional access into the analysis. This indicates that use in the workplace or school, home broadband access, and mobile access do little to explain the broader trend of lower techno-capital among Austinites.

Although institutional access was not a factor that this study initially planned to investigate, it appears to have a substantive role in techno-capital formation. Institutional access is somewhat confounding since it is likely that there are thresholds of techno-capital individuals must possess to obtain many jobs that involve Internet use or pursue particular educational programs. Regardless, its prominence – along with the significance of home broadband – in these analyses suggest that integration of the Internet into daily life and the habitus is critical to techno-capital formation. These results further bolster the notion that the broader social context needs to be incorporated into discussions of digital inclusion, rather than simply cost or other matters of material access. However, the National Broadband Plan and similar digital-inclusion efforts do make a step toward improving the ability of the public to use the Internet since home broadband is a significant factor in this measure of techno-capital, but expanding the institutional and other contexts where members of society cultivate techno-capital and are included in online life should be considered.

The statistical significance of exclusive public access to the Internet might be interpreted as validation that the Austin Public Library's Internet access programs and the city's wireless mesh network are successful in helping the public make meaningful use of the Internet. This slice of the population is small and tends to comprise younger well, educated people. Rather than suggest that these programs improve techno-capital, these results may indicate that individuals need fairly high techno-capital in order to get by using only public-access services, particularly the city's wireless network. These services may, however, provide an important service for younger cash-strapped individuals as they work to establish careers or conduct personal business.

Mobile access also has a strong effect in the combined analysis. Although the iPhone had been on the market for three years when this survey was conducted in 2010, smartphones had yet to explode in use. (Smith, 2012, 2010) Future versions of this study may show little difference between mobile Internet use and the general public now that smartphones are mainstream, or a modest difference, as with home broadband in this analysis. Some individuals and households may further eschew home broadband for a mobile Internet subscription, so future studies may indicate that mobile Internet use has a negative effect on techno-capital since, compared to general-purpose computers, mobile phones generally have reduced affordances for input and display, as well as slower Internet connections.

DISCUSSION

These multivariate analyses highlight some of the critical concerns for expanding digital inclusion. Marginalized people of color do have statistically significant differences in their ability to access the Internet, as the descriptive statistics in Chapters 5 and 7 show. However, for African-Americans other factors such as educational attainment and income may account for some of their differences, while the multivariate analyses suggest that Hispanics face particular challenges in using the Internet. These may relate to lower levels of use in Hispanic communities and social networks or the low levels of institutional access, which appears to play some role in nurturing techno-capital. While barriers to education for African-Americans remains a matter of concern, particularly in cities like Austin where the legacies of segregation are apparent in the varying quality of schools in neighborhoods that were once segregated, identifying ways that digital-inclusion projects can address the needs of Hispanics seems to be desirable. These results also indicate that persons of age also face barriers to digital inclusion that are not otherwise explained by education or types of access, so they may also be an important target population for digital-inclusion programs. Education also remains a significant factor in both techno-capital and non-use. This survey unfortunately did not ask whether respondents had taken an Internet skills class or other continuing education program related to Internet use. Since these programs are available in Austin, it would have been interesting to see to what extent these programs affect the techno-capital of individuals or substitute for further formal schooling.

Like education, institutional access makes up part of the habitus of individuals in Austin, and these multivariate analyses suggest that it has a powerful effect in techno-capital formation. The integration into daily life at work or school – or through mobile access on a smartphone – likely encourages individuals to turn to the Internet for solving problems, socializing, or simply finding information. If Internet-based services were limited to recreational pursuits or pursuits limited to well educated or affluent individuals, the importance of integrating Internet use into daily life would be of minimal concern. However, since finding employment, obtaining public services, and pursuing education is much more convenient with – if not contingent on – Internet use, the unequal distribution of Internet access and techno-capital remains a prominent social-justice issue. Identifying barriers to Internet use for populations such as people of color, the aged, and perhaps women – and how they may be excluded from Internet use in daily life – is important for encouraging an equitable and democratic society.

Chapter 10: Conclusion

Stark inequalities in Internet use remain in Austin. As a whole, much of the city has home broadband access, but disadvantaged segments such as people of color and the less educated face barriers to using the Internet. The pervasiveness of Internet use for much of Austin only increases the contrast of these differences in access. Policy makers tend to emphasize home broadband access to the exclusion of other factors that encourage or discourage Internet use. The results of this study suggest that access to social contexts where the Internet is used is more important than home access. Improving access to schools and types of work where people can learn to use the Internet in social and meaningful ways could be more effective in address inequalities in Internet use.

The results of this study suggest that the degree, and form of peoples' socialization with technology has the strongest relationship to meaningful Internet use. The analyses for use at work and school in Chapter 6 indicate a sharp difference between institutional access for whites and for African-Americans and Hispanics, while the regressions in Chapter 9 suggest institutional access is the most significant factor for cultivating techno-capital. Many people are not afforded situations where they can engage with the Internet socially and gain the techno-capital to make meaningful use to the Internet. This limits the non-economic resources the poor, the less educated, and people of color have for going online.

Although the multivariate results suggest that race itself may have little to do with techno-capital – factors like education and types of employment are more statistically significant – non users and users with limited techno-capital tend to be African-American and Hispanic, raising the question whether communities and neighborhoods of color remain unconnected to the Internet. Internet use may not be part of the collective habitus

(Bourdieu 1984) of African-Americans and Hispanics. This may have the ongoing effect of reinforcing social hierarchies and eroding relationships with institutions like schools and governments.

Current US policy tends to emphasize the costs of going online, particularly the cost and availability of home broadband. The results of this study suggest that while historically disadvantaged groups use forms of access such as home broadband or mobile Internet at lower rates than dominant groups like whites and the well educated, connectivity itself plays a smaller role in meaningful use. Non-use and a lack of access are linked with low cultural capital and low educational attainment, factors which have a greater role in forming techno-capital than the mere availability of an Internet connection. Although having a home Internet connection is certainly helpful for developing techno-capital, particularly for children and teens, the connection itself has a minor constitutive role in forming techno-capital. Instead, not having a connection at home or at work appears to be more the result of a habitus that does not include Internet use. The current policy emphasis on home broadband foregrounds technology in a problem that has roots in culture and social inequality.

SUMMARY OF RESULTS

Demographics and Types of Access

Before turning to the broader social context of Internet use and non-use, this study asked what inequalities exist in material access. By first identifying which groups have which kinds of access, these analyses provide an overview of the material conditions of access for various demographic groups in Austin. It also provides continuity with an enduring strain of digital-inclusion research.

One of the earliest digital-inclusion concerns was whether people marginalized in the United States and around the world would be able to have material access to the Internet, which offered the potential to expand the reach of information services and communication (DiMaggio & Hargittai, 2001; National Telecommmunications and Information Administration, 1995). Because access to these services at the time offered advantages in education, careers, and public participation, many observers worried that a "digital divide" would further marginalize people of color, women, the aged, and people with low income or lower education (Lievrouw, 2000; Livingstone, 2005; Warschauer, 2003; Wyatt, 2005). Today, access to the Internet is no longer simply a useful amenity, but a near necessity given the emphasis on online access to public services such as signing up for Obamacare or to educational resources like the FAFSA form for applying for university financial aid, courseware and MOOCs.

Although further research in digital inclusion has complicated the model of what resources an individual needs to make meaningful use of the Internet, at a base level some form of material access to the Internet is necessary to go online. This study's results suggest that some gaps in material access, such as those between women and men, have narrowed in Austin, while troubling inequalities of access persist. Although most people in Austin (88.1%) used the Internet when the survey was administered in 2010, large segments of marginalized groups said they did not use the Internet. Over a quarter of African-Americans,(29.5%) and nearly a quarter of Hispanics (22.9%) in Austin did not use the Internet at all, while 95.4% of whites and 97.7% of Asian-Americans said they used the Internet. Although an overemphasis on racial/ethnic categories may obscure how broader inequalities in education and income affect Internet use because of intersectionalities of disadvantage, it does suggest that Internet use may not be as widespread in some Austin communities as it is in others.

Home broadband is often considered an ideal use case, and with roughly two-thirds (65.5%) of Austinites having home broadband it may be considered typical or normative for the city – for at least some segments of the city. While 70.6% of whites had home broadband, only two fifths of African-Americans in Austin (40.3%), had home broadband and almost three fifths (58.4%) of Hispanics did in 2010. Given the importance of "autonomy of use" in developing techno-capital and other resources needed to make meaningful use of the Internet (Hassani, 2006; Robinson, 2009) these results suggest that marginalized people of color may be poorly disposed to develop techno-capital in the future. These dispositions should not be considered a matter of individual blame, as Eubanks (2011) notes. In Bourdieu's accounts (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bourdieu, 1984) dispositions emerge from a collective habitus that reflects the social class, family environment, local community, and collective "common sense" in which an individual lives. This collective habitus affects individual decisions to attend school, pursue particular occupations, or use the Internet.

Age and gender have also long been considered potential obstacles to meaningful use of the Internet (Broos, 2005; Fox & Pew Internet & American Life Project., 2004; Hargittai & Shafer, 2006). None of the analyses by gender for types of access technologies in this study were statistically significant, which reflect and corroborate results in other digital-inclusion research (Broos, 2005; Hargittai & Shafer, 2006; Smith, 2012). Age-based analyses did indicate that older persons still use a variety of access technologies at lower rates than younger persons. For example, 27.6 percent of persons older than 65 in Austin did not use the Internet in 2010. None of the age-based analyses for broadband subscriptions or public-access use were statistically significant, but, perhaps unsurprisingly, Austinites older than 45 used mobile Internet services at lower rates than younger persons, with use decreasing with each age grouping.

In Chapter 9, multivariate analyses were used to find which social factors have the most significant effect on Internet use and non-use. The logit model for Internet use or nonuse implicated education as the most significant variable for predicting Internet use, and descriptive statistics also show that Internet use is often divided along the lines of education and cultural capital. Nearly a fifth of high-school graduates in Austin (19.1%) do not use the Internet at all and even fewer persons with less than a high-school education (38.6%) use the Internet. In contrast, only 1.3% of Austinites with bachelors degrees or higher do not use the Internet at all, suggesting that Internet use has thoroughly penetrated the habitus of well-educated people in Austin. Results for broadband access by education level or cultural capital were not statistically significant, but results for mobile Internet use were significant, indicating mobile Internet use increased with education up to a bachelor's degree and with the education of respondents' parents. The links between education or cultural capital and Internet use suggests that Internet use is to some extent a function of role of education in forming an individual's habitus, the durable set of dispositions that inform actions (Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992).

This study framed Internet use around Bourdieu's notions of multiple forms of capital, dispositions, and habitus (Bourdieu & Passeron, 1977; Bourdieu, 1984, 2002; Brubaker, 1993; Calhoun, 1993). Although Bourdieu published most of his research before networked computing was widespread, other researchers have applied the concepts to offer an explanatory model of technology use in contemporary society (Brock, Kvasny, & Hales, 2010; Gilbert, 2010; Kvasny, 2006a, 2006b; Robinson, 2009, 2011; Rojas et al., 2012; Rojas, Straubhaar, Roychowdhury, & Okur, 2004). Following this framing, the study included analyses based on Bourdieu's notion of cultural capital, here operationalized as the average of respondents' parents' education scaled from 1 to 5. The descriptive results for cultural-capital analyses were most often statistically significant among the demographic independent variables in the access-technology analyses, although they had less statistical significance than the respondents' own education in multivariate models. Among Austinites whose parents had less than a high-school education, over a quarter, (26.0%) did not use the Internet, and those whose parents had at most a high-school education 7.78% did not go online. By comparison, Austinites whose parents' education averaged out to 4, a bachelor's degree, only 3.41% did not use the Internet. Similarly, use of a variety of access technologies such as mobile and public access increased sharply among individuals with a cultural capital score of 3, indicating some college or technical training. The significance of the cultural-capital variable indicates that the broader social environment influences Internet use; people who grew up in better-educated families are more disposed to seek Internet access and use it. Despite the strength of the education and cultural-capital variables in these analyses, differences in material access or Internet use still break out on racial/ethnic categories with African-Americans and Hispanics using the Internet less and have less access at the home. These results suggest that differences in Internet use are not a matter of color, but inequalities in access to education and low (dominant) cultural capital among people of color.

Demographics and Sites of Access

The second major research question of this project asked in what social contexts do particular groups use the Internet. This research question expands the analysis of inequalities of access by looking more broadly at the social environments where the

Internet is used. Existing digital-inclusion research often emphasizes home access and, now, home broadband, but the home is only one of many situations where people might use the Internet (Hassani, 2006; National Telecommmunications and Information Administration, 1995; Zickuhr & Smith, 2013). Internet use is also common in workplaces and schools – much of the concern about the digital divide relates to employment and educational opportunities – so examining how common school or work use is among particular demographic groups can further show who is excluded from integrating Internet use into their lives.

Although most Austinites do have some form of access in the home, greater disparities emerge when access at work or school is examined. The results of this study indicate that institutional access to the Internet, at work or school, was significantly lower for minorities, for those with less cultural capital, for the least educated, for the youngest and oldest, and for women. The differences by racial/ethnic category are striking since 68.8% of African-Americans and 61.1% of Hispanics do not use the Internet at work or school, which would be expected to be extremely important sites of informal learning and peer support for Internet use. Although many people in these categories do have access to the Internet at home or at the homes of friends or family, it may be the case that they use the Internet in isolation with no one to turn to for help or maybe only help for limited purposes such as multiplayer gaming online. People who use the Internet only at home may miss out on opportunities to develop techno-capital and the ability to make meaningful use of the Internet.

Bourdieu's notion of habitus suggests that dispositions and practices are often formed in family environments (Bourdieu & Passeron, 1977; Calhoun, 1993). Based on the results of this study the link between low cultural capital, measured here as the average of parents' educational attainment, and barriers to Internet use at work or school appears to be strong. Persons with low cultural capital, people whose parents did not go beyond high school in their educational attainment, had low rates of Internet use at work or school. Only 30.0% of people whose parents had less than a high-school education used the Internet at work or school, a rate that is half of the overall average for Austin, 59.5%. Institutional access among those whose parents finished high school was also low at 47.5%, particularly compared to people whose parents had a bachelors degree (76.8%) and a graduate or professional degree (81.8%.) This suggests that early life experiences affects outcomes in later life, even if the Internet was not in mainstream use when respondents were children. People who grew up in high-education environments appear to be better disposed toward both education and Internet use, and cultural capital is an asset for obtaining work that involves Internet use.

These results suggest that the broader social context such as home environment and work environment is an important constitutive factor in Internet use. Communities that face barriers to Internet use because of low income or obstacles to education may find themselves further excluded from broader participation if Internet use is uncommon in those communities since there may be a lack of peer support or other resources, which are often found at school and work. The survey asked respondents whether they used the Internet at school, but did not ask if Internet access were available and to what extent. Robinson's (2009, 2011) work has indicated that low income students often face barriers to Internet use, not just at the home where parents may lack the material resources to provide an Internet-connected computer, but also at school, where their neighborhood schools may lack the resources to provide Internet access at a level where students can engage in open-ended learning (Robinson, 2009, 2011). These results also suggest that the context where the Internet is used also matters for including people in digital life.

Techno-capital Among Demographic Groups

From the outset, the core research question asked about how techno-capital, the ability to make meaningful use of Internet, is distributed among segments of the Austin population. This study follows Bourdieu's concept of multiple forms of capital in society, including economic, social, and cultural capitals (Bourdieu & Passeron, 1977; Bourdieu, 1984, 2002, 2005; Brubaker, 1993; Calhoun, 1993) to conceptualize the role that technology use plays in contemporary society. Bourdieu himself proposed further forms of capital and suggested that cultural capital is a subset of broader "informational capital" (Bourdieu & Wacquant, 1992; Bourdieu, 2005). Later researchers have formulated a concept of capital that relates to the ability of an individual to exert power and achieve life goals using technology (Brock et al., 2010; Gilbert, 2010; Rojas et al., 2012, 2004). The techno-capital framing used in this study conceptualizes Internet use as one social practice among many, unlike skills and sometimes literacy framing which tend to treat Internet use in isolation.

To operationalize techno-capital, this study created an index from existing survey data based on respondents' self-ratings on their comfort with the following computer tasks:

- Uploading content (ex. videos, photos, music) to a website
- Blocking spam or unwanted content
- Adjusting my privacy settings on a website
- Bookmarking a website or adding a website to my list of favorites
- Comparing different sites to verify the accuracy of information
- Creating and managing my personal profile on a social network site
- Creating and managing my own personal website

The average of these ratings were used as a techno-capital index that ranged from one to five. This index was used as a dependent variable in a number of analyses related to demographics and access types and a proxy for how well respondents are able to use networked computing technology to achieve life goals. Although the items in the techno-capital index repurposed from the original survey could also be framed as "skills," the questionnaire asked respondents to rate their comfort with the task and many the tasks identified were sufficiently broad that there are potentially multiple ways to complete them. For this reason, these survey items provide a worthwhile proxy for techno-capital, itself a social asset that emerges from the collective habitus.

The analysis of techno-capital among particular demographic groups generally confirmed the working hypothesis that techno-capital would be lower among groups that have been historically disadvantaged in society such as people of color, persons from low-income households, and persons with low educational attainment. Most of the results were not surprising: on average, whites (4.08 out of 5) had higher techno-capital scores than African-Americans (3.53) or Hispanics (3.76); techno-capital generally increased with income and education up to a bachelor's degree, and techno-capital generally decreased with age. One surprise came in the age-range analysis for techno-capital. The 18-24 age group had lower techno-capital (3.92 out of 5) than the 25-34 (4.29) and 35-44 (4.16) age groups. This conflicts with the popular "digital natives" thesis that holds that younger people are predisposed to Internet use and possess a full suite of skills for going online (Vaidhyanathan, 2008; Watkins, 2009). Instead this finding further confirms the suggestion that the workplace and school are important sites for developing techno-capital: since these youth are largely college age or at least would have spent few years in the working world, they had fewer opportunities to develop techno-capital compared to people in their late 20s, 30s, and early 40s. The multivariate model for techno-capital, discussed in Chapter 9, indicated that institutional use was strongly correlated with higher techno-capital, reinforcing that this use context is important for learning how to make meaningful use of the Internet.

The low techno-capital means for African-Americans and Hispanics are also troubling. The results of this study – in its theoretical framework – suggest that socialization, such as using the Internet with peers or family members is an important and often neglected factor in nurturing techno-capital and meaningful Internet use. Since the results presented in Chapter 5 indicate that individuals in these groups are less likely to have home broadband and more likely to be non-users, it raises concerns that familial and peer support for Internet use and online social contacts may be in short supply in these communities of color. In the regression model for techno-capital, both dummy variables for African-Americans (-.547) and Hispanics (-.322) had statistically significant negative coefficients – until the education variable is introduced. With education included in the model, the Hispanic dummy variable was still statistically significant ($p = 0.011$) with a negative coefficient in the model (-0.272), but the dummy variable for African-Americans was not statistically significant. This suggests that lower techno-capital among African-Americans may be attributed, in part, to lower educational achievement, although it may be the case that low techno-capital and low educational attainment are both evidence of similar negative dispositions, related to group habitus, toward schooling and technology use. While Hispanics also had lower educational attainment compared to the rest of Austin, the fact that being Hispanic had a negative relationship with techno-capital suggests that negative dispositions toward technology may persist in Hispanic families and communities, as was suggested by the earlier qualitative study by Rojas, et al (2012).

The language proxy based on non-English media use, was not statistically significant, but this may reflect the weakness of this proxy, rather than challenges Spanish speakers face in making meaningful use of the Internet in the United States. Although the descriptive statistics on access technologies indicate that Hispanics have higher rates of home Internet access than African-Americans, it may also be the case that meaningful use is less common among Hispanics, leading to less social support for Internet use and a shared habitus where little work is done online.

Internet use is a valuable practice in contemporary US society, and, as the Introduction discusses, it is all but necessary for a variety of tasks such as finding work, applying for public benefits, and completing schoolwork (Gallaga, 2011; Robinson, 2009; Rodino-Colocino, 2006). Further education may help younger members of marginalized groups form techno-capital, but older adults may not have the time or disposition to take an internet-skills class such as those offered by libraries or training groups such as Skillpoint Alliance or Austin Free-Net (Kvasny, 2006a; Servon & Nelson, 2001). While the results of this study link education with greater techno-capital, more education alone may not increase techno-capital. First, educational attainment and techno-capital may be outcomes of the same dispositions and habitus of an individual; that is to say, similar dispositions – informed by experiences with family, neighbors, and schools – may lead individuals to pursue further education or Internet use (Straubhaar, et al, 2012). Secondly, the significance of the institutional access variable for techno-capital suggests that informal learning (Selwyn, 2004) – or undirected play[19] – is more important for developing Internet skills applicable to real-life situations. A continuing education

[19] As Robinson (2009) suggests, the autonomy of use that more affluent youth have allows them to develop Internet skills and information-seeking behaviors that their less fortunate peers – who are restricted in the amount of time they spend online – lack.

class on how to use the Internet may help people who need a basic introduction, but have limits to what extent it can nurture techno-capital.

Although nearly all of the analyses for gender in this study showed no statistically significant differences between men and women, the analysis comparing techno-capital between men and women was statistically significant with women having lower techno-capital than men. The techno-capital index is based on questions asking respondents to do a self-assessment of their Internet skills, so this may reflect gender differences in confidence, rather than competence. As Hargittai and Shafer (2006) point out, women may have the same level of ability to perform computer skills but rate themselves lower than men. This difference in confidence may translate into real differences in techno-capital since lower confidence in technological ability may translate into negative dispositions toward technology, discouraging some women from attempting a particular computer or Internet task. In the multivariate model, gender had the largest negative coefficient for techno-capital, even when including institutional access, which many women in the study also did not have. As noted above, one of the few statistically significant analyses based on gender was the gap in institutional access between men and women. Although some of the difference between women and men in institutional access can be attributed to differences in full-time employment, this disparity in access in professional settings raises concerns about gender differences in meaningful use of the Internet. Although this statistical difference between men and women may not translate into differences in actual skill lower confidence in computer use may translate into a diminished ability to try to make meaningful use of the Internet.

The results of this study confirm the broad hypothesis that techno-capital is not evenly distributed through society – in Austin at least – and that historically privileged groups such as men, whites, and those with greater cultural capital[20] along with relatively younger people, are better situated to use the Internet for social advantage. As participation in society becomes further entwined with Internet use, it may be the case that members of these demographic groups extend their techno-capital in order to catch up with technology use by social institutions such as schools and governments. However, this data suggests that people of color, women, and the aged may face further barriers to social inclusion, as society moves further online.

Techno-capital and Types of Access

With analyses for demographics and techno-capital, it is clear which variable is independent (demographic) and which is dependent (techno-capital). The situation with types of access and techno-capital is somewhat muddier. At first blush, it is a reasonable assumption that individuals with greater techno-capital would choose the fastest or most convenient type of access they can afford. However, given the research suggesting that autonomy of use plays an important role in developing Internet skills and cultivating techno-capital, (DiMaggio, et al, 2004; Robinson, 2009) individuals who have home broadband or mobile Internet access may find using the Internet more pleasant and spend more time using it, therefore cultivating techno-capital. In addition, some forms of access may not be available to individuals in certain areas or life circumstances. For the sake of consistency and this study's theoretical frame, this study treats techno-capital as the dependent variable in these analyses.

In general, individuals who used faster or more convenient access technologies had higher techno-capital than those who did not. Based on current US federal policy

[20] For this study, cultural capital was operationalized as the mean of the respondents' parents' educational attainment. Bourdieu emphasized family as a key factor in cultural capital (1984). More broadly, family resources are theoretically important in this study because of their key role in shaping the habitus.

