Chapter 7
The Digital Divide in the U.S. in the 21st Century

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ABSTRACT

The United States has the world's largest national population of Internet users, roughly 170 million people, or 70% of the adult population. However, the deep class and racial inequalities within the U.S. are mirrored in access to cyberspace. This chapter examines the nature of the U.S. digital divide, differentiating between Internet access and usage, using data from 1995 to 2005. Although Internet usage has grown among all sociodemographic groups, substantial differences by income and ethnicity persist. The chapter also examines discrepancies in access to broadband technologies.

INTRODUCTION

By now, digital reality and everyday life for hundreds of millions of people have become so thoroughly fused that it is difficult to disentangle them. The Internet is used for so many purposes that life without it is simply inconceivable for vast numbers of people. From email to on-line shopping and banking to airline and hotel reservations to playing multiplayer video games to chat rooms to Voice over Internet Protocol telephony to distance education to down-loadable music and television shows to blogs to YouTube to simply "Googling" information, the Internet has emerged as much more than a luxury to become a necessity for vast swaths of the population in the economically developed world. In this context, simple dichotomies such as "off-line" and "on-line" fail to do justice to the diverse ways in which the "real" and virtual worlds for hundreds of millions are interpenetrated.

Yet for many others – typically the poor, the elderly, the undereducated, ethnic minorities – the Internet remains a distant, ambiguous world. Denied regular access to cyberspace by the technical skills necessary to log on, the funds required to purchase a computer, or public policies that assume their needs will be addressed by the market, information have-nots living in the economically advanced world are

DOI: 10.4018/978-1-60566-699-0.ch007

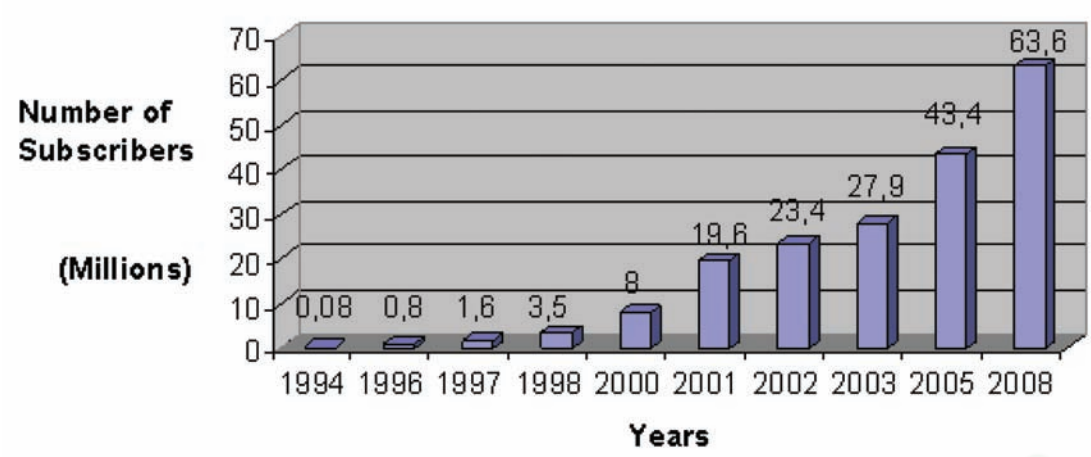
deprived of many of the benefits that cyberspace could offer them. While those with regular and reliable access to the Internet often drown in a surplus of information – much of it superfluous – those with limited access have difficulty comprehending the savings in time and money it allows, and the convenience and entertainment value it offers. As the uses and applications of the Internet have multiplied rapidly, the opportunity costs sustained by those without access rise accordingly. At precisely the historical moment that contemporary capitalism has come to rely upon digital technologies to an unprecedented extent (Schiller 1999; Zook 2005; Malecki and Moriset 2008), large pools of the economically disenfranchised are shut off from cyberspace. In a society increasingly shaped by digital technologies, lack of access to cyberspace becomes ever-more detrimental to social mobility, rendering those excluded from the Internet more vulnerable than ever before (Graham 2002).

In 2008, roughly 1.5 billion people, or 22% of the planet, used the Internet on a regular basis (http://www.internetworldstats.com). The United States continues its long standing position as one of the world's societies with abundant access to the Internet (Figure 1). Although Internet penetration rates in the U.S. (70% in 2006) are not as high as Scandinavian nations, they remain higher than many other urbanized, industrialized countries, and Americans as a whole still constitute the largest and most influential national bloc of Internet users in the planet. Despite this prominence, there exist important discrepancies in Internet access within the U.S. in terms of age, income and class, ethnicity, and location. As a slough of books has demonstrated, the digital divide is real, rapidly changing, complex, difficult to measure, and even more difficult to overcome (Compaine 2001; Cooper and Compaine 2001; Norris 2001; Servon 2002; Kuttan and Peters 2003; Warschauer 2003; Van Dijk 2005; Stevens 2006). While some decry the divide as a catastrophe, others deny its very existence. Indeed, the digital divide is so multi-dimensional that it cannot be reduced to dichotomous measurements, but should be seen as a continuum measured across a variety of variables (Barzilai-Nahon 2006).

This chapter examines the changing social differentials in access to the Internet in the U.S. in the period between 1995 and 2006. "Access," of course, is a nebulous term that exhibits different meanings (e.g., access at home, school or work); perhaps the multiplicity of meanings is optimal for conveying the complexity of the digital divide, which does not lend itself easily to simple dichotomies (DiMaggio et al. 2001). Equally important as access is what users do with the Internet, for simple access does not automatically lead one to become an Internet user. Although the ability to gain access to the Internet at work, home, school, or public libraries is widespread, employing cyberspace to gain meaningful information is another story. For many users, the Internet will remain primarily a toy. Thus, assessments of Internet usage must take into account the perspectives of the various populations that deploy it (or not) for their own means.

