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Contexts and Effects of Digital Media Use

Gendered Space: The Digital Divide between Male and Female Users in Internet Public Access Sites[†]

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Abstract

Community technology centers and libraries have been crucial components of public policy initiatives to reduce the digital divide. Using theories of structuration and the social construction of technology, this paper examines the gender dynamics of the digital divide at public access points in Austin, TX over 10 years. Using extensive participant observations, we found male users outnumber female users in public access Internet usage, even accounting for age and ethnicity. In-

depth interviews revealed that both sexes saw public access as the least desirable place to use the Internet, but discourses around libraries differed. Female interviewees associated libraries with nostalgia for books and family, while male interviewees associated libraries with technology. Older female users also described feelings of technophobia.

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As digital technologies have increased in prevalence and importance, a digital divide has emerged along the lines of previously existing social divides. In other words, these new technologies have benefited those who already had access to other resources at greater rates than people who had fewer resources (de Haan, [2004](#) ; van Dijk, [2006](#)). Thus, this divide reproduced the already extant inequalities between rich and poor, urban and rural, and ethnic white majority and ethnic minorities, including Latinos, Native Americans, and African Americans (e.g., Hoffman & Novak, [1998](#) ; Howard, Rainie, & Jones, [2001](#) ; Katz & Aspden, [1997](#) ; LaRose, Gregg, Strover, Straubhaar, Carpenter, [2007](#)). These digital gaps may exacerbate existent inequalities between social groups because new technologies provide opportunities to access information, a necessary tool for participating in a democratic society, as well as access to trade, education, job opportunities, health care information, and information about government programs.

One of the most enduring technological inequalities is the gender divide. Research has detailed a variety of ways in which women lag behind men in the ownership of technology and the development of technological skills. For example, men own and use computers and the Internet more than women, spend more time online, take more technology classes, and show more motivation to learn digital skills (Cooper, [2006](#) ; Correa, [2010](#) ; Fallows, [2005](#) ; Livingstone & Helsper, [2007](#) ; Losh, [2004](#) ; Pinkard, [2005](#) ; Wilson, Wallin, & Reiser, [2003](#)). Giddens' structuration theory (1984) helps establish that even as individuals have the agency to pursue their desires, social structures can influence their behaviors and the way they think about objects such as technology. There are also cultural and psychological factors that may constrain certain people, such as women, from using technologies even when they have access (Terry & Gomez, [2010](#)).

The debate on the digital divide has moved beyond the concept of a gap between a literal access gap in digital technologies to pay closer attention to a multifaceted concept of access that involves cognitive and social access, which may shed light on the reasons behind the digital divide (Hargittai, [2002](#) ; Newhagen & Bucy, [2004](#) ; van Dijk, [2006](#)). Cognitive access refers to individual resources used to access the technology (e.g. attitudes, anxiety, and skills). Social access refers to the cultural norms and social resources embedded in a social group (Newhagen & Bucy, [2004](#)).

At the local level, community technology centers (CTCs) and public libraries have been key components of national policy initiatives to provide public access and reduce to some extent the digital divide both in the US (Bertot, Jaeger, & McClure, [2011](#) ; Straubhaar, Tufekci, Lentz, & Spence, forthcoming) and elsewhere (Gomez, Ambikar, & Coward, [2009](#) ; Spence, Straubhaar, Machado, Correa, & Lee, [2010](#)). Internet public access sites are defined as venues that offer access to information technologies such as Internet that are available to all (Terry & Gomez, [2010](#)). Using Austin, Texas as a case study, the general purpose of this study is to examine the efficacy of these

initiatives in narrowing digital gaps such as the gender divide.

Austin is considered a thriving technopolis and the “best case” scenario in terms of public access potential because of its strongly information-oriented economy with ever-increasing job opportunities in the technology industries (Straubhaar et al, forthcoming). Federal- and state-level programs have provided funds for public use of computers and Internet access, and private institutions have also joined the effort. For instance, the Austin public libraries have received three grants from the Dell Foundation to support Internet use at public libraries. All Austin city libraries offer free public access. Even so, as cities such as Austin integrate digital technology increasingly into their community, economy, and city geography, the digital divide remains a major concern.

This study considers the ways these digital initiatives have affected the gendering of public access use. It specifically investigates demographic patterns to illuminate structural inequality. Finally, it examines the relationship of gender to individuals' attitudes toward public access.

Structuration Theory

Structuration theory (Giddens, 1984) articulates the relationship of the social subject to his structural environment. Structuration theory suggests that, although individuals have agency, they are bound or constrained by social structures that they, in turn, reinforce. Giddens argues against the lack of power accredited to individuals in the face of structures as theorized by functionalism and structuralism, writing, “One of my principal ambitions in the formulation of structuration theory is to put an end to each of these empire-building endeavors” (2). He continues, “The basic domain of study of the social sciences, according to the theory of structuration, is neither the experience of the individual actor, nor the existence of any form of societal activity, but social practices ordered across space and time” (2). His attention to “social practices” integrates the study of structure and the individual. In our case, the social practice of public access to computers and the Internet has elements of structure: institutions such as the library system, community centers, or others decide to put in public access computers. However, the actual practice of that access at any given library or center is powerfully affected by both the librarians who structure the implementation of that decision and the actual users, who to some degree, restructure the system by how they use it. Early in our study in 1999, one librarian in charge of one branch library was not initially convinced that this was an important part of their mission, so they put the two access computers in the corridor by the bathrooms. By 2009, most branches had computers in the very center of their physical space. In another library, dominated by diverse Latino users in 1999, was subsequently reconfigured by users when a large shelter for homeless men was put in nearby. When we looked at it again in 2009, the men who frequented the homeless shelter had begun to use the library, including public access, more heavily, but female users were somewhat intimidated by the large number of homeless men.

