

BEHAVIORAL AND ENVIRONMENTAL CORRELATES OF DIGITAL INEQUALITY

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ABSTRACT

Inequality between Whites and Blacks has fluctuated since the 1970's, when a number of technological and structural changes in the economy adversely affected Blacks. In this 'information age', researchers concerned with inequality have coined the term 'digital divide' to signify the effects of exclusion from these powerful new information technologies. As increasing numbers of Americans have gone online, the academic focus has shifted from the digital divide to 'digital inequality', in which attention is given to White and Black levels of Internet social support, navigational sophistication, and Internet knowledge – factors which directly facilitate or inhibit Internet use beyond simple access.

Using the Years 2000 and 2002 General Social Survey, this article examines whether what Whites and Blacks are doing online drives them to invest more or less time online, in order to speculate on whether the Web will widen the already substantial access divides between the Whites and Blacks. Results indicate surprisingly similar levels of online time, social support, navigational sophistication and Internet knowledge. Taken as a whole, then, Whites and Blacks have similar Internet activity patterns – although Whites focus more on news, financial, and political Websites, whereas Blacks are drawn to education-related sites.

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The United States has been rapidly transformed by its immersion in what Castells (1996) has called the 'Internet Revolution'. As more and more Americans embrace information technology (IT), the potential for widespread changes in the way one's work, live and play increases. The nearly unprecedented transformative power of this current period of technological change has driven research concern over a 'digital divide'.

Defined in terms of the gap between those with Internet access and those without, or alternatively the 'information haves' versus the 'information have-nots', the digital divide focused on how marginalized groups – such as the poor, those with lower education and minorities – were being left behind in the Internet revolution. As a repository of vast amounts of information, of varying reliability, the World Wide Web holds the promise of easier job searches, lowered cost for news reading and information surveillance, making distant contacts, or simply finding free music. In other words, the Web has the potential to help increase an individual's 'life chances' by making information cheaper and more readily available, although it also has the possibility of becoming simply an interactive TV.

Studies of the digital divide focused on ways of making the Internet more affordable to wider segments of society, mostly through access points away from the home, e.g. libraries and Community Technology Centers (CTC), many funded by the government and justified by treating access to Information Technologies as an extension of the Universal Service Policy. However, as Internet access has diffused more widely, and as marginalized groups have adopted the Internet with increasing frequency, researchers have begun to discuss 'digital inequality', or the inequalities that arise from differences within the online population (DiMaggio and Hargittai 2000). Digital inequality extends the technologically deterministic access/no access framework and instead focuses on the broader context in which users attempt to leverage the power of the Internet to their own ends. The digital inequality framework is sensitive to variables affecting Internet access and use often overlooked, or underestimated, in the digital divide literature: the quality of Internet access, the location of access, skills in locating specific content, levels of Internet social support and actual Internet usage patterns.

Using data from the preeminent social science survey, the General Social Survey, this analysis adopts the digital inequality perspective to examine how Whites and Blacks are using the Internet differently. More specifically, it looks at White/Black differences in:

- 1) Internet social support, in terms of differences in who they can seek out for help,
- 2) Internet knowledge, their overall familiarity with a variety of Internet terms,
- 3) Internet navigation skills, and lastly
- 4) Activities of significance for driving time online.

If ultimately the concern is not just that there are differences between the two groups, but that these differences lead to actual material or symbolic inequalities that impact individual life chances, the primary concern should be not only the 'structural' inequalities that shape Internet use, but with the patterns of usage that shape the ultimate 'payoffs'. To that end, this article breaks down Internet usage into separate categories for analysis: into 'productive' social and human capital enhancing Internet activities (such as news sites, educational sites, financial sites, etc), and 'entertainment' activities (such as hobby information, or music, TV and movie related information). These categories are used to explain what drives increased 'investment' of time on the Internet for the respective groups. In this way, this analysis adds a more expansive view of Internet usage, by focusing on a wide range of Internet variables which might mediate White and Black Internet usage.

HISTORICAL PERSPECTIVES ON BLACK - WHITE INEQUALITY

Inequality, and Black-White inequality in particular, has been ingrained in this country since its inception. It was codified into law with slavery, and later, through separate but [un]equal Black codes, and the like. Some semblance of "Formal" equality before the law began with landmark law cases like the *Brown vs. Board of Education* decision (including later cases which actually forced the implementation of the *Brown* ruling) and the passing of the 1960's civil rights legislation, such as the 1964 Civil rights act, the 1965 Voting Rights Act and the 1968 Open Housing Act.

Since the second World War, the changing lives of Blacks relative to Whites can put into two periods, the first beginning at the end of the World War II and ending in the late 1960's, the second beginning in the early 1970's and running until the mid 1990's. The first period is dominated by the effects of the post-war boom, where the US economy performed at historically high levels. The proverbial tide raised all boats, with low unemployment that spread income gains throughout the population (Levy 1998, p.33). Median family income increased throughout, while the ratio of Black to White income increased steadily from .51 to .71 in the 1970's (Levy 1998, p.27, 34). Starting in 1965, affirmative action meant that more Blacks were 'getting ahead', swelling the ranks of the middle class, variously defined (Landry 1987; Oliver and Shapiro 1997). Under these conditions, a booming economy, income gains for a vast majority of the working population, a vast swing in public opinion towards equality (Farley 1997) and a war on poverty, it becomes relatively more justifiable to think that American society was approaching equality of opportunity.

The second period, stretching from the beginning of the 1970s to the 1990s was of a completely different tenor than the postwar boom that preceded it. Many of the strides towards parity that Blacks had made began to erode or

came to a halt as the economy burnt itself out. No one cause can easily be pointed to, but a number of factors were prominent:

1) *The slow movement of manufacturing jobs out of the central cities.* Wilson's (1996) data suggests that between 1967 and 1987 cities such as Philadelphia, Chicago, New York, and Detroit lost over half their manufacturing jobs, well over a million jobs in total. Central city job loss is particularly damaging to Blacks, considering that many had migrated there originally during the period of decreasing agricultural employment, so that over 80% of poor Blacks resided in central cities (Kasarda 1993). No other ethnic group was as severely affected, and in comparison to Whites, "Blacks living in central cities have less access to employment, as measured by the ratio of jobs to people and the average travel time to travel time to and from work" (Wilson 1996, p. 37).

2) *Increasingly competitive environments that led to organizational restructuring.* Katz-Fishman and Scott (1994) found that during the period of wide spread restructuring of the 1990's, Blacks were the only group to show a net loss of jobs.

3) *Technological change that ratcheted up skill and educational requirements for even entry level positions, within both manufacturing and service employment.* This has been a major factor in limiting Black employment opportunities, especially in central cities. Just one generation after a scant 1/3 of all Black men had been educated beyond the seventh grade (Levy 1998, p.92), Blacks were asked to compete for jobs that placed an increasing premium on formal education. Though gains were made in equalizing the disparity in years of schooling between the two groups, differences in the quality of education, as evidenced by test scores, still remain (Levy 1998, p. 99).

4) *A concomitant shift towards service employment saw slower productivity and wage growth versus manufacturing.* From the periods 1973 to 1979, 1979 to 1990, and 1990 to 1996, the manufacturing sector on average grew at 1.2 percent, 2.6 percent and 3.5 percent, respectively. The corresponding numbers for the service sector are .5 percent, .4 percent and .2 percent (Levy 1998). Wilson (1996, p.31) reports that by 1987 "the average annual earning of 20-to-29-year old males who held jobs in the retail trade and service sectors were 25 to 30 percent less than those of males employed in manufacturing sectors" (p. 31).

5) *The deleterious effects of the middle class exodus of Blacks from central city communities led to areas with high rates of poverty and joblessness (Wilson 1987; 1996).* The lack of visible role models and social

capital has had wide ranging effects on urban Black communities (Conley 1999, p. 61). Lastly,

6) Stagnating middle class wages decreased support for remedial measures, such as Affirmative Action (Farley 1997).

A number of authors recently have also begun to examine the role of high levels of wealth inequality in creating and sustaining inequality. Works by Wolff (1996), Oliver and Shapiro (1997), Conley (1999) and Keister (2000) demonstrate the salience of treating wealth as a prime determinant of other forms of inequality. Generally, it is suggested that the history of racial discrimination that has severely limited Black opportunities to acquire assets has limited their ability in the present to achieve significant, long lasting prosperity. Exclusion from capital markets for financing housing and education (Massey and Denton 1993; Oliver and Shapiro 1997; Dalton 1999) has affected not only educational and economic advancement but the security of Black families, especially those that have 'made it', middle class Black families (Oliver and Shapiro 1997).

Across these two periods, Blacks have by and large improved their positions vis-à-vis Whites, though the pace of improvement slackened, or stopped, across the second period. Research explaining these trends have also generally shown the absurdity of cultural arguments (see Sowell 1994; McWhorter 2000; D'Souza 1995) that gained prominence during the 1980's and 1990's, in which the primary determinant of aggregate Black success or failure was rooted in the structure of Black culture, and poor Black urban culture in particular. In the face of effective equality, it was said, Blacks have mainly held themselves back through a dysfunctional cultural system, making success in mainstream America elusive. Recent scholarship has, in the main, illustrated that race matters primarily because of the historical effects of racism. The major impediments to rectifying current inequalities stems from current individual level racism, and, more importantly, from Black's structural position, both economic and social – a factor shaped largely by the long term effects of previous discrimination, especially as it relates to the ability of the Black community to accumulate assets. Thus, despite long term positive gains in the aggregate, these achievements are tenuous and ebb and flow with changing social and economic conditions.

TECHNOLOGY AND INEQUALITY

As the situation in America's inner cities illustrates, rapid technological change has had wide ranging effects. Changing telecommunications technologies were at the heart of 'globalization', which expanded the scope of competition and forced companies to streamline both production processes as well as their organizational structures. Computers and other information technologies are now a ubiquitous portion of white-collar service work, as are increasingly

sophisticated software packages. These changes have rapidly increased the skill and educational requirements of even the most basic positions. In an increasingly technology oriented society, those with the necessary skills and training will find themselves with expanding job opportunities and located within greater reward structures. Those unfamiliar with computers and uncomfortable with technology will find themselves left behind in the wealth creation that typified the 'new economy' and more vulnerable to the vagaries of the global economy.