(FCC, 2010) and the results of this study[21], home broadband appears to be both a typical and normative or desired access situation. The techno-capital analysis for home broadband users was only slightly higher (4.01 out of 5) than the average for Austin (3.944), so it is perhaps more revealing that the techno-capital average for Austinites who did not have home broadband is significantly lower than the overall average at 3.79. Mobile Internet users had significantly higher techno-capital at 4.25, suggesting that these were relatively elite and affluent Internet users when the survey was conducted in 2010. Now that mobile Internet use has become mainstream and perhaps supplanting home wire-line access for lower income individuals, (Smith, 2012, 2010) further iterations of this survey may indicate that the average techno-capital of mobile users has dropped, particularly since ongoing qualitative interviewing by groups working on separate projects with Straubhaar and Watkins in Austin indicates younger disadvantaged users, whose parents do not have home broadband, have been migrating to it. Although it is unclear to what extent having faster and more convenient Internet access cultivates techno-capital, users of faster and more convenient services do have higher techno-capital as it was measured in this study.

One notable result is the high techno-capital averages for users of public-access services and coffee-shop Wi-Fi. The City of Austin's wireless mesh network is used by a slim fraction of the city[22], but its users appear to be quite sophisticated in computer and Internet use. Although results for Austin Public Library Internet users were not statistically significant (an ongoing study of Austin Public Library users by Straubhaar, et

[21] The results of this study indicate that 71.7% of Austinites have home broadband defined here as cable modem or DSL access.
[22] The mesh network only covers sections of downtown and East Austin, so it stands to reason that its user base would be largely limited to individuals who have leisure time in these areas and an Internet-capable device on hand.

al, shows that library access users, while concentrated among ethnic minorities and the poor, are often pretty diverse), among respondents techno-capital was higher for its users. Together, users of these public-access services have significantly higher techno-capital than non-users of the public-access services. While this raises questions about how effective these services are at offering access to people who would not otherwise have access to the Internet, if nothing else, the city provides a useful amenity to tech-savvy members of “the Creative Class” (Florida, 2005; Straubhaar, Tufecki, Rojas, & Spence, 2012). Similarly, users of coffee-shop Internet also had techno-capital averages that were significantly higher than the average for the city. Coffee-shop users had the highest techno-capital average of any specific user group in the city at 4.28 compared to the city average of 3.94. Coffee-shop users may be avid recreational Internet users who take their machines into social spaces or they may be freelancers in technology or creative fields who use the café as a secondary office (Forlano, 2009). Taken in tandem with the high techno-capital of the wireless mesh network users, it is easy to imagine a category of power users toting notebook and tablet computers around the city availing themselves of Wi-Fi as the spirit moved them.

These results also suggest that the people with the most techno-capital integrate technology the most into their habitus. Although the relationship between using the Internet in public places and techno-capital is likely mutually exclusive, these results also further reinforce the conclusion that the social context where people use the Internet has a strong role in forming techno-capital. Using the Internet with other people in social places nurtures techno-capital. In the analysis, exclusive public-access users had a higher than average techno-capital mean. Although one might expect this group to include very casual Internet users who occasionally go to the library for access, but, in Austin, exclusive public-access users are often sophisticated users who by dint of circumstance lack home access, but have the ability to get by using free public or coffee-shop Wi-Fi. Open Wi-Fi networks like these may do little to address the digital divide (Fuentes-Bautista & Inagaki, 2006) but it appears they may keep highly skilled technophiles in touch with the global network society (Castells, 2000). Moreover, qualitative work by Dixon et al. (2014) indicates that services offered by the Austin Public Library provide an important site for low-income youth and other community members to get access when they lack it at home.

Social Factors and Internet Use

The final question of this study asked about which factors were most significant in forming techno-capital. The results presented in Chapter 9 indicated that institutional access at work or school has the greatest and most statistically significant effect on techno-capital. Combined with the strength of the variable for mobile Internet use, this suggests that the social context of use matters more than material access. In fact, the variable indicating public-access users with no home connection had a stronger relationship with techno-capital than home broadband, raising questions about the value of emphasizing home broadband access. As noted above, inequalities of Internet use tend to break out along racial/ethnic lines, but the models for non-use and techno-capital suggests that differences in education, along with factors like institutional use, account for much of the inequality in access. The introduction of the education variable eliminated any statistically significance for the variable indicating African-Americans and lessened the effect of the variable for Hispanics, which may reflect a latent variable reflecting English-language ability. Although demographic categories may reflect inequalities in Internet use and techno-capital, broader inequalities appear to be the root of these barriers to Internet use.

ASSESSING THIS APPROACH

This project strained to expand the analysis of existing survey data in an effort to situate Internet use in its social context. Applying Bourdieu's concepts of habitus, field, and capital to contemporary technology provided an established critical framework for analyzing social inequality and class. The research questions informed by Bourdieu's theory offered a different way to approach analyzing the data, and inquiries emerged, such as the comparisons of sites of access, that were fruitful for understanding the role Internet use plays in the lives of Austinites. Applying Straubhaar's concept of techno-capital was an important conceptual step for thinking through the relationship between social inequality and Internet use, but operationalizing it with an existing data set required some theoretical leaps. The Internet activities assessed in the survey are pretty general and were not specifically identified for measuring techno-capital. These items do measure techno-capital, to an extent, since respondents rate their confidence in their ability to complete activities – confidence is a component of techno-capital – and often describe a goal such as creating a website rather than discrete tasks such as uploading to an FTP server or hand-coding HTML.[23] Although the distinction between skills and techno-capital is blurry when techno-capital is operationalized using activities this specific, the particular wording of the survey items suggests that the use of these items in an index does measure at least some facets of techno-capital. Techno-capital itself, however, is relational and contingent on the particular social context and would be impossible to operationalize perfectly. Survey-based measures of techno-capital could

[23] Skills-oriented research such as the work by Hargittai (Hargittai & Shafer, 2006; Hargittai, 2002, 2010) tends to operationalize skills using discrete computer tasks or through vocabulary questions. The broader activities identified by the survey are more goal-oriented and do not specify the particular method by which to accomplish them.

certainly improve on these particular items, but the survey items available to this study do provide some indication of differences in techno-capital between individuals.

Strengths of this Approach

Technology use changes quickly as new products reach the market and particular services fall in and out of favor. The sections related to mobile use stressed that the data from 2010 was collected before smartphone use exploded in the United States, so the data did not reflect the current realities of mobile use even at the time of analysis. One of the strengths of using the concepts techno-capital and habitus to analyze and understand technology use is that while technology use continues to change quickly, inequalities in the social power people derive from technology use are likely to remain for the foreseeable future. The skills approach relies on identifying particular tasks common to Internet use at the time of the study. This means that the assessment items that research in this strain likely have to change with each new study, making it difficult to conduct longitudinal studies. Although, like differences in techno-capital, differences in skill levels are likely to persist, emphasizing goals that are typically accomplished using the Internet over the discrete tasks of the skills approach could make comparable longitudinal results more feasible. Finally, the goal of this project is not to measure techno-capital but to better understand Internet use in a milieu of social inequality; the crude measure of techno-capital kluged from this existing survey did succeed in highlighting differences in the technological resources of Austinites and provided some insights into the roots of these inequalities.

The secondary data analysis of this study presented some significant challenges, most notably a less-than-perfect fit between the research questions and the available data, but analyzing existing datasets does offer some advantages for digital-inclusion researchers. First, and most obviously, secondary data analysis reduces the costs of conducting a survey since it has already been administered. This spares researchers the time needed to enter data and develop the questionnaire. It also affords the ability to conduct research of this type with a small amount of commitment; if a few exploratory analyses suggest survey data will not yield interesting or useful results, there are fewer sunk costs for a particular research project. Secondly, for this project, using a survey administered by a local government fit the study's emphasis on basic access to government information and services. Using the survey administered by the City of Austin drew from the expertise of the Telecommunications and Regulatory Affairs staff and the questions included on the instrument likely reflect what tasks city staff believe are important and perhaps survey items that are known not to be useful were omitted. Finally, in some cases it may be possible to conduct comparative studies by finding comparable data sets administered in different cities. Although this would depend on some degree of consistency between surveys, the prominence of the survey developed by the University of Washington's Center for Communication and Civic Engagement suggests that model surveys are circulating and gaining acceptance among researchers in this area. For digital-inclusion researchers with limited resources, secondary analysis of survey data can provide an accessible way to answer research questions, although adapting data to meet them is not without its challenges.

Limitations of this study

The use of secondary data analysis in this study had some substantial limitations, although using existing data to further explore data is an attractive approach for digital-inclusion research. The survey items were not developed for the research questions of the study. This required a certain degree of adapting survey items to fit within the theoretical framework of this study, using Bourdieu's theory of multiple forms of capital to understand how Internet use and non-use reflect broader inequalities in social power in Austin.

Some survey items that would have been useful may have been omitted as a matter of oversight. For example, the survey lacked straightforward items asking respondents to identify their primary language or to provide a self-assessment of their English-language skills. The multivariate analyses in Chapter 9 indicated that being Hispanic is a statistically significant variable in the regression models for Techno-capital that used only demographic variables and used all of the variables explored in this study. Because being African-American was not statistically significant in these analyses, it may be the case that language is a latent variable affecting techno-capital since there was no robust language item in this survey data. It could be the case that there is something specific to being Hispanic – other than language – that affects techno-capital, but without a variable that can control for language differences, the results suggest that Hispanic identity plays a role in the cultivation of techno-capital.

Additional oversights in the survey design led to statistical challenges rather than issues related to missing information. Differences in income have long been implicated in non-use of the Internet, but the way that income was assessed in the 2010 survey limited the usefulness of the results. Although this study went to lengths to avoid simplifying the digital divide as a matter of economic and material resources, introducing income into the analysis could have been helpful to clarify which issues were a matter of money and which were related to education, language, or a host of other broader social factors. The results of the income item could not be used for multivariate analyses since the income ranges were not of equal size. Moreover, the top category for income, $75,000, was too low to show much difference at the upper end of the income scale. Among respondents, 44.2% said their 2010 household income was greater than $75,000, and, after weighting, it was still the most common income category with 33.9% of the weighted sample in the $75,000+ category. Although concerns about the digital divide often emphasize persons with low income, more granularity at upper income ranges would have been helpful to understand relationships between affluence, education, and techno-capital.

Other potentially useful survey items directly relate to the research questions of this project and likely were not asked since they did not relate to the initial project of assessing technology use in Austin. Survey items assessing dispositions toward technology would have been helpful to understand the link between techno-capital and dispositions related to technology. Although some qualitative work documents dispositions toward technology and their relationship to technology use (Kvasny, 2006a; Robinson, 2009; Rojas et al., 2012), in this quantitative study, dispositions are largely inferred or assumed on the basis of existing qualitative research. Much of this study relied on survey items where respondents self-evaluate their confidence with computer tasks on a 1-5 scale. A similar battery of survey items could be used to assess dispositions toward technology. Items that ask respondents the extent to which they agree or disagree with statements such as “I am scared of computers” or “I enjoy using technology” could provide an insight into the relationships between these attitudes toward technology use and techno-capital, as well as paint a picture of what attitudes are common among particular groups. The research questions of this study did avoid directly implicating income in non-use of limited use of the Internet since analyses centered on material access tend to emphasize the role of income over other factors such as education and cultural capital, but more robust data related to income would have provided stronger comparisons to the role these factors play in digital inclusion.

An effort to assess dispositions could also complicate assumptions about techno-capital and the attitudes of groups. For example, analyses in Chapter 7 indicated that persons in the youngest age categories actually had less techno-capital than somewhat older persons, suggesting that the "digital natives" hypothesis is a myth. Results in Chapters 8 and 9 suggested that Internet use at school and work play a key role in forming techno-capital; it is likely using technology in social environments outside the home develops techno-capital. Assessing dispositions toward technology might suggest that young people often do have positive dispositions toward technology, but simply have not had the exposure to technology to truly form techno-capital. Among other groups, say less educated respondents, negative attitudes toward technology may limit their interest in using technology and therefore limit the cultivation of techno-capital. Assessing dispositions toward technology would also go further toward situating technology use as a social practice among many. Although the theoretical approach based on habitus and capital used in this project seems to be the strongest for understanding issues related to digital inclusion, survey-based assessments of feelings and attitudes toward technology could be useful for studies based in other theoretical frameworks such as the affective turn (Clough, 2000). Survey items assessing dispositions – an important component of Bourdieu's theoretical framework – would have strengthened the theoretical framing of this study and provided useful results for other digital-inclusion work that attempts to understand how users and non-users think and feel about technology. Since this study emphasizes skills useful for using government information and services online – and a local government conducted the initial survey – survey items about attitudes and feelings toward public institutions would have further situated results related to technology in the broader range of social practices and institutions.

The construction of particular survey items also limited their usefulness in statistical analysis. Although binary questions related to device access make sense in a conventional analysis framed around material access, binary results limit the ability to use statistical techniques such as index construction and factor analysis. As Chapter 5 describes, the initial design of this study included a device index, which simply summed the affirmative responses to questions like "Do you have a tablet computer?" Because these items were binary, the usual Cronbach's Alpha covariance test could not be used, and the alternative KR20 measure of internal consistency indicated that the items did not appear to have much similarity. Assessing device use on a scale from 1, indicating the respondent does not have access to a device, to 5, indicating that the respondent uses a device daily (or more regularly), could both provide basic access measures in the survey discussed here and show more variation in device use. Although it is likely that all of the items in a battery of device-access questions would not covary, a scalar measure of particular items could be used in techniques like cluster analysis or factor analysis to develop use profiles of respondents. Given that 1% of the weighted sample had home broadband, but did not use the Internet, device access measured in a binary fashion is likely an indicator of affluence, rather than use. By assessing device access and other factors with a scale, future research could better analyze use patterns. Other items could have benefitted from more scalar measurements; relatively early digital-divide research asked respondents how much time they spent online (DiMaggio et al., 2004), but this survey simply asked "Do you use the Internet at all?" The bias toward collecting binary responses to access questions may be particular to this survey, but it also reflects perspective of studies that emphasize material access over actual use.

Pre-testing the survey questionnaire may have obviated some of the issues described in this section. By administering a draft version of the instrument to small groups, some of the oversights such as the lack of a robust language question may have become clear, or the need for more granularity at the upper income ranges may have been identified. It may have also indicated that some of the items with low affirmative responses, such as access to pre-paid phones, could have been dropped or at least needed more justification related to research questions. Larger research projects that combine qualitative and quantitative methods may be able to integrate pre-testing survey items while conducting qualitative interviews, sparing the need to conduct pre-tests or, at least, see if survey questions make sense for a limited group before integrating them into a city-wide survey. Ideally, digital inclusion researchers would work toward a common set of survey items in order to replicate studies in different places or over time. By replicating survey items from existing studies, pre-testing each survey would be less necessary, and lead to more comparable results from different contexts.

As digital-inclusion research moves from binary access conceptualizations of use toward more multi-faceted efforts to understand how technology fits – or does not fit – into the lives of marginalized or underprivileged groups (Brock et al., 2010; Dixon et al., 2014; Kvasny, 2006a, 2006b; Robinson, 2009, 2011; Rojas et al., 2012; Straubhaar et al., 2012), survey-based studies should expand the scope of survey items to include measures of the more ephemeral realties of technology use such as feelings and attitudes toward technology or simply how frequently a particular device or service is used. To gain a better understanding of what barriers individuals may face in using the Internet or what motivates people to use the Internet, adding survey questions related to the attitudes and feelings of respondents would expand the universe of results further research can analyze.

POLICY CONSIDERATIONS

As noted in the introduction, this project is not a policy study, but its exploration of the relationships between social inequality and Internet use intersects with policy in significant ways. One concrete policy suggestion arising from the results of this study is that the City of Austin should assess the purpose and efficacy of its wireless mesh network since it appears to serve very sophisticated users. If the purpose of the project is to provide service to people who would not otherwise use the Internet, it may be ineffective. Otherwise, this study raises questions about the priorities of policy research and interventions, suggesting that the emphasis on connectivity, such as home broadband, may be misplaced.

The results of this study indicate that Internet connectivity is a relatively minor factor in factor in cultivating the resources needed to make meaningful use of the Internet. This study found no statistically significant difference between home broadband and techno-capital, suggesting that current federal priorities for broadband access (Federal Communications Commission, 2010) may be misplaced. The emphasis on broadband may be a function of the fact that the federal agencies that are most prominently concerned with digital-inclusion issues, the Federal Communication Commission and the National Telecommunications and Information Administration, core functions are regulating and promoting communication networks, including data carriers. Digital inclusion initiatives emphasize subsidizing and expanding Internet access because improving connectivity is in the regulatory and administrative toolset of these organizations.

This study suggests, however, that a lack of community resources, rather than a lack of connectivity, is the more substantial obstacle to meaningful use among disadvantaged groups. Disadvantaged members of society lack access to social contexts where the Internet is used – such as well-equipped schools and white-collar workplaces – and the opportunities for informal learning that these contexts afford. Although interest in community technology centers (CTCs) has waned in the last decade, this approach to digital inclusion may merit further exploration. Research by Strover (2004) suggested that one program's CTCs in Texas were no more cost-effective than simply supplying individual households with computers and Internet connections. Strover's study does note that the CTCs lacked the resources to provide appropriate support and training for its patrons, which left the computers unused, and, in some cases, powered off. Although this initiative provided the material resources for Internet access, it did not provide appropriate funding and training for staff to support the needs of new Internet users. Kvasny (2006) describes how many would-be clients of a CTC were denied training because other life priorities such as work or child care made it difficult for the to regularly attend classes. In both of these cases, the digital-inclusion initiatives foregrounded the technology before other elements of the broader social context and failed to meet the needs of potential Internet users.

The strong relationship between Internet use in institutional settings such as work and school and developing techno-capital indicated in this study suggests two considerations that may be relevant to future CTC projects. First, using the Internet to achieve goals may be the best way to learn how to use it effectively. The kinds of computer-skills classes Kvasny describes may be too onerous for the targeted groups because of the time demands and likely negative dispositions toward formal learning. Instead, support for individual goals such as attaching a photo to an email message may be a better way to help non-users or users with limited techno-capital to gain comfort with computers and learn strategies for accomplishing goals using the Internet. This approach of ad hoc support may be more resource-intensive than traditional classroom instruction, but it could be more effective than classes that walk through the features of browsers and productivity software in a structured fashion. Secondly, social support from peers may be key; learning how to accomplish a task from a peer may be more comfortable than learning from a teacher or a technician, and could enhance the social capital as well as techno-capital of communities. Future CTC projects may consider integrating peer-support programs and collaborative learning into their programs as a way to better serve the learning styles of their clients.

Since the places where people use the Internet appears to play a substantive role in developing techno-capital, another strategy might be to take digital-inclusion interventions out of CTCs and instead provide Wi-Fi or other Internet services at places where members of disadvantaged communities gather. Small grants to community centers and possibly churches where people already congregate may be a way to leverage existing social capital and introduce Internet use into the collective habitus of these communities. It is likely challenged users may feel more comfortable learning how to attach a photo from a friend or neighbor than from a technician or trainer, particularly if it is in a place that they already frequent. Observing peers use the Internet in social spaces may also encourage non-users to consider using the Internet. In Austin, Google Fiber's Community Connections program offers free gigabit Internet connections to 100 selected institutions, but these sites tend to be government sites such as schools and libraries or non-profits who will likely use the connection for their internal needs. Gigabit fiber may be overkill for small community institutions, anyway, but expanding an access program to smaller organizations for connections available to the public may broaden the integration of internet use in disadvantaged neighborhoods.

A digital-inclusion policy concern that seems to be overlooked is the design and organization of government websites. Web publishers in government could stand to be more mindful of differences in techno-capital among constituents. Choices like posting meeting agenda and other information in formats such as pdf likely alienates less confident people who may not know how to install required plugins or may be confused when clicking a link opens a different application. Information architects and web designers have been exhorted for over a decade not to make the structure of a website reflect an organization's org chart (Nielsen, 1997), yet government websites continue to arrange information in ways that make little sense to the people who need it. User testing – as far as it happens in resource-challenged government IT departments – should make a point of including diverse participants, particularly those who have limited use of the Internet. Government websites should be the most accessible to people with limited techno-capital, but they are often the most difficult to use.

A policy area that garners a great deal of attention today is open data, government data published in machine-readable formats. This study was initially motivated by a concern that open data initiatives would supply the already privileged with additional resources, while disadvantaged persons lack the resources to use or interpret the data sets. The data used in this study does not directly address the skills and resources needed to use open data, but its results suggest that this concern was warranted. While open data may do little to address digital inequality itself, it is potentially useful for digital-inclusion research. The data used for this project is published on the City of Austin's data portal. Open data initiatives in other cities may help further digital-inclusion research if data sets from similar surveys are published, opening the opportunity for further secondary data analysis and comparative studies.

FINAL THOUGHTS

Internet use is not evenly distributed across Austin and the ability to make meaningful use of the Internet certainly is not. Although it appears that the "digital divide" has narrowed in many ways since the 1990s, the increasing centrality of the Internet in contemporary US society increases the consequences for segments of society who lack the ability to achieve life goals using technology. While many observers such as Shirky (2008) and Noveck (2009) or interest groups such as Code for America and the Sunlight Foundation hail the adoption of intensive Internet systems by organizations and governments as a step forward for democracy, the question remains whether these systems will only expand the social and political power of already powerful segments of society. These optimists are perhaps correct in asserting that collaborative online systems such as wikis and civic-hacking projects will diffuse power from a few centers to interested citizens, but these citizens are likely to be well educated, tech-savvy, and middle-class members of society. These Internet-based forms of social organization and political participation likely offer little to individuals and communities that struggle to get online because of a number of barriers such as cost, skill, language, and, perhaps most importantly, a tacit understanding of the dominant norms of online communication.

Techno-capital offers a useful analytical framework for understanding how Internet use functions in society. By expanding Bourdieu's notions of multiple forms of capital, it situates Internet use in the broader relationships of power in society, while attempting to avoid treating non-users as deficient or lacking. This approach has some weaknesses that could be addressed in future research and data collection. First, this concept is somewhat difficult to operationalize since analyzing respondent confidence with common computer tasks has a tenuous relationship to how well an individual can actually achieve life goals using computer technology. While confidence with these tasks is likely a necessary condition for cultivating techno-capital, respondent self-assessment is at best an indirect measure of real techno-capital. Moreover, there are substantial challenges in using this approach in secondary data analysis, since few surveys are conducted with this analytical approach in mind, leaving the researcher to hack a proxy out of existing survey responses. Secondly, Bourdieu's theories of capital, dispositions, habitus, and field address multiple, yet intertwined, social processes. Habitus and field are useful for conceptualizing this this type of research, and would be very difficult to operationalize. However, an effort to measure dispositions in further research would likely lead to interesting and useful results.

This study has acknowledged two broad reasons individuals would not develop techno-capital. First, it acknowledges a lack of resources – such as the funds to pay for a computer and Internet subscription – poses a barrier to Internet use and techno-capital formation. Secondly, negative dispositions toward technology and allied social practices such as reading likely discourages some individuals from forming techno-capital. The theoretical analysis of this project has tilted toward dispositions in its explanations of low techno-capital in some segments of society, but some assessment of dispositions would improve the analysis of future studies in this vein. Add a third, lack of institutional access?