The relationship between the ideas of “agency” and “structure” figures prominently in Giddens' argument. He defines agency as not “the intentions people have in doing things but to their capability of doing those things in the first place” (p. 9). Agency lies in the *possibility* of individual action. He emphasizes the role of the individual in determining outcomes: “Agency concerns events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of

conduct, have acted differently” (p. 9). Several types of agency are crucial in our study: actions of library administrators, actions by foundations to donate equipment, and changing patterns of use by changing populations.

With regards to structure, Giddens takes care to explain “the duality of structure,” which means that “the structural properties of social systems are both medium and outcome of the practices they recursively organize” (p. 25). Structure is “always both constraining and enabling” (p. 25). Significantly, he does not configure structure as existing apart from individuals. He writes, “Analyzing the structuration of social systems means studying the modes in which such systems, grounded in the knowledgeable activities of situated actors who draw upon rules and resources in the diversity of action contexts, are produced and reproduced in interaction” (p. 25). Through repeated collective action, individuals reproduce social structures.

Giddens' theories present a possibility for understanding the relationship of the individual to social structure that strikes a balance between understanding the power of inertia of social institutions but also the possibility of individuals to enact change. Because he theorizes social structure as constituted by the production and reproduction of individual actors, the social structure does not take on the status of a monolithic, extrahuman power. In the examples above, decisions by both librarians and users configured or structured the evolving meaning of public access over time.

Gender and Technology

From the structuration framework of understanding the individual's relationship to their social structure, we have looked to more specific scholarship on women and technology. Despite having different approaches, many scholars have suggested that relationships with technology are gendered. Some even argue that the phenomenon of technology itself cannot be fully understood without reference to gender. The social construction of technology (SCOT) theory (Mackenzie & Wajcman, 1985 ; Pinch & Bijker, 1984) suggests that technology is socially shaped according to different social contexts; the way society is structured informs the technological shapes, designs, and meanings. Social construction theories try to explicitly counteract the tendency to see technology itself as determinant of social outcomes and uses. While a technological determinist like McLuhan has famously argued, “the medium is the message” (McLuhan 2001), SCOT theory argues that societies shape new potential media based on new technological possibilities to ultimately produce the messages and uses that are most productive or fit best into a given society (Fulk 1993). Another variation on the idea is the social shaping of technology (MacKensie and Wajcman 1985). Dutton (2012 , p. 3) observes,

... the SST [social shaping of technology] perspective was primarily a reaction against two prevailing determinisms (Williams and Edge 1996): 1. A technological determinism that posits a rational logic of technical development towards the one best way to do things, and with the implications of this development flowing logically from features of the technology; and 2. A social determinism that posits technical change following a specific economic or other social rationality, where technology does not matter per se since it is driven by and follows a social process. (Dutton 2012 p. 3)

Technology enables changes in society, so technology plays a role in the construction of gender by creating new possibilities of how gender roles might be performed in a new area. However, in the social shaping view, gender also shapes the construction and meanings of technology. For example, domestic technologies are strongly associated with women and femininity (Cockburn, [1992](#) ; Meraz, [2008](#)). Computer use was initially associated with males, such as in the stereotype of the computer geek, but that gendering began to change as more women in diverse roles began to use computers and go online. As the NTIA and Pew national surveys of computer/Internet use have noted, a visible gender gap in overall computer/Internet use in the late 1990s largely disappeared by the late 2000s. However, as our study will show, computer and Internet use in a public space such as a library might still be gendered.

Socialization and gender gap

Perceiving technology as a gendered space illuminates the ways women and men are socialized to develop different relationships with technology from childhood, at home and school. When the computer was in its early stages of adoption, boys were three times more likely to use a computer and participate in computer-related activities (Kramer & Lehman, [1990](#)). Although those gaps have diminished, there are strong differences in the way women relate to technology, particularly computers and the Internet. Statistics suggest that since 2000, women are equally likely to have access to the Internet; however, men are more frequent and intense users of the Internet than women (Fallows, [2005](#)). Men have also taken more technology classes and are more likely to have had a computer in their own room, which provides more opportunities to experiment and acquire confidence and skills associated with digital technologies (Correa, [2010](#)). Males use the Internet more than women for a wide range of activities, particularly those that require greater technological skills such as job searching, e-banking, and posting or uploading material (Fallows, [2005](#) ; Hargittai & Walejko, [2008](#)).

Regarding attitudes toward technology, there are no major gender differences in the actual abilities to locate online content in an effective and efficient way (Hargittai & Steven, [2006](#)). However, women perceive that their abilities are significantly lower than men's (Cooper, [2006](#) ; Correa, [2010](#) ; Hargittai & Shafer, [2006](#) ; Lunt & Livingstone, [1996](#)), which eventually may affect their motivation and online behavior. Similarly, while women's interest in computers and technology has increased, they still feel more uncomfortable with technology than men (Colley & Comber, [2003](#) ; Cooper & Weaver, [2003](#)).