It is thus not surprising that some social observers have noted the glaring lack of Blacks in technology-related fields. As of 1998, when Blacks made up 12 percent of the workforce, they were just 4 percent of doctors and 5 percent of those in engineering, computer science and the sciences. Blacks represent just 5 percent of bachelor's degrees in science and engineering, and only 2 percent of doctorates in those fields (Jacoby 1999). In an "information age", it is imperative that Blacks not only have the requisite skills and education to master the various information technologies, but that they have both the talents and opportunities to influence the development of the technology.

Blacks have a long history of unfavorable encounters with technology, dating back to slavery and the caravel (the ships used to transport slaves), continuing through the mechanical cotton picker and the great migration, and into the present day with the decline of manufacturing (Rifkin 1995; Walton 1999). As previously noted, the decline of manufacturing has had a particularly severe effect on Blacks, primarily because so many of these jobs were originally located in central cities. Additionally, whereas changing mass production technologies were described as "skill neutral" (Levy 1996), the same cannot be said of the effects of information technologies. "It is important to recognize that much of the sharp rise in inner city joblessness in the United States...stems from the swift technological changes in the global economy" (Wilson 1996, p.151). The effects of these changes cannot be overstated, and Rifkin has gone so far as to suggest that "Technological unemployment has fundamentally altered the sociology of America's Black community" (Rifkin 1995, p.77).

The Scope of Technological Change in the Information Age: It is with the knowledge of the increased importance of technology in individual life chances that researchers have begun to think about inequality in the information age. What has made these issues all the more pressing are the particular characteristics of the current period of technological change: information technologies are more than simply productive technologies, but are technologies for communicating, and connecting, with others. Technology has become ever more important *not* because one must face it at work, but because one increasingly encounters it in every aspect of our lives: work, home and play. Information and Communication Technologies (ICTs) are penetrating people's lives in a way that few technologies have. An acknowledgement of the novel

nature of these changes has led researchers to discuss the information age as a new and distinct phase of society. Whether thought of as a "Control Revolution" (Beniger 1986), the emergence of a "network society" (Castells 1996), the "information society" (Schement and Curtis 1995) or the emergence of a "post-modern" sensibility (Gergen 1991), it is argued that the ways in which a large proportion of the United States, and a growing proportion of the world, lives, works, plays and votes are being reexamined and transformed by the application and incorporation of Information Technology (IT) into peoples' everyday lives.

There are no shortages of exaggerated predictions regarding the importance of the Internet to the world, or to American society. While the reality may be a little less dark, or a little less bright, than most assume, it remains one of the primary transformative forces of this era. Schement and Curtis (1995) note that in 1930's, Americans spent on average one dollar on information for every six dollars on food. By as early as 1986, this figure had grown to \$3.50 for every dollar on food. Americans are not only 'consuming' more information, but they are also using the technologies that allow them to manipulate information to build and rely on new social forms.

Wellman (2001) argues that computer networks are 'social networks', and that "Work, community, and domestic life have largely moved from hierarchically arranged, densely knit, bounded groups to social networks" (Wellman 2001, p.2031). Similarly, building on the work of Wellman and others, Castells (2001) discusses the redefinition of 'community' in the information age, the shift towards selective values and interests based networks as a primary factor in sociability, and the subsequent emergence of "networked individualism" (Castells 2001, p.130). Castells is one of the more forceful advocates of the idea that the information society represents a significant shift from previous epochs.

In contrast, Schement and Curtis (1995) suggest that the current period is far from a radical break, but rather an extension of the 'social organization' of capitalism and industrialism. Information technologies have been a mainstay of American life, they contend, throughout the 20th century, and recent history has only further enriched American 'media environments'. In many ways, their perspective is commensurate with Beniger's (1986) more 'evolutionary' perspective, although his long-term historical approach dates the fundamental impetus for social change earlier than most writers.

Thus the current state of 'information age' or 'information society' research leans heavily towards accepting the view that the previous two decades have been a period of rapid social change – changes which researchers have only begun to identify and analyze. Some portion of the difficulty of identifying changing trends has been the complexity of information technologies, in that they represent not only 'productive' technologies that undergird 'knowledge workers' (Reich 1991), but are also networking and communication technologies. Whereas the effect of changing productive technologies can often be measured in

productivity measures and employment statistics, the increasing penetration of information technologies is much more diffuse in its implications and thus that much more difficult to appraise. Much of the 'revolutionary' nature of new information technology, and the Internet in particular, stems from its communication and interactional capacities, capacities which when directed to new and innovative ends often times are not captured by national statistics or survey results, and many take place within the confines of bounded networks behind firewalls or other security systems, outside the eyes of authorities and scholars. In many ways then, the Internet represents a collection of technologies that appear to users more as a new mass medium rather than as a static machine or tool. This interactional capability makes it difficult to specify its 'effects', as so much of what happens to individuals when they gain access to the Internet depends on to what ends, or payoffs, they can leverage out of the Internet's capabilities. Castells (1996) captures a good deal of this complexity when he discusses his five material bases for the informational society:

1. Information technologies are technologies to act on information, where information is a fundamental portion of the process
2. Information's ubiquity means that the effects of new technologies will be pervasive, touching almost all human activity
3. The system has an inherent networking logic
4. The system requires, and enhances, flexibility
5. The technology seems to be collapsing in on itself, incorporating features from various technologies and in the process blurring the distinction between different technologies.

These distinctions conveniently capture both the novelty and subsequent difficulty of explicating the precise relationship between technology, changing social forms and inequality. The first expression of such a relationship is the digital divide debate, which argued straightforwardly that those without access to the Internet would fall behind those with access. As the percentage of those with Internet access exceeded 50 percent, many began to question this relatively simplistic formulation, and research began to focus more clearly on the individual/technology/inequality dynamics involved. It is within these changing social contexts that 'the digital divide' and 'digital inequality' must be understood, an era where old skills, outdated work processes and outmoded social forms have increasingly given way to more flexible and creative, networked alternatives.

DIGITAL DIVIDE

The beginning of the Internet's brisk growth can be fairly accurately dated by the introduction of graphic Web browsers, like Netscape Navigator, starting in 1995. While there had been online services available for sometime

before this, academic and military email use being the most obvious example, graphic browsers did much to popularize the Internet. The rapid advances and increasingly intuitive interfaces in browsers, and similar gains in operating systems, were significant factors in sustaining growth. More importantly, computer prices dropped precipitously during the late 1990's, even as computing power increased.

The rapid dissemination of both computer use and Internet access among many of the 'privileged' led to a concern that many were being left out of the nation's technological boom (Civille 1995). The federal government acknowledged the increasing importance of technology, and indeed began to think about the limits of its universal service policy, which to date focused primarily on telephone subscriptions. The first data collection by the National Telecommunications and Information Administration's (NTIA) in 1995 reported:

"There are legitimate questions about linking universal service solely to telephone service in a society where individuals' economic and social well-being increasingly depends on their ability to access, accumulate, and assimilate information. While a standard telephone line can be an individual's pathway to the riches of the Information Age, a personal computer and modem are rapidly becoming the keys to the vault."

Over the subsequent NTIA surveys, consistent gaps between groups have been found, despite the rapid growth of the overall online population. The most recent 2002 NTIA report, one of the most controversial to date, attempted to put a different spin on the data, as captured by its title "A Nation Online: How Americans are Expanding Their Use of the Internet". Following the previous three reports, it also focused primarily on individual level access. Whereas all demographic groups saw increases in access rates, the report emphasized that the rates of change for minority groups grew at a faster rate than for Whites. Some 60 percent of Whites were connected, whereas just over 40 percent of Blacks were, representing a one percentage point reduction of the gap from the previous report and illustrating faster growth by Blacks. The obvious caveat is that the growth was from a smaller base. An analysis of the 2001 NTIA data, using Multiple Classification Analysis, shows that even with demographic controls, substantive gaps persist between Blacks and Whites in Internet connectivity. If one controls for education and income within the latest NTIA data, 65 percent of Whites have access versus 52 percent of Blacks (Chart 1).

CHART 1: ADJUSTED PENETRATION RATE CONTROLLING FOR EDUCATION, INCOME AND RACE (AGE 18 – 64)

		N	Unadjusted	Adjusted
Education	Less Than High School	8,617	.219	.310
	High School	22,867	.506	.530
	Some College	21,122	.729	.722
	College Grad	12,439	.875	.820
	Grad School	6,062	.905	.825
	Eta / Partial Beta			.442
Income	< \$19,999	11,056	.327	.448
	20,001 to 34,999	13,226	.486	.542
	35,000 to 49,999	11,927	.625	.635
	50,000 to 74,999	15,821	.733	.702
	75,000+	19,077	.845	.756
	Eta / Partial Beta			.377
Race	White	63,868	.658	.648
	Black	7,239	.438	.526
	Eta / Partial Beta			.138

Overall Trend: These data show that more of the population at large is getting online, and as the latest NTIA (2002) report illustrates, nearly a majority of Americans are now online. While subgroups remain far beneath this level, there are some segments of the population that far exceed it. Pew (2001) reports show that 75 percent of 18 to 29 year olds, 82 percent of those with a college or advanced degree and 82 percent of those earning over \$75,000 a year, are connected to the Internet.

There is some ongoing controversy over the extent of the digital divide, given the NTIA's 2002 report stress on closing gaps. In addition, a number of pundits have attempted to debunk the digital divide (Samuelson 2002; Crandall 2001), or at least to trivialize it (Powell 2001; Compaine 2001). In particular, many of these authors note, as the NTIA (2002) report does, that when including access from other locations outside the home, the numbers support the notion that the divides look much less daunting, and in the face of these statistics, no government action is necessary to combat gaps that will 'naturally' close. The MCA analysis presented in Chart 1 demonstrates the persistence of differential rates of access for Blacks and Whites, and research by Cooper (2002) has confirmed that home use differs from other types of usage. Home access lends itself to doing a wider range of activities more frequently. Home Internet users are two to three times more likely to engage in certain activities (newspaper reading, visiting government offices) with about one and half times greater frequency. Similarly, research by Nielsen/NetRatings has shown that use patterns for those with broadband differs markedly from those with narrowband. An analysis of the 2001 NTIA data, which contain large enough sample sizes to provide confidence in the estimates, 19 percent of Whites use broadband in comparison to 16 percent of Blacks – a significant though not

necessarily substantive difference. This line of research is indicative of the future direction of Internet inequality, or digital inequality, research as the online population becomes more similar to the overall population and as the differences within the online population sharpens. Much as research on literacy and education moved from looking at those who received an education versus those who did not towards looking at the differences within the educational system and those under its purview, the notion of 'digital inequality' broadens the perspective of those interested in technology related inequality (DiMaggio 2000) . The debate that surrounds the digital divide, 'universal service' and the National Information Infrastructure legitimizes moving towards this expansive view of the disparate components that constitute effective access and its impediments.