Given the inequalities of Internet access and meaningful use illustrated by the analysis in this study, digital inclusion should remain a concern for policy makers interested in an equitable and democratic society. The policy implications are two-fold. First, the increasing reliance on Internet-based systems for government services and communication can reduce costs and afford conveniences for citizens with techno-capital, but could further marginalize citizens with less techno-capital or deprive services to those who may need them the most. Government services like the federal health care exchange or the Texas unemployment insurance program do offer phone-based services, but it seems as if phone – and in-person services where they still exist – are often inferior accommodations for people unable to use the websites. Although it may have always been the case that paper-based forms always depended on a particular print-based cultural capital, governments should maintain awareness of differences in techno-capital so as not to further exclude citizens through projects that move paperwork and processes online. Secondly, further work to nurture techno-capital across society is needed to maintain an equitable and democratic society. Based on the results of this study, it is unclear that current efforts to provide public-access services in Austin are effective in helping underserved individuals go online and make meaningful use of the Internet. In particular, the city's wireless mesh network was an innovative effort to provide Wi-Fi access to parts of East Austin, but it appears to be serving individuals who would find Internet access through other means if it did not exist. The network may be useful to the city as a way to bolster its image as a creative and tech-savvy metropolis and for serving the needs of younger technology enthusiasts, but it does little to expand access. Many of the results for the Austin Public Library were inconclusive, perhaps because its user base reflected the breadth of the city population, apart from the most affluent and educated. It may be the case that APL's Internet-access programs are so successful at training and providing access that its users are largely indistinguishable from the rest of the city. However, from this study, it does not appear to be reaching the populations that could use public-access services the most.[24] This may be a matter of dispositions toward technology among non-users, but it may also be a case of negative dispositions toward or government facilities such as public libraries. Future community-technology center programs might look at

[24] Case studies by Dixon, et al. (2014) do indicate that libraries do provide an important resource in low-income neighborhoods, even if at the city level, library use does not appear to be limited to poor or marginalized populations.

funding projects that are better integrated into Hispanic and African-American communities and offer the kinds of peer support middle-class users find at work or at school. Technology initiatives would likely benefit from assessing how they are situated in the broader social context and whether they are appropriate for the populations they hope to serve.

Disparities in the ability to make meaningful use of the Internet are likely to persist in the future and become more harmful as life in the United States grows further intertwined with Internet use. Continued study into the role of technology plays in social inequality can help understand how the putatively democratic technology of the Internet may exclude swaths of society can help remind policy-makers and technologists to be inclusive in the design of systems and institutions such as schools and libraries address the needs of its students and patrons in developing techno-capital. Framing digital-inclusion issues in broader power relationships and social context also avoids the trap of minimizing exclusion as a function of economics, skills, or literacy, working to understand how the Internet functions –or does not function – in the lives of citizens.

Appendix A: Internet and the Global Citizen Survey Questionnaire

Zip+4: ___________________

THE AUSTIN INTERNET AND GLOBAL CITIZENS PROJECT

Q1. HOUSEHOLD: We would like to begin by asking you some questions about your household.

A. Including yourself, how many adults (age 18 or older) live in the place you currently live? _____

A. How many children (under the age of 18) live with you in the place you currently live? _____

Q2. HOME MEDIA: The following questions ask about the media that you have access to at the place you currently live. Please check þ your answer.

	Yes	No	Don't Know
A. Do you subscribe to a newspaper that is delivered to your current residence?	..	..	..
A. Do you have a TV in your current residence?	..	..	..
A. Do you subscribe to cable TV (ex. Time Warner, Grande)?	..	..	..
A. Do you subscribe to satellite TV (ex. DIRECTV, DISH)?	..	..	..
A. Is there a game console in your current residence (ex. PlayStation, Wii, Xbox)?	..	..	..
If YES, is the game console connected to the Internet?	..	..	..
A. Is there a desktop computer you can use in your current residence?	..	..	..
A. Do you personally own a laptop or notebook computer?	..	..	..
Do you personally own an mp3 player (ex. iPod, Zune, Archos)?	..	..	..
Do you have a home phone line (wired, landline)?	..	..	..
Do you have a cell phone?	..	..	..

► IF YOU DO NOT OWN A CELL PHONE, PLEASE GO TO Q4. INTERNET ON PAGE 2.

Q3. CELL PHONES: If you own a cell phone, please answer the following questions.

	Yes	No	Don't Know
A. Do you use a pre-paid cell phone?	¨	¨	¨
A. Do you use a smart phone (ex. iPhone, Blackberry, Android)?	¨	¨	¨
A. Do you send or receive text messages?	¨	¨	¨
A. Do you ever make a charitable donation by text messages?	¨	¨	¨

A. Based on your personal experience, how would you complete the following statement? (CHECK ONE)

"On an average day, I make and receive my telephone calls ________________."

- ☐ All on a landline phone (including, home and work phone)
- ☐ Mostly on a landline phone
- ☐ Equally between my cell phone and a landline phone
- ☐ Mostly on my cell phone
- ☐ All on my cell phone

A. How often do you access the Internet using your cell phone? (CHECK ONE)

☐ Daily ☐ Weekly ☐ Monthly ☐ Less often ☐ Never

A. **If you use your cell phone to go online**, do you use it to do any of the following activities? (CHECK ALL THAT APPLY)

- ☐ Read or send email
- ☐ Send or post a photo or video
- ☐ Watch a video
- ☐ Purchase a product (ex. books, music, toys or clothing)
- ☐ Access a social network site (ex. Facebook, Twitter, LinkedIn)

Q4. INTERNET: We would now like to ask about your use of the Internet.

A. Do you use the Internet at all (ex. surf the web, chat, email)? ¨ Yes ¨ No

► If YES, you use the Internet, please go to <u>Question D</u> on Page 3.

► If NO, you do NOT use the Internet, please answer the following Questions B & C.

Thinking about the reasons why you do NOT use the Internet, please indicate how much you agree or disagree with the following statements. (CHECK ONE for each row)

	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
An Internet connection is too expensive.	..	..	..	..	..
I am concerned about my safety and privacy.	..	..	..	..	..
I do not have enough time.	..	..	..	..	..
I am not interested.	..	..	..	..	..

A. If you wanted to start using the Internet, do you feel that you know enough about computers and technology to be able to do that on your own, or would you need someone to help you? (CHECK ONE)

- ☐ I know enough to go online on my own.
- ☐ I would need someone to help me.
- ☐ I would not want to start using the Internet.

► **If you do NOT use the Internet, please go to Question K on the top of Page 5.**

A. Who taught you how to use the Internet? (CHECK ALL THAT APPLY)

- ☐ My father or mother
- ☐ My brother or sister
- ☐ My son or daughter
- ☐ Another relative
- ☐ My friends
- ☐ My boyfriend or girlfriend
- ☐ A teacher
- ☐ Myself

A. Where do you use the Internet? (CHECK ALL THAT APPLY)

- ☐ At home (where you currently live)
- ☐ At work
- ☐ At school or university
- ☐ At an Austin Public Library
- ☐ Coffee shop
- ☐ At the home of a friend or family
- ☐ Some other place: ______________________________

A. How does your computer connect to the Internet at home? (CHECK ALL THAT APPLY)

- ☐ Dial-up telephone line
- ☐ High speed DSL-enabled phone line (from the phone company)
- ☐ High speed cable modem (from the cable company)
- ☐ Wireless

- ☐ I do not know.
- ☐ I do not have access to the Internet through a computer at home.

A. There are many ways to connect to the Internet. Do you use any of the following technologies to access the Internet? (CHECK ALL THAT APPLY)

☐ Cell phone ☐ WiFi/Wireless ☐ 4G or WiMax ☐ City of Austin's free public WiFi

Please indicate how often you use the Internet to do each of the following activities. Please think about your online activities on a computer, cell phone, and other portable devices, combined.

(CHECK ONE for each row)	**Daily**	**Weekly**	**Monthly**	**Less Often**	**Never**
Read or send email	¨	¨	¨	¨	¨
Play online games	¨	¨	¨	¨	¨
Buy a product online	¨	¨	¨	¨	¨
Pay bills online	¨	¨	¨	¨	¨
Discuss politics	¨	¨	¨	¨	¨
Listen to music or radio	¨	¨	¨	¨	¨
Watch videos (ex. clips, TV shows, movies)	¨	¨	¨	¨	¨
Read a blog	¨	¨	¨	¨	¨
Comment on a blog	¨	¨	¨	¨	¨
Participate in a discussion forum	¨	¨	¨	¨	¨
Use social network sites (ex. MySpace, Facebook, Twitter, LinkedIn)	¨	¨	¨	¨	¨
Visit a virtual world (ex. Second Life)	¨	¨	¨	¨	¨

Please indicate how much you agree or disagree with the following statements regarding how you feel about your Internet skills. (CHECK ONE for each row)

I feel capable of……	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Uploading content (ex. videos, photos, music) to a website.	..	..	..	..	..
Blocking spam or unwanted content.	..	..	..	..	..
Adjusting my privacy settings on a website.	..	..	..	..	..
Bookmarking a website or adding a website to my list of favorites.	..	..	..	..	..
Comparing different sites to verify the accuracy of information.	..	..	..	..	..
Creating and managing my own personal profile on a social network site.	..	..	..	..	..
Creating and managing my own personal website.	..	..	..	..	..

People interact with their family, friends, neighbors, co-workers, acquaintances, and strangers **online**. Thinking about these people you know **online**, please indicate how much you agree or disagree with the following statements. (CHECK ONE for each row)

When thinking about people I know **ONLINE** (on the Internet)......	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
There are several people online I trust to help solve my problems.	..	..	..	..	..
There is someone online I can turn to for advice about making very important decisions.	..	..	..	..	..
When I feel lonely, there are several people online I can talk to.	..	..	..	..	..
The people I interact with online would be good job references for me.	..	..	..	..	..
Interacting with people online makes me want to try new things.	..	..	..	..	..
Interacting with people online makes me feel like part of a larger community.	..	..	..	..	..

I am willing to spend time to support general online community activities.	..	..	..	..	..
Interacting with people online gives me new people to talk to.	..	..	..	..	..

People interact with their family, friends, neighbors, co-workers, acquaintances, and strangers **offline**. Thinking about these people you know **offline**, please indicate how much you agree or disagree with the following statements. (CHECK ONE for each row)

When thinking about people I know **OFFLINE** (not on the Internet)......	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
There are several people offline I trust to help solve my problems.	..	..	..	..	..
There is someone offline I can turn to for advice about making very important decisions.	..	..	..	..	..
When I feel lonely, there are several people offline I can talk to.	..	..	..	..	..
The people I interact with offline would be good job references for me.	..	..	..	..	..
Interacting with people offline makes me want to try new things.	..	..	..	..	..
Interacting with people offline makes me feel like part of a larger community.	..	..	..	..	..
I am willing to spend time to support general offline community activities.	..	..	..	..	..
Interacting with people offline gives me new people to talk to.	..	..	..	..	..

Q5. GENERAL MEDIA: Here we have some more specific questions about your use of media.
How often do you engage in the following media activities in a language other than English?

(CHECK ONE for each row)	**Daily**	**Weekly**	**Monthly**	**Less Often**	**Never**
Read a book, newspaper, or magazine	..	..	..	..	..
Watch TV	..	..	..	..	..
Watch a movie	..	..	..	..	..

Visit a website	¨	¨	¨	¨	¨
Listen to music	¨	¨	¨	¨	¨

A. In which language(s) do you use these non-English media (books, TV, movies, websites)?

____

From which sources do you get information about each of the following? (CHECK ALL THAT APPLY)

	People	Internet	TV (Offline)	Radio (Offline)	Newspaper (Offline)	Other
Your neighborhood	¨	¨	¨	¨	¨	
Local businesses	¨	¨	¨	¨	¨	
Local events	¨	¨	¨	¨	¨	

	People	Internet	TV (Offline)	Radio (Offline)	Newspaper (Offline)	Other
Austin City Services	¨	¨	¨	¨	¨	
Texas	¨	¨	¨	¨	¨	
USA	¨	¨	¨	¨	¨	
Countries outside the US	¨	¨	¨	¨	¨	
Country your family immigrated from	¨	¨	¨	¨	¨	
Jobs and employment	¨	¨	¨	¨	¨	
Education	¨	¨	¨	¨	¨	
Health or medical issues	¨	¨	¨	¨	¨	
News and current events	¨	¨	¨	¨	¨	
Entertainment and pop culture	¨	¨	¨	¨	¨	
Politics	¨	¨	¨	¨	¨	

A. Please take this time to briefly think about the most recent Presidential Election (of 2008). Which of the following sources did you turn to for information about the campaigns and election? (CHECK ALL THAT APPLY)

☐ Newspapers (offline)
☐ Radio (offline)
☐ TV (offline)
☐ Internet
☐ People
☐ Other: ____

A. Channel 6 is the City of Austin's government access channel. How often do you watch Channel 6? (CHECK ONE)

☐ Daily ☐ Weekly ☐ Monthly ☐ Less often ☐ Never

A. What Channel 6 programming do you watch? (CHECK ALL THAT APPLY)

☐ City council meetings
☐ Board meetings
☐ Bulletin board / CityView
☐ Other programming: _________________________________

☐ I do not know.

A. Channels 10, 11, and 16 are Austin's public access channels. How often do you watch any one or more of these channels? (CHECK ONE)

☐ Daily ☐ Weekly ☐ Monthly ☐ Less often ☐ Never

A. How often do you visit the City of Austin website (www.cityofaustin.org)? (CHECK ONE)

☐ Daily ☐ Weekly ☐ Monthly ☐ Less often ☐ Never

Q6. SOCIAL RESOURCES: Please tell us about the people in your life.

A. We would like to ask about the jobs people you know may now have. These people include your relatives, friends, and acquaintances (Acquaintances are people who know each other by face and name). Is there anyone you know who is……?
(CHECK ALL THAT APPLY)

- ☐ a nurse
- ☐ a farmer
- ☐ a lawyer
- ☐ a middle school teacher
- ☐ a full-time babysitter
- ☐ a janitor
- ☐ a personnel manager
- ☐ a hair dresser
- ☐ a bookkeeper
- ☐ a production manager
- ☐ an operator in a factory
- ☐ a computer programmer
- ☐ a taxi driver
- ☐ a professor
- ☐ a policeman
- ☐ a Chief Executive Officer (CEO) of a large company

A. Who influenced your choices about furthering your education or schooling throughout your life? (CHECK ALL THAT APPLY)

- ☐ Siblings
- ☐ Spouse or Partner
- ☐ Parents
- ☐ Grandparents
- ☐ Other relative
- ☐ Friends
- ☐ People in church or other associations
- ☐ People in neighborhood
- ☐ Teachers
- ☐ Other: ________________________________

Q7. AUSTIN PUBLIC LIBRARY: Please tell us about your use of the City of Austin's public libraries.

A. Have you visited an Austin Public Library within the last 12 months?	¨ Yes	¨ No
A. Do you have a library card that you can use at an Austin Public Library?	¨ Yes	¨ No
A. Have you ever accessed your library account via the Austin Public Library website?	¨ Yes	¨ No
A. Have you ever placed a book on hold via the Austin Public Library website?	¨ Yes	¨ No

Q8. WORK: Next, we would like to learn about your work and employment.

A. What is your current employment status? (CHECK ALL THAT APPLY)

- ☐ Employed full-time
- ☐ Employed part-time
- ☐ Student
- ☐ Full-time homemaker
- ☐ Unemployed
- ☐ Retired
- ☐ Other: ____

► If you are NOT currently employed, please go to <u>Q9. PERSONAL INFORMATION</u> on Page 8.

► If you are EMPLOYED either full-time or part-time, please answer the following questions.

A. Which of the following best describes your current arrangements with your employer? (CHECK ONE)

- ☐ Salaried
- ☐ Contracted
- ☐ Employed hourly
- ☐ Employed as temporary worker
- ☐ Self-employed/Freelancer

A. Which of the following BEST describes the sector in which you work? (CHECK ONE)

☐ Construction	☐ Manufacturing
☐ Creative	☐ Media
☐ Education	☐ Services
☐ Government	☐ Technology
☐ Health	☐ Other

A. Do you supervise other employees? ¨ Yes ¨ No

A. About how many days a week do you work from home or someplace other than your office?

¨ 0 ¨ 1 ¨ 2 ¨ 3 ¨ 4 ¨ 5 ¨ 6 ¨ 7

A. When you work from home or other place, do you telecommute or use telecommunications

media to remotely access resources from the office? ¨ Yes ¨ No

Q9. PERSONAL INFORMATION: In this final section, please answer some questions about yourself.
Please indicate how much you agree or disagree with the following statements about yourself.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
On the whole I am satisfied with myself.	¨	¨	¨	¨	¨
I have high self-esteem.	¨	¨	¨	¨	¨

A. Are you male or female? ¨ Male ¨ Female

A. Which of the following do you MOST consider yourself to be? (CHECK ONE)
- ☐ White
- ☐ Black or African-American
- ☐ Hispanic or Hispanic
- ☐ Asian or Asian-American
- ☐ Mixed
- ☐ Other: ___________________________________

A. What year were you born? _______________

A. Were you born in the United States? ¨ Yes ¨ No

A. Were you born in Texas? ¨ Yes ¨ No

A. About how long have you lived in the United States? _______ year(s) and ______ month(s)

A. About how long have you lived in Austin? _______ year(s) and ______ month(s)

A. What is the highest degree or level of school you have completed? (CHECK ONE)

☐ Less than high school
☐ High school or equivalent
☐ Technical certificate, 2-year college degree, or some college education
☐ 4-year undergraduate degree (ex. BA or BS)
☐ Graduate or professional degree (ex. MA, MS, MD, JD, PhD)

A. What is your current civil status? (CHECK ONE)

☐ Married	☐ Separated
☐ Living with a partner	☐ Widowed
☐ Divorced	☐ Single and never been married

A. Last year in 2009, what was your total family income from all sources, before taxes?

☐ Less than $10,000
☐ $10,000 to $19,999
☐ $20,000 to $29,999
☐ $30,000 to $39,999
☐ $40,000 to $49,999
☐ $50,000 to $74,999
☐ $75,000 or above

☐ Prefer not to answer

Please answer the following questions about your MOTHER.

A. About what year was your mother born? _______________

A. Was she born in the United States? ¨ Yes ¨ No

A. Was she born in Texas? ¨ Yes ¨ No

A. What is/was the highest degree or level of school your mother completed? (CHECK ONE)

☐ Less than high school
☐ High school or equivalent
☐ Technical certificate, 2-year college degree, or some college education
☐ 4-year undergraduate degree (ex. BA or BS)
☐ Graduate or professional degree (ex. MA, MS, MD, JD, PhD)

Now, please tell us about your FATHER.

A. About what year was your father born? _______________

A. Was he born in the United States? ¨ Yes ¨ No

A. Was he born in Texas? ¨ Yes ¨ No

A. What is/was the highest degree or level of school your mother completed? (CHECK ONE)
- ☐ Less than high school
- ☐ High school or equivalent
- ☐ Technical certificate, 2-year college degree, or some college education
- ☐ 4-year undergraduate degree (ex. BA or BS)
- ☐ Graduate or professional degree (ex. MA, MS, MD, JD, PhD)

Were any of your grandparents born outside the United States? ¨ Yes ¨ No

If any of your parents or grandparents immigrated to the US, where did they come from? **(CHECK ALL THAT APPLY)**

Africa
Asia
Europe
Latin American
Middle East
Other: ________________________________

None of my parents or grandparents immigrated to the US.

Appendix B Full Results for Chapter 5

H1: Non-use of the Internet is more common among less affluent users and members of marginalized groups.				
H1a: Non-use is less common among those with greater cultural capital, measured by the aggregate of parents' education.				
		Do you use the Internet at all?		
Cultural Capital		Yes	No	Total
	1	74.00%	26.00%	100.00%
	2	92.23%	7.77%	100.00%
	3	96.21%	3.79%	100.00%
	4	96.59%	3.41%	100.00%
	5	95.38%	4.62%	100.00%
Total		90.43%	9.57%	100.00%
Pearson:				
Uncorrected chi2(4) = 120.0212				
Design-based F(2.69, 3574.91)= 6.3510 P = 0.0005				

H1b: Non-use is more common among African-Americans and Hispanics than among whites.			
	Do you use the Internet at all?		
Racial/Ethnic Category	Yes	No	Total
White	95.39%	4.61%	100.00%
African-American	70.52%	29.48%	100.00%
Hispanic	77.11%	22.89%	100.00%
Asian-American	97.67%	2.33%	100.00%
Other	97.25%	2.75%	100.00%
Total	88.12%	11.88%	100.00%
Pearson:			
Uncorrected chi2(4) = 127.7907			
Design-based F(2.47, 3447.09)= 8.2906 P = 0.0001			

H1c: Non-use is more common among migrants from other countries than among respondents born in the United States.			
	Do you use the Internet at all?		
	Yes	No	Total
US-born	92.63%	7.37%	100.00%
First Generation Immigrant	67.59%	32.41%	100.00%
Total	88.04%	11.96%	100.00%
Pearson:			
Uncorrected chi2(1) = 124.0999			
Design-based F(1, 1390) = 13.6390 P = 0.0002			

H1d: Non-use is more common among those with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent is more likely to be a non-user.			
	Do you use the Internet at all?		
Family History of US Immigration	Yes	No	Total
No recent family history	93.24%	6.76%	100.00%
First Generation	67.59%	32.41%	100.00%
Second Generation	92.06%	7.94%	100.00%
Third Generation	91.78%	8.22%	100.00%
Total	88.12%	11.88%	100.00%
Pearson:			
Uncorrected chi2(3) = 125.8481			
Design-based F(2.27, 3166.61)= 8.2592 P = 0.0001			

H1e & H1f: Non-use is more common among older users than younger users.			
	Do you use the Internet at all?		
Age Range	yes	no	
18-24	95.32%	4.68%	100.00%
25-34	86.85%	13.15%	100.00%
35-44	98.83%	1.17%	100.00%
45-54	85.39%	14.61%	100.00%
55-64	78.86%	21.14%	100.00%
65+	72.37%	27.63%	100.00%
			100.00%
Total	88.12%	11.88%	100.00%
Pearson:			
Uncorrected chi2(5) = 80.5083			
Design-based F(3.16, 4415.08)= 2.7748 P = 0.0371			
	Do you use the Internet at all?		
	yes	no	
Millennials	88.66%	11.34%	100.00%
Generation X	98.75%	1.25%	100.00%
Younger Boomers	83.09%	16.91%	100.00%
Older Boomers	81.37%	18.63%	100.00%
Silent Generation	87.81%	12.19%	100.00%
G.I. Generation	51.34%	48.66%	100.00%
Total	88.12%	11.88%	100.00%
Pearson:			
Uncorrected chi2(5) = 108.8079			
Design-based F(2.37, 3305.15)= 6.0080 P = 0.0013			

H1g: Non-use is more common among women than men.				
		Do you use the Internet at all?		
		Yes	No	Total
Man		0.8738	0.1262	100.00%
Woman		0.8896	0.1104	100.00%
Total		88.12%	11.88%	100.00%
Pearson:				
Uncorrected chi2(1) = 0.8325				
Design-based F(1, 1396) = 0.0999 P = 0.7520				

H1h: Non-use is more common among lower-income groups.				
		Do you use the Internet at all?		
		Yes	No	
	< $10,000	68.13%	31.87%	100.00%
$10,000-$19,999		85.77%	14.23%	100.00%
$20,000-$29,999		74.96%	25.04%	100.00%
$30,000-$39,999		78.93%	21.07%	100.00%
$40,000-$49,999		95.56%	4.44%	100.00%
$50,000-$64,999		96.85%	3.15%	100.00%
> $75,000		99.36%	0.64%	100.00%
Total		89.30%	10.70%	100.00%
Pearson:				
Uncorrected chi2(6) = 164.7401				
Design-based F(4.14, 5022.34)= 7.4950 P = 0.0000				