What are the roots of these differences? Research on the gender divide points to the social development of boys and girls and the social expectations and stereotypes about what is appropriate for both genders (Cooper, [2006](#) ; Meraz, [2008](#)). Generally, children are socialized to computers through video games. Video games are not only experienced through peer-learning, but educators also use them to make the learning experience in schools more enjoyable. The competitive nature of video games makes them more attractive to boys than girls. In addition, computer software is usually developed for and marketed toward males (Huff & Cooper, [1987](#)). As a result, boys feel more attracted to and develop more confidence with computers, while many girls develop negative attitudes, lowered interest, and anxiety (Cooper & Weaver, [2003](#)). In addition, the widely held stereotype that

women are not good at technology may also increase their levels of anxiety and affect their performance (Cooper, 2006 ; Meraz, 2008). These processes shed light on why Livingstone and Helsper (2007) found that while among younger children (7–11 years old) there was no gender difference in computer usage, when the kids grew into their mid-teens (16–17), the gender gaps expanded significantly; by then, boys used the Internet more frequently and performed a wider range of activities than girls.

Another reason behind the digital gender gap is the effect of household chores and childrearing. The second shift faced by women as workers in both their workplace and household leads to a gendering of leisure time. Often, women have less time than men to pass time, pursue hobbies, and experiment on the Internet (Fallows, 2005 ; Madden & Rainie, 2003 ; Meraz, 2008).

Internet public access and women

Because of awareness of the persistent digital divide in low income communities, local and national policy initiatives have attempted to address the problem of the digital divide by providing access to Internet technologies through several venues, including community technology centers (CTCs), and public libraries (Gomez, Ambikar, & Coward, 2009).

As demonstrated by the research in *The Persistence of Inequity* (Straubhaar et al., forthcoming), most Austin libraries, similarly to most libraries across the nation, have continued to change in the past decade to adapt to the evolving needs of patrons. In so doing, the space of libraries has become more dominated by technology. Card catalogs are almost exclusively accessible through the Internet; DVD, CD, and laptop rentals are available; and of course, Internet access is provided. The modern library provides much of its information mediated through technology (Bertot, Jaeger, & McClure, 2011). The automated systems such as online catalogs and online databases provide access to more information sources but reduce access to information for the people who are not tech-savvy (Jerabek, Meyer, & Kordinak, 2001).

Moreover, the actual space of the library has changed to centralize the role that public access plays in patrons' experiences. Participant observations conducted by Straubhaar and colleagues (forthcoming) observed, in every instance, computer technology attaining a more central role in the library. Libraries universally added more computers for general use as well as special rooms or designated areas dedicated to youth users under Dell's Wired for Youth project.

A survey drawn from Internet users of CTCs found that community technology centers were particularly important for connectivity for women and ethnic minorities (Chow, Ellis, Mark, & Wise, 1998). Many of these centers were forced to stop as federal funding decreased in the early 2000s. Previous research has indicated that men use public access at modestly higher rates than women. A survey conducted in the Colorado Public Libraries in 2002 revealed that men were somewhat more likely than women to use public libraries for Internet access (55% vs. 45%). Males also used library computers somewhat more frequently than women; 54% of males used them more than once a week compared to 43% of females (Moe, 2004). Moe (2004) has argued that this moderate difference may indicate that public access is contributing to the reduction of the gender gap. Nonetheless, it is also noteworthy that as public libraries become more technology-oriented, the places traditionally

occupied and determined by women and children—as both employees and patrons—may become more masculine spaces. Another survey conducted only among women library patrons of Chester County Library in Exton, PA, found that females used the library mostly to borrow books and for children's activities. They also mentioned using public computers but it was not a first priority. Although 74% of female respondents felt comfortable using computers, 34% used them in the library (Fidishun, 2007).

Regarding attitudes toward libraries, the literature has found a strong association between computer anxiety and library anxiety, particularly among women (e.g., Jiao & Onwuegbuzie, 2004 ; Jerabek, Meyer, & Kordinak, 2001). This finding suggests that the introduction of computer technology to the library has triggered negative emotional responses among women, especially because they feel lack of support (Jerabek, Meyer, & Kordinak, 2001).

Research Questions

Based on our theoretical framework of structuration theory, we have sought to examine the social structure of public access in Austin and how and why individuals engage it. From our literature review, which has demonstrated distinct gender differences in the approach to and use of technology, we decided to examine the variable of gender to address who was using the structure of public access and why. We approached the public access situation in Austin with the following research questions:

1. To answer the question, “Who is using technology, based along the lines of gender category,” we asked: What are the quantitative gender demographic patterns in the usage of public access in CTCs and libraries in Austin, Texas?
2. To answer the question, “Why are people of each gender using (or not using) technology,” we asked: What are the attitudes that influence users' choices to use public access in CTCs and libraries? How do male and female users differ in their attitudes and discourses?

Methodology: Participant Observations and Interviews

To approach an understanding of who is using technology and why, this study relied both on participant observations combined with a quantitative analysis of users and in-depth qualitative interviews conducted as part of a larger research project that has aimed to assess digital inequalities in Austin, TX, including the usage of public access. In the first stage of the project, researchers at the authors' university performed extensive participant observations at public access locations in both 1999 and 2009.¹ These locations targeted low-income neighborhoods whose residents were less likely to have Internet access in their homes. The 10-year time span provides a useful comparison to explore the demographic patterns of public access usage. In total, researchers observed and coded 1321 people using computers in six different libraries and three community technology centers over both years (438 in 1999 and 883 in 2009).² Due to the closure of CTCs in 2009, the centers were observed only in 1999. In 2009, the research project only focused on libraries.