DIGITAL INEQUALITY

The growing number of Internet users and the closing of some of the digital divides has sensitized researchers to differences within the online population as well as to questions of the sufficiency of treating access in and of itself as an unmitigated good. Acknowledging that simply wiring schools and providing computers and Internet access is only a first step towards taking advantage of the Internet, policy analysts and researchers have begun to give more thought to the impediments that users face once they are online ; and as a result, the very idea of "access" to the Internet has been redefined to include a variety of dimensions. However, these efforts are hampered by a lack of data. In his comprehensive review of the digital divide literature, Lentz (2000) points to the paucity of work looking at "...content and information use, or how and why computing and Internet technologies are being produced, whose interests these technologies serve and what choices individuals and families are making with regard to technology access and use" (p. 369).

However, a small number of studies have begun to examine inequality within the online population more seriously. Jung, Qiu and Kim (2001) have developed what they call the 'Internet Connectedness Index', a survey instrument that includes a variety of measures to better reflect a fuller notion of being online. Their notion of 'connectedness' is meant to embellish the relationship between users and technology, particularly how technology and its use are situated within a larger context of relations with other communications technologies, or the 'communication infrastructure'. Redefining the digital divide as a "problem of developing a relationship with the technology", they attempt to move away from what they believe are simplistic, as well as ambiguous, time-based measures of Internet use and towards more in-depth measures that better represent the relationships that individuals develop with the technology. Their survey has nine components, which measure:

- How long individuals have been using a computer

- The tasks for which they use the Internet (school, work or personal related)
- The number of places users have access
- The variety of goals for which users have used the Internet
- The variety of activities they engage in online
- The time spent online
- Users' evaluation of the effect of the Internet on their lives
- Computer dependency
- Internet dependency

Applying their operationalization to the data in the Metamorphosis project, a survey conducted in Los Angeles, their results show the gains to be made by moving away from a single-item measure that attempts to summarize what they see to be a very complex relationship.

While their study offers an interesting benchmark, there are a number of drawbacks to their approach, both methodological and theoretical. The first is the rather obvious methodological point that more in-depth information about users' relationship with the Internet is something most researchers would prefer, if they could afford it. The single item approach, one imagines, is not followed because of intellectual or conceptual laziness, but rather because of the expense of adding questions to surveys. They report their survey took roughly 40-45 minutes to complete (perhaps one of the reasons leading to a response rate in the 30 percent range). The General Social Survey (GSS), in comparison, takes in total nearly 90 minutes, but yields information on a wide variety of topics, with the Internet module taking 15-20 minutes to complete. Given the expense of collecting data, however, many researchers have been forced to rely on smaller subsets of questions, especially single item measures such as time estimates.

Two other theoretical issues warrant attention. Jung, Qiu and Kim (2001; p.510) take issue with time-based measures of Internet use, suggesting they are inadequate for digital divide research, for a variety of reasons, and time is indeed a limited proxy for the complex patterns of Internet practice. That being said, the authors underestimate the power of time-use measures because they overlook the zero-sum nature of time. This zero-sum property necessitates time allocation decisions that reflect sometimes subconscious cost/benefit analyses of ends and means, and are arguably constitutive of life style differences. Grouping by time spent online may be important not because it accurately portrays homogeneous sets of practices, nor because it shows that these users are more "affected" by the Internet, but because it represents groups who have taken time away from other activities and deemed it sufficiently important to their lives to invest their limited amount of time there. A growing body of research is showing consistently greater time online by experience level, increasing reliance on the Internet as a source of information, increased confidence in the available information (UCLA 2003; Nie and Erbring 2000; Pew

2000, 2001), as well as increasing online skill and sophistication (Hargittai 2001). Within their theoretical framework, concerned as it is with the communication infrastructure and the relationship of new communication technologies, the usefulness of this measure should be readily apparent, as it allows for comparisons of Internet use with other media. While time studies can benefit from collecting estimates or reports for a variety of online activities (as the GSS does by collecting time estimates for work related Web use, time using email for a variety of purposes, as well as time spent in online chats), the ability to discuss the relationship between Internet time and time spent on other activities is of no small import (especially when combined with more in-depth ethnographic research), because it can illuminate both the perceived benefits and sacrifices of Internet use.

A second theoretical point concerns the mechanisms of inequality in their theory. Relying on Bourdieu, they attempt to expand upon simplistic instrumentalist notions of technology use by better contextualizing the relationship between individuals, technology and society, through the notion that dispositions towards the technology-individual relationship are structured by an individual's habitus. Thus the particular forms of this relationship, with its concomitant orientations, represent varying distributions of cultural capital. While this offers some provocative insights into the rhetoric surrounding both science and technology, it does little to shed light on the precise mechanisms of inequality. Jung, Qiu and Kim (2001) assert that differing levels of cultural capital lead to greater or less ability to generate other forms of capital, primarily through "goals, tastes, attitudes, or expectations". While this may well be true, their articulation obfuscates rather than illuminates the precise nature of those processes, processes that must be made more transparent for technology-related research on inequality to advance.

Nonetheless, this articulation of the problem, moving from the simplified access/not access categories to a more complex view of the determinants of digital inequality, is a step in the right direction. The difficulty of the Jung, Qiu and Kim formulation is that it leaves unclear the mechanisms through which inequality is generated, even when backed quantitatively with their measures.

A more sophisticated treatment of this problem can be found in DiMaggio and Hargittai (2001), who delineate five specific dimensions along which differences within the online population might generate inequality:

1. Differences in the technical means by which people connect to the Internet. This includes both connection means (broadband versus dial-up, etc.) and the quality of computer and other hardware.
2. User autonomy in using the Web. Can individual connect solely at work? Are their Internet sessions monitored? Are the sites they can visit limited by filtering software, as is often the case in public facilities?

3. Skill levels of users. Four different kinds of knowledge make up what they call 'Internet competence', 1) How to log on, 2) How to search the Web, 3) Basic knowledge about how the Web works and 4) Knowledge of computers and software that will allow users to solve equipment problems that occur.
4. User's levels of social support. Where can users turn when they have problems that they cannot solve on their own?
5. The purposes for which users use the Internet. There are numerous ends towards which the power of the Internet can be directed, some with greater long term benefits than others.

Beyond individual action and location, these factors are further shaped by structural and institutional arrangements, and by the actions of various types of organizations (including corporate, governmental and private).

In the case of Jung et al, one is left with an index with which one can compare communities or aggregated groups, however constructed. It is the responsibility of the analyst to determine how these numbers should be interpreted when making these comparisons, but on the whole, their index does provide a more reasoned understanding of how these groups/communities or individuals interact with technology; this still leaves unanswered the question of how these relationships produce differential outcomes, or inequality. Their shorthand answer is simply that cultural capital facilitates the creation of other forms of capital.

For DiMaggio and Hargittai the emphasis is making the causal mechanisms between technology and inequality clearer by analytically separating the dimensions along which differences may be found, while hypothesizing on the relationship between the dimensions of difference, its effect on Internet use and then finally on how differential effects produce differential outcomes.

Clearly, there is quite a bit of overlap between the Jung et al. and DiMaggio and Hargittai approaches. That being said, the DiMaggio and Hargittai, dimensions benefit from the concrete way in which one can say purposeful, instrumentalist action is facilitated or inhibited by differences within the online population that are readily identifiable, such as the types of computers used, the speed of connections, skill at locating information online and the like. Despite its length, the Internet Connectedness Index is a more comprehensive survey instrument, whereas the digital inequality approach has a tighter analytical focus on the specific ways difference produces unequal outcomes. It may very well be that underlying the analytical framework of digital inequality is a model of action that closely mirrors a cultural capital approach, but what is here privileged are the analytical distinctions created between problematics within the digital inequality perspective.

Hargittai's (2001) observational study on the role of online searching skills and the "Second Level Digital Divide" provides an insightful illustration of how this perspective can frame work on both the individual/technology relationship and broader concerns about inequality. By having respondents locate a variety of different types of information online, she was able to identify specific forms of information which respondents struggled to find (political and tax) and to identify user demographics that most affect this – namely age and experience.

Elaborating Digital Inequality: Of the five dimensions delineated, this article pays most attention to the particular activities that individuals engage in online. Hardware, software and skill deficiencies will mainly act as inhibitors to the activities users pursue online. A number of studies have attempted to measure the range and frequency of Internet user's online activities. The most recent UCLA (2003) study found that over its three year history that average time spent online steadily increased, from 9 to 10 and then 11 hours per week. The most popular Web activities were browsing, news, entertainment information, shopping/buying, hobbies, travel, medical information, playing games and tracking credit card information. There was also an increase in the percentage of users who thought of the Web as a 'very or extremely important' source of information, up to 67 percent from 60 percent in the two previous surveys. Interestingly, only 25 percent of respondents thought of the Web as a 'very or extremely important' source of entertainment. Another interesting aspect of this research illustrates the effects of experience on Web use. Not only does time spent online increase as experience increases, but experienced users also ranked the Internet as a more important source of information than other media, including books, television, radio and newspapers. In addition, though the UCLA researchers note that Internet users are heavier media users than non-Internet users on average, television use in particular dropped as Internet experience increased.