H1i: Non-use is more common among those with lower educational attainment than those with greater educational attainment			
	Do you use the Internet at all?		
	no	yes	total
Less than High School	61.43%	38.57%	100.00%
High School	80.93%	19.07%	100.00%
Technical/Some College	91.99%	8.01%	100.00%
4-year Unviersity	98.70%	1.30%	100.00%
Graduate/Professional	98.70%	1.30%	100.00%
Total	88.12%	11.88%	100.00%
Uncorrected chi2(4) = 235.8174			
Design-based F(1.60, 2233.15)= 12.1016 P = 0.0000			

H1j: Non-use is more common among respondents whose primary language is not English.			
	Do you use the Internet at all?		
	Yes	No	Total
never	94.16%	5.84%	100.00%
rarely	92.08%	7.92%	100.00%
weekly/d	83.47%	16.53%	100.00%
Total	89.42%	10.58%	100.00%
Pearson:			
Uncorrected chi2(2) = 32.9295			
Design-based F(1.55, 2052.93)= 3.5729 P = 0.0395			

H2: Broadband Internet access in the home (using DSL or cable modem) is more commonly used by privileged groups like whites, the well educated, and the affluent, as well as younger users and those who have lived in Austin longer.				
H2a: Broadband use is more common among users with greater cultural capital, measured by the aggregate of parents' education.				
		Home DSL Connection		
Index of Cult_Cap		no	yes	
	1	70.80%	29.20%	100.00%
	2	80.97%	19.03%	100.00%
	3	81.61%	18.39%	100.00%
	4	81.23%	18.77%	100.00%
	5	86.95%	13.05%	100.00%
Total		79.88%	20.12%	100.00%
Pearson:				
Uncorrected chi2(4) = 23.1462				
Design-based F(1.35, 1875.12)= 0.6961 P = 0.4447				
		Home Cable Modem Connection		
Index of Cult_Cap		no	yes	
	1	67.83%	32.17%	100.00%
	2	54.87%	45.13%	100.00%
	3	41.95%	58.05%	100.00%
	4	45.60%	54.40%	100.00%
	5	45.95%	54.05%	100.00%
Total		51.78%	48.22%	100.00%
Pearson:				
Uncorrected chi2(4) = 50.3765				
Design-based F(2.07, 2886.12)= 2.4204 P = 0.0870				

	Home Broadband Connection		
Index of Cult_Cap	no	yes	
1	39.37%	60.63%	100.00%
2	36.29%	63.71%	100.00%
3	24.76%	75.24%	100.00%
4	27.32%	72.68%	100.00%
5	35.86%	64.14%	100.00%
Total	32.72%	67.28%	100.00%
Pearson:			
Uncorrected chi2(4) = 20.7194			
Design-based F(2.14, 2973.25)= 0.9760 P = 0.3814			

H2b: Broadband use is more common among whites than among African-Americans and Hispanics.			
	Home DSL Connection		
Racial/Ethnic Category	no	yes	
White	83.48%	16.52%	100.00%
African-American	83.11%	16.89%	100.00%
Hispanic	77.88%	22.12%	100.00%
Asian-American	73.76%	26.24%	100.00%
Other	64.73%	35.27%	100.00%
Total	80.78%	19.22%	100.00%
Pearson:			
Uncorrected chi2(4) = 13.8589			
Design-based F(1.53, 2238.54)= 0.4665 P = 0.5756			

	Home Cable Modem Connection		
Racial/Ethnic Category	no	yes	
White	44.77%	55.23%	100.00%
African-American	74.81%	25.19%	100.00%
Hispanic	63.63%	36.37%	100.00%
Asian-American	39.14%	60.86%	100.00%
Other	56.14%	43.86%	100.00%
Total	52.65%	47.35%	100.00%
Pearson:			
Uncorrected chi2(4) = 69.8829			
Design-based F(2.71, 3962.55)= 3.7779 P = 0.0128			

	Home Broadband Connection		
Racial/Ethnic Category	no	yes	
White	29.42%	70.58%	100.00%
African-American	59.71%	40.29%	100.00%
Hispanic	41.64%	58.36%	100.00%
Asian-American	16.51%	83.49%	100.00%
Other	20.87%	79.13%	100.00%
Total	34.46%	65.54%	100.00%
Pearson:			
Uncorrected chi2(4) = 65.6556			
Design-based F(2.71, 3957.96)= 3.3453 P = 0.0222			

H2c: Broadband use is more common among respondents born in the United States than migrants from other countries.			
	Home DSL Connection		
	no	yes	
US-born	79.65%	20.35%	100.00%
First Generation Immigrant	86.01%	13.99%	100.00%
Total	80.77%	19.23%	100.00%
Pearson:			
Uncorrected chi2(1) = 5.5152			
Design-based F(1, 1457) = 1.1475 P = 0.2843			
	Home Cable Modem Connection		
	no	yes	
US-born	53.53%	46.47%	100.00%
First Generation Immigrant	49.87%	50.13%	100.00%
Total	52.89%	47.11%	100.00%
Pearson:			
Uncorrected chi2(1) = 1.1383			
Design-based F(1, 1457) = 0.1171 P = 0.7322			
	Home Broadband Connection		
	no	yes	
US-born	34.05%	65.95%	100.00%
First Generation Immigrant	37.72%	62.28%	100.00%
Total	34.70%	65.30%	100.00%
Pearson:			
Uncorrected chi2(1) = 1.2569			
Design-based F(1, 1457) = 0.1173 P = 0.7320			

H2d: Broadband use is less common among respondents with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent is less likely to be an broadband user.

	Home DSL Connection		
Family History of US Immigration	no	yes	
No recent family history	83.11%	16.89%	100.00%
First Generation	86.01%	13.99%	100.00%
Second Generation	88.72%	11.28%	100.00%
Third Generation	66.77%	33.23%	100.00%
Total	80.78%	19.22%	100.00%
Pearson:			
Uncorrected chi2(3) = 53.1829			
Design-based F(1.49, 2181.48)= 2.1703 P = 0.1285			
	Home Cable Modem Connection		
Family History of US Immigration	no	yes	
No recent family history	49.83%	50.17%	100.00%
First Generation	49.87%	50.13%	100.00%
Second Generation	59.10%	40.90%	100.00%
Third Generation	58.11%	41.89%	100.00%
Total	52.65%	47.35%	100.00%
Pearson:			
Uncorrected chi2(3) = 9.6227			
Design-based F(2.67, 3905.47)= 0.4137 P = 0.7199			

	Home Broadband Connection		
Family History of US Immigration	no	yes	
No recent family history	34.23%	65.77%	100.00%
First Generation	37.72%	62.28%	100.00%
Second Generation	47.82%	52.18%	100.00%
Third Generation	25.20%	74.80%	100.00%
Total	34.46%	65.54%	100.00%
Pearson:			
Uncorrected chi2(3) = 26.1941			
Design-based F(2.67, 3905.15)= 1.2126 P = 0.3025			

H2e & H3f: Broadband use is more common among younger users than older users.			
	Home DSL Connection		
6 Cat Age Recode	no	Yes	
18-24	65.60%	34.40%	100.00%
25-34	89.69%	10.31%	100.00%
35-44	79.55%	20.45%	100.00%
45-54	78.01%	21.99%	100.00%
55-64	80.08%	19.92%	100.00%
65+	82.33%	17.67%	100.00%
Total	80.78%	19.22%	100.00%
Pearson:			
Uncorrected chi2(5) = 57.2722			
Design-based F(1.34, 1955.46)= 1.5335 P = 0.2190			
	Home Cable Modem Connection		
6 Cat Age Recode	no	yes	
18-24	63.53%	36.47%	100.00%
25-34	50.61%	49.39%	100.00%
35-44	44.84%	55.16%	100.00%
45-54	51.29%	48.71%	100.00%
55-64	52.83%	47.17%	100.00%
65+	61.12%	38.88%	100.00%
Total	52.65%	47.35%	100.00%
Pearson:			
Uncorrected chi2(5) = 21.6333			
Design-based F(2.19, 3205.71)= 0.8506 P = 0.4361			

	Home Broadband Connection		
6 Cat Age Recode	no	yes	
18-24	30.73%	69.27%	100.00%
25-34	40.46%	59.54%	100.00%
35-44	25.71%	74.29%	100.00%
45-54	31.70%	68.30%	100.00%
55-64	33.60%	66.40%	100.00%
65+	44.14%	55.86%	100.00%
Total	34.46%	65.54%	100.00%
Pearson:			
Uncorrected chi2(5) = 24.2582			
Design-based F(2.33, 3407.04)= 0.9106 P = 0.4149			

	Home DSL Connection		
	no	yes	
Millennials	81.31%	18.69%	100.00%
Generation X	81.42%	18.58%	100.00%
Younger Boomers	78.22%	21.78%	100.00%
Older Boomers	79.64%	20.36%	100.00%
Silent Generation	80.75%	19.25%	100.00%
G.I. Generation	84.45%	15.55%	100.00%
Total	80.78%	19.22%	100.00%
Pearson:			
Uncorrected chi2(5) = 19.0270			
Design-based F(2.45, 3587.85)= 1.4938 P = 0.2205			
	Home Cable Modem Connection		
	no	yes	
Millennials	53.83%	46.17%	100.00%
Generation X	47.70%	52.30%	100.00%
Younger Boomers	49.66%	50.34%	100.00%
Older Boomers	57.20%	42.80%	100.00%
Silent Generation	49.09%	50.91%	100.00%
G.I. Generation	77.23%	22.77%	100.00%
Total	52.65%	47.35%	100.00%
Pearson:			
Uncorrected chi2(5) = 19.0270			
Design-based F(2.45, 3587.85)= 1.4938 P = 0.2205			

	Home Broadband Connection		
	no	yes	
Millennials	35.81%	64.19%	100.00%
Generation X	30.20%	69.80%	100.00%
Younger Boomers	30.42%	69.58%	100.00%
Older Boomers	37.12%	62.88%	100.00%
Silent Generation	30.37%	69.63%	100.00%
G.I. Generation	62.58%	37.42%	100.00%
Total	34.46%	65.54%	100.00%
Pearson:			
Uncorrected chi2(5) = 24.7402			
Design-based F(2.79, 4076.00)= 1.8543 P = 0.1396			

H2g: Broadband use is more common among men than women.			
	Home DSL Connection		
	no	yes	total
Men	84.89%	15.11%	100.00%
Women	76.26%	23.74%	100.00%
Total	80.78%	19.22%	100.00%
Pearson:			
Uncorrected chi2(1) = 17.5130			
Design-based F(1, 1463) = 1.7281 P = 0.1889			
	Home Cable Modem Connection		
	no	yes	total
Men	47.00%	53.00%	100.00%
Women	58.86%	41.14%	100.00%
Total	52.65%	47.35%	100.00%
Pearson:			
Uncorrected chi2(1) = 20.6153			
Design-based F(1, 1463) = 3.4635 P = 0.0629			
	Home Broadband Connection		
	no	yes	total
Men	32.90%	67.10%	100.00%
Women	36.17%	63.83%	100.00%
Total	34.46%	65.54%	100.00%
Pearson:			
Uncorrected chi2(1) = 1.7290			
Design-based F(1, 1463) = 0.2742 P = 0.6006			

H2h: Broadband use is more common among higher-income groups.			
	Home DSL Connection		
	no	yes	
< $10,000	94.02%	5.98%	100.00%
$10,000-$19,999	84.01%	15.99%	100.00%
$20,000-$29,999	91.98%	8.02%	100.00%
$30,000-$39,999	84.16%	15.84%	100.00%
$40,000-$49,999	75.33%	24.67%	100.00%
$50,000-$64,999	83.26%	16.74%	100.00%
> $75,000	78.54%	21.46%	100.00%
	68.81%	31.19%	100.00%
Total	80.73%	19.27%	100.00%
Pearson:			
Uncorrected chi2(7) = 56.9697			
Design-based F(1.94, 2798.54)= 1.4630 P = 0.2321			
	Home Cable Modem Connection		
	no	yes	
< $10,000	74.79%	25.21%	100.00%
$10,000-$19,999	52.06%	47.94%	100.00%
$20,000-$29,999	59.78%	40.22%	100.00%
$30,000-$39,999	62.02%	37.98%	100.00%
$40,000-$49,999	51.89%	48.11%	100.00%
$50,000-$64,999	43.88%	56.12%	100.00%
> $75,000	41.45%	58.55%	100.00%
	58.69%	41.31%	100.00%
Total	52.44%	47.56%	100.00%
Pearson:			
Uncorrected chi2(7) = 58.6327			
Design-based F(3.48, 5026.80)= 1.6761 P = 0.1615			

	Home Broadband Connection		
2009 Household Income	no	yes	
<$10,000	71.96%	28.04%	100.00%
$10,000	36.07%	63.93%	100.00%
$20,000	51.76%	48.24%	100.00%
$30,000	46.17%	53.83%	100.00%
$40,000	28.48%	71.52%	100.00%
$50,000	27.55%	72.45%	100.00%
$75,000	21.76%	78.24%	100.00%
Total	35.56%	64.44%	100.00%
Pearson:			
Uncorrected chi2(6) = 139.0925			
Design-based F(4.43, 5624.84)= 7.0561 P = 0.0000			

H2i: Broadband is more common among those with greater educational attainment than those with lower educational attainment			
	Home DSL Connection		
	no	yes	total
Less than High School	70.86%	29.14%	100.00%
High School	89.24%	10.76%	100.00%
Technical/Some College	82.25%	17.75%	100.00%
4-year University	82.89%	17.11%	100.00%
Graduate/Professional	75.78%	24.22%	100.00%
Total	80.78%	19.22%	100.00%
Pearson:			
Uncorrected chi2(4) = 31.5579			
Design-based F(1.25, 1827.98)= 0.7404 P = 0.4179			
	Home Cable Modem Connection		
	no	yes	total
Less than High School	73.09%	26.91%	100.00%
High School	60.95%	39.05%	100.00%
Technical/Some College	45.76%	54.24%	100.00%
4-year University	46.03%	53.97%	100.00%
Graduate/Professional	44.99%	55.01%	100.00%
Total	52.65%	47.35%	100.00%
Pearson:			
Uncorrected chi2(4) = 65.1783			
Design-based F(1.78, 2601.27)= 2.4598 P = 0.0922			

	Home Broadband Connection		
	no	yes	total
Less than High School	43.95%	56.05%	100.00%
High School	50.53%	49.47%	100.00%
Technical/Some College	28.47%	71.53%	100.00%
4-year University	30.21%	69.79%	100.00%
Graduate/Professional	24.00%	76.00%	100.00%
Total	34.46%	65.54%	100.00%
Pearson:			
Uncorrected chi2(4) = 57.4480			
Design-based F(1.73, 2526.38)= 1.9741 P = 0.1457			

H2h: Broadband is less common among respondents whose primary language is not English.			
	Home DSL Connection		
Index of Non-English Media Use in 3 Categories	no	yes	
never	79.96%	20.04%	100.00%
rarely	88.13%	11.87%	100.00%
weekly/d	76.07%	23.93%	100.00%
Total	80.62%	19.38%	100.00%
Pearson:			
Uncorrected chi2(2) = 20.6655			
Design-based F(1.18, 1629.66)= 1.2575 P = 0.2694			
	Home Cable Modem Connection		
Index of Non-English Media Use in 3 Categories	no	yes	
never	49.83%	50.17%	100.00%
rarely	43.37%	56.63%	100.00%
weekly/d	59.36%	40.64%	100.00%
Total	51.83%	48.17%	100.00%
Pearson:			
Uncorrected chi2(2) = 23.6602			
Design-based F(1.49, 2060.88)= 2.3298 P = 0.1128			

Index of Non-English Media Use in 3 Categories	Home Broadband Connection no	yes	
never	30.63%	69.37%	100.00%
rarely	32.92%	67.08%	100.00%
weekly/d	36.35%	63.65%	100.00%
Total	33.47%	66.53%	100.00%
Pearson:			
Uncorrected chi2(2) = 3.7825			
Design-based F(1.51, 2087.17)= 0.3662 P = 0.6327			

H3: Public-access use of the Internet through the Austin Public Library or City of Austin Wireless is more common among less affluent users and members of marginalized groups.				
H3a: Public access is less common among users with greater cultural capital, measured by the aggregate of parents' education.				
	Austin Public Library Use			
Cultural Capital Index	No	Yes	Row Total	
1	96.34%	3.66%	100.00%	
2	86.96%	13.04%	100.00%	
3	93.71%	6.29%	100.00%	
4	90.88%	9.12%	100.00%	
5	93.64%	6.36%	100.00%	
Total	92.18%	7.82%	100.00%	
Pearson:				
Uncorrected chi2(4) = 21.2297				
Design-based F(3.62, 5034.51)= 2.6392 P = 0.0374				
	Austin City Wireless			
Cultural Capital Index	No	Yes	Row Total	
1	99.29%	0.71%	100.00%	
2	90.55%	9.45%	100.00%	
3	96.20%	3.80%	100.00%	
4	90.09%	9.91%	100.00%	
5	85.36%	14.64%	100.00%	
Total	92.70%	7.30%	100.00%	
Pearson:				
Uncorrected chi2(4) = 46.4222				
Design-based F(3.09, 4294.45)= 6.8500 P = 0.0001				

		Public-Access Use Aggregate		
Cultural Capital Index		No	Yes	Row Total
	1	95.99%	4.01%	100.00%
	2	84.06%	15.94%	100.00%
	3	90.88%	9.12%	100.00%
	4	83.93%	16.07%	100.00%
	5	81.73%	18.27%	100.00%
Total		87.64%	12.36%	100.00%
Pearson:				
Uncorrected chi2(4) = 36.2896				
Design-based F(3.64, 5064.62)= 4.6710 P= 0.0014				

H3b: Public-access use is more common among African-Americans and Hispanics than among whites.			
	Austin Public Library Use		
Racial/Ethnic Category	no	yes	
White	92.90%	7.10%	100.00%
African-American	88.42%	11.58%	100.00%
Hispanic	91.76%	8.24%	100.00%
Asian-American	96.42%	3.58%	100.00%
Other	86.57%	13.43%	100.00%
Total	92.33%	7.67%	100.00%
Pearson:			
Uncorrected chi2(4) = 6.3829			
Design-based F(3.45, 5052.34)= 0.6646 P = 0.5946			
	Austin City Wireless		
Racial/Ethnic Category	no	yes	
White	92.68%	7.32%	100.00%
African-American	90.53%	9.47%	100.00%
Hispanic	92.06%	7.94%	100.00%
Asian-American	100.00%	0.00%	100.00%
Other	100.00%	0.00%	100.00%
Total	92.93%	7.07%	100.00%
Pearson:			
Uncorrected chi2(4) = 10.7013			
Design-based F(3.04, 4442.29)= 1.0267 P = 0.3801			

	Public-Access Use Aggregate		
Racial/Ethnic Category	no	yes	
White	87.23%	12.77%	100.00%
African-American	84.98%	15.02%	100.00%
Hispanic	87.79%	12.21%	100.00%
Asian-American	96.42%	3.58%	100.00%
Other	86.57%	13.43%	100.00%
Total	87.81%	12.19%	100.00%
Pearson:			
Uncorrected chi2(4) = 7.6049			
Design-based F(3.49, 5101.99)= 0.7710 P = 0.5277			

H3c: Public-access use is more common among migrants from other countries than among respondents born in the United States.				
	Austin Public Library Use			
1st Generation Immigrants	no	yes		
US-born	91.68%	8.32%	100.00%	
First Generation Immigrant	95.06%	4.94%	100.00%	
Total	92.27%	7.73%	100.00%	
Pearson:				
Uncorrected chi2(1) = 3.3864				
Design-based F(1, 1457) = 1.9632	P = 0.1614			
	Austin City Wireless			
Immigration	no	yes	Row Total	
US Born	91.85%	8.15%	100.00%	
Born Outside US	97.74%	2.26%	100.00%	
Total	92.88%	7.12%	100.00%	
Pearson:				
Uncorrected chi2(1) = 11.1161				
Design-based F(1, 1457) = 9.7626	P = 0.0018			
	Public-Access Use Aggregate			
Immigration	no	yes	Row Total	
US Born	86.50%	13.50%	100.00%	
Born Outside US	93.46%	6.54%	100.00%	
Total	87.73%	12.27%	100.00%	
Pearson:				
Uncorrected chi2(1) = 9.5116				
Design-based F(1, 1457) = 5.3310	P = 0.0211			

H3d: Public-access use is more common among respondents with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent will be more likely to be a public-access user.