The observations were conducted by undergraduate and graduate students throughout 2-week periods in different times of the year (i.e, February-March, June-July, and September), at different times of the day, both weekdays and weekends to capture the flow of different publics. They were trained to take notes on the rules regarding Internet usage and ease of access and fill out a spreadsheet with the demographic information of the computer users, such as gender, ethnicity, and approximate age.³ All of these categories were based on sight and not on direct inquiry because we thought that interrupting library patrons to ask demographic information would disrupt the shared space and the users' experience and would also draw too much attention to our researchers and change users' behavior. While we cannot expect 100% accuracy in our observers' perceptions of the somewhat slippery categories of gender, ethnicity, and age, we observed enough people (1330) to sufficiently account for ambiguous cases. Moreover, participant observers could choose an "other" category if they did not feel reasonably comfortable placing the user into the ethnic categories.

Our participant observation data set showed a high proportion of minority usage due to the focus on CTC's and public access sites in neighborhoods in Austin with large minority populations. The analyses are based on the three ethnic categories –Latino, African American, and white. Of the 1330 users observed in 1999 and 2009 combined, 48% were Latino, 31% were African-American, and 21% were White. Less than 1% of users (nine in total) were identified as being part of other races. Adults comprised 52% of our observed users, along with 2% elderly users, 22% teen users, and 22% preteen users.

To further understand user attitudes toward public access, the second stage of this study delved into a set of 146 semistructured interviews that were conducted in Austin in 2004–2006 and 2009, in which three generations of Austin families were spoken to in depth about media usage. These interview subjects were not randomly sampled, but instead deliberately chosen to represent a range of ethnicities, classes, family immigration histories, and national origins, with a particular focus on African-Americans and Latinos from disadvantaged backgrounds in neighborhoods that are more likely to use public access to ICTs. Although they were not the actual participants that researchers observed in the libraries during the first phase of participant observation (although there may have been some incidental overlap), these interview subjects were Austin residents who were likely to be operating in the same constellation of culture and technology as our public access participants. This process of selection allowed us to speak with both users and nonusers of both computers and public access to help distinguish why individuals made those choices within the range of choices available to them by their structural environment. Most relevant to this study was a final section of the interviews that focused on computer and Internet usage as well as usage of and attitudes toward libraries.

As we had hoped, a large number of the interview respondents who spoke at length about libraries were Latino/a. So the research results do tentatively indicate some directions about attitudes toward libraries and public access centers in the Latino community in Austin. Although we had fewer interviews from these groups, responses from African-American and white people seemed to support similar conclusions as those of the Latino/a respondents, indicating that our information is most likely not ethnically specific, but that possibility remains open.

We conducted a textual analysis of the results of the interviews to note general attitudes toward public access as well as gender similarities and differences, taking into consideration statements that both men and women made about their use of libraries and public access. Some of the questions that

elicited the most pertinent responses were: 1) Have you ever used computers? How recently? When did you start using computers? Where do you use them? What do you use them for? 2) Have you ever used the Internet? How recently? Where do you use it? What do you use it for? 3) If you don't use the Internet regularly, do you know where you could use it? 4) Have you ever been to a library in Austin? What did you use there? These questions sparked follow-up discussion on attitudes toward and experiences with libraries.

We also examined the qualitative ethnographic observations written by the research team in order to provide insight into the way the observation staff discussed space, technology, and user behavior in the public access sites both in 1999 and 2009.

Findings

Gender patterns in public access usage: Demographic profile

In order to begin to understand the relationship of individual members of the Austin community to the structure of Internet access and public access in particular, our first research question focused on demographic patterns of library usage, with particular attention to gender. Both in 1999 and 2009, we noted a strong pattern of sex-differentiated usage. Designed to be comparative, the two studies revealed that, even among many changes that were seen in libraries, a gender divide remained consistent. Consistent to both time frames of analysis, for every two female users, there were three male users—60% male to 40% female in 1999 and 61% male to 39% female in 2009 (see tables 1 and 2). To account for an age-related or an ethnically inflected pattern, we broke down the data according to age, gender and ethnicity, creating categories for men / women, preteen / teen/ adult/ elderly, and White / Latino / African-American. Asian was not included as a category of analysis because the public access sites observed were in neighborhoods primarily populated by white, Latino, and African-American people. We did include a category for “other” ethnicity in our initial participant observation sheets, but this was an extremely rare occurrence (less than 1% of users, only 9 in total) and we decided not to incorporate those very few people into our pattern analysis.

Table 1. Gender Differences in Internet Usage at Public Access Sites in 1999

	Sample size	1999 (n = 438)	
		Men (%)	Women (%)
Overall	438	60	40
Ethnicity			
AfricanAmerican	159	60	40
Latino	203	64	36
White	76	70	30

Age

Preteen	136	70	30
Teen	106	54	46
Adult	190	64	36
Elderly	6	83	16

Age x Race

Preteen African American	60	67	33
Preteen Latino	65	72	38
Preteenwhite	11	64	46
Teen AfricanAmerican	37	46	54
Teen Latino	26	52	48
Teen white	15	80	20
Adult AfricanAmerican	61	61	39
Adult Latino	81	63	37
Adult white	48	69	31
ElderlyAfricanAmerican	1	100	0
Elderly Latino	3	100	0
Elderly white	2	50	50

Asians were not included as a category because of low numbers. The public access sites observed were located in areas primarily populated by whites, Latinos and African Americans.