First, the chapter summarizes the various economic and political forces that have altered patterns of Internet access in the U.S. Central to understanding the digital divide is the rapid growth in computer and Internet usage among many social groups: the divide, such as it is, is never frozen in time or space, but a fluid, malleable entity that constantly shifts in size, composition, meaning, and implications. Second, it charts the growth in the absolute and relative numbers of different groups of American Internet users in terms of their access at home and at work from 1995 to 2005, with occasional excursions into later dates as data allow. Third, it focuses on the critical issue of broadband delivery, which has generated new patterns of inequality. The conclusion explores the changing meanings of the American digital divide in an age in which access has become widespread, Internet usage is of unparalleled importance, market imperatives

Figure 1.



dominate, and the consequences of not getting on-line are ever more profound. Throughout, it argues that the divide is not simply "digital," but profoundly social, political, and spatial.

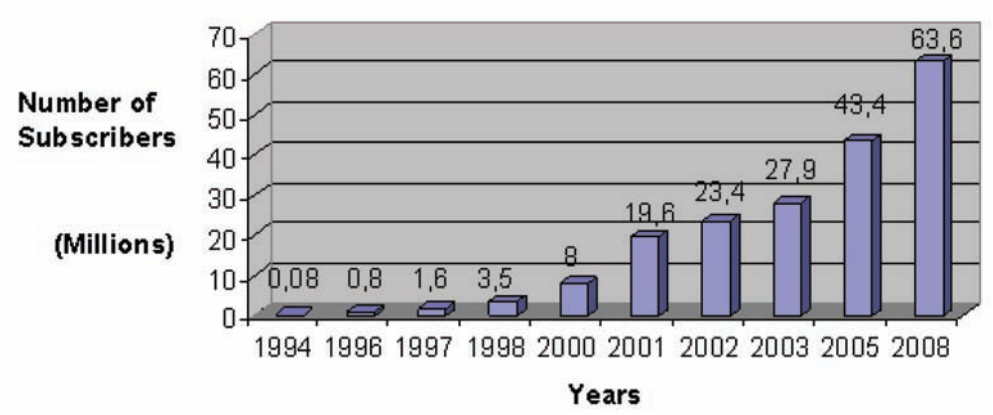
FORCES CHANGING AND PERPETUATING THE U.S. DIGITAL DIVIDE

Several factors have conspired to dramatically accelerate Internet access and usage in the U.S. among different social groups, including three major sets of forces: the declining costs of personal computers; public policies aimed at closing the digital divide; the deregulation and changing industrial structure of the telecommunications industry; and changing accessibility patterns in public schools and libraries.

Declining Personal Computer Costs

The continued decline in the price of personal computers (PCs) looms as a major factor in expanding access to the Internet. Following Moore's Law, which holds that the cost of computers falls in half roughly every 1½ years, PCs have become increasingly ubiquitous across the U.S. Indeed, relatively fast, low-end machines with Pentium microprocessors are readily available for less than $600 in numerous retail outlets. With 574 PCs per 1,000 people in 2005, the U.S. stands second only to San Marino in terms of ownership rate. Almost 80% of Americans use a PC once or more per week either at work or at home, the vast bulk of which are networked (Figure 2). Because the value of a network rises proportional to the square of the number of users (Zipf 1946), the Internet and the PC made each other increasingly powerful and attractive. Simultaneously, the rise in user-friendly graphics interfaces such as Netscape greatly facilitated Internet access for the parts of the population lacking in sophisticated computer skills. Moreover, as the number of applications of the Internet has grown, the hours of usage have steadily increased to more than nine per week. The rise in PC ownership has been a central claim of those who argue the digital divide will disappear on its own accord (e.g., Cawkell 2001; Van Dijk and Hacker 2003; Strover 2003).

Figure 2.



Changing Public Policies and Structure of Telecommunications Industry

Changes in public policy – including the deregulated environment unleashed by the 1996 Telecommunications Act – also shape the contours of the U.S. digital divide. Among other things, the Act was designed to encourage competition in high-cost rural areas and deliver the same access to cyberspace as found in cities. The Clinton Administration actively sought to reduce the digital divide by inserting the E-rate program (officially the Schools and Libraries Program of the Universal Service Fund) into the Act, which generated $2.25 billion to provide discounts to telecommunications services ranging from 20 to 90% for low-income schools (Cooper and Kimmelman 1999). E-rate was credited with raising the proportion of schools with Internet access from 14% in 1996 to 95% in 2005. However, the E-rate program did not provide funding for hardware, software, technological training, or access to broadband services, which are every bit as important as discounted telecommunications services. Additionally, the Clinton Administration created the "E-Corps," consisting of 750 AmeriCorps volunteers who facilitated Internet access in low-income communities through federally subsidized Community Technology Centers. Finally, under the Clinton Administration, the National Telecommunications and Information Administration (NTIA) (1995, 1998, 1999, 2000) released a series of reports calling attention to the digital divide and offering potential remedies.

Unlike the Clinton Administration, however, that of George W. Bush was reluctant to intervene in what it deemed market imperatives, a policy of "technology neutrality" designed to avoid "market distortions." In practice, this strategy has accentuated discrepancies in Internet access (Cooper 2002). Typically, the Bush Administration either argued that the divide has diminished to the point of irrelevance; upon taking office, FCC Chair Michael Powell declared "I think there's a Mercedes Benz divide; I'd like one, but I can't afford it" (quoted in Cooper 2004). In 2003, the Administration ended funding for two institutions central to previous efforts to minimize the divide, the Technology Opportunities Program in the Department of Commerce and the Community Technology Center initiative in the Department of Education. Instead of promoting universal access, the administration excused cable television and telephone companies from this public service obligation. These policies encouraged telecommunications providers to offer services on a "pay per" basis, allowing them to "cherry-pick"

the most profitable customers and abandon those without significant purchasing power. Children will suffer the most from these policies; as the Kaiser Foundation (2004) notes,

A decade ago, the increasing importance of technology led policymakers, industry, and advocates to make reducing the digital divide a high priority policy issue in the public and private sectors. Since then, the role of the Internet – at work, at school, at home, and in the community – has continued to grow. Yet policy interest in children's access to the Internet appears to have cooled, due at least in part to a sense that most of the divide has been closed.