	Austin Public Library Use		
Family History of US Immigration	no	yes	
No recent family history	91.91%	8.09%	100.00%
First Generation	95.06%	4.94%	100.00%
Second Generation	86.70%	13.30%	100.00%
Third Generation	94.06%	5.94%	100.00%
Total	92.33%	7.67%	100.00%
Pearson:			
Uncorrected chi2(3) = 11.6036			
Design-based F(2.36, 3447.53)= 1.3406 P = 0.2618			

	Austin City Wireless		
Family History of US Immigration	no	yes	
No recent family history	91.43%	8.57%	100.00%
First Generation	97.74%	2.26%	100.00%
Second Generation	91.93%	8.07%	100.00%
Third Generation	93.04%	6.96%	100.00%
Total	92.93%	7.07%	100.00%
Pearson:			
Uncorrected chi2(3) = 11.7773			
Design-based F(2.04, 2977.73)= 1.2244 P = 0.2945			

	Public-Access Use Aggregate		
Family History of US Immigration	no	yes	
No recent family history	86.11%	13.89%	100.00%
First Generation	93.46%	6.54%	100.00%
Second Generation	84.25%	15.75%	100.00%
Third Generation	89.07%	10.93%	100.00%
Total	87.81%	12.19%	100.00%
Pearson:			
Uncorrected chi2(3) = 12.0445			
Design-based F(2.54, 3710.62)= 1.3145 P = 0.2692			

H3e & H3f: Public-access use is more common among older users than younger users.			
	Austin Public Library Use		
Age in 6 Categories	no	yes	
18-24	94.07%	5.93%	100.00%
25-34	90.72%	9.28%	100.00%
35-44	93.14%	6.86%	100.00%
45-54	90.05%	9.95%	100.00%
55-64	92.68%	7.32%	100.00%
65+	97.05%	2.95%	100.00%
Total	92.33%	7.67%	100.00%
Pearson:			
Uncorrected chi2(5) = 8.5166			
Design-based F(2.23, 3255.59)= 0.6726 P = 0.5257			
	Austin City Wireless		
Age in 6 Categories	no	yes	
18-24	94.07%	5.93%	100.00%
25-34	90.97%	9.03%	100.00%
35-44	90.04%	9.96%	100.00%
45-54	94.03%	5.97%	100.00%
55-64	96.28%	3.72%	100.00%
65+	98.57%	1.43%	100.00%
Total	92.93%	7.07%	100.00%
Pearson:			
Uncorrected chi2(5) = 15.8488			
Design-based F(1.96, 2865.25)= 1.3745 P = 0.2531			

	Public-Access Use Aggregate		
Age in 6 Categories	no	yes	
18-24	94.07%	5.93%	100.00%
25-34	83.40%	16.60%	100.00%
35-44	85.71%	14.29%	100.00%
45-54	86.94%	13.06%	100.00%
55-64	91.04%	8.96%	100.00%
65+	95.62%	4.38%	100.00%
Total	87.81%	12.19%	100.00%
Pearson:			
Uncorrected chi2(5) = 26.3077			
Design-based F(2.14, 3130.08)= 2.0583 P = 0.1243			
	Austin Public Library Use		
	no	yes	
Millennials	92.03%	7.97%	100.00%
Generation X	92.47%	7.53%	100.00%
Younger Boomers	90.50%	9.50%	100.00%
Older Boomers	92.17%	7.83%	100.00%
Silent Generation	95.78%	4.22%	100.00%
G.I. Generation	98.76%	1.24%	100.00%
Total	92.33%	7.67%	100.00%
Pearson:			
Uncorrected chi2(5) = 5.5761			
Design-based F(3.24, 4739.23)= 0.8634 P = 0.4662			

	Austin City Wireless		
	no	yes	
Millennials	91.84%	8.16%	100.00%
Generation X	90.88%	9.12%	100.00%
Younger Boomers	94.40%	5.60%	100.00%
Older Boomers	95.50%	4.50%	100.00%
Silent Generation	97.49%	2.51%	100.00%
G.I. Generation	100.00%	0.00%	100.00%
Total	92.93%	7.07%	100.00%
Pearson:			
Uncorrected chi2(5) = 11.7786			
Design-based F(2.85, 4167.96)= 1.8151 P = 0.1452			
	Public-Access Use Aggregate		
	no	yes	
Millennials	87.15%	12.85%	100.00%
Generation X	85.43%	14.57%	100.00%
Younger Boomers	87.58%	12.42%	100.00%
Older Boomers	90.18%	9.82%	100.00%
Silent Generation	93.27%	6.73%	100.00%
G.I. Generation	98.76%	1.24%	100.00%
Total	87.81%	12.19%	100.00%
Pearson:			
Uncorrected chi2(5) = 10.7863			
Design-based F(3.12, 4565.62)= 1.8194 P = 0.1389			

H3g: Public-access use is more common among men than women.				
		Austin Public Library Use		
		no	yes	
Men		93.24%	6.76%	100.00%
Women		91.32%	8.68%	100.00%
Total		92.33%	7.67%	100.00%
Pearson:				
Uncorrected chi2(1)	=	1.9066		
Design-based F(1, 1463)	=	0.7298	P = 0.3931	
		Austin City Wireless		
		no	yes	
Men		93.39%	6.61%	100.00%
Women		92.43%	7.57%	100.00%
Total		92.93%	7.07%	100.00%
Pearson:				
Uncorrected chi2(1)	=	0.5198		
Design-based F(1, 1463)	=	0.2159	P = 0.6423	
		Public-Access Use Aggregate		
		no	yes	
Men		87.85%	12.15%	100.00%
Women		87.77%	12.23%	100.00%
Total		87.81%	12.19%	100.00%
Pearson:				
Uncorrected chi2(1)	=	0.0021		
Design-based F(1, 1463)	=	0.0008	P = 0.9774	

H3h: Public-access use is more common among lower-income groups.			
	Austin Public Library Use		
	no	yes	
< $10,000	89.37%	10.63%	100.00%
$10,000-$19,999	88.66%	11.34%	100.00%
$20,000-$29,999	85.52%	14.48%	100.00%
$30,000-$39,999	90.14%	9.86%	100.00%
$40,000-$49,999	92.65%	7.35%	100.00%
$50,000-$64,999	94.80%	5.20%	100.00%
> $75,000	94.25%	5.75%	100.00%
prefer n	94.91%	5.09%	100.00%
Total	92.29%	7.71%	100.00%
Pearson:			
Uncorrected chi2(7) = 21.8498			
Design-based F(4.30, 6211.50)= 1.3130 P = 0.2605			
	Austin City Wireless		
	no	yes	
< $10,000	92.96%	7.04%	100.00%
$10,000-$19,999	92.15%	7.85%	100.00%
$20,000-$29,999	92.00%	8.00%	100.00%
$30,000-$39,999	95.55%	4.45%	100.00%
$40,000-$49,999	94.10%	5.90%	100.00%
$50,000-$64,999	93.42%	6.58%	100.00%
> $75,000	91.85%	8.15%	100.00%
prefer n	93.52%	6.48%	100.00%
Total	92.88%	7.12%	100.00%
Pearson:			
Uncorrected chi2(7) = 2.3375			
Design-based F(4.55, 6573.24)= 0.1514 P = 0.9732			

	Public-Access Use Aggregate		
	no	yes	
< $10,000	89.37%	10.63%	100.00%
$10,000-$19,999	81.91%	18.09%	100.00%
$20,000-$29,999	83.14%	16.86%	100.00%
$30,000-$39,999	86.48%	13.52%	100.00%
$40,000-$49,999	88.24%	11.76%	100.00%
$50,000-$64,999	88.71%	11.29%	100.00%
> $75,000	87.25%	12.75%	100.00%
prefer n	92.41%	7.59%	100.00%
Total	87.75%	12.25%	100.00%
Pearson:			
Uncorrected chi2(7) = 12.9154			
Design-based F(4.85, 7010.59)= 0.7845 P = 0.5571			

H1i: Non-use is more common among those with lower educational attainment than those with greater educational attainment			
	Austin Public Library Use		
	no	yes	total
Less than High School	100.00%	0.00%	100.00%
High School	87.98%	12.02%	100.00%
Technical/Some College	88.97%	11.03%	100.00%
4-year Unviersity	93.09%	6.91%	100.00%
Graduate/Professional	92.77%	7.23%	100.00%
Total	92.33%	7.67%	100.00%
Pearson:			
Uncorrected chi2(4) = 31.8399			
Design-based F(2.50, 3653.61)= 2.2637 P = 0.0909			
	Austin City Wireless		
	no	yes	total
Less than High School	100.00%	0.00%	100.00%
High School	96.14%	3.86%	100.00%
Technical/Some College	91.61%	8.39%	100.00%
4-year Unviersity	88.69%	11.31%	100.00%
Graduate/Professional	91.85%	8.15%	100.00%
Total	92.93%	7.07%	100.00%
Pearson:			
Uncorrected chi2(4) = 34.3202			
Design-based F(2.52, 3685.66)= 2.5434 P = 0.0650			

	Public-Access Use Aggregate		
	no	yes	total
Less than High School	100.00%	0.00%	100.00%
High School	87.56%	12.44%	100.00%
Technical/Some College	85.92%	14.08%	100.00%
4-year Unviersity	83.81%	16.19%	100.00%
Graduate/Professional	85.67%	14.33%	100.00%
Total	87.81%	12.19%	100.00%
Pearson:			
Uncorrected chi2(4) = 40.8255			
Design-based F(2.32, 3396.87)= 2.6138 P = 0.0647			

H3h: Public-access use is less common among respondents whose primary language is not English.			
	Internet Use at Austin Public Library		
Index of Non-English Media Use in 3 Categories	no	yes	
never	96.08%	3.92%	100.00%
rarely	89.04%	10.96%	100.00%
weekly/daily	91.09%	8.91%	100.00%
Total	92.26%	7.74%	100.00%
Pearson:			
Uncorrected chi2(2) = 16.1405			
Design-based F(1.65, 2290.71)= 3.7898 P = 0.0303			
	Austin City Wireless		
Index of Non-English Media Use in 3 Categories	no	yes	
never	94.45%	5.55%	100.00%
rarely	88.66%	11.34%	100.00%
weekly/daily	94.07%	5.93%	100.00%
Total	92.76%	7.24%	100.00%
Pearson:			
Uncorrected chi2(2) = 12.6510			
Design-based F(1.71, 2372.12)= 2.7010 P = 0.0760			

	Public-Access Use Aggregate		
Index of Non-English Media Use in 3 Categories	no	yes	
never	91.34%	8.66%	100.00%
rarely	81.83%	18.17%	100.00%
weekly/daily	88.42%	11.58%	100.00%
Total	87.67%	12.33%	100.00%
Pearson:			
Uncorrected chi2(2) = 17.8869			
Design-based F(1.72, 2380.36)= 3.8877 P = 0.0263			

H4: Use of the Internet exclusively through public-access services is more common among less affluent users and members of marginalized groups than among privileged groups.				
H4a: Exclusive public-access use is less common among users with greater cultural capital, measured by the aggregate of parents' education.				
		Exclusive Public-Access Use		
Index of Parent's Cultural Capital		no	yes	
	1	99.63%	0.37%	100.00%
	2	89.23%	10.77%	100.00%
	3	97.19%	2.81%	100.00%
	4	96.08%	3.92%	100.00%
	5	95.31%	4.69%	100.00%
Total		95.41%	4.59%	100.00%
Pearson:				
Uncorrected chi2(4) = 41.8996				
Design-based F(3.43, 4779.87)= 6.2060 P = 0.0002				
H4b: Exclusive public-access use is more common among African-Americans and Hispanics than among whites.				
		Exclusive Public-Access Use		
Racial/Ethnic Category		no	yes	
White		88.22%	11.78%	100.00%
African-American		90.27%	9.73%	100.00%
Hispanic		92.54%	7.46%	100.00%
Asian-American		96.42%	3.58%	100.00%
Other		86.57%	13.43%	100.00%
Total		90.19%	9.81%	100.00%
Pearson:				
Uncorrected chi2(4) = 10.7604				
Design-based F(3.89, 5685.87)= 1.3121 P = 0.2637				

H4c: Exclusive public-access is more common among migrants from other countries than among respondents born in the United States.			
	Exclusive Public-Access Use		
First Generation of Immigrants	no	yes	
US-born	94.80%	5.20%	100.00%
First Generation Immigrant	98.86%	1.14%	100.00%
Total	95.52%	4.48%	100.00%
Pearson:			
Uncorrected chi2(1) = 8.1299			
Design-based F(1, 1457) = 6.5404 P = 0.0106			

H4d: Exclusive public-access use is more common among respondents with recent immigration histories. If a respondent's parent or grandparent moved to the United States from another country, that respondent will be more likely to be a public-access user.			
	Exclusive Public-Access Use		
Family History of US Immigration	no	yes	
No recent family history	95.34%	4.66%	100.00%
First Generation	98.86%	1.14%	100.00%
Second Generation	89.25%	10.75%	100.00%
Third Generation	96.67%	3.33%	100.00%
Total	95.55%	4.45%	100.00%
Pearson:			
Uncorrected chi2(3) = 23.0854			
Design-based F(2.11, 3092.11)= 2.7667 P = 0.0599			

H4e & H4f: Exclusive public-access use is more common among older users than younger users.			
	Exclusive Public-Access Use		
Age in 6 Categories	no	yes	
18-24	95.66%	4.34%	100.00%
25-34	93.93%	6.07%	100.00%
35-44	96.34%	3.66%	100.00%
45-54	94.10%	5.90%	100.00%
55-64	97.52%	2.48%	100.00%
65+	99.69%	0.31%	100.00%
Total	95.55%	4.45%	100.00%
Pearson:			
Uncorrected chi2(5) = 10.8899			
Design-based F(1.98, 2889.90)= 0.8377 P = 0.4316			
	Exclusive Public-Access Use		
	no	yes	
Millennials	95.29%	4.71%	100.00%
Generation X	94.71%	5.29%	100.00%
Younger Boomers	94.46%	5.54%	100.00%
Older Boomers	97.01%	2.99%	100.00%
Silent Generation	99.46%	0.54%	100.00%
G.I. Generation	100.00%	0.00%	100.00%
Total	95.55%	4.45%	100.00%
Pearson:			
Uncorrected chi2(5) = 7.0735			
Design-based F(3.03, 4431.71)= 0.8416 P = 0.4719			

H4g: Exclusive public-access use is more common among men than women.			
	Exclusive Public-Access Use		
	no	yes	
Men	96.74%	3.26%	100.00%
Women	94.24%	5.76%	100.00%
Total	95.55%	4.45%	100.00%
Pearson:			
Uncorrected chi2(1) = 5.3839			
Design-based F(1, 1463) = 1.8724 P = 0.1714			

H4h: Exclusive public-access use is more common among lower-income groups.			
	Exclusive Public-Access Use		
	no	yes	
< $10,000	93.59%	6.41%	100.00%
$10,000-$19,999	91.53%	8.47%	100.00%
$20,000-$29,999	89.63%	10.37%	100.00%
$30,000-$39,999	96.26%	3.74%	100.00%
$40,000-$49,999	95.07%	4.93%	100.00%
$50,000-$64,999	97.33%	2.67%	100.00%
> $75,000	98.21%	1.79%	100.00%
Total	95.38%	4.62%	100.00%
Pearson:			
Uncorrected chi2(6) = 28.9838			
Design-based F(4.95, 6281.92)= 3.0188 P = 0.0103			

Student Status by Income			
Household Income	Non-Student	Student	Row Total
< $10,000	96.08%	3.92%	100.00%
$10,000-$19,999	78.80%	21.20%	100.00%
$20,000-$29,999	81.72%	18.28%	100.00%
$30,000-$39,999	97.01%	2.99%	100.00%
$40,000-$49,999	91.56%	8.44%	100.00%
$50,000-$64,999	95.57%	4.43%	100.00%
> $75,000	93.82%	6.18%	100.00%
Total	91.32%	8.68%	100.00%
Pearson:			
Uncorrected chi2(6) = 59.7371			
Design-based F(4.12, 5234.52)= 3.3007 P = 0.0096			

H4i: Exclusive public-access use is more common among those with lower educational attainment than those with greater educational attainment			
	Public-Access Use Only		
	no	yes	total
Less than High School	100.00%	0.00%	100.00%
High School	92.05%	7.95%	100.00%
Technical/Some College	92.40%	7.60%	100.00%
4-year Unviersity	96.74%	3.26%	100.00%
Graduate/Professional	97.29%	2.71%	100.00%
Total	95.55%	4.45%	100.00%
Pearson:			
Uncorrected chi2(4) = 28.9523			
Design-based F(2.51, 3666.05)= 2.3030 P = 0.0866			

H4j: Exclusive public-access use is less common among persons whose primary language is not English.			
	Exclusive Public-Access Use		
Index of Non-English Media Use in 3 Categories	no	yes	
never	98.19%	1.81%	100.00%
rarely	93.52%	6.48%	100.00%
weekly/daily	94.69%	5.31%	100.00%
Total	95.58%	4.42%	100.00%
Pearson:			
Uncorrected chi2(2) = 12.3812			
Design-based F(1.54, 2139.73)= 2.8024 P = 0.0748			

H5: Mobile Internet use is more common among privileged groups like whites, the well educated, and the affluent.

H5a: Mobile Internet use is more common among people with greater cultural capital, based on parents' education.				
		Mobile Internet Use		
		no	yes	
	1	65.85%	34.15%	100.00%
	2	54.41%	45.59%	100.00%
	3	39.63%	60.37%	100.00%
	4	41.24%	58.76%	100.00%
	5	41.60%	58.40%	100.00%
Total		49.23%	50.77%	100.00%
Pearson:				
Uncorrected chi2(4) = 59.1863				
Design-based F(1.89, 2632.89)= 2.5816 P = 0.0790				
Mobile Internet				
Parents' Education Level		No	Yes	Total
No Post-Secondary		56.36%	43.64%	100.00%
Some Post-Secondary		42.30%	57.70%	100.00%
Total		50.51%	49.49%	100.00%
Pearson:				
Uncorrected chi2(1) = 28.1367				
Design-based F(1, 1463) = 4.8720 P = 0.0275				

H5b: Mobile Internet use is more common among whites than among marginalized racial or ethnic groups such as African-Americans or Hispanics.			
	Mobile Internet Use		
Racial/Ethnic Category	no	yes	
White	96.72%	3.28%	100.00%
African-American	93.33%	6.67%	100.00%
Hispanic	93.49%	6.51%	100.00%
Asian-American	100.00%	0.00%	100.00%
Other	89.18%	10.82%	100.00%
Total	95.55%	4.45%	100.00%
Pearson:			
Uncorrected chi2(4) = 15.1825			
Design-based F(2.99, 4378.73)= 1.3394 P = 0.2597			

H5c: Mobile Internet use is more common among persons born in the United States than among immigrants to the US.			
	Mobile Internet Use		
1st Generation of Immigrants	no	yes	
US-born	49.43%	50.57%	100.00%
First Generation Immigrant	64.87%	35.13%	100.00%
Total	52.15%	47.85%	100.00%
Pearson:			
Uncorrected chi2(1) = 20.1797			
Design-based F(1, 1457) = 1.9154 P = 0.1666			

H5d: Mobile Internet use is more common among persons with no recent family history of immigration than among immigrants or persons who had a parent or grandparent who immigrated.			
	Mobile Internet Use		
Family History of US Immigration	no	yes	
No recent family history	45.55%	54.45%	100.00%
First Generation	64.87%	35.13%	100.00%
Second Generation	42.55%	57.45%	100.00%
Third Generation	63.58%	36.42%	100.00%
Total	52.42%	47.58%	100.00%
Pearson:			
Uncorrected chi2(3) = 51.7612			
Design-based F(2.65, 3883.80)= 2.2991 P = 0.0833			

H5e & H5f: Mobile Internet use is more common among younger respondents than older respondents.			
	Mobile Internet Use		
Age in 6 Categories	no	yes	
18-24	46.42%	53.58%	100.00%
25-34	40.68%	59.32%	100.00%
35-44	39.88%	60.12%	100.00%
45-54	61.82%	38.18%	100.00%
55-64	75.22%	24.78%	100.00%
65+	89.13%	10.87%	100.00%
Total	52.42%	47.58%	100.00%
Pearson:			
Uncorrected chi2(5) = 154.6118			
Design-based F(1.64, 2404.08)= 4.8169 P = 0.0127			
	Mobile Internet Use		
	no	yes	
Millennials	42.76%	57.24%	100.00%
Generation X	39.67%	60.33%	100.00%
Younger Boomers	63.79%	36.21%	100.00%
Older Boomers	76.67%	23.33%	100.00%
Silent Generation	85.17%	14.83%	100.00%
G.I. Generation	94.43%	5.57%	100.00%
Total	52.42%	47.58%	100.00%
Pearson:			
Uncorrected chi2(5) = 157.3773			
Design-based F(1.91, 2789.82)= 12.6859 P = 0.0000			

H5g: Mobile Internet use is more common among men than women.			
	Mobile Internet Use		
	no	yes	
Men	48.33%	51.67%	100.00%
Women	56.93%	43.07%	100.00%
Total	52.42%	47.58%	100.00%
Pearson:			
Uncorrected chi2(1) = 10.8265			
Design-based F(1, 1463) = 1.7842 P = 0.1818			

H5h: Mobile Internet use is more common among members of affluent households than members of lower-income households.			
	Mobile Internet Use		
	no	yes	
< $10,000	48.45%	51.55%	100.00%
$10,000-$19,999	68.69%	31.31%	100.00%
$20,000-$29,999	41.88%	58.12%	100.00%
$30,000-$39,999	66.63%	33.37%	100.00%
$40,000-$49,999	58.48%	41.52%	100.00%
$50,000-$64,999	45.16%	54.84%	100.00%
> $75,000	40.37%	59.63%	100.00%
Total	47.94%	52.06%	100.00%
Uncorrected chi2(6) = 49.6991			
Design-based F(4.24, 5379.25)= 2.4790 P = 0.0387			

H5i: Mobile use is less common among those with lower educational attainment than those with greater educational attainment			
	Mobile Internet Use		
	no	yes	total
Less than High School	77.51%	22.49%	100.00%
High School	60.66%	39.34%	100.00%
Technical/Some College	46.38%	53.62%	100.00%
4-year Unviersity	41.61%	58.39%	100.00%
Graduate/Professional	46.35%	53.65%	100.00%
Total	52.42%	47.58%	100.00%
Pearson:			
Uncorrected chi2(4) = 93.4939			
Design-based F(1.85, 2704.77)= 3.2356 P = 0.0433			

H5j: Mobile use is less common among those whose primary language is not English.			
	Mobile Internet Use		
Index of Non-English Media Use in 3 Categories	no	yes	
never	47.35%	52.65%	100.00%
rarely	46.99%	53.01%	100.00%
weekly/d	57.64%	42.36%	100.00%
Total	51.27%	48.73%	100.00%
Pearson:			
Uncorrected chi2(2) = 14.4297			
Design-based F(1.45, 2011.57)= 1.3698 P = 0.2516			

H6: Mobile-only use of the Internet is more common among less affluent users and members of marginalized ethnic groups.

H6a: Mobile-only Internet use is more common among people with greater cultural capital, based on parents' education.				
		Mobile Internet Use Exclusively		
Index of Parent's Cultural Capital		no	yes	
	1	0.9737	0.0263	1
	2	0.9492	0.0508	1
	3	0.9893	0.0107	1
	4	0.9745	0.0255	1
	5	0.9775	0.0225	1
Total		0.9721	0.0279	1
Pearson:				
Uncorrected chi2(4) = 9.5170				
Design-based F(2.89, 4019.64)= 0.8615 P = 0.4568				
H6b: Mobile-only Internet use is more common among whites than among marginalized racial or ethnic groups such as African-Americans or Hispanics.				

	Mobile Internet Use Exclusively		
Racial/Ethnic Category	no	yes	
White	98.73%	1.27%	100.00%
African-American	97.53%	2.47%	100.00%
Hispanic	94.19%	5.81%	100.00%
Asian-American	100.00%	0.00%	100.00%
Other	100.00%	0.00%	100.00%
Total	97.35%	2.65%	100.00%
Pearson:			
Uncorrected chi2(4) = 26.4521			
Design-based F(2.60, 3809.80)= 2.5510 P = 0.0625			

H6c: Mobile-only Internet use is more common among persons born in the United States than among immigrants to the US.			
	Mobile Internet Use Exclusively		
1st Generation of Immigrants	no	yes	
US-born	96.82%	3.18%	100.00%
First Generation Immigrant	99.76%	0.24%	100.00%
Total	97.34%	2.66%	100.00%
Pearson:			
Uncorrected chi2(1) = 7.0384			
Design-based F(1, 1457) = 10.0001 P = 0.0016			

H6d: Mobile-only Internet use is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.			
	Mobile Internet Use Exclusively		
Family History of US Immigration	no	yes	
No recent family history	97.35%	2.65%	100.00%
First Generation	99.76%	0.24%	100.00%
Second Generation	91.98%	8.02%	100.00%
Third Generation	98.26%	1.74%	100.00%
Total	97.35%	2.65%	100.00%
Pearson:			
Uncorrected chi2(3) = 25.3544			
Design-based F(1.99, 2910.09)= 3.0456 P = 0.0480			

H6e & H6f: Mobile-only Internet use is more common among younger respondents than older respondents.			
	Mobile Internet Use Exclusively		
Age in 6 Categories	no	yes	
18-24	95.66%	4.34%	100.00%
25-34	96.08%	3.92%	100.00%
35-44	97.85%	2.15%	100.00%
45-54	98.31%	1.69%	100.00%
55-64	99.07%	0.93%	100.00%
65+	100.00%	0.00%	100.00%
Total	97.35%	2.65%	100.00%
Pearson:			
Uncorrected chi2(5) = 11.5405			
Design-based F(2.12, 3108.15)= 0.7628 P = 0.4737			

	Mobile Internet Use Exclusively		
	no	yes	
Millennials	95.78%	4.22%	100.00%
Generation X	97.99%	2.01%	100.00%
Younger Boomers	98.42%	1.58%	100.00%
Older Boomers	98.87%	1.13%	100.00%
Silent Generation	100.00%	0.00%	100.00%
G.I. Generation	100.00%	0.00%	100.00%
Total	97.35%	2.65%	100.00%
Pearson:			
Uncorrected chi2(5) = 12.2147			
Design-based F(2.43, 3561.90)= 1.4024 P = 0.2443			

H6g: Mobile-only Internet use is more common among men than women.			
	Mobile Internet Use Exclusively		
	no	yes	
Men	97.87%	2.13%	100.00%
Women	96.79%	3.21%	100.00%
Total	97.35%	2.65%	100.00%
Pearson:			
Uncorrected chi2(1) = 1.6498			
Design-based F(1, 1463) = 0.4366 P = 0.5089			

H6h: Mobile-only Internet use is more common among members of affluent households than members of lower-income households.			
	Mobile Internet Use Exclusively		
	no	yes	
< $10,000	96.07%	3.93%	100.00%
$10,000-$19,999	98.13%	1.87%	100.00%
$20,000-$29,999	95.18%	4.82%	100.00%
$30,000-$39,999	97.77%	2.23%	100.00%
$40,000-$49,999	97.12%	2.88%	100.00%
$50,000-$64,999	97.99%	2.01%	100.00%
> $75,000	98.91%	1.09%	100.00%
Total	97.63%	2.37%	100.00%
Pearson:			
Uncorrected chi2(6) = 9.6503			
Design-based F(4.34, 5517.33)= 0.9284 P = 0.4519			

H6i: Exclusive mobile access is more common among those with lower educational attainment than those with greater educational attainment			
	Mobile Internet Use Exclusively		
	no	yes	total
Less than High School	100.00%	0.00%	100.00%
High School	95.80%	4.20%	100.00%
Technical/Some College	95.65%	4.35%	100.00%
4-year Unviersity	98.20%	1.80%	100.00%
Graduate/Professional	97.32%	2.68%	100.00%
Total	97.35%	2.65%	100.00%
Pearson:			
Uncorrected chi2(4) = 13.6716			
Design-based F(2.79, 4083.01)= 0.9183 P = 0.4256			

H3h: Exclusive mobile access is more common among respondents whose primary language is not English.			
	Mobile Internet Use Exclusively		
Index of Non-English Media Use in 3 Categories	no	yes	
never	97.28%	2.72%	100.00%
rarely	97.35%	2.65%	100.00%
weekly/daily	97.09%	2.91%	100.00%
Total	97.23%	2.77%	100.00%
Pearson:			
Uncorrected chi2(2) = 0.0615			
Design-based F(1.78, 2464.80)= 0.0088 P = 0.9861			

H7: Members of privileged groups such as whites and the better educated will use more forms of access than members of marginalized groups.				
		Item	Item	Item-rest
Item	Obs	difficulty	variance	correlation
Domestic	1464	0.8716	0.1119	0.3056
Institutional	1464	0.2375	0.612	0.3414
Public Access	1464	0.1318	0.1145	0.105
Test		0.5385		0.2507
KR20 coefficient is 0.4014				
The KR20 coefficient is too low to use as an index for this analysis.				
		Item	Item	Item-rest
Variable	Obs	difficulty	variance	correlation
Home of respondent	1464	0.8607	0.1199	0.2878
Work	1464	0.5956	0.2409	0.3308
School	1464	0.0915	0.0832	0.3007
APL	1464	0.0751	0.0695	0.1644
Coffee Shop	1464	0.2227	0.1731	0.4413
Home of a friend or family member	1464	0.2295	0.1768	0.4172
Test		0.3459	0.3237	
KR20 coefficient is 0.4014				
The KR20 coefficient is too low to use as an index for this analysis.				