Table 2. Gender Differences in Internet Usage at Public Access Sites in 2009

	2009 (n = 883)		
	Sample size	Men (%)	Women (%)

Overall	883	61	39
Ethnicity			
African American	256	57	43
Latino	428	59	41
White	199	70	30
Age			
Preteen	157	64	36
Teen	184	53	47
Adult	526	61	39
Elderly	16	94	6
Age x Race			
PreteenAfricanAmerican	36	69	31
PreteenLatino	113	60	40
Preteenwhite	8	88	22
Teen AfricanAmerican	71	45	55
Teen Latino	106	57	43
Teen white	7	71	29
Adult AfricanAmerican	146	58	42
Adult Latino	206	59	41
Adult white	174	67	33
ElderlyAfricanAmerican	3	100	0
Elderly Latino	3	100	0
Elderly white	10	90	0

Asians were not included as a category because of low numbers. The public access sites observed were located in areas primarily populated by whites, Latinos and African Americans.

Even comparing across ethnicity and age, the study demonstrated that men used public access computers at higher rates than women in every subgroup, ranging from 57% male to 88% male, with the exception of African-American teenagers. For African-American teens, the demographics were 55% female to 45% male, the only subdemographic in which the percentage of women was greater than the percentage of men (Tables 1 and 2).

General and Gendered Attitudes: Interviews

In the second stage of our study, we explored both general attitudes toward libraries and the potential reasons for the significantly smaller presence of women from public access sites. In other words, what factors could encourage men to exercise their agency toward this choice and what could discourage women? We also worked to explain the gender divide as it has existed in Austin for ten years in hopes of contributing to the larger body of work that analyzes the relationship between women and technology.

The textual analysis of the interviews revealed that the attitudes toward libraries for both men and women were structured around four themes: Hierarchy of access; Libraries as last resort; Libraries as a safe space; and Youth acceptance of technology. Accounting for gender difference, two main themes emerged: Library nostalgia and Generational differences in women.

General Attitudes Toward Public Access and Libraries

In general, patrons showed attitudes and perceptions about the structures of public access that informed their use and relationships to those structures.

Hierarchy of Access—It became clear through reading the interviews that the patrons of the library system public access desire Internet access in the home. Generally, respondents seem to create a hierarchy of preferred access as follows: 1) home; 2) school or work; 3) friends' or family members' homes; 4) public access sites. As agents acting within the structures of public and private Internet access, personal home access emerges as the preference while the most public—public access sites such as libraries—comes in last.

One respondent mentions the turn to home access as the avoidance of public access spaces: “I didn't want to go to the library, so I told my mom and dad to buy a computer.” Other respondents echoed this concern with the inconvenience of physically going to a library. One woman stated, “I'm here [at work] all day now, so when I get off I'm tired and...don't want to go.” She then comments that the due dates for library books deter her from using the library because of the anxiety it causes her, presumably over late fees that she could incur. Another respondent explains that he has to take more than one bus in order to get to the library, which is to him “kind of a hassle.” Another man sums up the task of going to the library as simply a convenience issue, and appreciates not having to leave the home “to do a lot of things.”

These statements indicate a preference toward staying in the home not only for Internet access, but also for other activities that may have once taken place in a public setting. Participant observations

revealed that privacy emerged as a major concern, and observers produced descriptions of users moving to computers out of sight of the reference librarian if they were available or clicking off sites and closing windows if staff members or other patrons came behind them in a position to potentially view the screen. The physical layout of the library spaces, the positioning of the screens, and the potential of monitoring by library employees all created a structural environment that did not instill feelings of privacy. The preference in our respondents for in-home access and for staying home to “do a lot of things” deepened our understanding of structural “privacy” in public settings. There are of course concerns about being seen viewing materials that you would prefer members of your community not observe; however, concern for privacy can also be understood as a concern for private resources instead of public, for the comfort of accessing the Internet on one's own terms without being on display.

A common understanding among those interviewed was that the introduction of Internet access in the home negates the need to use public libraries at all, either to access the Internet or check out books and other research materials such as encyclopedias. As one respondent stated, “I don't have to leave to go to the library when I need to do some research or look something up on the Internet. I can do it all from my home.” Another respondent stated, “They should put every book online, that way I never have to leave my computer.” In these two instances, the Internet itself seems to encompass all the research needs of the individual, and the materials that a library offers, such as books, magazines, encyclopedias, and public access Internet are surpassed by in-home access to the Internet in efficiency and accessibility. However, some respondents mentioned that they continue to use public libraries if they cannot access research materials (books) from their homes. In general, user preference leans toward in-home use.

Libraries as last resort

As the hierarchy of use showed, the attitudes presented by our users demonstrated that the library functions as a “last resort” for public access. It can be inferred, because of its low preference amongst our interview participants, that public access in libraries serves the needs of patrons who do not have reliable access via any of the more preferable routes, such as work, school, or friends' and family members' houses. Public sites are chosen by patrons who don't have access to the full range of structural options. Our interviews have also made clear that the library can serve as access points to people in transition between more preferable access points. For example, when someone loses Internet access because of changing residencies or a temporary job loss, they can count on library Internet.