In the private sector, waves of corporate consolidation reshaped the landscape of telecommunications ownership and correspondingly, the abilities of different social groups to get on-line. The market structure of telecommunications services has undergone a sustained transformation, including steady oligopolization. Like many sectors of telecommunications, Internet service providers (ISPs) were heavily affected by a wave of mergers and acquisitions, particularly after the 1996 Telecommunications Act, which greatly facilitated the process of corporate consolidation. Most ISPs lease capacity on fiber optics lines from telecommunications companies, many of which are publicly regulated, in contrast to the unregulated state of the Internet itself. The privatization of the Internet, which began in 1993 with NSF's transfer of the system's management to a consortium of private firms led by MCI, increasingly brought it gradually into conformity with the dictates of the market. The resulting pattern of service provision became steadily restructured by corporate ISPs in partnership with backbone providers (e.g., AT&T, MCIWorldcom, and Sprint), generating a geography centered largely on large metropolitan areas, whose concentrations of affluent users generate economies of scale that lead to the highest rates of profit (Warf 2003).

Access Via Public Schools and Libraries

Schools remain perhaps the most important arena in which the digital divide is manifested and reproduced (Monroe 2004). Given the lack of a national school system and reliance upon local property taxes as the primary means of funding public education, the U.S. school system tends to reinforce and deepen social inequalities rather than reduce them (Kozol 2005). In an age in which the acquisition of skills to participate in advanced producer services is key to upward social mobility, this issue assumes special importance. Inequalities in school funding are mirrored in the prevalence of the Internet in public classrooms (Becker 2000): while 99% of schools offer children access to networked PCs in one way or another, these rates vary significantly in terms of quality of access: "students with Internet-connected computers in the classroom, as opposed to a central location like a lab or library, show greater improvement in basic skills" (Kaiser Foundation 2004). Not surprisingly, the digital divide in schools has strongly racialized overtones: white students are much more likely than are minorities to use the Internet in the classroom or school library (U.S. Department of Education 2006).

Simple access to PCs at school is a poor measure of the extent of the digital divide: low-income students are less likely to have them at home or to possess the requisite technical skills necessary to install, maintain, and navigate such machines. Students with access at home are more likely to be enrolled, to graduate from high school, to go to university, and to have better grades than those who do not (Fairlie 2005). While roughly 96% of all U.S. children aged eight to 18 have "ever" gone on-line (Kaiser Foundation 2004), regular, reliable, and rapid access to the Internet with social and technical support, in a comfortable, nondistracting environment, remains stratified by ethnicity and family income. Bolt and Crawford (2000, p. 19) aptly sum up the sobering implica-

tions of the academic digital divide in terms of labor market potential:

The lack of exposure to technology, at home and in the classroom, dooms millions of American youths to low-paid, insecure jobs at the margins of our economy. At the same time, wealthy children in private schools are reaping the rewards of immersion in the new technologies: their homes have DSL internet connections and their summer jobs involve designing websites or writing computer code.

After home and school, public libraries are the third-most common point of Internet access, especially for lower income minorities. Libraries have been at the forefront of efforts to reduce the digital divide, and about 99.1% of all U.S. libraries offer free Internet use. In many communities, libraries are the only free access to the Internet. However, libraries have limited space and operating hours, often lack high-speed connections, and frequently find their limited information technology budgets strained by growing numbers of people such as the unemployed seeking to use their resources for job seeking, students using them for school work, or others hoping to acquire computer skills (Walsh 2007). In 2007, the Bill and Melinda Gates Foundation announced a multi-year technology grant program for public libraries as part of its effort to combat the digital divide (Bill and Melinda Gates Foundation 2004). This step was the latest in a long series of similar moves; for example, between 1998 and 2004, the Foundation installed 47,200 Internet-ready PCs in 11,000 libraries across the U.S. and trained 62,000 library workers (Stevenson 2007).

THE CHANGING PROFILE OF THE U.S. DIGITAL DIVIDE

Throughout the 1995-2006 period, growth in Internet use among various socio-demographic groups was rapid, often spectacular (Table 1). Average Internet penetration rates – including access at home, work, or school – more than quadrupled, from 14 to 70% (Figure 3); by 2006, 176 million Americans were using the Internet regularly (Figure 4). Thus the innovation, the most rapidly diffused technology in world history, went from a tool or toy of a minority to an essential implement used by the vast majority. Every social group, as differentiated by age, gender, race/ethnicity, educational level, or household income, experienced marked gains. To the extent that the digital divide persists in the U.S. (and other economically advanced countries), it must be understood within the context of this sustained and rapid increase in the number of users and proportion of the population.

This growth, however, did not occur at identical rates among all social categories. Take, for instance, age, as measured in four broad categories. The young (i.e., under 30 years of age) steadily exhibited the highest Internet penetration rates, reaching 83% in 2006. For many children who grow up surrounded by digital technologies, the Internet is hardly mysterious. In contrast, in both benchmark years, the elderly experienced the lowest rates of Internet usage (a mere two percent in 1995 v. 33% in 2006), as well as the slowest rate of increase in users. Many elderly people find new technologies to be difficult or intimidating, do not appreciate the potential benefits, are easily frustrated by their lack of technical skills, and are comfortably ensconced in their pre-Internet lives. The digital divide, therefore, is closely wrapped up with generational differences, and the views and preferences of different groups of users are vital to understanding their willingness (or not) to participate in cyberspace.