H8: Members of privileged groups such as whites and the better educated will use more devices to access the Internet than members of marginalized groups.				
		Item	Item	Item-rest
Item	Obs	difficulty	variance	correlation
Game Console	1464	0.2432	0.184	0.3114
Desktop computer at home	1464	0.7165	0.2031	0.0727
Owns Desktop or Notebook Computer	1464	0.6728	0.2201	0.255
Smartphone	1464	0.4686	0.249	0.3095
KR20 coefficient is 0.4211				
The KR20 coefficient is too low to use as an index for this analysis.				

Appendix C Full Results for Chapter 6

H9: Members of privileged groups such as whites and the better educated are more likely to use domestic sites of access either at their own homes or at the homes of friends or family.			
H9a: Persons with more cultural capital are more likely to use the Internet in domestic contexts than persons with less cultural capital.			
	Domestic Internet Use		
Cultural Capital Index	No	Yes	Row Total
1	19.38%	80.62%	100.00%
2	15.32%	84.68%	100.00%
3	8.96%	91.04%	100.00%
4	7.66%	92.34%	100.00%
5	5.05%	94.95%	100.00%
Total	11.77%	88.23%	100.00%
Pearson:			
Uncorrected chi2(4) = 36.6066			
Design-based F(2.75, 3829.12)= 3.0224 P = 0.0326			

H9b: Whites are more likely to use the Internet in domestic contexts than African-Americans or Hispanics.			
	Domestic Internet Use		
	No	Yes	Row Total
White	10.15%	89.85%	100.00%
African-American	20.40%	79.60%	100.00%
Hispanic	22.47%	77.53%	100.00%
Asian-American	6.10%	93.90%	100.00%
other	7.76%	92.24%	100.00%
Total	14.39%	85.61%	100.00%
Pearson:			
Uncorrected chi2(4) = 44.6583			
Design-based F(2.28, 3338.82)= 3.3390 P = 0.0296			

H9c: Internet use in domestic contexts is more common among persons born in the United States than among immigrants to the US.			
	Domestic Internet Use		
	No	Yes	Row Total
US-born	13.02%	86.98%	100.00%
First Generation Immigrant	21.38%	78.62%	100.00%
Total	14.49%	85.51%	100.00%
Pearson:			
Uncorrected chi2(1) = 11.9164			
Design-based F(1, 1457) = 0.8853 P = 0.3469			

H9d: Internet use in domestic contexts is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.			
	Domestic Internet Use		
	No	Yes	Row Total
No recent family history	12.45%	87.55%	100.00%
First Generation	21.38%	78.62%	100.00%
Second Generation	19.61%	80.39%	100.00%
Third Generation	10.44%	89.56%	100.00%
Total	14.39%	85.61%	100.00%
Pearson:			
Uncorrected chi2(3) = 20.0183			
Design-based F(2.07, 3025.48)= 0.9622 P = 0.3846			
	Domestic Internet Use Among Hispanic Immigrants		
	No	Yes	Row Total
No recent family history	11.41%	88.59%	100.00%
First Generation	33.44%	66.56%	100.00%
Second Generation	33.13%	66.87%	100.00%
Third Generation	6.51%	93.49%	100.00%
Total	14.39%	85.61%	100.00%
Pearson:			
Uncorrected chi2(3) = 81.7901			
Design-based F(2.17, 3176.26)= 3.2082 P = 0.0366			

H9e & H9f: Younger persons are more likely to use the Internet in domestic contexts than older persons.			
Age Ranges			
	Domestic Internet Use		
	No	Yes	Row Total
18-24	7.37%	92.63%	100.00%
25-34	12.23%	87.77%	100.00%
35-44	6.35%	93.65%	100.00%
45-54	16.61%	83.39%	100.00%
55-64	25.12%	74.88%	100.00%
65+	35.15%	64.85%	100.00%
Total	14.39%	85.61%	100.00%
Pearson:			
Uncorrected chi2(5) = 84.4519			
Design-based F(2.97, 4348.86)= 3.2010 P = 0.0227			
Generations			
	Domestic Internet Use		
	No	Yes	Row Total
Millennials	10.07%	89.93%	100.00%
Generation X	8.30%	91.70%	100.00%
Younger Boomers	15.81%	84.19%	100.00%
Older Boomers	28.83%	71.17%	100.00%
Silent Generation	21.78%	78.22%	100.00%
G.I. Generation	53.04%	46.96%	100.00%
Total	14.39%	85.61%	100.00%
Pearson:			
Uncorrected chi2(5) = 110.2690			
Design-based F(2.41, 3528.91)= 5.8333 P = 0.0015			

H9g: Men are more likely to use the Internet in domestic contexts than women.			
	Domestic Internet Use		
	No	Yes	Row Total
Men	15.86%	84.14%	100.00%
Women	12.77%	87.23%	100.00%
Total	14.39%	85.61%	100.00%
Pearson:			
Uncorrected chi2(1) = 2.8302			
Design-based F(1, 1463) = 0.4920 P = 0.4831			

H9h: The affluent are more likely to use the Internet in domestic contexts such as their homes or the homes of friends or family than persons with lower incomes.			
	Domestic Internet Use		
	No	Yes	Row Total
< $10,000	25.43%	74.57%	100.00%
$10,000-$19,999	13.16%	86.84%	100.00%
$20,000-$29,999	16.59%	83.41%	100.00%
$30,000-$39,999	26.01%	73.99%	100.00%
$40,000-$49,999	7.09%	92.91%	100.00%
$50,000-$64,999	10.02%	89.98%	100.00%
> $75,000	7.43%	92.57%	100.00%
Total	12.82%	87.18%	100.00%
Pearson:			
Uncorrected chi2(6) = 49.7142			
Design-based F(4.85, 6163.78)= 2.9783 P = 0.0117			

H9i: The better educated are more likely to use the Internet in domestic contexts such as their homes or the homes of friends or family than persons with less education.			
	Domestic Internet Use		
	No	Yes	Row Total
Less than High School	29.13%	70.87%	100.00%
High School	23.20%	76.80%	100.00%
Technical/Some College	10.59%	89.41%	100.00%
4-year University	8.65%	91.35%	100.00%
Graduate/Professional	5.84%	94.16%	100.00%
Total	14.39%	85.61%	100.00%
Uncorrected chi2(4) = 85.4841			
Design-based F(1.75, 2562.22)= 3.8985 P = 0.0253			

H9i: Non-native speakers of English are less likely to use the Internet in domestic contexts than native speakers.			
	Domestic Internet Use		
	No	Yes	Row Total
never	9.16%	90.84%	100.00%
rarely	15.36%	84.64%	100.00%
weekly	17.33%	82.67%	100.00%
Total	14.00%	86.00%	100.00%
Pearson:			
Uncorrected chi2(2) = 14.7975			
Design-based F(1.43, 1980.44)= 1.5615 P = 0.2141			

H10: Members of privileged groups such as whites and the better educated are more likely to use institutional sites of access such as the workplace or school.

H10a: Persons with more cultural capital are more likely to use institutional sites of access such as the workplace or school than persons with less cultural capital.

	Institutional Internet Use		
Cultural Capital Index	No	Yes	Row Total
1	69.96%	30.04%	100.00%
2	52.54%	47.46%	100.00%
3	29.81%	70.19%	100.00%
4	23.22%	76.78%	100.00%
5	18.19%	81.81%	100.00%
Total	40.45%	59.55%	100.00%

Pearson:
Uncorrected chi2(4) = 219.4309
Design-based F(2.12, 2953.08)= 11.0097 P = 0.0000

H10b: Whites are more likely to use the Internet in institutional settings such as work or school than members of marginalized racial or ethnic groups such as African-Americans and Hispanics.

	Institutional Internet Use		
	No	Yes	Row Total
White	30.53%	69.47%	100.00%
African-American	68.75%	31.25%	100.00%
Hispanic	61.08%	38.92%	100.00%
Asian-American	25.16%	74.84%	100.00%
other	20.71%	79.29%	100.00%
Total	42.24%	57.76%	100.00%

Pearson:
Uncorrected chi2(4) = 157.3096
Design-based F(2.64, 3855.39)= 8.9699 P = 0.0000

H10c: Internet use in institutional contexts is more common among persons born in the United States than among immigrants to the US.			
	Institutional Internet Use		
	No	Yes	Row Total
US-born	40.28%	59.72%	100.00%
First Generation Immigrant	52.93%	47.07%	100.00%
Total	42.50%	57.50%	100.00%
Pearson:			
Uncorrected chi2(1) = 13.8526			
Design-based F(1, 1457) = 1.3918 P = 0.2383			

H10d: Internet use in institutional contexts is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.			
	Institutional Internet Use		
	No	Yes	Row Total
No recent family history	34.90%	65.10%	100.00%
First Generation	52.93%	47.07%	100.00%
Second Generation	42.23%	57.77%	100.00%
Third Generation	50.69%	49.31%	100.00%
Total	0.4224	0.5776	1
Pearson:			
Uncorrected chi2(3) = 37.2494			
Design-based F(2.68, 3920.21)= 1.3756 P = 0.2504			

H10e & H10f: Younger Austinites are more likely to use the Internet in the workplace or school than older Austinites.			
By Age Range			
	Institutional Internet Use		
	No	Yes	Row Total
18-24	59.24%	40.76%	100.00%
25-34	30.07%	69.93%	100.00%
35-44	23.88%	76.12%	100.00%
45-54	42.38%	57.62%	100.00%
55-64	52.76%	47.24%	100.00%
65+	85.67%	14.33%	100.00%
Total	42.24%	57.76%	100.00%
Pearson:			
Uncorrected chi2(5) = 196.7072			
Design-based F(2.17, 3172.13)= 7.1503 P = 0.0005			
Age (by Generation)			
	Institutional Internet Use		
	No	Yes	Row Total
Millennials	39.65%	60.35%	100.00%
Generation X	25.90%	74.10%	100.00%
Younger Boomers	44.48%	55.52%	100.00%
Older Boomers	51.47%	48.53%	100.00%
Silent Generation	79.63%	20.37%	100.00%
G.I. Generation	93.75%	6.25%	100.00%
Total	42.24%	57.76%	100.00%
Uncorrected chi2(5) = 143.7226			
Design-based F(2.02, 2958.37)= 9.6615 P = 0.0001			

H10g: Men are more likely to use the Internet at work or school than women.			
	Institutional Internet Use		
	No	Yes	Row Total
Men	35.27%	64.73%	100.00%
Women	49.91%	50.09%	100.00%
Total	42.24%	57.76%	100.00%
Pearson:			
Uncorrected chi2(1) = 32.1115			
Design-based F(1, 1463) = 4.4197 P = 0.0357			

H10h: More affluent Austinites are more likely to access the Internet in institutional settings than those with lower incomes.			
	Institutional Internet Use		
	No	Yes	Row Total
< \$10,000	90.61%	9.39%	100.00%
\$10,000-\$19,999	49.35%	50.65%	100.00%
\$20,000-\$29,999	50.15%	49.85%	100.00%
\$30,000-\$39,999	45.25%	54.75%	100.00%
\$40,000-\$49,999	37.14%	62.86%	100.00%
\$50,000-\$64,999	27.57%	72.43%	100.00%
> \$75,000	20.46%	79.54%	100.00%
Total	38.30%	61.70%	100.00%
Pearson:			
Uncorrected chi2(6) = 224.4179			
Design-based F(5.25, 6671.36)= 13.7706 P = 0.0000			

H10i: Better educated Austinites are more likely to access the Internet from work or school than those with less educational attainment.			
	Institutional Internet Use		
	No	Yes	Row Total
Less than High School	83.32%	16.68%	100.00%
High School	66.97%	33.03%	100.00%
Technical/Some College	35.27%	64.73%	100.00%
4-year Unviersity	22.06%	77.94%	100.00%
Graduate/Professional	20.32%	79.68%	100.00%
Total	42.24%	57.76%	100.00%
Pearson:			
Uncorrected chi2(4) = 344.8370			
Design-based F(1.54, 2246.74)= 11.9032 P = 0.0001			

H10j: Austinites who are not native speakers of English are less likely to use the Internet at work or school than native speakers.			
	Institutional Internet Use		
	No	Yes	Row Total
never	31.48%	68.52%	100.00%
rarely	34.52%	65.48%	100.00%
weekly	54.74%	45.26%	100.00%
Total	41.37%	58.63%	100.00%
Pearson:			
Uncorrected chi2(2) = 66.2528			
Design-based F(1.46, 2017.25)= 6.5850 P = 0.0042			

H11: Members of privileged groups such as whites and the better educated are more likely to use the internet at coffee shops than members of marginalized groups

H11a: Persons with more cultural capital are more likely to use the Internet at coffee shops than persons with less cultural capital.			
	Coffee Shop User		
Cultural Capital Index	No	Yes	Row Total
1	91.88%	8.12%	100.00%
2	85.34%	14.66%	100.00%
3	72.75%	27.25%	100.00%
4	70.31%	29.69%	100.00%
5	56.46%	43.54%	100.00%
Total	76.70%	23.30%	100.00%
Pearson:			
Uncorrected chi2(5) = 125.9353			
Design-based F(3.02, 4411.89)= 7.2251 P = 0.0001			

H11b: Whites are more likely to use the Internet at coffee shops than African-Americans or Hispanics.			
	Coffee Shop User		
	No	Yes	Row Total
White	71.12%	28.88%	100.00%
African-American	80.34%	19.66%	100.00%
Hispanic	90.55%	9.45%	100.00%
Asian-American	67.76%	32.24%	100.00%
other	90.90%	9.10%	100.00%
Total	77.91%	22.09%	100.00%
Pearson:			
Uncorrected chi2(4) = 71.2128			
Design-based F(2.84, 4149.45)= 4.4729 P = 0.0046			

H11c: Internet use at coffee shops is more common among persons born in the United States than among immigrants to the US.			
	Coffee Shop User		
	No	Yes	Row Total
US-born	78.68%	21.32%	100.00%
First Generation Immigrant	74.07%	25.93%	100.00%
Total	77.87%	22.13%	100.00%
Pearson:			
Uncorrected chi2(1) = 2.5955			
Design-based F(1, 1457) = 0.3954 P = 0.5296			

H11d: Internet use in coffee shops is more common among persons with no recent family of history than among immigrants or persons who had a parent or grandparent who immigrated.			
	Coffee Shop User		
	No	Yes	Row Total
No recent family history	34.90%	65.10%	100.00%
First Generation	52.93%	47.07%	100.00%
Second Generation	42.23%	57.77%	100.00%
Third Generation	50.69%	49.31%	100.00%
Total	77.91%	22.09%	100.00%
Pearson:			
Uncorrected chi2(3) = 7.0809			
Design-based F(2.82, 4120.46)= 0.4652 P = 0.6944			

H11e & H11f: Younger people are more likely to use the Internet at coffee shops than older people.			
	Coffee Shop User		
	No	Yes	Row Total
18-24	86.16%	13.84%	100.00%
25-34	68.19%	31.81%	100.00%
35-44	70.61%	29.39%	100.00%
45-54	82.45%	17.55%	100.00%
55-64	87.83%	12.17%	100.00%
65+	95.59%	4.41%	100.00%
Total	77.91%	22.09%	100.00%
Pearson:			
Uncorrected chi2(5) = 77.0674			
Design-based F(2.11, 3089.50)= 4.7256	P = 0.0078		
	Coffee Shop User		
	No	Yes	Row Total
Millennials	74.19%	25.81%	100.00%
Generation X	71.46%	28.54%	100.00%
Younger Boomers	82.61%	17.39%	100.00%
Older Boomers	87.23%	12.77%	100.00%
Silent Generation	94.09%	5.91%	100.00%
G.I. Generation	97.60%	2.40%	100.00%
Total	77.91%	22.09%	100.00%
Pearson:			
Uncorrected chi2(5) = 45.8947			
Design-based F(2.41, 3521.13)= 6.2184	P = 0.0010		

H11g: Men are more likely to use the Internet at coffee shops than women.			
	Coffee Shop User		
	No	Yes	Row Total
Men	75.49%	24.51%	100.00%
Women	80.57%	19.43%	100.00%
Total	77.91%	22.09%	100.00%
Pearson			
Uncorrected chi2(1) = 5.4720			
Design-based F(1, 1463) = 1.3799 P = 0.2403			

H11h: Affluent persons are more likely to use the Internet at coffee shops than persons with lower income.			
	Coffee Shop User		
	No	Yes	Row Total
< $10,000	94.34%	5.66%	100.00%
$10,000-$19,999	90.00%	10.00%	100.00%
$20,000-$29,999	73.08%	26.92%	100.00%
$30,000-$39,999	81.63%	18.37%	100.00%
$40,000-$49,999	73.30%	26.70%	100.00%
$50,000-$64,999	79.32%	20.68%	100.00%
> $75,000	66.91%	33.09%	100.00%
Total	76.20%	23.80%	100.00%
Pearson:			
Uncorrected chi2(6) = 57.4521			
Design-based F(4.24, 5384.96)= 3.5019 P = 0.0062			

H11i: Persons with greater educational attainment are more likely to use the Internet at coffee shops than those with less educational attainment.			
	Coffee Shop User		
	No	Yes	Row Total
never	79.95%	20.05%	100.00%
rarely	68.65%	31.35%	100.00%
weekly	83.52%	16.48%	100.00%
Total	78.33%	21.67%	100.00%
Pearson:			
Uncorrected chi2(2) = 29.7561			
Design-based F(1.88, 2602.40)= 4.8177 P = 0.0095			

H11j: Native speakers of English are more likely to use the Internet at coffee shops than non-native speakers of English.			
	Coffee Shop User		
	No	Yes	Row Total
Less than High School	90.19%	9.81%	100.00%
High School	92.04%	7.96%	100.00%
Technical/Some College	76.23%	23.77%	100.00%
4-year University	72.24%	27.76%	100.00%
Graduate/Professional	62.86%	37.14%	100.00%
Total	77.91%	22.09%	100.00%
Pearson:			
Uncorrected chi2(4) = 87.7007			
Design-based F(2.12, 3099.91)= 4.4593 P = 0.0102			

Appendix D All Results for Chapter 7

H12: Members of privileged groups such as whites and the better educated have more techno-capital than marginalized groups.					