Libraries as safe spaces

Despite their reluctance to venture outside of the home for certain activities, respondents continue to perceive libraries as a social institution quite positively. Several parents and grandparents mention that libraries are good places to take the children in their families, partially because of the educational aspect that books offer to their children and also because of the welcoming environment that the library provides. Other respondents mention that they go to libraries to study because of its quiet atmosphere, while others use them as places for group meetings. Implicit in these observations is the general sense of the safety that libraries provide. The ease with which grandparents take their

grandchildren to libraries indicates that they view libraries as clean, secure, and family-friendly. Meanwhile, younger adults also feel comfortable holding group meetings and studying alone at libraries. Their sense of security within libraries demonstrates stability in the public perception of libraries as safe areas for the public.

Youth acceptance of technology

Generational differences were observed in these interviews, both from men and women. While younger people generally spoke with ease about the inclusion of computers and the Internet in public libraries, older generations felt more ambiguous about this growing inclusion of technology. One 36-year-old male respondent mentions, "This [younger] generation is really into the Internet. The kids know how to use the Internet a lot better than me. It's easier for me to go to the library and get a bunch of books and start reading." Younger people seem much more comfortable with the idea that libraries have become a technological center than older people do.

Male and Female Differences

Our interviews indicated some differences between the ways men and women perceived the structural space of the libraries, which can help explain why, in our study, women may be using libraries at lower rates than men. In particular, women expressed library nostalgia that did not include technology as meaningful element. Also, we found notable generational differences, with older women demonstrating more technophobia.

Library nostalgia

Mentioning libraries produced nostalgic feelings in both males and females for their childhoods, when many of them often used libraries. This reflects the tendency of those with Internet access at home to no longer use public libraries; these particular respondents' only experiences with libraries occurred several years in the past, before the advent of computer technologies in the library system. However, the sentiment differed between the genders. Males seemed to remember their experiences in libraries as an activity they did because of a lack of other ways to spend their time. One man stated, "We didn't have much to do when we were young, so we would spend a lot of our time [at the library]." Another man reflected this attitude by saying that he would go to the library to check out "random books," indicating his use of the library to assuage boredom during childhood. The male respondents that mentioned any sense of nostalgia for the library did not report their memories in an interpersonal way.

Women reflected more fondly on their childhood experiences in libraries, focusing on the social element of attending libraries. They tended to perceive going to the library during childhood as a family activity often done with their mothers. While one woman remembers going to the library with her sister and two nieces, another attributes her mother's love for books with her frequent library visits during her childhood. Although some women do not automatically associate childhood library attendance with family, such as the woman who remembers taking the bus to go to the library by herself, more women repeatedly referenced family figures in their recollections. In continuation of this tradition, one woman mentions how she takes her granddaughter to the library so that she can read books for school

reading competitions. Only one respondent mentioned going to the library with her father, and none referenced any other male authority figure or family member in these memories.

Two responses focused on the emotional value of libraries and books in opposition to computers. One response came from the woman whose mother loved reading. When asked if she used the Internet at libraries, she stated, "I [don't] want to mix the Internet with the library. The library has sentimental value." Although this respondent was the only one to state explicitly that she believes in a division between books and the Internet, her feelings parallel those of older respondents, whose discomfort with computers and technology in libraries was previously discussed. Another woman explained her preference for books over electronic books, saying, "I like the paper...I like the feeling of holding books...[it] feels so wonderful." She clearly connects emotionally with the tangible medium of books in a way that she does not with computers.

These comments also reinforce that females are more likely to only associate books with libraries, whereas men are more likely to think of computers as well. Although males also have a tendency to associate libraries with only books and reference the Internet in passing, only a few women even mentioned the Internet. While males are more likely to include the Internet while naming uses of public libraries, females are far more likely to refer to only books. This finding is consistent with previous studies that have found that women associate libraries with children and books (Fidishun, 2007) and indicates that a binary exists for women, and not men, between libraries and the Internet. Although a clear relationship does not exist between this binary and the kind of nostalgia that people feel toward libraries, women's higher levels of nostalgia may reinforce the idea of the library as a place for books. This is consistent with our idea that as libraries become more technology-oriented, they may be perceived as more masculine spaces. As libraries become more technologically saturated, library anxiety may increase in connection with technology anxiety (e.g., Jerabek, Meyer, & Kordinak, 2001; Jiao & Onwuegbuzie, 2004).

In fact, women's perception of the library as mainly a place only for books may deter them from using libraries for Internet access. While they may continue to take their children and grandchildren to libraries, they do not often automatically connect libraries with the Internet. Because women spoke more often of taking the children of their families to the library, it is of utmost importance that women without alternate forms of Internet access begin to relate the libraries positively with the Internet in order to 1) begin to reap the benefits for themselves and 2) allow younger generations to develop comfort with new technologies and Internet literacy.

Generational Differences in Women

Among women, the greatest difference in attitudes between older generations (ages 50 and up) and younger generations (below age 50) was their general comfort level with technology. Older women had mixed attitudes toward technology – computers in particular – with one woman saying that she "uses the Internet for everything" and another saying she was unable to use libraries or computers because of her inability to read or write. Some of these women completely refused to use computers, but the same number of respondents was either very or fairly comfortable with technology, as demonstrated by the willingness to use the Internet for basic tasks such as e-mail. Three women who reported more confidence with technology also reported using the Internet at their places of work. Only one older woman reported teaching herself how to use computers by "jumping in the pool and learning it."

Although more research would be needed in this area, it seems that those older women who are comfortable with computers have generally become more confident with them through their occupations, which now require computer usage. Of course, it could be that employees who did not adapt to increasingly tech-heavy workplaces were weeded out.