The Pew "African-Americans and the Internet" (Spooner and Rainie 2001) report looked specifically at the online behavior of Whites and Blacks. In general, the online Black population is much less experienced than its White counterpart. It contains more women, more of those in the lower income brackets, has a greater number with lower levels of education and is younger. Blacks were much less likely to go online in a typical day than Whites (36 to 56 percent), though they were more likely to have searched for information about "major life issues" such as jobs and housing, in addition to education related activities and job training. Blacks were also more likely to look for entertainment online, such as music, videos and audio clips. By and large however, the report notes a remarkable level of similarity between the populations in their daily online habits, and suggests that some of the differences might be the result of Blacks having a higher percentage of access exclusively from work. They also note the role experience plays in shaping the

Internet use, as more experienced users were more likely to go online on a typical day.

Similar to the Pew findings, Nie and Erbring (1999) also found that there was more similarity than difference between the online population, and what differences did occur could not primarily be explained by demographics. In multivariate analyses, they found that only 6 percent of the difference in Internet use was accounted for by demographic factors.

Nielsen/NetRatings also studies Web activities, but by using 'click stream' data, which records actual Internet user sessions. Their listing of the most popular White and Black Websites is shown in the first section of Appendix A. These are primarily portals and search engines, and there are no large discrepancies between Whites and Blacks. The data also allow sorting by unique audience composition percentage (UAC), or the percentage of visitors that is made up by a demographic category. Sorting by UAC, then, by total number of unique visits, gives a picture of what popular sites are viewed heavily by each group. These are reported in the second set of tables in Appendix A. Three of the top ten of these sites for Whites are pornographic sites, one is a gun site, and the rest include product information, financial services and hobby-oriented sites. While Blacks also look at product information, they are drawn more to music and entertainment sites, as well as job and education sites. As a caveat, the number of visits for this second set of sites show relatively equal numbers of visits; for Whites this represents a much smaller proportion of overall visits than for Blacks.

Using the 2000 GSS data, DiMaggio (2000) also investigated differential aspects of Internet use. Using his digital inequality framework, he investigated whether lower costs of information on the Internet would reduce or reproduce inequality, as information is now more readily available for anyone to capitalize on. Information is seen as a resource in increasing human-capital, though not all Internet activities are human-capital building activities. Breaking down the Web activities available in the GSS to capital-enhancing and recreational, his results indicated that race was not a significant predictor of using the Internet for either capital-enhancing or recreational purposes – though education and the GSS aptitude proxy were. His interpretation of these results suggests that while there are small differences in capital building and entertainment uses, aside from education affects, inequality is produced by the inability to translate information to material payoffs, as represented by the significance of the GSS aptitude proxy (the "wordsum" variable). Thus, despite similarities in usage, skill (or cognitive) differences prohibit some users from taking full advantage of the possibilities the available information the Internet provides – in particular the type of information that leads to human capital gains.

Expanding the Available Evidence: Much of the current research indicates a great deal of similarity within the usage patterns of those online. While DiMaggio's (2000) work in particular illustrates that similarity can still

breed inequality, the lack of adequate data on the outcomes of Internet use prohibits strong conclusions. In an attempt to move a step beyond this problem, this analysis uses a similar approach to DiMaggio, while using time spent online as the primary outcome variable. Rather than trying to see what predicts particular types of usage, this analysis instead attempts to understand what types of usage lead users to invest more time online, with Whites and Blacks analyzed as separate populations. Using a factor analysis, the 21 different Web activities are divided into 6 different dimensions (three 'productive' dimensions and three 'entertainment' dimensions), that, along with demographic variables, are used to predict time spent online.

Some Hypotheses: Thus this article argues that inequality is generated by Web use primarily through the accumulation (or lack thereof) of human capital, achieved through the information gained in certain types of Web activities. If Whites or Blacks were to focus primarily on entertainment activities online, while simultaneously the other group focused solely on human capital enhancing Web sites, this would indicate the possibility of inequality in how individuals were using the Internet – patterns of usage that might exacerbate or ameliorate offline inequities.

The GSS allows one to not only see if Whites or Blacks have participated in an online entertainment of human capital enhancing activity, but to test the effects of participation, and the frequency of participation, on time spent online. The implication of this model intuitively suggest that time online as an outcome variable is equivalent to utilities or payoffs. Because of data limitations, this simply cannot be tested. Additionally, this formulation suffers from a number of flaws, which Jung et al. (2001) have noted. That being said, time online can be interpreted as dispositions toward the technology shaped by the activities (and presumably the outcomes received from such activities) users engage in online. Thus decisions to spend time online, driven by particular types of Web sites, are constitutive elements in the individual-technology relationship.

The other dimensions of digital difference, such as hardware quality, autonomy of use, etc., act mainly as inhibitors to achieving ends online, and thus impact time online both ambiguously and indirectly. The proxies for the measures adopted here, which look at navigational sophistication, Internet knowledge and Internet social support, are of import to the extent that they frustrate achieving ends, with this frustration directly effecting time spent online. This frustration, however, can both increase and decrease time spent online, either by making users invest more time to find valuable information, or by making users give up due to the difficulty in finding relevant content. However, results from Pew, UCLA and SIQSS all show increased time online by greater level of experience, which also leads to increased reliance on the Internet as a source of information as well as increased confidence in online information. Consequently, it seems more likely that time spent online is related to payoffs in a positively reinforcing process, where payoffs lead to greater time

online, though mediated by temporally bounded, or task specific, feelings of frustration and efficacy.

The position taken here then is that time spent online is one indicator of the disposition that individuals have towards the Web, one shaped by the activities they engage in, and mediated by 'environmental' concerns such as location of use, quality of hardware, availability of support when faced with problems, and so forth. Ultimately, however, it is the behavioral component Web use that will determine how the Web will affect inequality. The following hypotheses are offered as an operationalization of this theoretical model:

H₁ = on the whole, the weight of Website visits across various Internet activities indicate more similarity than difference between Blacks and Whites

Because Blacks have both lower levels of access in a less experienced online population, it is hypothesized that:

H₂ = they will have lower levels of social support

H₃ = they will have lower levels of Internet skill and

H₄ = they will have lower levels of Internet knowledge

METHODOLOGY

Field Procedures: The year 2000 GSS was a personal in-home interview that usually took about 90 minutes to complete with a national probability sample of 2817 respondents aged 18 and older. The year 2002 GSS was identical, but had a sample of 2784. At each selected household, one adult person was interviewed at random using sampling procedures described below. The GSS survey has been conducted at one-to-two year intervals since 1972 by the National Opinion Research Center (NORC) at the University of Chicago, and is generally considered the premier social science instrument for monitoring social life and trends in the United States.

Sampling: Like its predecessors, the 2000 and 2002 national probability samples were selected in two major stages, with Primary Sampling Units (PSUs) consisting of one or more counties selected at the first stage and segments consisting of one or more blocks selected at the second. In a few cases, segments were sub-sampled, a procedure that constituted a third stage of sample selection.

The sample included 100 first-stage selections. The PSUs consisted of metropolitan areas or non-metropolitan counties. The metropolitan PSUs include metropolitan areas of all three types distinguished Consolidated

Metropolitan Statistical Areas (or CMSAs, which join the metropolitan area of a very large city with the adjacent metropolitan area of one of its suburbs), and New England County Metropolitan Areas. Prior to the PSU selection, the United States was divided into 2489 PSUs; the PSUs were then sorted into strata. The major strata again grouped metropolitan and non-metropolitan PSUs within each of the four Census regions. The non-metropolitan PSUs were further sorted by state; then, within state, by percent minority; and, finally, within populations who are minority group members; this encompassed everyone but non-Hispanic Whites. Percent minority groupings were formed by classifying each PSU according to percent minority quartiles within its major stratum. The metropolitan PSUs were sorted by Census division, minority quartile, and per capita income. The sample PSUs were selected using systematic selection, with the selection probability for a PSU proportional to the number of housing units. This selection procedure ensured proportionate representation along each of the sort variables. Nineteen PSUs (such as Chicago or Boston) were so large that they had to be included in the sample with certainty.

The second-stage sampling unit in the GSS national sample was again the segment, consisting of one or more adjoining blocks. The number of segments selected within a PSU again depended on the whether the PSU was a certainty selection. From three to 26 segments were selected in the 19 certainty PSUs; in each of the remaining 81 sample PSUs, three segments were selected. All told, the national sample includes 384 second stage selections.

Prior to selection, the segments within each sample PSU were sorted successively by: a) whether they were within the central city of a metropolitan area or outside of it (in metropolitan PSUs), b) state (in those PSUs that crossed state lines), or c) county, d) place, e) percent minority quartile within the PSU, and f) census tract (CT) or block numbering area (BNA). The sample segments were selected using systematic sampling with probability proportional to size (in housing units). Undersized blocks were linked to adjacent ones to assure that each segment included at least 50 housing units. Similarly, census tracts with fewer than 50 housing units were linked with adjoining CTs.

In the smallest PSUs, it was possible for a segment to be selected more than once. In such cases and when segments included unexpectedly large numbers of dwellings, a third stage of sampling was carried out. The segment was subdivided into pieces by a field count; based on the field count, one piece of the segment was selected with probability proportional to its estimated size. About 5 housing units per segment were selected. Because the year 2000 GSS instrument was subdivided into 6 versions that were spread across segments, the design effect was much lower than if all respondents in a segment answered the same version.

Interviewer Training: Professional interviewers hired and trained by NORC conducted the interviews. In addition to a 23 day *general* training

session before hiring, these NORC interviewers went through a mailed training session focusing on the various goals and modules of the year 2000 GSS. Interviewers made repeat visits to households at which no one was home, or the designated household respondent was not available. Enough repeat call-backs were made to such households that the main form of non-response was respondent refusal. Interviewers were able to complete interviews with 70% of designated respondents, compared to most GSS response rates that had exceeded 75%. The total of 2817 GSS respondents in year 2000 completed one of the six versions described below and shown in its entirety on the website www.webuse.umd.edu.

Questionnaire: Five of the six different versions or ballots in the year 2000 GSS, except ballot 3 ($n=454$), contained some Internet questions. That left 2363 respondents eligible for the Internet module questions on the remaining 5 ballots, with each ballot representing a separate (and minimally clustered) random sample of the country.

Adults: The full-probability GSS samples used since 1975 are designed to give each household an equal probability of inclusion in the sample. Thus for household-level variables, the GSS sample is self-weighting. Persons living in large households are less likely to be interviewed, because one and only one interview is completed at each preselected household.