H12a: People with greater cultural capital, as measured by parents' education, will have more techno-capital than people with lower cultural capital.					
Index		Mean	Std. Err.	95% Confidence Interval	
	1	3.583838	0.1927748	3.205641	3.962035
	2	3.669506	0.1117195	3.450328	3.888684
	3	4.133857	0.0756092	3.985522	4.282192
	4	4.162954	0.0547842	4.055475	4.270433
	5	4.151816	0.0924264	3.970488	4.333143
Overall Average		3.944982	0.0531121	3.840788	4.049177
F(1, 1252) = 14.50					
Prob > F = 0.0001					
R-squared = 0.0648					
Post-secondary Education of One or More Parents					
		Mean	Std. Err.	95% Confidence Interval	
	0	3.554196	0.1409539	3.277675	3.830717
	1	4.105815	0.0365323	4.034147	4.177484
F(1, 1304) = 14.35					
Prob > F = 0.0002					
R-squared = 0.0781					

H12b: White respondents will have greater techno-capital than respondents from marginalized ethnic/racial categories, particularly African-Americans and Hispanics.				
	Mean	Std. Err.	95% Confidence Interval	
White	4.079874	0.0357148	4.009809	4.149939
African-American	3.533128	0.1954744	3.149649	3.916607
Hispanic	3.757375	0.1348907	3.492748	4.022001
Asian-American	3.880352	0.3071776	3.277736	4.482969
Other	4.515517	0.1132831	4.29328	4.737754
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(4, 1301) = 7.17				
Prob > F = 0.0000				
R-squared = 0.0489				

H12c: Persons born who immigrated to the United States have less techno-capital than persons born in the United States.				
	Mean	Std. Err.	95% Confidence Interval	
US Born	3.97445	0.0491608	3.878007	4.070893
Born Outside US	3.73809	0.2302782	3.286332	4.189848
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1299) = 1.01				
Prob > F = 0.3157				
R-squared = 0.0091				

H12d: Respondents with recent immigration histories will have less techno-capital than respondents with more distant recent immigration histories				
	Mean	Std. Err.	95% Confidence Interval	
No History	4.038042	0.0421508	3.955351	4.120733
First Generation	3.73809	0.2302778	3.286334	4.189845
Second Generation	4.14569	0.1495152	3.852373	4.439006
Third Generation	3.769505	0.1006987	3.571956	3.967054
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(3, 1302) = 2.76				
Prob > F = 0.0409				
R-squared = 0.0277				

H12e & H12f: Older individuals will have less techno-capital than younger individuals.				
Age Ranges				
	Mean	Std. Err.	95% Confidence Interval	
18-24	3.923947	0.1936551	3.544037	4.303856
25-34	4.286783	0.0762734	4.137151	4.436414
35-44	4.162311	0.0471695	4.069774	4.254847
45-54	3.713229	0.0787664	3.558707	3.867752
55-64	3.479435	0.1395256	3.205716	3.753154
65+	2.87996	0.185548	2.515955	3.243966
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(5, 1300) = 17.85				
Prob > F = 0.0000				
R-squared = 0.1866				
Generation				
	Mean	Std. Err.	95% Confidence Interval	
Millenials	4.169589	0.1090008	3.955753	4.383425
Generation X	4.147561	0.0542993	4.041037	4.254084
Younger Boomers	3.64527	0.1048231	3.439629	3.85091
Older Boomers	3.51659	0.0871321	3.345656	3.687524
Silent Generation	2.894323	0.2580332	2.388118	3.400529
G.I. Generation	2.844808	0.1251517	2.599287	3.090329
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(5, 1300) = 26.93				
Prob > F = 0.0000				
R-squared = 0.1688				

H12g: Men have greater techno-capital than women.				
	Mean	Std. Err.	95% Confidence Interval	
Men	4.133878	0.0644578	4.007426	4.260331
Women	3.749906	0.0672865	3.617904	3.881908
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 16.98				
Prob > F = 0.0000				
R-squared = 0.0458				

H12h: Respondents with higher income have greater techno-capital than respondents with lower income.				
	Mean	Std. Err.	95% Confidence Interval	
<$10K	3.426173	0.1656797	3.101103	3.751244
$10K-$19,999	3.700866	0.2500293	3.210298	4.191434
$20K-$29,999	3.779608	0.1446471	3.495804	4.063411
$30K-$39,999	4.020629	0.1252757	3.774832	4.266425
$40K-$49,999	3.848877	0.1121807	3.628774	4.068981
$50K-$74,999	4.033423	0.0705182	3.895063	4.171783
$75K +	4.161624	0.0403046	4.082544	4.240703
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(6, 1138) = 5.07				
Prob > F = 0.0000				
R-squared = 0.0646				
	Weighted % of Respondents	Unweighted % of Respondents		
<$10K	9.24%	3.78		
$10K-$19,999	8.50%	5.9		
$20K-$29,999	15.16%	7.4		
$30K-$39,999	7.56%	8.03		
$40K-$49,999	7.32%	8.34		
$50K-$74,999	18.33%	22.34		
$75K +	33.88%	44.22		

H12i: Individuals with more educational attainment have greater techno-capital than respondents with less educational attainment.				
	Mean	Std. Err.	95% Confidence Interval	
Less Than High School	3.452679	0.2966606	2.870695	4.034663
High School	3.636972	0.0970618	3.446558	3.827387
Technical School/Some College	4.000967	0.0846215	3.834958	4.166976
4-year university	4.201914	0.0448434	4.113941	4.289887
Graduate/Professional	4.08625	0.0486792	3.990752	4.181749
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 11.77				
Prob > F = 0.0006				
R-squared = 0.0708				
Age by Educational Attainment				
Over	Mean Age	Std. Err.	[95% Confidence Interval	
Less Than High School	38.347	5.206559	28.13388	48.56012
High School	41.62094	2.329576	37.05127	46.19061
Technical School/Some College	41.18693	1.535047	38.1758	44.19806
4-year university	38.34584	0.7574632	36.86001	39.83167
Graduate/Professional	44.76517	0.8294658	43.1381	46.39223
Techno-capital by Student Status				
Over	Mean	Std. Err.	[95% Confidence Interval	
non-students	3.888344	0.054496	3.781435	3.995254
students	4.423402	0.1493576	4.130394	4.716409
F(1, 1304) = 11.33				
Prob > F = 0.0008				

H12j: Native speakers of English have greater techno-capital than persons who are not native speakers of English.				
	Mean	Std. Err.	95% Confidence Interval	
never	3.981738	0.0586903	3.866595	4.09688
rarely	4.081294	0.0543677	3.974631	4.187956
weekly	3.828577	0.1208762	3.591434	4.06572
Overall Average	3.944982	0.0531121	3.840788	4.049177
	F(2, 1247) = 2.09			
Prob > F = 0.1239				
R-squared = 0.0132				

H12k: Respondents employed in information-intensive sectors have greater techno-capital than respondents employed in other fields.				
	Mean	Std. Err.	95% Confidence Interval	
Construction	3.884221	0.3628227	3.172222	4.596219
Creative	4.05583	0.1342059	3.792466	4.319194
Education	4.050727	0.0879709	3.878094	4.22336
Government	4.029304	0.069003	3.893893	4.164714
Health	4.088401	0.107116	3.878198	4.298605
Manufacturing	4.035241	0.1478717	3.74506	4.325423
Media	4.224608	0.1943339	3.843249	4.605966
Services	4.195466	0.102069	3.995167	4.395765
Technology	4.519705	0.0617333	4.39856	4.64085
Other	4.03173	0.0923341	3.850535	4.212925
F(9, 972) = 4.75				
Prob > F = 0.0000				
R-squared = 0.0519				

Appendix E All Results for Chapter 8

H13: Users of faster or more convenient forms of access will have greater techno-capital than persons who do not use that form of access.				
H13a: Non-users have lower techno-capital than other users.				
Do you Use The Internet at All?				
Over	Mean	Std. Err.	95% Confidence Interval	
Yes	3.993758	0.052928	3.88992	4.097595
No	2.625968	0.2334141	2.168042	3.083894
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1253) = 32.66				
Prob > F = 0.0000				

H13b: Persons with no home Internet have lower techno-capital than other users				
	Mean	Std. Err.	95% Confidence Interval	
No	3.986051	0.0548693	3.878409	4.093693
Yes	3.409537	0.2128497	2.991972	3.827102
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 6.88				
Prob > F = 0.0088				
	Mean	Std. Err.	95% Confidence Interval	
Non-users Without Home Internet	2.085732	0.2166132	1.635261	2.536204
Non-users With Home Internet	2.937356	0.1789213	2.565269	3.309443
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 21) = 9.19				
Prob > F = 0.0064				

H13c: DSL users have higher techno-capital than others.				
DSL	Mean	Std. Err.	95% Confidence Interval	
no	3.978665	0.0567977	3.86724	4.09009
yes	3.818675	0.1073916	3.607996	4.029354
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 1.73				
Prob > F = 0.1881				

H13d: Cable Modem users have higher techno-capital than other users.				
Cable Modem	Mean	Std. Err.	95% Confidence Interval	
No	3.792499	0.0650038	3.664976	3.920023
Yes	4.089772	0.071242	3.950011	4.229534
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 4.16				
Prob > F = 0.0415				

H13e: Broadband users, DSL and cable modem users combined, have higher techno-capital than other users.				
Home Broadband				
Home Broadband	Mean	Std. Err.	95% Confidence Interval	
No	3.790606	0.0816449	3.630436	3.950776
Yes	4.00739	0.0680123	3.873964	4.140815
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 4.16				
Prob > F = 0.0415				

H13f: Mobile Internet users have higher techno-capital than other users.				
	Mobile			
Mobile	Mean	Std. Err.	95% Confidence Interval	
No	3.585215	0.0675861	3.452625	3.717804
Yes	4.251844	0.0533017	4.147277	4.356411
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 59.98				
Prob > F = 0.0000				

H13g: Mobile-only users have lower techno-capital than other users.				
	Mobile-Only			
Mobile-Only	Mean	Std. Err.	95% Confidence Interval	
No	3.939072	0.0537326	3.83366	4.044484
Yes	4.173786	0.2680145	3.647999	4.699573
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 0.74				
Prob > F = 0.3907				

H13h: Austin Public Library users have lower techno-capital than other users.				
	Austin Public Library User			
APL Users	Mean	Std. Err.	95% Confidence Interval	
No	3.938629	0.0558002	3.829161	4.048097
Yes	4.015562	0.1637618	3.694297	4.33682
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 0.20				
Prob > F = 0.6566				

H13i: Austin Public Wifi have lower techno-capital than other users.				
City of Austin Free Public Wi-Fi				
CoA Wifi Users	Mean	Std. Err.	95% Confidence Interval	
No	3.911185	0.0558444	3.80163	4.02074
Yes	4.34236	0.0992713	4.147611	4.537109
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 14.33				
Prob > F = 0.0002				

H13j: Users who use public-access services have lower techno-capital.				
Public Access Aggregate				
Public-Access Users	Mean	Std. Err.	95% Confidence Interval	
No	3.912337	0.0581473	3.798264	4.026409
Yes	4.159606	0.1057691	3.95211	4.367103
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 4.20				
Prob > F = 0.0407				

H13j: Users who use public-access services exclusively have lower techno-capital.				
Public-Access Only				
Public-Access Only	Mean	Std. Err.	95% Confidence Interval	
No	3.901811	0.0577646	3.788489	4.015132
Yes	4.311127	0.0690914	4.175584	4.446669
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 20.66				
Prob > F = 0.0000				

H14: Users who access the Internet in more contexts have more techno-capital than users with fewer contexts.				
H14a: Persons who use the Internet at work or school will have greater techno-capital than those who do not.				
	Mean	Std. Err.	95% Confidence Interval	
No Institutional Access	3.452	0.0801	3.295531	3.609977
Institutional Access	4.241	0.0397	4.163642	4.319245
Overall Average	3.944	0.0531	3.840788	4.049177
F(1, 1304) = 77.80				
Prob > F = 0.0000				
H14b: Persons who use the Internet in domestic contexts such as at home or at the home of a friend or family member will have greater techno-capital than those who do not.				
	Mean	Std. Err.	95% Confidence Interval	
No Domestic Access	3.683351	0.223423	3.245043	4.121659
Domestic Access	3.965047	0.0552483	3.856662	4.073432
F(1, 1304) = 1.50				
Prob > F = 0.2212				

Techno-capital Means by Domestic Access Types				
	Techno-Capital Mean	Std. Err.	95% Confidence Interval	
Home Access,	3.860083	0.065809	3.73098	3.989187
Does not access at others' homes				
Home Access,	4.22045	0.131846	3.961797	4.479103
Accesses at others' homes				
No Home Access,	3.291259	0.165005	2.967555	3.614964
Accesses at others' homes				
No Home Access,	3.513121	0.353771	2.819099	4.207143
Does not access at others' homes				
F(3, 1302) = 6.75				
Prob > F = 0.0002				

Coffee Shop Use by Domestic Access Types			
	no	yes	row total
Home Access,	88.75%	11.25%	100.00%
Does not access at others' homes			
Home Access,	57.23%	42.77%	100.00%
Accesses at others' homes			
No Home Access,	37.78%	62.22%	100.00%
Accesses at others' homes			
No Home Access,	88.79%	11.21%	100.00%
Does not access at others' homes			
Total	77.91%	22.09%	100.00%
Uncorrected chi2(3) = 215.8259			
F(2.49, 3637.12)= 16.7815 P = 0.0000			

H14c: Persons who use the Internet at coffee shops will have greater techno-capital than those who do not.				
Coffee-Shop Use				
	Techno-Capital Mean	Std. Err.	95% Confidence Interval	
Does not use Internet at Coffee Shop	3.837152	0.0632509	3.713067	3.961237
Uses Internet at Coffee Shop	4.277911	0.081009	4.118989	4.436834
Overall Average	3.944982	0.0531121	3.840788	4.049177
F(1, 1304) = 18.39				
Prob > F = 0.0000				

Appendix F Results for Chapter 9

Logit for Non-use for demographic variables						
Number of strata = 1		Number of obs = 1464				
Number of PSUs = 1464		Population size = 1700.1885				
		Design df = 1463				
		F(6, 1458) = 10.81				
		Prob > F = 0.0000				
Linearized						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Cultural Capital	-0.1595905	0.389047	-0.41	0.682	-0.92274	0.6035589
African Americans	1.566982	0.6516073	2.4	0.016	0.2887974	2.845166
Hispanics	1.420929	0.6148724	2.31	0.021	0.2148038	2.627055
Age	0.0503945	0.0145611	3.46	0.001	0.0218315	0.0789574
Education	-0.890466	0.1757988	-5.07	0	-1.235311	-0.5456214
Non-English	0	(omitted)				
Women	-0.6773652	0.5924832	-1.14	0.253	-1.839572	0.484842
_cons	-2.314079	1.505439	-1.54	0.124	-5.267129	0.6389706

2nd Iteration of Logit with Demographic Variables						
Number of PSUs = 1464			Population size = 1700.1885			
		Design df = 1463				
		F(4, 1460) = 13.08				
		Prob > F = 0.0000				
Linearized						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
African-American	1.317462	0.6792675	1.94	0.053	-0.0149798	2.649905
Hispanic	1.567123	0.4330055	3.62	0	0.7177453	2.416501
age	0.0519537	0.0150276	3.46	0.001	0.0224757	0.0814317
q9i	-0.932427	0.2512646	-3.71	0	-1.425304	-0.4395497
_cons	-2.924292	1.191332	-2.45	0.014	-5.261194	-0.5873899

3rd Iteration of Logit with Demographic Variables						
Number of strata = 1			Number of obs = 1464			
Number of PSUs = 1464			Population size = 1700.1885			
		Design df = 1463				
		F(3, 1461) = 13.27				
		Prob > F = 0.0000				
Linearized						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Hispanic	1.061654	0.6019484	1.76	0.078	-0.1191201	2.242428
age	0.0501493	0.0157887	3.18	0.002	0.0191784	0.0811201
q9i	-1.040992	0.2708295	-3.84	0	-1.572248	-0.5097365
_cons	-2.169309	1.35688	-1.6	0.11	-4.830948	0.4923288

Final Logit for Non-Use with Demographic Variables						
Number of PSUs = 1464			Population size = 1700.1885			
		Design df = 1463				
		F(2, 1462) = 15.81				
		Prob > F = 0.0000				
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
age	0.0392188	0.0157483	2.49	0.013	0.0083271	0.0701106
q9i	-1.177789	0.256106	-4.6	0	-1.680163	-0.6754148
_cons	-0.8759023	1.183453	-0.74	0.459	-3.197348	1.445543

Linear Regression for Techno-capital with demographic Independent Variables Including All Usable Variables						
Number of strata = 1		Number of obs = 1305				
Number of PSUs = 1305		Population size = 1501.0578				
		Design df = 1304				
		F(6, 1299) = 27.49				
		Prob > F = 0.0000				
		R-squared = 0.3065				
		Linearized				
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Cultural Capital	-0.0296544	0.0285595	-1.04	0.299	-0.085682	0.0263732
African Americans	-0.153473	0.1452227	-1.06	0.291	-0.4383687	0.1314227
Hispanics	-0.3221854	0.1081981	-2.98	0.003	-0.5344468	-0.109924
Age	-0.0295259	0.0030509	-9.68	0	-0.035511	-0.0235407
Education	0.1813653	0.0426066	4.26	0	0.0977804	0.2649502
Non-English	0	(omitted)				
Women	-0.3859917	0.0857315	-4.5	0	-0.5541784	-0.217805
_cons	4.893585	0.232753	21.0	0	4.436974	5.350196

Linear Regression for Techno-capital Including Only Significant Variables						
Number of strata = 1				Number of obs =1305		
Number of PSUs = 1305				Population size = 1501.0578		
				Design df = 1304		
				F(4, 1301) = 38.90		
				Prob > F = 0.0000		
				R-squared = 0.3036		
Linearized						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Women	-0.3987114	0.086099	-4.63	0	-0.5676192	-0.2298036
Education	0.1756495	0.0398837	4.4	0	0.0974063	0.2538927
Hispanics	-0.2723238	0.1067047	-2.55	0.011	-0.4816556	-0.0629921
Age	-0.0290341	0.0029047	-10	0	-0.0347324	-0.0233358
Construct	4.790946	0.2102026	22.79	0	4.378573	5.203318

Linear Regression for Techno-capital with access type Independent Variables						
Number of strata = 1 Number of obs = 1305						
Number of PSUs = 1305 Population size = 1501.0578						
Design df = 1304						
F(7, 1298) = 14.62						
Prob > F = 0.0000						
R-squared = 0.1654						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Home Broadband	0.2033946	0.0970821	2.1	0.036	0.0129403	0.3938489
Mobile	0.6314068	0.086558	7.29	0	0.4615987	0.8012149
Mobile Only	0.2356125	0.275827	0.85	0.393	-0.3055007	0.7767258
APL	0.0732137	0.2264196	0.32	0.746	-0.3709728	0.5174003
Wi-Fi Network	0.2477322	0.2593239	0.96	0.34	-0.2610055	0.75647
Public Access	-0.5064829	0.4086976	-1.24	0.215	-1.30826	0.295294
Public Access Only	0.628959	0.3197069	1.97	0.049	0.0017629	1.256155
_cons	3.428515	0.0985285	34.8	0	3.235223	3.621806

Linear Regression for Techno-capital with access type Independent Variables and Redundant Variables Removed						
Number of strata = 1 Number of obs = 1305						
Number of PSUs = 1305 Population size = 1501.0578						
	Design df = 1304					
	F(4, 1301) = 20.11					
	Prob > F = 0.0000					
	R-squared = 0.1577					
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Home Broadband	0.2342048	0.0915497	2.56	0.011	0.0546041	0.4138055
Mobile	0.6478823	0.0852065	7.6	0	0.4807256	0.815039
APL	0.0326089	0.1309986	0.25	0.803	-0.2243822	0.2895999
Wi-Fi Network	0.2878115	0.0942094	3.06	0.002	0.1029928	0.4726301
_cons	3.403297	0.0962473	35.3	0	3.21448	3.592113
Linear Regression for Techno-capital with Significant Access Independent Variables						
Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
			Design df = 1304			
			F(3, 1302) = 26.73			
			Prob > F = 0.0000			
			R-squared = 0.1576			
Linearized						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Home Broadband	0.232922	0.092335	2.52	0.012	0.0517806	0.4140635
Mobile	0.6470137	0.0853148	7.58	0	0.4796445	0.8143829
Wi-Fi Network	0.2980309	0.0987592	3.02	0.003	0.1042866	0.4917751
Constant	3.406571	0.096457	35.32	0	3.217343	3.595799

Linear Regression for Techno-capital with Independent Access Context Variables						
Number of strata = 1		Number of obs = 1305				
Number of PSUs = 1305		Population size = 1501.0578				
		Design df = 1304				
		F(4, 1301) = 25.83				
		Prob > F = 0.0000				
		R-squared = 0.1962				
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Domestic	-0.0809249	0.2300909	-0.35	0.725	-0.5323136	0.3704639
Institutional	0.7442917	0.0904217	8.23	0	0.5669037	0.9216796
Coffee Shop	0.2301159	0.0793787	2.9	0.004	0.0743919	0.3858398
Public Access	0.1012812	0.1117075	0.91	0.365	-0.1178648	0.3204272
_cons	3.485955	0.2294948	15.19	0	3.035736	3.936175

Linear Regression for Techno-capital with Significant Access Context Independent Variables						
Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
			Design df = 1304			
			F(2, 1303) = 43.73			
			Prob > F = 0.0000			
			R-squared = 0.1940			
Linearized						
Techno-Capital Index	Coef.	Std. Err.	t	P > t	95% Confidence Interval	
Institutional	0.7372393	0.0936178	7.87	0	0.5535813	0.9208973
Coffee-Shop	0.2407024	0.0773906	3.11	0.002	0.0888787	0.3925261
construct	3.425978	0.0826644	41.44	0	3.263808	3.588147

Linear Regression with Demographic and Access Variables						
Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
		Design df = 1304				
		F(10, 1295) = 28.50				
		Prob > F = 0.0000				
		R-squared = 0.3909				
Techno-Capital Index	Coef.	Std. Err.	t	P > t	95% Confidence Interval	
Institutional Access	0.3527468	0.0783092	4.5	0	0.1991209	0.5063727
Coffee Shop	0.0415839	0.069219	0.6	0.548	-0.0942088	0.1773767
Mobile	0.2948447	0.0635707	4.64	0	0.1701326	0.4195567
Mesh Network	0.1973317	0.1969599	1	0.317	-0.1890613	0.5837248
Home Broadband	0.1860652	0.071941	2.59	0.01	0.0449324	0.3271981
Age	-0.0233322	0.0026249	-8.89	0	-0.0284818	-0.0181826
Hispanics	-0.2259291	0.0892831	-2.53	0.012	-0.4010833	-0.0507749
Education	0.0952663	0.0346848	2.75	0.006	0.0272222	0.1633104
Women	-0.2982295	0.0673665	-4.43	0	-0.4303881	-0.1660709
Public Access Only	0.0494729	0.1367251	0.36	0.718	-0.2187524	0.3176981
_cons	4.220456	0.1699609	24.83	0	3.887029	4.553883

2nd Linear Regression with Demographic and Access Variables						
Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
		Design df = 1304				
		F(8, 1297) = 32.10				
		Prob > F = 0.0000				
		R-squared = 0.3887				
Techno-Capital Index	Coef.	Std. Err.	t	P > t	95% Confidence Interval	
Institutional	0.3515219	0.0797621	4.41	0	0.1950457	0.507998
Mobile Access	0.3090262	0.0631313	4.89	0	0.1851761	0.4328763
Home Broadband	0.1719948	0.0738424	2.33	0.02	0.0271318	0.3168578
Age	-0.0234813	0.0025992	-9.03	0	-0.0285804	-0.0183822
Hispanics	-0.2223119	0.0907368	-2.45	0.014	-0.4003181	-0.0443058
Education	0.0986278	0.0347711	2.84	0.005	0.0304144	0.1668412
Women	-0.2968978	0.0676284	-4.39	0	-0.4295702	-0.1642254
Public Access Only	0.1756534	0.0663114	2.65	0.008	0.0455648	0.3057421
_cons	4.229306	0.1673652	25.27	0	3.900971	4.55764

Final Linear Regression for Techno-capital With Significant Independent Variables						
Number of strata = 1			Number of obs = 1305			
Number of PSUs = 1305			Population size = 1501.0578			
			Design df = 1304			
			F(7, 1298) = 34.25			
			Prob > F = 0.0000			
			R-squared = 0.3853			
Linearized						
	Coef.	Std. Err.	t	P>t	95% Confidence Interval	
Institutional	0.3515219	0.0797621	4.41	0	0.1950457	0.507998
Mobile Access	0.3090262	0.0631313	4.89	0	0.1851761	0.4328763
Women	-0.2968978	0.0676284	-4.39	0	-0.4295702	-0.1642254
Hispanic	-0.2223119	0.0907368	-2.45	0.014	-0.4003181	-0.0443058
Public Access Only	0.1756534	0.0663114	2.65	0.008	0.0455648	0.3057421
Home Broadband	0.1719948	0.0738424	2.33	0.02	0.0271318	0.3168578
Education	0.0986278	0.0347711	2.84	0.005	0.0304144	0.1668412
Age	-0.0234813	0.0025992	-9.03	0	-0.0285804	-0.0183822
Construct	4.229306	0.1673652	25.27	0	3.900971	4.55764

References

Arbona, C., & Nora, A. (2007). The influence of academic and environmental factors on Hispanic college degree attainment. *The Review of Higher Education*, *30*(3), 247–269.

Austin Free-Net. (2013, August). *A Look Into the Lab*. Retrieved July 11, 2014, from http://www.austinfree.net/?page_id=3457

Austin Free-Net. (n.d.). *Locations*. *Austin Free-Net*. Retrieved July 7, 2014, from http://www.austinfree.net/?page_id=2791

Bawden, D. (2001). Information and digital literacies: a review of concepts. *Journal of Documentation*, *57*(2), 218–259. doi:10.1108/EUM0000000007083

Becker, G. S. (1976). *The economic approach to human behavior*. University of Chicago Press.

Block, D. (2004). Globalization, transnational communication and the Internet. *International Journal on Multicultural Societies*, *6*(1), 13–28.