Notably, gender differences in Internet usage, which included an eight percentage point lead among men in 1995, declined steadily throughout this period, so that by 2006 it declined to relatively minor two percentage points. Despite its popular reputation as an exclusive haven of masculinity, the Internet in fact has been harnessed by increas-

Table 1. Growth in adult U.S. Internet users, 1995-2006

	----% On-Line in----		Percentage Growth
	2006	**1995**	
AGE			
18–29	83	21	62
30–49	82	18	64
50–64	70	9	61
65+	33	2	31
Total	70	14	56
SEX			
Men	71	18	53
Women	69	10	59
RACE/ETHNICITY			
White	72	14	58
Black	58	11	47
Latino/Hispanic	69	21	48
EDUCATION			
<High school	36	2	34
High school graduate	59	8	51
Some college	84	20	64
College graduate	91	29	62
HOUSEHOLD INCOME			
<$30,000	45	8	37
$30,000-$49,000	75	15	60
$50,000-$75,000	90	23	67
>$75,000	93	32	61

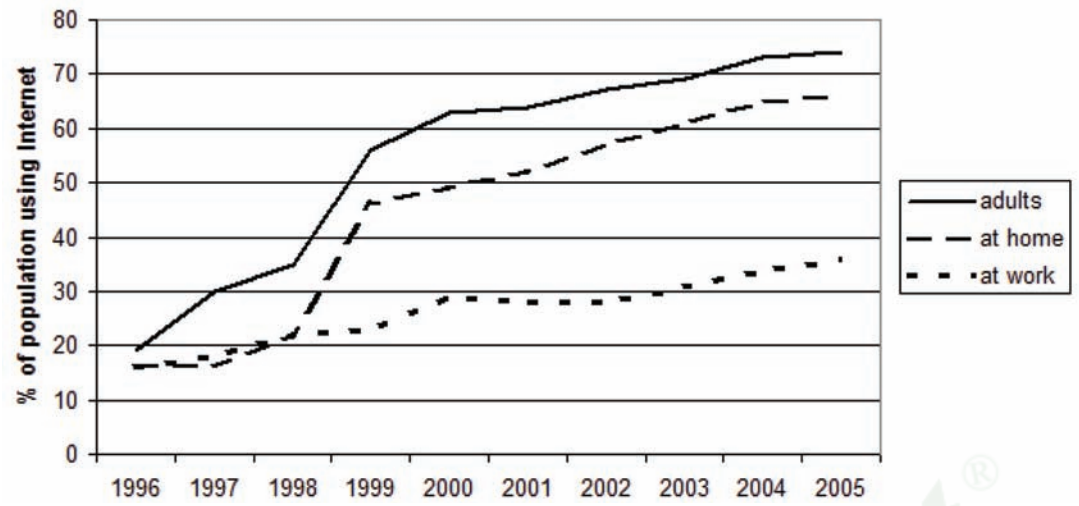
Source: http://www.census.gov/compendia/statab/tables/08s1128.xls

ing numbers of women. Gender differentials in access reflect both the lower socio-economic status of women relative to men as well as sexist cultural attitudes toward science and technology (Bimber 2000). The declining gender gap speaks to the increasing familiarity with digital technologies among many women, particularly the young and well educated, who are often employed in producer services in which computer skills are an essential prerequisite. Moreover, enrollment rates in American universities for women have consistently surpassed those for men (Mather and Adams 2007), indicating that the future gendered digital divide will become smaller yet, if not disappear altogether.

One dimension of the U.S. digital divide that has drawn the most serious scrutiny concerns racial or ethnic differences. Given the profound inequalities in U.S. society in terms of income, educational opportunities, and employment that exist between whites and ethnic minorities, it is not surprising that this gap is manifested in terms of access to cyberspace, i.e., much of the racial ravine in digital access is due to income discrepancies (Fairlie 2005). In 2006, Internet access rates for whites remained well above those for minorities or the national average. In 1995, for example, white Internet usage rates were more than double that of Latinos/Hispanics (37.7 v. 16.6%), and roughly double that of Blacks or African-Americans (19.0%). (2006 Census data on other ethnic groups such as Asian-Americans or Native-Americans were unavailable; however, studies using 2003 data (Fairlie 2005) indicate that Asian-American PC ownership and Internet use rates exceeded those for whites, while rates for Native-Americans resembled those of African-Americans). However, income alone does not explain the totality of the digital divide, as Internet use and adoption are intertwined with cultural preferences of different ethnic populations.

There are signs, however, that this dimension of the digital divide is slowly, if hesitantly, diminishing. Today, the majority of ethnic minorities uses the Internet, and the relative difference between them and the white population declined. There are important differences within minority populations, however. Among African-Americans, Internet usage tends to be concentrated among the