Other older respondents demonstrated a greater distaste for technology, such as one woman who first stated, "I don't do computers," and then later reiterated this feeling with, "I hate computers," without an explanation, indicating such extreme dislike for computers that she did not want to justify her stance. Another woman describes herself as "not a computerized person," yet continues to use public libraries to read books and socialize. Additionally, two respondents offered different views on the switch from card catalogues to a computerized database. While one laughed at her surprise upon her discovery of the change, another stated that she "[doesn't] go as much now since they got rid of the card catalogues... if they have it on a computer, then forget it." These responses indicate that generational differences in attitudes are in no way definite. While older generations tend to reflect on difficulties caused by the transition, not all are completely against these developments. One older female who refused to use computers acknowledged their importance in the modern world, saying, "[Computers are] the future." A grandmother who did not use the Internet commented, "I hope this library will bring more computers," for her grandchildren to use. Alternatively, younger generations displayed a general acceptance and taken for granted view of technology in their lives.

This demonstration of both using and understanding technology by some older women shows that despite their initial discomfort with the transition to newer technologies, they are also capable of utilizing them when necessary. In addition, one respondent reflected on her use of technology, saying, "Whenever I sit down at my computer I always check my e-mail and then if I have work to do, if I have schoolwork, I always save my files to web space...and sometimes I just surf the Internet for things I like to research...baseball a lot." Another woman stated, "I use the Internet for everything," demonstrating absolute comfort using the Internet, especially in her place of work at a local library. These two women understand the use of the Internet as a tool, but also as a way to spend free time and do non-work-related activities.

Even though women from the younger generation used public access sites at a lower rate than men did, none of the respondents from younger generations reported high levels of discomfort with technology or computers, or at least levels high enough to cause the person to refuse to use technology. The most anxiety from the younger generation was reported by a woman in her 30s. She said, "I don't do any of that MySpace stuff or any of that. I don't have a site, I don't really know." Although this woman uses the Internet for e-mail, her statement reflects uneasiness with certain aspects of the Internet. On the other hand, the greatest confidence in using technology came from a woman under the age of 20, who recalled learning computer programs at school. She stated, "[The teachers] always assigned projects using those things so that we could learn how to use them. I never ever ran into a problem of not knowing how to use a program." Although these statements reflect the diversity within attitudes toward technology among the younger generation, on a whole this younger group demonstrated higher levels of comfort and confidence when speaking of computers and the Internet than the older generation did. Additionally, the younger generation of women spoke about technology in a different manner than most of the older generation. They naturalized the Internet as something taken for granted in their lives. One woman under the age of 20 described how she did not

have access to the Internet in her college dorm room, so she and her roommates would go to the downstairs lounge or the library next door to use it. Her assumption was that everyone should realize that the Internet is an integral part of life.

Conclusions

In sum, the purpose of this research study was to understand the gendering of public access use using both quantitative and qualitative methods. Specifically, it explored gender demographic patterns of usage to illuminate structural inequality in the digital inclusion process and also the ways men and women differ in their attitudes toward public access.

This research has shown that moving toward universal digital inclusion will require a nuanced understanding of how communities work. The same structures do not affect everyone in the same way. There can be “divides within the divide”—and in this case, it has been shown that gender is a consistent factor affecting who accesses computers. The observations conducted for this study showed that men consistently outnumbered women in computer usage in public access sites such as community technology centers and libraries both in 1999 and 2009. This pattern was consistent even when taking into account ethnicity and age. The only exception was among African American adolescents; black female teens used public access sites' computers more often than black male teens. A study that analyzes this at length concluded that African-American teenage men saw the library as a place that was not for them, as opposed to African-American teenage women, who saw it as a comfortable space (Straubhaar et al,). Although this gender gap in public access usage had been reported previously (Fidishun, 2007 ; Moe, 2004), the differences found in this study are significant because, first, the overall percentage difference found was larger than had previously been reported, and has persisted for more than one decade. Secondly, we observed the gap as persistent over time from 1999 to 2009 and through almost all demographic breakdowns by age and ethnicity. These results indicate that the gender gap in library Internet usage is not decreasing. The ramifications are that structures—the physical layout of the space, the procedures for getting assistance on computers, the rules and regulations regarding use, and so on—are not gender-neutral. Women and men are experiencing public access sites differently, and user perceptions and experiences vary by gender.

Regarding general attitudes toward public access, both men and women see public access as the least convenient way to use the Internet, largely because of the hassle it takes to get to the library and because of preference for the most private usage situations. However, those who do not have better options rely on public settings to engage these new technologies. Although access to the equipment (computer and Internet lines) is only one aspect of the digital divide, it is a necessary step to develop further digital skills and use the new technologies effectively (de Haan, 2004 ; van Dijk, 2006 , 2005). For low-income and otherwise disenfranchised women, public access may represent an entry point for them to engage in the digital world. Our Internet users that did rely on public access points expressed definite satisfaction that the libraries and other public access sites were there to support their wide-ranging use.

Using a paradigm of complete access that includes not only physical but also cognitive and social

access (Newhagen & Bucy, 2004 ; van Dijk, 2005), the second stage of this study that involved interviews revealed that cognitive (attitudes, anxiety, and skills) as well as social and cultural factors seem to be affecting individuals' basic access and control of technology.