Post-Stratification: In general the GSS samples closely resemble distributions reported in the Census and other authoritative sources. Because of survey non-response, sampling variation, and various other factors the GSS sample does deviate from known population figures for some variables. The GSS does not calculate any post-stratification weights to adjust for such differences. Relevant discussion of distribution variation caused by non-response and other factors is covered in the GSS Methodological Reports.

GSS Internet Use Questions: This analysis uses a variety of Internet use questions from the GSS: Internet site visitation, Web time estimates, navigational skills, computer/Internet social support, and a series of question on Internet knowledge (2002 only).

Most important are a series of questions that asked respondents to report the frequency of their use of various types of Websites over the last 30 days. Appendix B gives a complete listing of the 21 Websites included in this section. The questions cover a wide variety of sites, from work and educational sites to TV/movie and adult sites. Only a smaller subsection of the overall Year 2000 sample answered this series of questions. Specifically, respondents had to be Internet users, and had to have used the Internet for more than an hour a week (for ballots 4-6), or more than 4 hours a week (for ballots 1 and 2). All Internet users were asked these questions in the 2002 sample.

Additionally, analyses of the self-reported time spent online estimates are presented. This question simply asked respondents to estimate the number of hours and minutes that they spent online from home, work or other location in the previous week. The navigational skills questions asked respondents how often they used various Web navigation strategies to find things online, such as by using bookmarks or search engines. The social support questions asked respondents if they could turn to specific people, such as family members or work associates, for help with computer related problems. Lastly, in the 2002 dataset a series of questions asked how familiar respondents were with various Internet and technology terms, such as mp3's, ezines and newsgroups. These questions are shown in Appendix B.

Some remarks should be made concerning the use of the race variable across the two years. The race variable used for this analysis is a combination of two variables from the 2000 and 2002 GSS, *race* and *racecen1*. The *race* question, which is not used in the 2002 survey, has interviewers fill out the respondents race, only asking the respondent if it is not obvious to the interviewer what the race of the respondent is. While *racecen1* does ask the respondents race, in the 2000 data not all respondents are asked this question, though in 2002 it is the main race question, and the *race* questions is not asked. This leaves two 'standards' for computing race, one based primarily on interviewer identified race, the other respondent's self-description. In order to create a single race measure, a new variable was created *racez*. Respondent's self-identified race was privileged over the interviewers. If a respondent self-identified as either White or Black, they were coded as so on the *racez* variable. If they did not answer the *racecen1* question, as many in the 2000 survey did not, the *race* variable was relied upon. Since this analysis focuses solely on Whites and Blacks, all other races were coded as missing data, with the final tallies shown in Chart 2.

Internet Use in the GSS, Years 2000 and 2002: The year 2000 GSS had 2817 respondents, 2363 of which were actually presented with the core Internet questions, given the distribution of the questions across the ballots. In 2002 the Internet core questions were asked on every ballot, for an *n* of 2748. Respondents were asked if they used a computer and if they used WebTV. If they replied no to both of these, they were skipped to the next section.

Those with a computer were asked how many hours and minutes they spend answering emails. Additionally, they were asked if, aside from email, they ever used the Internet or the Web, and if so, they were asked to estimate their time spent in minutes and hours over the course of a week. In order to calculate the number of Web users, all those without a computer, or those with a computer that did not connect to the Web (even if they did other online

CHART 2: FREQUENCY OF WHITES AND BLACKS IN THE 2000 AND 2002 GSS

	<u>Year 2000</u>	<u>Year 2002</u>
Whites	2254	2175
Blacks	<u>431</u>	<u>402</u>
	2685	2577

activities, such as chatting and emailing) were coded as non-Web users. Roughly 958 of the possible 2363 respondents (41%) were connected in 2000, whereas 1524 of the possible 2685 (57%) were connected in 2002. In order to determine the number of respondents who were Web users, a new variable was created based upon the time estimates of the *wwwhr* variable. This essentially copies the original values over from the *wwwhr* variable. Respondents that were not computer users, did not use the Web, and did not use WebTV were coded as having zero hours of Webtime. This was then coded into a variable called *Webyesno*, which was coded 1 (yes) for any respondent who had more than 1 minute of Webtime, and 0 (no) for any respondent that had no Webtime.

This strategy was followed for a number of reasons. Most notably was that without use of the computer, Web and WebTV variables, one could not know what proportion of all those that might be Web users actually were. Thus the best measure for this is to see who has Web time, who doesn't, and if not, why. If it is because they don't have access, or just don't use the Web, they are coded as zero hours. If they have no Webtime listed because they simply were not asked the question, then they are coded as a not asked, a missing value. Email users were not counted in this, as this study has focused primarily on Web use. Thus, the online percentages presented here are to some extent not comparable to those that include email use as being 'connected'.

Whites were connected at much higher rates than Blacks in the GSS. In 2000, almost 45 percent were connected, versus just 24 percent for Blacks. By 2002, the numbers had grown to nearly 60 percent and 42 percent, respectively. Across both years, 53 percent of Whites were using the Web while 34 percent of Blacks were online.

Much as one would expect, there are marked upward trends from 2000 to 2002 in many demographic categories. Among older Americans, those over 65, 13 percent of Whites and no Blacks were connected in 2000, while the numbers in 2002 stood at 22 percent and 7 percent. The gaps between the sexes were erased or reversed during this period: The gap between White males and females went from 9 points to 2, while Black females moved from a 6 point deficit to a positive 2 point gap.

As Figure 1 and Figure 2 demonstrate, gains were also made at almost every income and educational level (note that since not all respondents answered the respondent's income question, there is a slightly smaller sample size for this graph). By and large these also translated into smaller gaps between Whites and Blacks within important education and income demographic groups, with lower educated Blacks making significant strides in

FIGURE 1: WEB USE BY INCOME, RACE, AND YEAR

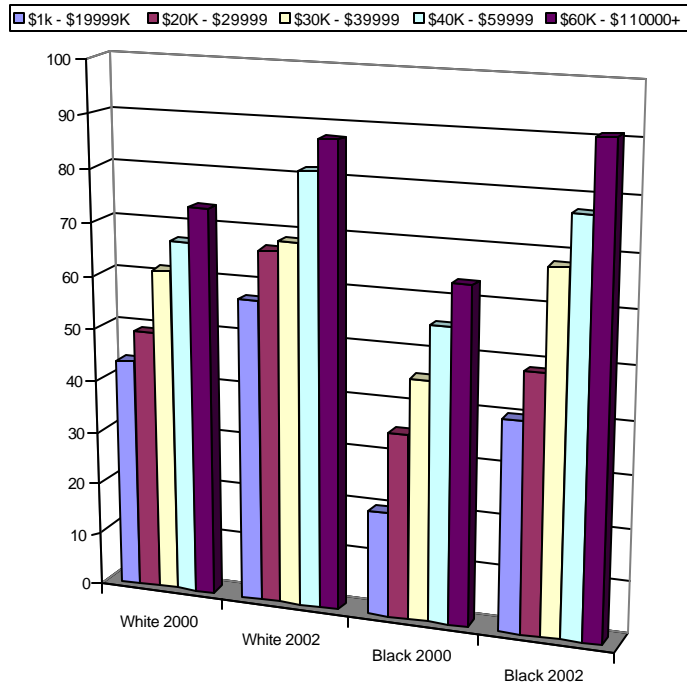
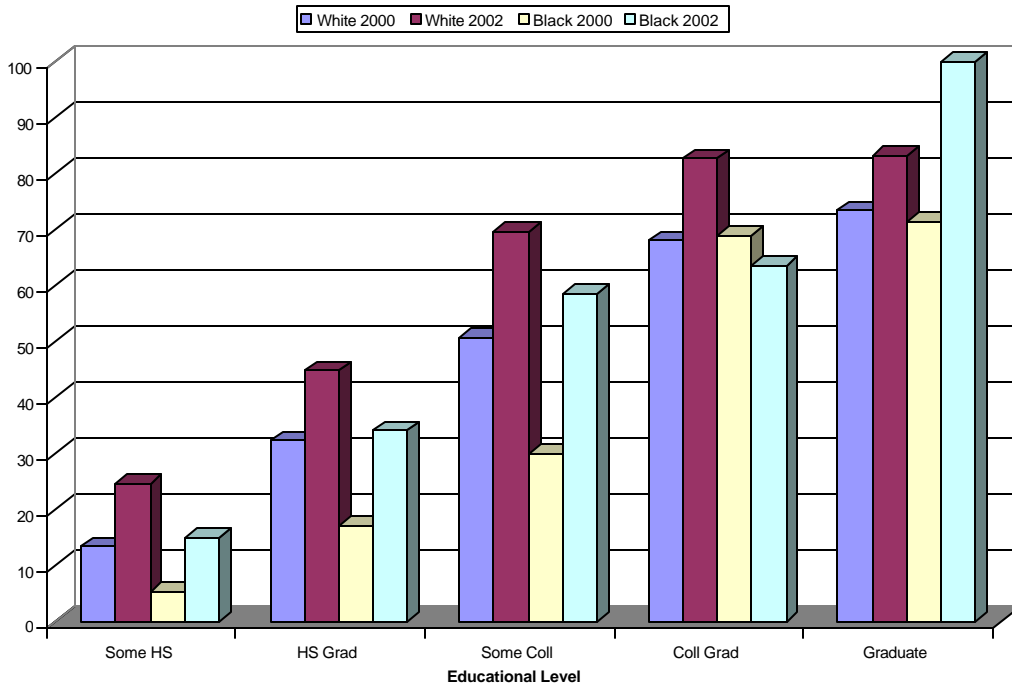


FIGURE 2: WEB USE BY EDUCATION, RACE AND YEAR



closing the gap on their White counterparts. A wide gap appeared between White and Black college graduates, as well as between those with a graduate education (with a high proportion of Blacks online, possibly due to the sample size for Blacks in these categories). Changes within income categories suggest that while some small gains have been made in closing the gap between less affluent Blacks and Whites (those earning under \$30,000), those making the most gains are their more affluent counterparts, even exceeding White use within the high income bracket (\$60,000+).