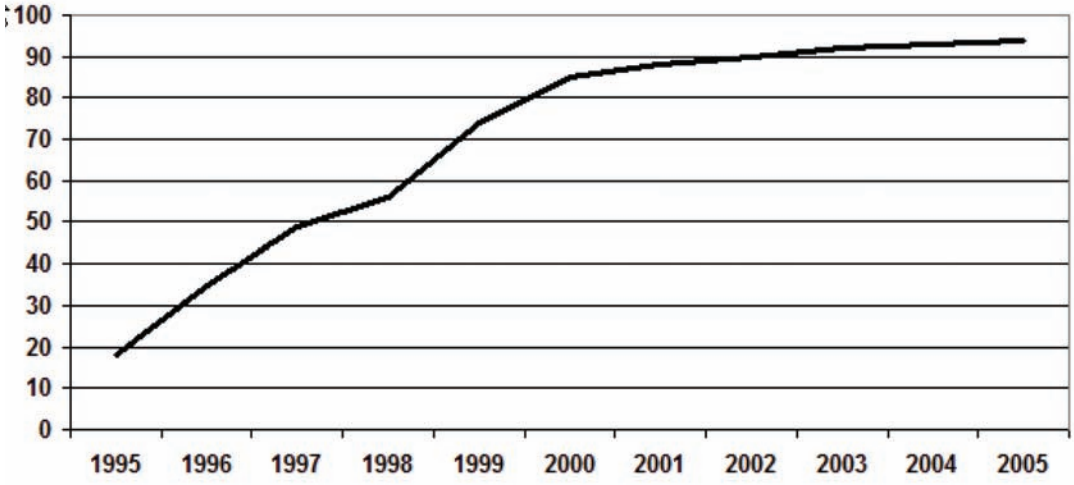
Figure 3.



young (Marriott 2006) and the college-educated, particularly women (*Journal of Blacks in Higher Education* 2001). Likewise, the Latino population is far from homogeneous, and significant discrepancies in Internet access and usage remain among various sub-groups; usage rates tend to be much higher among bilingual Latinos than those who speak only Spanish (http://www.pewinternet.org/pdfs/Latinos_Online_March_14_2007.pdf). Indeed, among English-dominant Latinos, Internet usage rates are identical to Whites. Generally, Mexican-Americans and those with origins in Central or South America had lower rates of access than did Cuban-Americans or Puerto Ricans (Fairlie 2005).

Among Native Americans, a sharp bifurcation exists between those living in urban areas, whose rates of access and usage mirror the country as a whole, and those living on reservations, the proportion of whom using the Internet falls well below the national mean; indeed, only 47% of residents of reservations have telephone access (Bissell

Figure 4.



2004, p. 137). Some Native Americans view the Internet as another tool of cultural assimilation, the latest in a long, sad history. While some universities (e.g., Northern Arizona University) offer free Internet services to reservations, in general such places are politically inconsequential and unable to confront telecommunications companies (e.g., over rights of way issues). The Bill and Melinda Gates Foundation's Native American Access to Technology Program has successfully worked with tribes in the Four Corners area of Utah, Colorado, Arizona, and New Mexico to increase access to digital information resources while preserving local heritages.

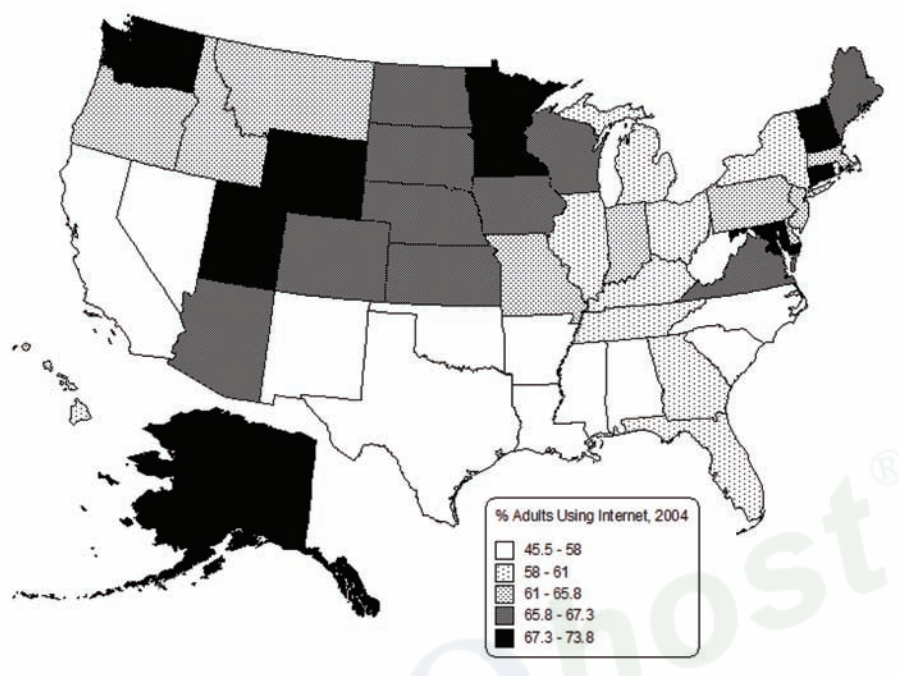
Persistently underlying the digital divide in the United States are vast socio-economic differences, particularly education and household income, which effectively serve as markers of class. Although populations at all of four broad educational levels (less than high school, high school graduate, some college, college graduate) exhibited gains in Internet access, profound differences remain (Lenhart et al. 2003). Among college-educated Americans, Internet usage is almost universal (91%); users with a high school education or less witnessed a growth in usership from a tiny two percent in 1995 to 35% in 2006. Educational level, therefore, is a prime predictor of who is on-line and who is not.

Similarly, income remains a useful measure of who has access and who does not, particularly at home. In 1995, roughly one-third of upper-income households (over $75,000 annually) used the Internet; by 2006, this share had risen to 93%. Rapid growth rates also occurred among those of more modest means, although less than a majority (45%) of poor households (earning less than $30,000 annually) were users in 2006. Thus, as with race/ethnicity and educational level, absolute discrepancies persist but relative differences declined as Internet usage rates advanced most rapidly among those with hitherto the least access.