While in general, women have shown many of the same frustrations as men with public access, such as concerns about privacy and transportation, they also have uniquely expressed nostalgia for the way libraries used to be. These nostalgic reflections are often tied up in memories of visiting the library with their parents, particularly their mothers, and their children. Thoughts of computers do not seem to conjure up those feelings in our women interviewees. Perhaps computers inspire fond memories less often because, unlike reading books together or attending story time, computers do not encourage interaction with family members. Furthermore, because our women respondents were children before technology was integrated into libraries, their childhood memories of libraries do not include computers.

This particular finding that women feel nostalgic about books and libraries and do not connect computers and libraries with the same positive feelings can shed light on the idea of technophobia and generally negative attitudes toward technology. While reducing fear of and resistance to technology can be seen as a useful way to address barriers to digital inclusion, it is also important to consider how “technophilia” can be increased. Our findings indicate that there are indeed structural factors that can create a positive experience for women. For example, increasing the potential for positive human interaction around the site of the technology, particularly interaction with close family members and more assistance from librarians, could help increase positive associations with technology in females.

For women 50 years old and over, attitudes toward computers and the Internet ranged dramatically, with some people unequivocally reporting that they “hate” computers and others viewing them as a welcome addition to life. Older users who did express a higher comfort level with computers often learned to use computers at work. This may indicate that exposure to computers allows women to build literacy and confidence. Moreover, it may suggest that a carefully structured learning environment could be an entry point to build confidence in computer usage, which in turn could help defray technophobia and encourage users to branch out from work-related tasks. In terms of structuration theory, we find that libraries, and librarians, have moved toward a more welcoming structure of public access between 1999, when the idea was new, and 2009, when public access is a visibly central and accepted part of library structure. An earlier report on the 1999 stage of this study (Lentz, Straubhaar et al. 2000), noted that libraries need to do more to structure a welcoming environment, particularly for minority youth. The Austin Public Libraries and many individual librarians have changed a great deal in 10 years, so that their agency has restructured public access at libraries in a way that accommodates the increasing needs of a demographically varied patron base for access and support with computers and the Internet. However, these spaces remain gendered in ways that also have to do with the agency of their users, as they structure the space and shape this particular form of technology access through their usage of it.

Libraries in Austin are not responsible for this gender inequality, which has been demonstrated by countless studies, but as it stands, they are not doing all they can to correct that imbalance—a goal of complete digital inclusion. Keeping in mind that the libraries provide Internet access for those who see the library as a “last resort,” it should be emphasized that many of the women most affected by this disenfranchisement most likely do not have other access. So more active structuring, or social shaping

of the library access space seems called for. If the institutions and professionals want to reshape the image of this space, to restructure it, then more active outreach to women, particularly older women, seems necessary. Libraries need to address the issue discovered here, that many older users, particularly women, are nostalgic for the older structure of the libraries, in which books and reading were clearly dominant over other uses. As libraries answer the pressing call to reshape and restructure themselves to provide access to ICT, they also need to help women and older library users understand and navigate that transition.

Further research could investigate the phenomenon further in Austin and go beyond the city. Although participant observations are not randomly conducted by definition and therefore may not be representative of a phenomenon that occurs across all libraries all the time, our observations were very comprehensive. They were conducted in various sites, during various times of day, on various days of the week, and in different months to capture the flow of various publics. They also allowed us to compare the usage patterns at two points during a decade. In order to see if these patterns are representative of other library settings, future research could conduct a random survey that can include questions on demographics and attitudes toward libraries and technology. Additional research can replicate this study to begin to determine if this is a local, national, or international phenomenon.

Follow-up research can also focus on male and female patrons of all ages who currently use public access. Interviews and surveys can focus on how each patron started to use computers, why he or she came to the library, what he or she likes and does not like about the library, his or her comfort with technology, and his or her reasons for using computers. Interviews with older women in particular can target their “turning point”—their transition from a nonuser to a user of the Internet. Interviews with all women can inquire about reasons why particular friends and family members are nonusers. Gathering more information can help determine action plans that work toward including all people, including women, into an increasingly digital culture.

With the growing trend to digitize all aspects of contemporary culture, from commerce, television, and even reading through digital platforms such as Google Books, libraries likely will continue to provide a crucial need for Internet services. In disadvantaged areas, the public will continue to need free and accessible Internet access through the public library system. But community initiatives cannot stop at merely providing access because of additional barriers to effective and fulfilling use. As many studies have shown that women are more likely to feel both library anxiety and computer anxiety, it is possible that the redesign of libraries to centralize technology has compounded anxiety in some female patrons. Decreasing anxiety and increasing positive feelings toward technology could go a long way in providing a more comfortable environment for women. The divides within the digital divide, in this case the gender divide, must be systematically and structurally addressed to attain the goal of “complete access

Notes

- 1 The observations in 1999 were conducted over a 2-week period in June-July and September. In 1999, 51 undergraduate students enrolled in different classes of the authors' university were trained and conducted observations in four libraries and three community technology centers (CTCs). They observed as they conducted some of these participant observations as Internet assistance volunteers. Students also had to take notes on the rules, limits as well as resources offered to patrons. Each student completed an analytical report of his or her observations and

thoughts as a final project. The observations in 2009 were conducted by 14 graduate students over 2-week period in February and March 2009 to gain information on the developments in public access over the past 10 years. They observed at four libraries, two of which had been observed in 1999.

- 2 Information from this observation series is also published in *The Persistence of Inequity* (Straubhaar et al). This data analysis is based on a data subset.

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