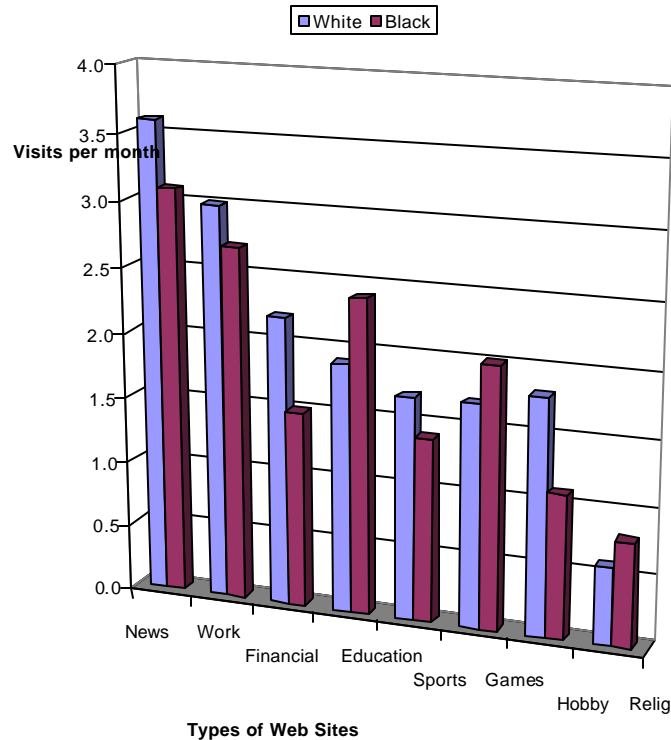
RESULTS

The core of the following analysis is based on two series of GSS questions. The first asked respondents to estimate their weekly time spent online, both minutes and hours. The hours were converted into minutes and the variables were summed to get total Web time. In terms of absolute amounts of Web usage, Whites and Blacks estimate remarkably similar amounts of time online. Whites average roughly 327 minutes (5.5 hours) per week, while Blacks average 312 minutes (5.2 hours) per week, a difference of only 15 minutes per week.

The second series of questions asked respondents how many times they visited certain types of Websites in the last 30 days. There were 4 answer categories for each question: never, 1-2 times, 3-5 times and more than five times. The answer categories were averaged (with the upper category set as 7) to produce a numerical answer suitable for use in regression.

Looking at mean frequencies of Web site visits illustrates a pattern of similarity mirrored in the time estimates. Figure 3 graphs the more popular Web sites for Whites and Blacks. The biggest differences are in news, financial, educational and hobby related sites. However, these differences represent at most half a visit over the course of a month. More importantly, levels of use seem roughly equal with the only noticeable differences being in financial and hobby sites. Financial site differences might be explained simply from higher levels of wealth among Whites, as well as a higher percentage with a bank account. No other sites differed by more than 0.3 visits a month, again demonstrating the remarkable similarities in White - Black Internet activity patterns. It is worth noting here that religious, sports and music (not shown) are roughly comparable, although Blacks do show slightly higher use of religious sites (one of the few, along with games, educational and government sites).

These Websites were entered into a factor analysis (using varimax rotation) which yielded 6 dimensions. These 6 dimensions are broken down into either productive (social or human capital enhancing) or entertainment (hobby, music, TV or movie related, adult sites), and the full categorization can be seen in Appendix C.

Figure 3: White/Black Differences in Web Site Frequencies (years 2000/2002 GSS)

The first dimension is a news and service oriented factor that includes financial, government, political, and work related sites, in addition to news sites. The second dimension is a mobility factor, comprised of school and education related Web sites. The third dimension is an 'idle' factor, representing time-passing sites such as games, humor sites, personal Web pages and hobby related sites. The fourth dimension is a lifestyle factor, including travel, health, cooking and religious sites. Factor five is the quintessential 'entertainment' factor, including sports and music sites, TV/movie sites and pornographic sites. The sixth dimension is a factor that includes only art and science sites.

It should be noted that this grouping is based on a factor analysis done on the complete GSS 2000 dataset, but is almost completely replicated in the 2002 data. After combining the datasets, then, similar results are obtained. In order to replicate these dimensions in the data, simple additive scales were created, summing the activity frequencies for each factor to create new variables. This was done across the 2000 and the 2002 datasets.

One interesting question is how this particular mix of activities differs between the two groups. Table 1 shows the ratio of entertainment use to productive use for Whites and Blacks (mean ratio). Whites view, on average, 1.3

entertainment sites for every productive site, whereas Blacks view 1.2 entertainment sites for every productive site.

Table 1 also shows entertainment and productive visits as percentages of total visits. One again sees the remarkably similar habits of the two groups. For both Blacks and Whites, entertainment is slightly less than half of all visits, and productivity sites are slightly more than half.

It is not possible with the available data to determine whether or not Internet time draws away from other media. Several analyses of media diffusion, such as Robinson and Neustadt (2002) and Robinson et al. (2002), generally show inconclusive evidence of functional equivalence displacement of other media time. The most recent UCLA study (2003) does show that as Internet experience increases time watching TV decreases. Though the year 2000 GSS has no reliable Internet experience variable, an analysis of year 2002 GSS respondents shows little support for this. Figure 4 shows mean TV time by Internet experience in the year 2002 GSS. Decreasing time spent watching TV might suggest that the Internet is increasingly thought of as an entertainment medium. Unfortunately, small sample sizes do not allow for a breakdown by race.

In both the Nie and Erbring (2000) and the UCLA (2003) studies, greater levels of experience are associated with more time spent on the Web, a trend that does indeed continue for Whites and Blacks in the GSS, as shown in Figure 5. Arguably, this illustrates greater Web immersion and suggests that, the longer individuals have been using the Web, the more they see it as a worthwhile investment of time. It should be noted that the high estimates for relatively recent Black users is questionable given the very small sample sizes in these categories.

Social Support: The GSS contains a number of questions asking respondents who they can turn to for computer or software assistance. Respondents were asked about a variety of relationships, twelve in all, from family members and peers to coworkers and acquaintances (see Appendix B for question listing). These questions were simple yes/no questions. In order to compare the two groups, the response categories were dichotomized to yes (1) or no (0), and then each respondent's answers were summed into a scale. The first column in Table 2 shows the mean levels of social support for each group. Despite a small sample size for Blacks, the two groups seem to have roughly equivalent opportunities to seek out Internet social support within their networks. On a twelve point scale, Whites score 4.6, while Blacks score 5.3, a statistically significant difference at the .05 level.

TABLE 1 : MEAN VISIT PERCENTAGES AND MEAN RATIO OF WHITE AND BLACK ENTERTAINMENT AND PRODUCTIVE VISITS IN LAST 30 DAYS

	Entertainment	Productive	Total Visits	Ratio
Whites	47.5%	52.5%	30.7	1.3
Blacks	47.6%	52.4%	28.1	1.2

FIGURE 4: TV HOURS/WK BY WEB EXPERIENCE

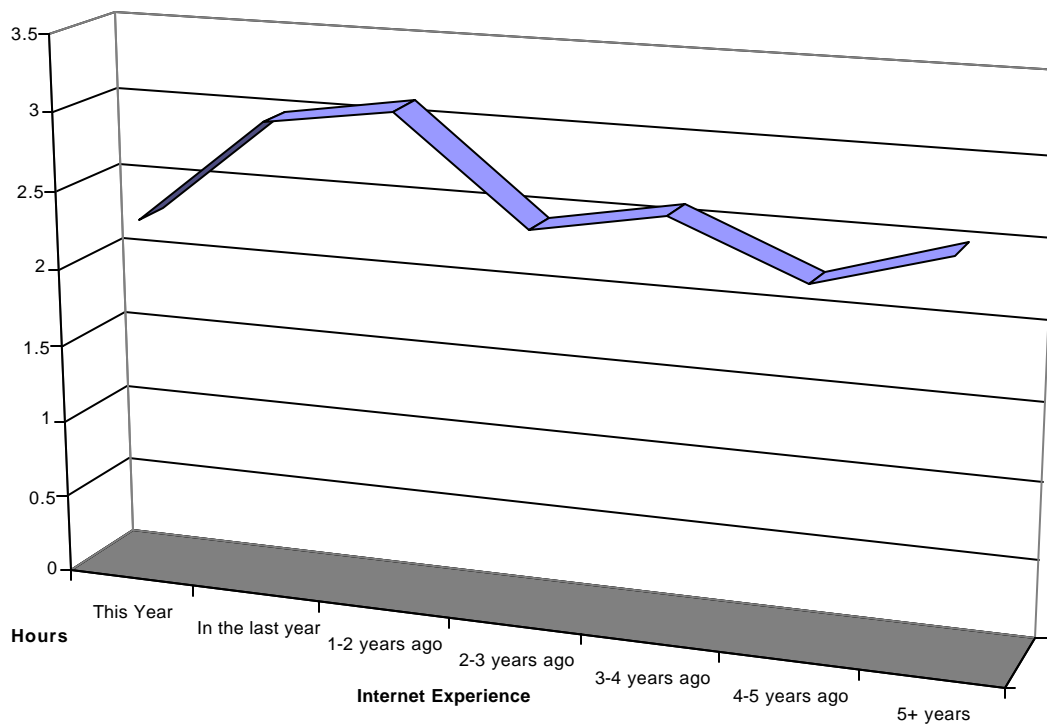
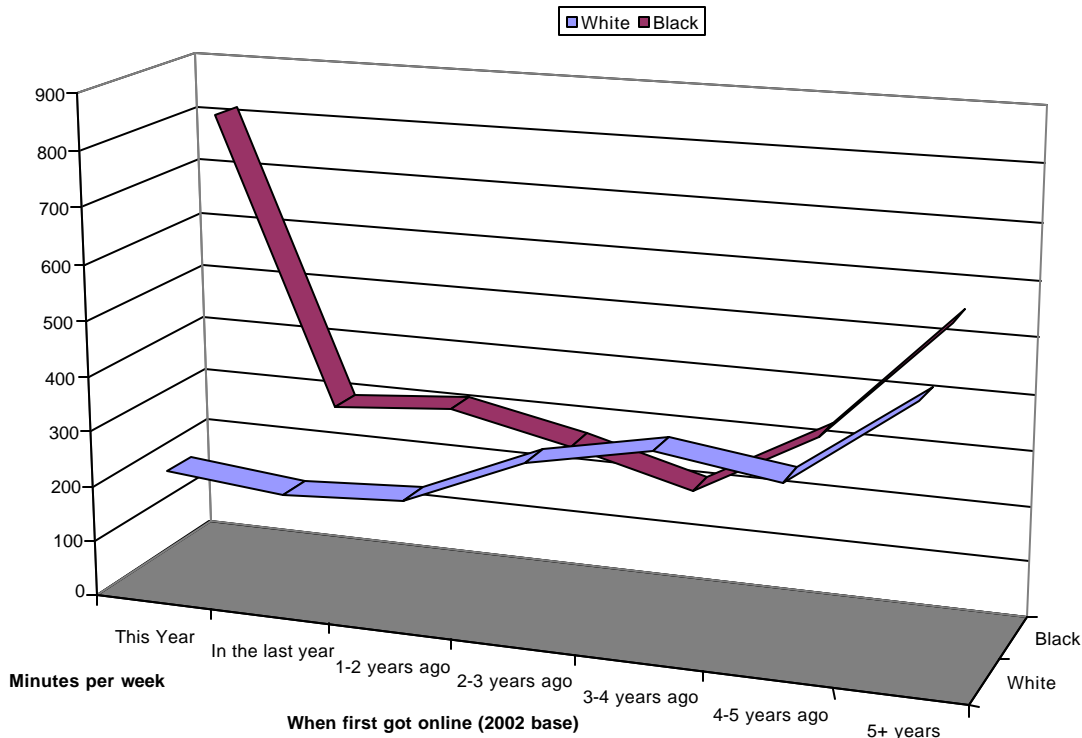