It should be emphasized that American non-users of the Internet are a surprisingly diverse bunch. They consist disproportionately of poorly educated women, minorities, and those who live in rural areas. One-quarter of non-users have not completed high school, compared to five percent of Internet users. Non-users are much more likely than users to be retired or unemployed. Roughly 20% of this population lives with someone who does have Internet access; as Lenhart et al. (2003) note, "Internet use is so normalized in America that even most non-users say they are in close proximity to the Internet." Another 17% consist of "Internet drop-outs," who typically became frustrated by their hardware, software, or service provider. Yet others consist of the disabled, particularly those who suffered severe strokes, and the blind, who lack or cannot afford Braile interfaces. Finally, a small but stubborn core of avowed non-users remain excluded from cyberspace not by income or education, but simply out of personal choice, saying they simply did not need the Internet. While some cite the cost of computers and on-line service access, or say that it is simply too complicated, others cite fears of Internet pornography, credit card fraud, or identity theft. Roughly ¼ of this group struggles with literacy in their everyday lives, and this group is less likely than other non-users to know of public Internet access points.

Social differentials in U.S. adult Internet usage were reflected in significant geographic variations among states (Figure 5); the digital divide is an inherently and deeply spatial phenomenon (Warf 2001). Data for 2004 (the last year in which such data are available) indicate the highest rates of usage (65% or higher) in the upper Midwest (e.g., Minnesota) as well as states with important high-technology clusters (e.g., Colorado, Washington) and the suburban environs of Washington, DC. In contrast, Internet usage rates were much lower (58% or less) throughout most of the South as well as California, Nevada, and New Mexico, all regions with substantial populations of impoverished minorities and underfunded school systems. It is worth emphasizing, however, that such state-level patterns mask broad internal

Figure 5.



variations, particularly between large urban areas and lightly populated rural ones. Even when they are connected, rural residents are far more likely than urban ones to be frustrated by slow Internet connections.

THE DIGITAL DIVIDE IN THE BROADBAND ARENA

The latest frontier in the digital divide is unquestionably the arena of broadband delivery services. As Web-based material has become increasingly graphics-based, involving the transmission of large, data-intensive files (e.g., photographs), broadband access has become correspondingly more important. Broadband applications include digital television, business-to-business linkages, Internet gaming, telemedicine, videoconferencing, and Internet telephony. With large, graphics-intensive files at the heart of most Internet uses today (e.g., downloading forms, reading on-line newspapers, and films), broadband has become increasingly imperative for efficient Web browsing. Broadband is also reflective and a driving force behind the phenomenon of digital convergence, the blurring of boundaries that traditionally separated industries such as telephone, cable television, and computers, allowing the generation of significant economies of scope and scale (Baldwin, McVoy and Steinfield 1996).

Broadband technology has existed since the 1950s, but its deployment was not economically feasible until the deployment of large quantities of fiber optics cable in the 1990s allowed vast amounts of data to be transferred at high speeds, (up to 2.4 gigabytes per second). While trunk fiber lines stretch across the country and the world, many local loops into homes and businesses still use relatively slow twisted pair copper wires, giving rise to the famous "last mile" problem.

In passing the Telecommunications Act of 1996, Congress directed the Federal Communications Commission (FCC) to encourage the growth

of advanced telecommunications technologies (but not any specific one), a directive that stimulated providers to offer fiber optic services directly into homes and businesses. Several technologies meet FCC standards for advanced services, which specify a very low minimum baud rate of 200 kbps, thus disqualifying ISDN connections, which operate at 144 kbps. Of the various options, digital subscriber lines (DSL) provided by cable television companies are the most popular; two-thirds of American households have cable television, and many couple Internet and television service into one integrated package. In addition, Asymmetric Digital Subscriber Lines (ADSL) include a suite of broadband technologies provided by local telephone companies that operate on twisted copper pairs and provide an "always on" Internet connection, unlike traditional modems. Broadband adoption has also been encouraged by steadily declining prices in this market. As a result, the number of broadband lines jumped from 6.8 million lines in December, 2000 to 82.5 million in December, 2006 (NTIA 2008).

In 2008, roughly 55% of the U.S. population used broadband technologies at home, the growth of which reduced dial-up services to marginal status (Figure 6). Non-users of broadband typically cite the expense or lack of availability in their local area as their reasons. Broadband accessibility tends to be most prevalent among the young, males, whites, the well educated, and rises monotonically with household income (Table 2), reflecting in many respects the same differentials that have accompanied dial-up Internet since its inception. The most rapid growth has occurred among middle class households and the young, while broadband usage among low income households actually declined by three percentage points between 2007 and 2008 (Horrigan 2008a). The elderly remain infrequent users of this mode of access, which was delivered only to 19% of those over age 65. Notably, however, some of the worst discrepancies have been mitigated: differences in broadband access between whites and Latinos, for example, have almost evaporated, although usage among African-Americans still lags behind. Nonetheless, income and educational level remain the prime determinants of who has access to broadband and who does not.

Figure 6.