Bourdieu, P. (1984). *Distinction a social critique of the judgement ot taste*. Cambridge: Harvard University Press.

Bourdieu, P. (2002). The Forms of Capital. In N. W. Biggart (Ed.), *Readings in Economic Sociology* (pp. 280–291). Oxford, UK: Blackwell Publishers Ltd. Retrieved from http://doi.wiley.com/10.1002/9780470755679.ch15

Bourdieu, P. (2005). *The social structures of the economy*. Cambridge, UK; Malden, MA: Polity.

Bourdieu, P., & Passeron, J. C. (1977). *Reproduction in education, society and culture*. London; Beverly Hills: Sage Publications.

Bourdieu, P., & Wacquant, L. J. D. (1992). *An invitation to reflexive sociology*. Chicago: University of Chicago Press.

Brock, A., Kvasny, L., & Hales, K. (2010). CULTURAL APPROPRIATIONS OF TECHNICAL CAPITAL. *Information, Communication & Society*, *13*(7), 1040–1059. doi:10.1080/1369118X.2010.498897

Broos, A. (2005). Gender and Information and Communication Technologies (ICT) Anxiety: Male Self-Assurance and Female Hesitation. *CyberPsychology & Behavior*, *8*(1), 21–31. doi:10.1089/cpb.2005.8.21

Brubaker, R. (1993). Social Theory as Habitus. In C. J. Calhoun, E. LiPuma, & M. Postone (Eds.), *Bourdieu : critical perspectives*. Chicago: University of Chicago Press.

Calhoun, C. J. (1993). Habitus, Field, and Capital: The Question of Historical Specificity. In *Bourdieu : critical perspectives*. Chicago: University of Chicago Press.

Castells, M. (2000). *The rise of the network society* (2nd ed.). Oxford ;;Malden Mass.: Blackwell Publishers.

City of Austin. (n.d.-a). *Citizen Participation at Council Meetings | AustinTexas.gov - The Official Website of the City of Austin*. Retrieved May 8, 2012, from http://www.austintexas.gov/department/citizen-participation-council-meetings

City of Austin. (n.d.-b). *Citizen Web Intake*. *Citizen Web Intake*. Retrieved May 8, 2012, from http://austin-p1csrprodcwi.motorolasolutions.com/Home.mvc/Index

Clement, A., & Shade, L. R. (2000). The Access Rainbow: Conceptualizing Universal Access to the Information/Communications Infrastructure. In *Community informatics : enabling communities with information and communications technologies* (p. 596). Hershey, PA: Idea Group.

Coleman, R., Lieber, P., Mendelson, A. L., & Kurpius, D. D. (2008). Public life and the internet: if you build a better website, will citizens become engaged? *New Media & Society*, *10*(2), 179–201. doi:10.1177/1461444807086474

Commission, F. C., & Commission, F. C. (2010). Connecting America: The national broadband plan.

Computer Training | Austin Public Library. (n.d.). Retrieved October 12, 2013, from http://library.austintexas.gov/information-guide/computer-training

Cooper, J. (2006). The digital divide: the special case of gender. *Journal of Computer Assisted Learning*, *22*(5), 320–334. doi:10.1111/j.1365-2729.2006.00185.x

Correa, T. (2010). The Participation Divide Among “Online Experts”: Experience, Skills and Psychological Factors as Predictors of College Students’ Web Content Creation. *Journal of Computer-Mediated Communication*, *16*, 71–92. doi:10.1111/j.1083-6101.2010.01532.x

Crawford, S. P. (2013). *Captive audience the telecom industry and monopoly power in the new gilded age*. New Haven [Conn.]: Yale University Press. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=518272

Custard, H. A. (2012). Pursuing development with educational technology standards: complicating narratives of ICTs in the classroom.

Deursen, A. J. A. M. van, & van Dijk, J. A. G. M. (2010). Measuring Internet Skills. *International Journal of Human-Computer Interaction*, *26*(10), 891–916. doi:10.1080/10447318.2010.496338

Dijk, J. (2005). *The deepening divide inequality in the information society*. Thousand Oaks (Calif.): Sage Pub.

DiMaggio, P. (1979). *On Pierre Bourdieu* (Vol. 84). JSTOR.

DiMaggio, P., & Hargittai, E. (2001). From the "Digital Divide" to "Digital Inequality": Studying Internet Use as Penetration Increases. Working Paper, Center for Arts and Cultural Policy Studies, Princeton University.

DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). Digital inequality: From unequal access to differentiated use. *Social Inequality*, 355–400.

Dix, A., & Howard, S. (2011). The personal information environment beyond the personal computer (pp. ii–iii). IEEE. doi:10.1109/iUSEr.2011.6150568

Dixon, L. J., Correa, T., Straubhaar, J., Covarrubias, L., Graber, D., Spence, J., & Rojas, V. (2014). Gendered Space: The Digital Divide between Male and Female Users in Internet Public Access Sites. *Journal of Computer-Mediated Communication*, n/a–n/a. doi:10.1111/jcc4.12088

Emmison, M., & Frow, J. (1998). Information Technology as Cultural Capital. *Australian Universities' Review*, (1), 41–45.

Epstein, D., Nisbet, E. C., & Gillespie, T. (2011). Who's Responsible for the Digital Divide? Public Perceptions and Policy Implications. *The Information Society*, *27*(2), 92–104. doi:10.1080/01972243.2011.548695

Eubanks, V. (2011). *Digital dead end : fighting for social justice in the information age*. Cambridge, Mass.: MIT Press.

Eubanks, V. E. (2007). Trapped in the digital divide: The distributive paradigm in community informatics. *The Journal of Community Informatics*, *3*(2). Retrieved from http://ci-journal.net/index.php/ciej/article/viewArticle/293

Florida, R. (2005). *Cities and the creative class*. New York, N.Y. [etc.]: Routledge.

Forlano, L. (2009). WiFi Geographies: When Code Meets Place. *The Information Society*, *25*(5), 344–352. doi:10.1080/01972240903213076

Fox, S. (2014). *The Web at 25*. Pew Internet Research Project.

Fox, S., & Livingston, G. (2007). *Latinos online: Hispanics with lower levels of education and English proficiency remain largely disconnected from the Internet. Washington, DC: Pew Internet and American Life Project*.

Fox, S., & Pew Internet & American Life Project. (2004). *Older Americans and the internet*. Pew Internet & American Life Project. Retrieved from http://www.worldcat.org/oclc/54953739

Fuchs, C. (2008). The Role of Income Inequality in a Multivariate Cross-National Analysis of the Digital Divide. *Social Science Computer Review*, *27*(1), 41–58. doi:10.1177/0894439308321628

Fuentes-Bautista, M., & Inagaki, N. (2006). Reconfiguring public Internet access in Austin, TX: Wi-Fi's promise and broadband divides. *Government Information Quarterly*, *23*(3-4), 404–434. doi:10.1016/j.giq.2006.07.013

Gilbert, M. (2010). Theorizing digital and urban inequalities: Critical geographies of "race", gender and technological capital. *Information, Communication & Society*, *13*(7), 1000–1018.

Grubesic, T. (2008). The spatial distribution of broadband providers in the United States: 1999–2004. *Telecommunications Policy*, *32*(3-4), 212–233. doi:10.1016/j.telpol.2008.01.001

Hamelink, C. J. (2000). *The ethics of cyberspace*. London: SAGE.

Hargittai, E. (2002). Second-Level Digital Divide: Differences in People's Online Skills. *First Monday*, *7*(4).

Hargittai, E. (2010). Digital Na(t)ives? Variation in Internet Skills and Uses among Members of the "Net Generation"*. *Sociological Inquiry*, *80*(1), 92–113. doi:10.1111/j.1475-682X.2009.00317.x

Hargittai, E., & Hinnant, A. (2008). Digital Inequality: Differences in Young Adults' Use of the Internet. *Communication Research*, *35*(5), 602–621. doi:10.1177/0093650208321782

Hargittai, E., & Shafer, S. (2006). Differences in Actual and Perceived Online Skills: The Role of Gender*. *Social Science Quarterly*, *87*(2), 432–448. doi:10.1111/j.1540-6237.2006.00389.x

Hargittai, E., & Walejko, G. (2008). THE PARTICIPATION DIVIDE: Content creation and sharing in the digital age1. *Information, Communication & Society*, *11*, 239–256. doi:10.1080/13691180801946150

Hassani, S. N. (2006). Locating digital divides at home, work, and everywhere else. *The Digital Divide in the Twenty-First Century*, *34*(4–5), 250–272. doi:10.1016/j.poetic.2006.05.007

Howe, N., & Strauss, W. (1992). *Generations: The history of America's future, 1584 to 2069*. HarperCollins.

Howe, N., & Strauss, W. (2000). *Millennials rising : the next great generation /by Neil Howe and Bill Strauss ; cartoons by R.J. Matson*. New York: Vintage Books.

Howe, N., & Strauss, W. (2009). *Millennials rising: The next great generation*. Random House Digital, Inc.

International Society for Technology in Education. (2007). *ISTE NETS Student Standards 2007. International Society for Technology in Education*. Retrieved October 25, 2012, from http://www.iste.org/standards/nets-for-students/nets-student-standards-2007

Katz, J. E., & Aspden, P. (1998). Internet dropouts in the USA. *Telecommunications Policy*, *22*(4-5), 327–339. doi:10.1016/S0308-5961(98)00013-5

King, J. (2011, December 6). *How Big Telecom Used Smartphones to Create a New Digital Divide - COLORLINES. Colorlines*. Retrieved April 3, 2012, from http://colorlines.com/archives/2011/12/the_new_digital_divide_two_separate_but_unequal_internets.html

Kleine, D. (2013). *Technologies of choice?: ICTs, development, and the capabilities approach*. Cambridge, Mass: MIT Press.

Kvasny, L. (2006a). Cultural (Re)production of digital inequality in a US community technology initiative. *Information, Communication & Society*, *9*(2), 160–181. doi:10.1080/13691180600630740

Kvasny, L. (2006b). The Role of the Habitus in Shaping Discourses about the Digital Divide. *Journal of Computer-Mediated Communication*, *10*(2), 00–00. doi:10.1111/j.1083-6101.2005.tb00242.x

Language Learning Resources | Austin Public Library. (n.d.). Retrieved October 12, 2013, from http://library.austintexas.gov/information-guide/language-learning-resources

Lareau, A., & Lamont, M. (1988). Cultural capital: Allusions, gaps and glissandos in recent theoretical developments. *Sociological Theory*, *6*(2), 153–168.

Lash, S. (1993). Pierre Bourdieu: Cultural Economy and Social Change. In C. J. Calhoun, E. LiPuma, & M. Postone (Eds.), *Bourdieu : critical perspectives*. Chicago: University of Chicago Press.

Lentz, B., Straubhaar, J. D., Dixon, L., Okur, O., Graber, D., Spence, J., … LaPastina, A. (2012). Structuring Access: The Role of Austin Public Access Centers in Digital Inclusion. In J. Straubhaar, J. Spence, Z. Tufecki, & R. Lentz (Eds.), *Inequity in the technopolis : race, class, gender, and the digital divide in Austin*. Austin: University of Texas Press.

Lentz, B., Straubhaar, J., LaPastina, A., Main, S., & Taylor, J. (2000). Structuring Access: the Role of Public Access Centers in the "Digital Divide." Presented at the International Communication Association, Acapulco, Mexico.

Lievrouw, L. A. (2000). The Information Environment and Universal Service. *The Information Society*, *16*(2), 155–159. doi:10.1080/01972240050032924

Livingston, G., Parker, K., & Fox, S. (2009). Latinos online, 2006-2008: Narrowing the gap. *Pew Hispanic Center, Washington, DC (December 22, 2009).*

Livingstone, S. (2004). Media Literacy and the Challenge of New Information and Communication Technologies. *The Communication Review*, *7*(1), 3–14. doi:10.1080/10714420490280152

Livingstone, S. (2005). Critical Debates in Internet Studies: Reflections on an Emerging Field. In *Mass Media and Society* (4th ed.). London: Hodder Education.

Livingstone, S. (2007). Internet literacy: young people's negotiation of new online opportunities. *The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning*, 101–122.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New Media & Society*, *9*(4), 671–696. doi:10.1177/1461444807080335

Livingstone, S., Van Couvering, E., & Thumim, N. (2008). Converging traditions of research on media and information literacies: Disciplinary, critical, and methodological issues. Retrieved from http://eprints.lse.ac.uk/23564/1/Converging_traditions_of_research_on_media_and_information_literacies_(LSERO).pdf

Morozov, E. (2012, February 4). *The Death of the Cyberflâneur*. *The New York Times*. Retrieved May 8, 2012, from http://www.nytimes.com/2012/02/05/opinion/sunday/the-death-of-the-cyberflaneur.html?pagewanted=all

National Broadband Plan - Chapter 9: Adoption and Utilization. (n.d.). *National Broadband Plan*. Retrieved September 21, 2012, from http://www.broadband.gov/plan/9-adoption-and-utilization/#s9-3

National Telecommmunications and Information Administration. (1995). *Falling through the Net: A Survey of the "Have Nots" in Rural and Urban America*. Retrieved October 22, 2012, from http://www.ntia.doc.gov/ntiahome/fallingthru.html

National Telecommmunications and Information Administration. (1998). *Falling Through the Net II: New Data on the Digital Divide*. Retrieved October 22, 2012, from http://www.ntia.doc.gov/ntiahome/net2

National Telecommmunications and Information Administration. (1999). *Falling Through the Net: Defining the Digital Divide*. Retrieved October 22, 2012, from http://www.ntia.doc.gov/report/1999/falling-through-net-defining-digital-divide

Nielsen, J. (1997, June 15). *Top 10 Mistakes of Web Management*. *Nielsen Norman Group*. Retrieved July 9, 2014, from http://www.nngroup.com/articles/top-10-mistakes-of-web-management/

North, S., Snyder, I., & Bulfin, S. (2008). DIGITAL TASTES: Social class and young people's technology use. *Information, Communication & Society*, *11*(7), 895–911. doi:10.1080/13691180802109006

Noveck, B. (2009). *Wiki government : how technology can make government better, democracy stronger, and citizens more powerful*. Washington D.C.: Brookings Institution Press.

Omar Gallaga. (2011, October 16). "Aunt Bertha" site helps those in need find aid. *Austin American-Statesman*. Austin, TX.

Perna, L. W. (2006). Studying college access and choice: A proposed conceptual model. In *HIGHER EDUCATION:* (pp. 99–157). Springer.

Perna, L. W., & Titus, M. A. (2005). The relationship between parental involvement as social capital and college enrollment: An examination of racial/ethnic group differences. *The Journal of Higher Education*, *76*(5), 485–518.

Robinson, L. (2009). A Taste For The Necessary. *Information, Communication & Society*, *12*(4), 488–507. doi:10.1080/13691180902857678

Robinson, L. (2011a). Information-Channel Preferences And Information-Opportunity Structures. *Information, Communication & Society*, *14*(4), 472–494. doi:10.1080/1369118X.2011.562224

Robinson, L. (2011b). Strivers 2.0: Digital Inequalities, Channel Preferences, & Opportunity Structures. *SSRN Electronic Journal*. doi:10.2139/ssrn.1927636

Rodino-Colocino, M. (2006). Laboring under the digital divide. *New Media & Society*, *8*(3), 487–511. doi:10.1177/1461444806064487

Rojas, V., Straubhaar, J., Roychowdhury, D., & Okur, O. (2004). Communities, Cultural Capital, and the Digital Divide. In E. P. Bucy & J. E. Newhagen (Eds.), *Media access : social and psychological dimensions of new technology use*. Mahwah, N.J.: L. Erlbaum.

Rojas, V., Straubhaar, J., Spence, J., Roychowdhury, D., Okur, O., Piñon, J., & Fuentes-Bautista, M. (2012). Communities, Cultural Capital, and Digital Inclusion: Ten Years of Tracking Techno-Dispositions and Techno-Capital. In J. D. Straubhaar, J. Spence, Z. Tufekci, & R. Lentz (Eds.), *Inequity in the technopolis : race, class, gender, and the digital divide in Austin*. Austin: University of Texas Press.

Roscigno, V. J., & Ainsworth-Darnell, J. W. (1999). Race, cultural capital, and educational resources: Persistent inequalities and achievement returns. *Sociology of Education*, 158–178.

Ryan, T., Field, R. H. ., & Olfman, L. (2003). The evolution of US state government home pages from 1997 to 2002. *International Journal of Human-Computer Studies*, *59*(4), 403–430. doi:10.1016/S1071-5819(03)00113-7

Schement, J. R. (1995). Beyond universal service: Characteristics of Americans without telephones, 1980–1993. *Telecommunications Policy*, *19*(6), 477–485. doi:10.1016/0308-5961(95)00025-2

Schradie, J. (2011). The digital production gap: The digital divide and Web 2.0 collide. *Poetics*, *39*(2), 145–168. doi:10.1016/j.poetic.2011.02.003

Schradie, J. (2012). The Trend Of Class, Race, And Ethnicity In Social Media Inequality. *Information, Communication & Society*, *15*(4), 555–571. doi:10.1080/1369118X.2012.665939

Selwyn, N. (2004). Reconsidering Political and Popular Understandings of the Digital Divide. *New Media & Society*, *6*(3), 341–362. doi:10.1177/1461444804042519

Selwyn, N. (2008). An investigation of differences in undergraduates' academic use of the internet. *Active Learning in Higher Education*, *9*(1), 11–22. doi:10.1177/1469787407086744

Servon, L. J., & Nelson, M. K. (2001). Community Technology Centers: Narrowing the Digital Divide in Low-Income, Urban Communities. *Journal of Urban Affairs*, *23*(3&4), 279–290. doi:10.1111/0735-2166.00089

Shirky, C. (2008). *Here comes everybody : the power of organizing without organizations*. New York: Penguin Press.

Smith. (2012a, June 26). *Cell Internet Use 2012, Pew Internet & American Life Project*. Retrieved October 4, 2012, from http://pewinternet.org/Reports/2012/Cell-Internet-Use-2012.aspx

Smith, A. (2010a). Mobile access 2010. Pew Center for Internet and Society. Retrieved from http://www.pewinternet.org/Reports/2010/Mobile-Access-2010.aspx

Smith, A. (2010b, July 7). *Mobile Access 2010, Pew Internet & American Life Project*. Retrieved October 4, 2012, from http://pewinternet.org/Reports/2010/Mobile-Access-2010.aspx

Smith, A. (2012b). 17% of cell phone owners do most of their online browsing on their phone, rather than a computer or other device. *Pew Research Center's Internet & American Life Project*.

Sterne, J. (2003). Bourdieu, Technique And Technology. *Cultural Studies*, *17*(3-4), 367–389. doi:10.1080/0950238032000083863a

Stevenson, B. (2009). The Internet and Job Search. In D. H. Autor & National Bureau of Economic Research (Eds.), *Studies of labor market intermediation*. Chicago; London: University of Chicago Press. Retrieved from http://public.eblib.com/EBLPublic/PublicView.do?ptiID=471829

Straubhaar, J. D. (2012). *Inequity in the technopolis : race, class, gender, and the digital divide in Austin*. (J. Straubhaar, Spence, & Tufekci, Eds.). Austin: University of Texas Press.

Straubhaar, J., Tufecki, Z., Rojas, V., & Spence, J. (2012). Digital Inequity in the Austin Technopolis: An Introduction. In J. D. Straubhaar, J. Spence, Z. Tufekci, & R. Lentz (Eds.), *Inequity in the technopolis : race, class, gender, and the digital divide in Austin*. Austin: University of Texas Press.

Strover, S. (2004). Beyond community networking and CTCs: access, development, and public policy. *Telecommunications Policy*, *28*(7-8), 465–485. doi:10.1016/j.telpol.2004.05.008

Swain, C., & Pearson, T. (2002). Educators and Technology Standards: Influencing the Digital Divide. *Journal of Research on Technology in Education*, *34*(3), n3.

Texas Workforce Commission. (2011a, September 30). *About the Texas Workforce Commission - TWC*. Retrieved May 7, 2012, from http://www.twc.state.tx.us/twcinfo/about-texas-workforce.html

Texas Workforce Commission. (2011b, October 18). *Unemployment Insurance Benefits Information*. Retrieved May 7, 2012, from http://www.twc.state.tx.us/ui/bnfts/claimant3.html

Tondeur, J., Sinnaeve, I., van Houtte, M., & van Braak, J. (2010). ICT as cultural capital: The relationship between socioeconomic status and the computer-use profile of young people. *New Media & Society*, *13*(1), 151–168. doi:10.1177/1461444810369245

Tufecki, Z. (2012). Past and Future Divides: Social Mobility, Inequality, and the Digital Divide in Austin during the Tech Boom. In J. D. Straubhaar, J. Spence, Z. Tufekci, & R. Lentz (Eds.), *Inequity in the technopolis : race, class, gender, and the digital divide in Austin*. Austin: University of Texas Press.

Tufekcioglu, Z. (2001). Rethinking the Theory Behind the Digital Divide Initiatives: It's Not All Good All the Time in the Age of Deskilled, Low-Paying" Hi-Tech" Jobs. In *Austin: University of Texas Department of Communication. Paper presented to the International Communication Association Conference, Washington, DC, May*.

Vaidhyanathan, S. (2008). Generational Myth. *Chronicle of Higher Education*, *55*(4).

Van Dijk, J. A. G. M. (2006). Digital divide research, achievements and shortcomings. *Poetics*, *34*(4-5), 221–235. doi:10.1016/j.poetic.2006.05.004

Van Dijk, J., & Hacker, K. (2003). The Digital Divide as a Complex and Dynamic Phenomenon. *The Information Society*, *19*(4), 315–326. doi:10.1080/01972240309487

Vanden Abeele, M., Scott W. Campbell, Eggermont, S., & Roe, K. (2012). Sexting, mobile porn use and the mobile youth culture: Boys' and girls' popularity, need for popularity, and perceived peer pressure. Presented at the Annual Conference of the International Communication Association – Preconference Mobile Communication, Community and Locative Media, Phoenix, AZ.

Vryonides, M. (2007). Social and cultural capital in educational research: issues of operationalisation and measurement. *British Educational Research Journal*, *33*(6), 867–885. doi:10.1080/01411920701657009

Warschauer, M. (2003a). Demystifying the digital divide. *Scientific American*, *289*(2), 42–47.

Warschauer, M. (2003b). *Technology and social inclusion : rethinking the digital divide*. Cambridge Mass.: MIT Press.

Watkins, S. C. (2009). *The young and the digital : what the migration to social-network sites, games, and anytime, anywhere media means for our future*. Boston: Beacon Press.

Wyatt, S. (2005). Non-Users Also Matter: The Construction of Users and Non-Users of the Internet. In N. Oudshoorn & T. J. Pinch (Eds.), *How users matter : the co-construction of users and technology*. Cambridge, Mass.; London: MIT.

Wyatt, S., Thomas, G., & Terranova, T. (2002). They Came, They Surfed, They Went Back to the Beach: Conceptualizing Use and Non-Use of the Internet. In S. Woolgar (Ed.), *Virtual society? : technology, cyberbole, reality*. Oxford; New York: Oxford University Press.

Zickuhr, K., & Smith, A. (2012, April 13). *Digital differences, Pew Internet & American Life Project*. Retrieved October 4, 2012, from http://pewinternet.org/Reports/2012/Digital-differences/Overview.aspx

Zickuhr, K., & Smith, A. (2013). *Home Broadband, 2013*. Pew Internet and American Life Program. Retrieved from http://pewinternet.org/Reports/2013/Broadband.aspx

Zillien, N., & Hargittai, E. (2009). Digital Distinction: Status-Specific Types of Internet Usage*. *Social Science Quarterly*, *90*(2), 274–291.