FIGURE 5: WHITE/BLACK WEB TIME DIFFERENCES BY EXPERIENCE (YEAR 2002 GSS)

Internet Knowledge: The year 2002 GSS also asked a series of questions probing whether or not respondents were familiar with different Internet concepts or phenomenon. Respondents were asked whether they were familiar with mp3's, ezines, newsgroups and a number of other similar such items. An additive scale was created from these questions, with the Black and White mean scores presented in the second column of Table 2. Whites appear to have a slightly higher average level of knowledge, scoring 6.3 on a scale of 9, with Blacks scoring 6.1. Again the overall levels are quite similar, and this difference is not statistically significant.

TABLE 2: MEAN SCORE FOR BLACKS AND WHITES ON INTERNET SOCIAL SUPPORT, INTERNET KNOWLEDGE AND NAVIGATION SOPHISTICATION

	Mean score on Internet social support scale for Whites and Blacks (sample size in parenthesis, 2000 and 2002)	Mean score on Internet knowledge scale Web for Whites and Blacks (sample size in parenthesis, 2002)	Mean score on Internet navigation sophistication scale for Whites and Blacks (sample size in parenthesis, 2000 and 2002)
	Score	Score	Score
Whites	4.6 (955)	6.3 (270)	6.2 (801)
Blacks	5.3 (106)	6.1 (26)	5.6 (85)

Navigation Sophistication: An additional set of questions asked respondents how they navigated the Web. Respondents were asked if they ever typed in url's, used search engines, direct links from home pages and a variety of other navigational strategies. The possible responses were: never, less than half of the time, about half of the time, more than half of the time, and almost always. This was also turned into an additive scale, with a weight (of 2) added to search engines and bookmarks, as they are the more 'sophisticated' of the navigation styles. The answer categories were recoded to a dichotomous variable, with 0 representing almost never or less than half of the time and 1 representing any more frequent use. This was then summed (including the weight) to create the scale. The third column in Table 2 displays the results of this analysis, with Whites having a slightly higher mean score (6.2) than Blacks (5.6). Though this is a statistically significant difference (at the .05 level), the scores seem substantively similar.

Determinants of Time Spent on the Web: The analyses thus far have looked at simple online behavioral patterns, as well as some important environmental factors that might affect time spent online. However, this has yet to address how particular Web activities are associated with more or less time online. This is an important measure for digital divide research – to the extent that it explicates what sorts of purposes leads to greater investment of time in Web use, productive, social and human capital building functions, or entertainment related activities. Thus, these results speak directly to the mechanisms through which digital inequality might be generated or exacerbated. It also allows one to specify the activities of importance for two groups that inequality researchers have a vested interest in understanding, namely Whites and Blacks. Table 3 present the results of the regression for

TABLE 3: REGRESSION RESULTS FOR WHITE AND BLACK WEB USERS

(STD. ERROR IN PARENTHESES)

	<u>Whites</u>	<u>Black</u>
Constant	267.8(117.1)	548.7 (366.0)
Income	2.0(2.7)	-3.0(9.9)
Sex	-32.8(31.0)	-140.0(94.3)
Education	-5.2(6.2)	-23.1(18.4)
Age	.3(1.3)	6.8(4.5)
News and Services	10.4*(2.1)	6.3(6.2)
Mobility Oriented	6.8(1.3)	28.0*(13.0)
Idle Time	15.7*(2.8)	-1.7(0.8)
Lifestyle	-4.6(3.2)	-13.2(10.0)
Entertainment	16.2*(4.0)	33.2*(14.3)
Arts and Sciences	7.3(5.8)	11.9(18.7)
R sq.	.142*	.187*

Whites and Blacks, respectively. Note that for both groups no demographic factors are significant predictors for time spent online. For Whites, the significant variables are the News and Services factor, as well as the Idle Time factor and the Entertainment factor. For Blacks, the Mobility factor is significant, as is the Entertainment factor. The model explains about 14% of the variance among Whites and 19% of variance in Blacks. Significance reported is at the .05 level.

Interestingly, the education variable, while not significant, appears to have a negative effect on time spent online, a surprising result given earlier work documenting the relationship between education and online activities (DiMaggio, 1999). A more in-depth analysis finds that, among both Whites and Blacks in the low education categories, there are large estimates of time spent online. Some of these estimates seem consistent with their reported experience level, where that data is available, but it is clear that many of the highest time estimates are included in this group. Given the strength of the Mobility factors among Blacks, as well as the slight negative effect of income, the models were rerun to determine the stability of the findings, this time excluding all those without a high school diploma. This did not substantively change the results, as Whites and Blacks had the same factors remain significant with similar strength of effects. None of the demographic factors are affected by this change, and education still displays a slightly negative effect, but again it is not significant. Additionally, there appears to be stronger age and gender effects within the Black online population, but again neither is significant.

Discussion: The findings presented here suggest less concern about digital inequality created through behavioral differences, and they instead raise questions about simple access being at the forefront by showing that Blacks and Whites who access the Internet do so in fairly similar ways, at least in the aggregate. These results indicate that the Internet is neither solely a productive

nor entertainment medium for Whites or Blacks. However, different dimensions within the entertainment and productive activities drive each group. The clickstream data presented in Appendix A provides some corroboration of this, as the aggregate numbers show very similar site visitations, while the lower level detailed 'White' and 'Black' sites show some interesting differences.

In terms of the four main hypotheses stated above, these results support hypothesis 1, clearly showing a great deal of similarity between White and Black online activity patterns, as do the Table 3 regression results. Black's focus more on education and school-related activities, which strongly affect their time spent online. That being said, the differences that do exist have important implications. Whites appear to have more variation in their Internet interests, while Blacks are clearly attracted to education-related sites, perhaps for the economic opportunities they offer for mobility. This would be consistent with earlier Pew, UCLA, NTIA and other studies showing that Blacks were much more likely to look for job and education-related information. The significance for both Whites and Blacks of Entertainment sites, many of which replicate entertainment content that can be found on TV, illustrate the continuing relevance of studies investigating functional equivalence among media, particularly among entertainment-oriented media.

Additionally, the strength of the Mobility factor among Blacks, directed explicitly towards human capital gains, could very well have long term implications. The lack of an outcome variable that illustrates either successful task completion or that measures the user's capability to translate information and opportunity into payoffs should temper any strong claims about real world benefits, however.

Hypotheses 2, 3 and 4 can be clearly rejected. Despite lower numbers online, overall and proportionally, Blacks have very similar levels of Internet social support when compared to Whites. Despite what is generally recognized to be a much less experienced online population (Spooner and Rainie 2001), Whites and Blacks demonstrated similar levels of Internet knowledge, skill and navigational sophistication.

The skill, navigation and support results can be interpreted to suggest that Blacks are, at least at this point in time, as capable as Whites in using the Internet to locate information relevant to their lives, again an encouraging finding.

CONCLUSIONS

This analysis has attempted to integrate work across a number of levels. First, it moves beyond a notion of Internet access as an unmitigated good, instead focusing on the processes through which Internet use can be made to generate positive outcomes, such as increased human capital, thus illuminating how the various potentials of the Internet may be exploited. As TV is dominated by entertainment programming – even if it simultaneously attempts to inform,

it is not unrealistic to attempt to anticipate whether the Internet will follow a similar fate. Indeed, research that illustrates declining TV times with increased Internet time is suggestive of the entertainment role of the Internet, especially in relation to its alternatives.

The results presented here suggest that the Web is considered both a productive and entertainment medium for both Blacks and Whites. Differences in the degree to which productive and entertainment functions drive increased investment of time online suggest patterns of technology use which might produce inequalities between the two groups. Additionally, it reinforces the validity and necessity of programs and studies dealing with even simple access, as empirical studies, such as the one undertaken here, continue to find behavioral similarities between different online populations.

Thus, despite the current administration's attempt to define Americans as a "Nation Online", notable gaps in Internet access persist and are indeed important when one considers the positive gains to be had once online, whether Black or White. More specifically, findings which demonstrate differences in home use versus office use, as well as differences between broadband and narrowband, illustrate that not all access points are created equally. The benefits of broadband usage have been understudied and represent another stratifying factor in access and use of the Internet.