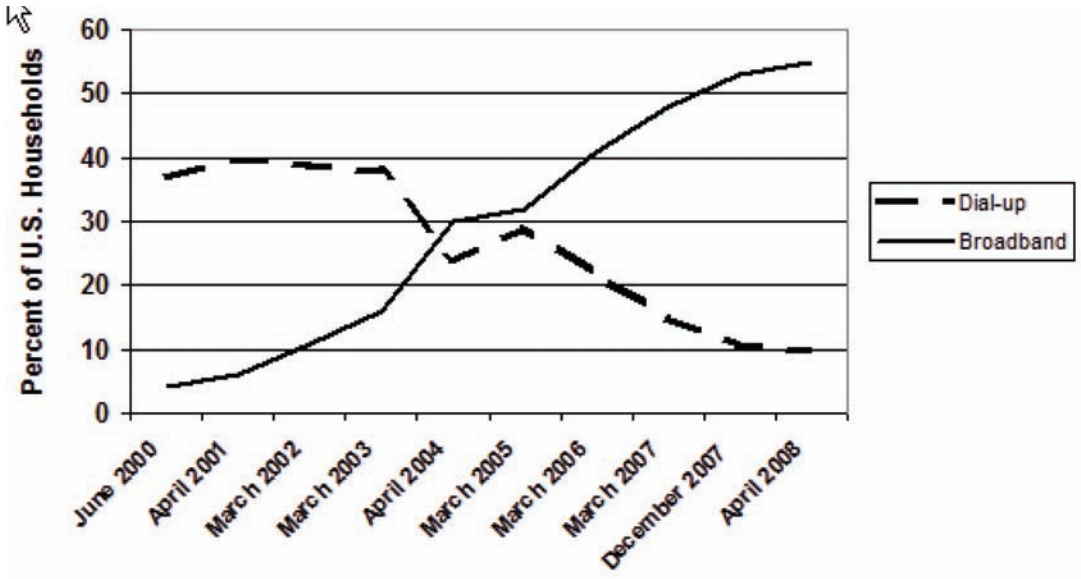


Table 2. Percent of adults with broadband accessibility at home, 2005-2008

	2005	2006	2007	2008
AGE				
18-29	38	55	63	70
30-49	36	50	59	69
50-64	27	38	40	50
65+	8	13	15	19
Total	44			
SEX				
Male	31	45	50	58
Female	27	38	44	53
RACE/ETHNICITY				
White	31	42	48	57
Black	14	31	40	43
Latino/Hispanic	28	41	47	56
EDUCATION				
<High school	10	17	21	28
High school graduate	20	31	34	40
Some college	35	47	58	66
College graduate	47	62	70	79
INCOME				
<$20,000	13	18	28	25
$20,000-$29,999	19	27	34	42
$30,000-$39,999	26	40	40	49
$40,000-$49,000	28	47	52	60
$50,000-$74,999	35	48	58	67
$75,000-$99,999	51	67	70	82
≥$100,000	62	68	82	85
LOCATION				
Urban	31	44	52	57
Suburban	33	46	49	60
Rural	18	25	35	38

Source: Horrigan 2008.

Such social differentials are accompanied by spatial ones. While 57% of urban residents use broadband, as do 60% of suburbanites, only 38% of rural denizens do so; however, growth rates were higher in rural than urban areas, indicating this discrepancy may decline in the future. Grubesic and Murray (2002) examined inequalities in access to broadband services in Ohio, noting the overconcentration in metropolitan regions and underserved rural areas. Broadband technologies have been slow to reach rural America: whereas 86% or residents in cities with more than 100,000 residents have access to DSL, very few in towns with less than 10,000 people do so (Greenman 2000). Thus, there are strong reasons to believe that far from eliminating the digital divide – a common refrain of the Bush Administration (Cooper 2004) – broadband reproduces it, gives it new form, and in some cases, accentuates it.

Despite its rapid growth, the proportion of broadband users in the U.S. is relatively low compared to most of the economically developed world; indeed, under the Bush Administration, the U.S. slipped internationally from fourth in 2001 to 15th in 2007 in terms of access to broadband services (Horrigan 2007), and Americans pay 10 to 20 times as much per megabit over broadband as do their counterparts in South Korea and Japan (Cooper 2004). As former FCC member Michael Copps (2006) argued, "America's record in expanding broadband communication is so poor that it should be viewed as an outrage by every consumer and businessperson in the country. Too few of us have broadband connections, and those who do pay too much for service that is too slow." Critics allege that the Federal Communications Commission (FCC) has exaggerated the extent of broadband usage in the U.S. (by including delivery speeds as low as 200 kbps, four times the speed of modem) and not taking the problems of inadequate access and low competition sufficiently seriously (e.g., Turner 2005); for example, the FCC holds a ZIP code as having broadband service if it contains only one subscriber, without consideration of price or speed.

However, the rapid growth in wireless and mobile broadband services injects complexity into this view (Wareham et al. 2004). In 2008, approximately 40 million Americans (15.6% of the adult population) subscribed to mobile Internet services and used it at least once per month (Nielson Mobile 2008), primarily through cell phones. Another 55 million subscribed to mobile Internet services but did not use it. Roughly 82% of iPhone owners utilized wireless broadband, about five times the rate of cell phone users as a whole. The gender of users was tilted toward men (56%). Surprisingly mobile Internet users had roughly the same household income distribution as the country as a whole. The young tended to be the heaviest users of this technology, and derived the greatest utility from it (Horrigan 2008b): roughly ½ of users are under 35, although as with the Internet in general the elderly (over 65) comprised a minuscule proportion (Table 3). In addition to wireless services at home, roughly one-third of U.S. Internet users employ wireless services outside of the home in roughly 66,000 Wi-Fi (wireless fidelity) "hot spots," such as airports, coffee shops, and restaurants (Horrigan 2008). Cities with the largest numbers of hot spots included New York, Seattle, Chicago, and San Francisco (Table 4). While the primary uses included access to information portholes such as Yahoo! or Google, as well as email, the average mobile Internet user accessed only 6.4 different webpages per month.

CONCLUDING THOUGHTS

Contrary to common utopian interpretations, cyberspace is shot through with relations of class, gender, ethnicity, and other social categories. When viewed in social terms, the interpenetration of the virtual and real worlds is mutually constitutive: discrepancies in access to the Internet simultaneously mirror and augment inequalities in the world outside of cyberspace.

The digital divide in the U.S. must be viewed in terms of the rapid absolute and relative growth in the number of users that occurred in the late 1990s and early part of the 2000-2010 decade. Today, 176 million people, almost ¾ of the adult U.S. population, have access to the Internet either at home or at work. Among those with occupations demanding a university education, Internet usage is almost universal. As the size of the U.S. Internet population has grown, it has steadily come to resemble demographically the country as a whole. Many of the most egregious dimensions of the digital divide have been mitigated. Gender differences, for example, which once loomed large, have largely evaporated as girls became as proficient at using the Web as boys. While whites continue to enjoy higher rates of

Table 3. Age distribution of U.S. mobile Internet users, 2008

Age Bracket	% of Mobile Users
13-17	12.7
18-24	11.8
25-34	27.4
35-54	37.0
55-64	9.1
65+	1.7

Source: Nielsen Mobile 2008.