Given the feelings of relative deprivation due to the fact that Blacks lag behind Whites economically in the aggregate, it is not surprising to see that the strongest motivator of Black Web time is linked to mobility opportunities, such as education. While it is still unclear that time spent online leads to successfully achieved goals or outcomes, it can at least be said that relatively equivalent levels of Internet social support, navigation skills and Internet knowledge suggest similar levels of competency in locating relevant information. It is imperative to understand the ways in which technology use will ameliorate or exacerbate different forms of inequality. Technology by itself is not going to bring effective equality of opportunity to marginalized and dispossessed groups, but through understanding the ways in which people are using new information technologies, one can begin to disentangle the complex implications they have for improving life chances.

As a corollary at this first level, this article has proposed a clear analytical strategy for understanding the relationship between one form of technology use (visiting Websites) and inequality. The digital inequality approach discussed and adopted here articulates some of the mechanisms through which inequality might be generated. Within this line of reasoning is an acknowledgement that technology within the information age, as in other periods of history, has presented individuals, communities, organizations, institutions and even nation-states with novel forms of acting and organizing. This suggests the necessity of reevaluating processes that have been subtly, and sometimes profoundly, transformed. Implicit in the current analysis is the argument that the processes that generate inequality, ranging as they do across

all varieties of human behavior, represent one such area that would benefit from understanding how previously studied patterns of activity and interaction have been reformed. The work of Beniger (1986) and Castells (1996, 1998), are notable exemplars of this form of analysis.

Lastly, on a more fundamental level, the current analysis makes certain claims about behavior, economic action (in the Weberian sense) and technology. To some degree, it assumes that Web use can be characterized as rational action directed towards knowable ends, or payoffs. Thus, one might characterize this as an analysis of revealed preferences, one that tries to identify the new pathways that individuals use to achieve mobility, of whatever type. Conceptualized as such, it is in some ways at odds with the 'cultural capital', communication infrastructure approach suggested by Jung, Qiu and Kim (2001). These two visions may be reconciled by noting that rational economic action is often thought of as being 'embedded' (Granovetter 1985; Polanyi 1952), a notion that allows for the incorporation of a wide range of individual, institutional and organizational factors in shaping action. Jung, Qiu and Kim (2001) contend that the individual/technology relationship is heavily shaped by cultural capital and habitus. An alternative that would allow for a more parsimonious, and therefore (at least in this case) more powerful, explanation – and which might allow us to avoid the claim of taking an overly economic perspective on behavior – is to suggest that whatever notion that individuals have about the uses and benefits of technology is heavily shaped by this embeddedness – their personal relationships and relations to any number of mediating institutions. The results here then have only analyzed online activity patterns, irrespective of their location within social structural systems that cannot be approximated through gender, education and income, while acknowledging that any individual's motivation, use and rewards are subject to a host of social influences.

Digital inequality research should concern itself with the transformation of the mechanisms of inequality in the information age. It should come to terms with the evolution of organizational forms as individuals and communities assimilate the advance communication and networking capabilities of information technologies. Sociologists and other Internet researchers are only beginning to understand much of this, but the work of Castells, Wellman and others offer steps in the right direction, as they specify both differences within the prerequisites of inclusion into the online world, as well as the ways to conceptualize how technology dependent 'social networks' emerge and structure social relations. It is not unreasonable to question whether the patterning of the allotment of rewards (both symbolic and material) has been transformed by the alteration of social forms, by new organizational and communication capacities, and by new modalities of action and identity – as brought about by responses to technological change.

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Appendix A: Most Popular Websites by Race from Nielsen/NetRatings

TABLE 4: MOST POPULAR WHITE WEB SITES

Demographic Targeting (Internet Applications Included) – Site Period: Month of January 2003 Panel Type: Home Location: US		
Target Audience: Race: White	Unique Audience	Unique Audience Composition
Site	(000)	(%)
Yahoo! -	59460	89.45
AOL -	55660	88.49
MSN -	54866	89.22
Microsoft -	52371	89.42
Google -	26666	90.84
eBay -	25152	91.44
Amazon -	22942	90.15
Lycos Networks -	19601	89.38
Real -	18610	87.88
About Network -	14271	89.88

TABLE 5: MOST POPULAR BLACK WEB SITES

Demographic Targeting (Internet Applications Included) - Site Period: Month of January 2003 Panel Type: Home Location: US		
Target Audience: Race: African American	Unique Audience	Unique Audience Composition
Site	(000)	(%)
AOL -	5306	8.44
Yahoo! -	4856	7.3
MSN -	4510	7.33
Microsoft -	4215	7.2
Real -	1910	9.02
Amazon -	1536	6.04
Google -	1476	5.03
Lycos Networks -	1474	6.72
eBay -	1385	5.03
KaZaA -	1336	9.26

TABLE 6: WEB SITES WITH HIGHEST PERCENTAGE OF WHITES VISITS

Demographic Targeting (Internet Applications Included) - Site Period: Month of January 2003 Panel Type: Home Location: US		
Target Audience: Race: White	Unique Audience (000)	Unique Audience Composition (%)
Site		
rockler.com – Hobby	331	100
Xxxmickey.com – Adult	293	100
Gunbroker.com – Prod Info	292	100
proxyvote.com – Financial	283	100
Visualtour.com – Prod Info	263	100
Broenink-art.nl – Art	250	100
CenturyTel – Prod Info/Long Dist	241	100
Pinkcenterfold.com – Adult	235	100
Nude-in-public.tv – Adult	235	100
Skillhosting.com – Adult	231	100

TABLE 7: WEB SITES WITH HIGHEST PERCENTAGE OF BLACK VISITS

Demographic Targeting (Internet Applications Included) - Site Period: Month of January 2003 Panel Type: Home Location: US		
Target Audience: Race: African American	Unique Audience (000)	Unique Audience Composition (%)
Site		
Zjamz.com – Music	175	76.89
BlackPlanet.com – Portal News/Culture	755	75.72
BET Interactive – Entertainment	369	58.04
NBA Internet Network – Sports	396	19.04
Sony Music – Music	390	16.03
U.S. Office of Personnel Management – Job Related	165	15.81
Sprint – Prod Info	429	15.35
U.S. Dept. of Education – Education	354	14.75
Keen – Portal News and Advice	300	14.28
BellSouth – Prod Info	351	14.21

APPENDIX B: Questions from the General Social Survey (GSS)

Time Spent Online:

wwwhr	WWW HOURS PER WEEK
Text of this Question or Item	
7. Not counting email, about how many minutes or hours per week do you use the Web? (Include time you spend visiting regular Web sites and time spent using interactive Internet services like chat rooms, Usenet groups, discussion forums, bulletin boards, and the like.)	

Wwwmin	WWW MINUTES PER WEEK
Text of this Question or Item	
7. Not counting email, about how many minutes or hours per week do you use the Web? (Include time you spend visiting regular Web sites and time spent using interactive Internet services like chat rooms, Usenet groups, discussion forums, bulletin boards, and the like.)	

INTERNET SOCIAL SUPPORT

Do the people you can ask for advice include?

a. Spouse or partner	Yes	No
b. Son or daughter	Yes	No
c. Mother or father	Yes	No
d. Brother or sister/brother -/sister-in-law	Yes	No
e. Other family	Yes	No
f. A teacher	Yes	No
g. A fellow student	Yes	No
h. A supervisor or trainer at work	Yes	No
i. Other co-worker	Yes	No
j. A close personal friend	Yes	No
k. Other friend or acquaintance	Yes	No
l. A librarian	Yes	No

VISITING WEB SITES

In the past 30 days, how often have you visited a Web site for _____?

	Never	1 – 2 times	3 – 5 times	More than 5 times
a. Financial Information	1	2	3	4
b. Sites related to a school attended	1	2	3	4
c. Other educational site	1	2	3	4
d. Sites related to your work	1	2	3	4
e. News and current events	1	2	3	4
f. Government information	1	2	3	4
g. Political information	1	2	3	4
h. Travel	1	2	3	4
i. Sports	1	2	3	4
j. Music/concerts	1	2	3	4
k. Visual art/art museums	1	2	3	4
l. Television or movies	1	2	3	4
m. Health and fitness	1	2	3	4
n. Religion/church related	1	2	3	4
o. Games you can play on your computer	1	2	3	4
p. Humor	1	2	3	4
q. Sexually explicit material	1	2	3	4
r. Personal home pages	1	2	3	4
s. Science	1	2	3	4
t. Hobbies and crafts	1	2	3	4
u. Cooking, recipes	1	2	3	4

NAVIGATION QUESTIONS

Now I'd like to ask you about how you navigate around the Web. How frequently do you ...

	Never	Less than half of the time	About half of the time	More than half of the time	Almost always
a. Use a direct link from your starting page (the page that you see when you go onto the Web)	1	2	3	4	5
b. Type (or paste in) the Web address yourself	1	2	3	4	5
c. Use a search engine	1	2	3	4	5
d. Use a bookmark	1	2	3	4	5
e. Go to a category directory or Web guide and select an option	1	2	3	4	5
f. Go from a hyperlink in another site that you are visiting	1	2	3	4	5

INTERNET KNOWLEDGE:

a. Can Respondent give the Name of a Web browser?	Yes	No	
	Very Familiar	Somewhat Familiar	Not Familiar
b. How familiar are you with the term Advanced Search?	1	2	3
c. MP3?	1	2	3
d. E-Zines?	1	2	3
e. Preference Settings?	1	2	3
f. Newsgroups?	1	2	3

APPENDIX C: FACTOR ANALYSIS DIMENSIONS OF GSS WEBSITE QUESTIONS**TABLE 8: ACTIVITY COMPONENTS OF FACTORS FROM FACTOR ANALYSIS (LOADINGS IN PARENTHESES)**

<u>News & Services</u>	<u>Mobility Oriented</u>	<u>Idle</u>	<u>Lifestyle</u>	<u>Entertainment</u>	<u>Arts & Science</u>
Financial Sites (.683)	School Related Sites (.844)	Games Related Sites (.686)	Travel Sites (.468)	Music Sites (.721)	Art Sites (.681)
Work Related Sites (.638)	Education Related Sites (.748)	Humor Sites (.706)	Health Sites (.744)	TV/Movie Sites (.622)	Science Sites (.463)
Political Sites (.560)		Personal Web Pages (.561)	Religious Sites (.509)	Pornographic Sites (.661)	
News Sites (.678)		Hobby Related Sites (.577)	Cooking Sites (.605)	Sports Sites (.363)	
Government Sites (.666)					