Table 4. Ten U.S. cities with largest number of wireless hot spots, 2008

New York	1,069
Seattle	870
Chicago	841
San Francisco	840
Houston	600
Los Angeles	490
Atlanta	485
San Diego	446
Austin	423
San Antonio	417

Source: http://www.jiwire.com/search-hotspot-locations.htm

access than do minorities, this gap has declined as well; the racial ravine has given way to a more modest ethnic gulch. Education level remains a prime marker of who has access and uses the Internet and who does not. That such differentials have declined in the face of the indifference of the George W. Bush administration testifies to the falling prices of computer hardware, the diffusion of software skills among ever large segments of the population, and the role played by schools and public libraries.

However, class differences – as expressed through different access rates for varying levels of education and household income – remain an important dimension of the American digital divide. Vast swaths of the population – largely minority, poorly educated, low in income, and often employed in the lowest rungs of the service sector – have little experience with the Internet. For many, cyberspace appears as some dimly perceived horizon with few concrete advantages to offer. Ironically, it is precisely such pools of people who might benefit the most, by having, for example, ready access to information about employment opportunities, bus schedules, or through the comparative shopping that the Internet affords. Lack of reliable access deprives the poor and uneducated of the possibility of participating as equals (Stevens 2006). Because low income ethnic minorities comprise a disproportionate share of new entrants into the labor force, the lack of Internet skills among such workers is also a matter of national competitiveness. It is only when the bottommost tiers of the social order have reliable access that the digital divide will disappear, if it ever does. Until then, the Internet may amplify social inequalities as much as it reduces them.

Moreover, important geographic variations remain: it is no accident that the highest rates of Internet access are to be found in states with relatively good public education systems (e.g., the northern Midwest) and relatively high per capita incomes. Conversely, the lowest rates are evident in poorer, frequently Southern states that typically underinvest in public education systems. Thus, the spatial dimensions of the digital divide mirror the socioeconomic ones; where users are located has as much to do with access as who they are, for the social and the spatial are hopelessly intertwined.

Even with enormous price declines in the cost of personal computers, considerable portions of the low-income population do not have them at home. Use of a networked PC, of course, presupposes minimal technical skills, which the country's least educated segments almost universally lack. As Korupp and Szydlik (2005) emphasize, social and family context and human capital matter as much or more than does the simple presence of a PC. Thus, attempts to overcome the digital divide by extending the Internet to the poorest, least educated portions of the country will encounter steeply diminishing returns: it is one thing to offer simple access, and quite another to teach the computer illiterate the basic skills necessary to navigate cyberspace and participate in the information economy. However, as a new generation of younger users increasingly familiar with the Internet gradually replaces their less computer-oriented elders, much of the roughest contours of the digital divide may be ameliorated over time.

The contemporary frontier that speaks most accurately to the digital divide's evolving nature is the uneven social and spatial distribution of broadband services. Given that the bulk of Internet applications are graphics-intensive, including Web-based functionality, broadband has become increasingly essential to meaningful Internet usage. Typically, given the deregulated climate of the telecommunications industry, providers seek to avoid low income or rural areas (where low densities inhibit economies of scale) and "cherry pick" relatively affluent, densely populated urban ones. Thus, rural-urban differences in Internet access – a topic woefully understudied in the academic literature – remain critical to understanding who has access and who does not (Parker 2000; Gabe and Abel 2002).

The digital divide in the U.S. reflects the unique constellation of cultural, political and economic forces that have long defined American society: its high degree of individualism; its faith in mythical free markets and distrust of state intervention; its tolerance of inequality; and the profoundly racialized nature that permeates differential access to social opportunities, including the Internet. Unequal access to the Internet reflects broader, growing inequalities generated by labor market polarization (including the loss of manufacturing jobs and the explosion of low-wage services), the growth of unearned income (particularly stock dividends), and a largely indifferent federal government.

What might be done to reduce the digital divide in the future? Three lines of action present themselves. First, universal service provisions, largely abandoned after the 1996 Telecommunications Act, should be re-instated as part of any federal government regulatory programs. Because the market for Internet services is unlikely to provide access for low income populations by itself, this type of policy stipulation lies at the core of any effective public program to reduce disparities in access. Second, subsidized partnerships between telecommunications companies and Internet service providers should address public schools and libraries in low-income neighborhoods, including a revival and expansion of the e-rate program, and focus not simply on the provision of computer hardware, but equally importantly on the generation of human capital, i.e., the skills necessary to log on, navigate the Internet, and employ it in substantively meaningful ways. Finally, aggressive efforts should be made to encourage broadband and mobile Internet access, including subsidies to overcome the last mile problem in impoverished regions and the proliferation of wireless "hot spots." Given how entrenched inequality is in the United States, such measures will require substantial investments and lengths of time to be effective; what is clear is that without them, the digital divide will persist.

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KEY TERMS AND DEFINITIONS

Broadband: high-speed modes of Internet access typically using fiber optics cables or satellite

Digital Divide: social and spatial discrepancies in Internet access

E-Rate: a program of the U.S. federal government in the 1990s to subsidize Internet access at public schools

Internet Drop-outs: those who once used the Internet but stopped doing so for various reasons

Moore's Law: named after Intel founder Gordon Moore, it asserts that the costs of computers and equipment decline by 50% roughly every 1½ years

Wi-Fi: wireless Internet, typically Local Area Networks at home or in some public places such as airports and coffee shops.y

Section 2
Digital Divides and Inequalities

Division 1
Digital Divides and Disabilities