

## **Introduction to Issues 4 and 5 Digital Divides: Past, Present and Future**

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Many social issues have surfaced as a result of the Internet's diffusion in society: its effects on social life, its relation to previous mass media and its impact on politics and business, among others. However, probably none has attracted as much scholarly and policy attention as what is commonly referred to as the "digital divide". The term was originally used to publicize findings from 1990's NTIA national surveys that showed the large differences in IT access by low income groups, minorities, women and the elderly, among other groups in society. (The term was reportedly coined first by former Markle Foundation President Lloyd Morrisette to describe much the same phenomenon). Whatever its origin, the term has been widely interpreted to cover a variety of gaps in American society, as well as differences between the US and other Western countries and the rest of the world.

### DIGITAL DIVIDES IN USE

In this Issue 5 of *IT&Society*, which is essence the second half of Issue 4, a number of concerns and publics are examined to illustrate the variety of findings and conditions that are thought to come under the "divide" umbrella. In the call for papers for this issue, contributors were encouraged to move beyond the usual definitions of the divide in the sense of simple access, and to focus attention instead on social processes and behavior once access had been achieved. Did one find that there were divides in Internet usage, such as in amount of time spent or number of Websites visited? Were users more engaged in social networks that allowed them to find more rewarding sites or to alert them to more useful content? Were certain users likely to be more adept in their Internet searches? Did they enjoy greater autonomy in their Internet access?

The Robinson, DiMaggio and Hargittai article that leads off Issue 5 addresses these concerns about digital inequality in use, that is once Internet access in the home has been realized. The authors first point out that the major predictor of Internet access in NTIA (and other) surveys is not a person's income but his or her level of education. Using General Social Survey (GSS) evidence from years 2000 and 2002, they then examine education differences *among*

*Internet users* in terms of five aspects of Internet sophistication. They find that the college educated demonstrate more advantage over the less educated on these aspects, such as knowledge of Internet terms and better and more autonomous access, but particularly in terms of the types of Internet sites visited. The college educated user is significantly more likely to visit sites that build on their human capital or enhance their life chances, such as sites related to work, education or health; conversely, the college-educated user is less likely to visit sites with entertainment or personal content. On certain other aspects of use like having social support from relatives and Internet search strategies, however, little difference by education is found.

Evidence for increasing divides in the GSS data was also the basis of the Issue 4 article by Robinson and Neustadt, in which year 2000 GSS respondents were reinterviewed of year 2001. These panel data afford the opportunity to test dynamic or possibly causal hypotheses about Internet use and the hundreds of other behavioral and attitudinal correlates collected by the GSS. In this dynamic context, most of the attitudinal multivariate correlates of Internet users in the static 2000 GSS data (described as a “diversity divide” and the items for which are presented in Appendix A) are found not to replicate using the panel data. One that does hold up, however, is the greater trust in people expressed by Internet users, a question series that showed considerably increased trust in the 2001 reinterview (probably as a result of the events on 9/11). While the increase was found among both users and nonusers, it was significantly higher among Internet users – and importantly by those who had become Internet users between the year 2000 and 2001 interviews. Behaviorally, by using the same comparison method, increased Internet use was related to less viewing of television, but not to the lower sexual activity, church going, newspaper reading or socializing suggested by the static 2000 data.

The digital divide in use is not isolated to America, as de Haan documented in his Issue 4 study of predictors of Dutch Internet behavior. Here again, one finds that education and age are the main predictors of use as well as access, along with certain psychological factors – especially as related to whether one is an “innovator” or “late adopter” in the societal diffusion process. Innovators and early adopters also become more adept at understanding Internet features and also using the Internet for making purchases and for meeting new people for social purposes.

The next article in Issue 4 on general digital divide topics, by Cho and his colleagues at the University of Wisconsin, was based on the mass communication literature dealing with the “uses and gratifications” that users of earlier communications media derived from the TV programs they viewed or the newspapers they read. Based on a secondary analysis of a Pew 2001 national survey, the authors find that younger and higher-status users use the Internet to satisfy their motivations strategically and to gain the desired gratifications. In contrast, younger and lower-status users employ consumptive strategies to attain

connection gratifications. Older and younger low-status groups used their interactions to gain learning gratifications.

*OVERALL DIGITAL DIVIDES IN ACCESS:*

Martin's lead article in Issue 4 focused most directly on traditional access concerns. While there have been many criticisms of the NTIA's 2002 report (which in 1990s editions of the NTIA reports had first drawn attention to the digital divide issue), Martin's article directly questions some key methodological assumptions about the measures employed in the 2002 report to conclude that America's digital divide problem was essentially healing itself. Martin finds inherent problems in using the "Gini coefficients" developed by economists to measure inequality – such as its inevitable increase as technologies diffuse and the report authors' failure to examine its inverse – that is the changes in the probability of *not* being online (which is also decreasing across time). Instead, Martin employs an alternative measure of inequality, the odds ratio, to argue that Internet access is actually spreading less quickly among poor households. Moreover, while the poor may eventually reach universal access, their catching up could last as long as two decades.

In the second article in this Issue 5, Lenhart and Horrigan employ data from the Pew Internet and American Life Project to argue that the digital divide in access is better seen as a "digital spectrum", rather than a dichotomy clearly separating users from nonusers. A main reason for their view comes from their 2002 Pew survey of nonusers, many of whom had been previous users. Thus, as in case of panel research on the poor, people move in and out of the user category rather than being permanent users or permanent nonusers. The authors' digital spectrum thus distinguishes between intermittent users and longer-term (or never) users, but it also differentiates the more intense broadband users from those who access via telephone modems. Interestingly, these movements in and out of different usage categories may be responsible for a possible decline in the rate of Internet diffusion. Finally, the authors identify a set of personal and psychographic measures that predict Internet access independently of the usual demographic predictors, like age and education.

In the third article in this issue, Mason and Hacker argue that a major problem with digital divide research is that has developed in much of a theoretical vacuum, often failing to tie in with relevant social science theories that preceded it. For example, the studies consistently supporting the "increasing knowledge gap" hypothesis provide ample reason to have anticipated that those already-informed (like the college educated) would be the ones most likely to take advantage of new information technology like the Internet. Terms and processes from the diffusion of innovations literature are widely used to describe the ways the Internet has diffused across society, as in the de Haan article in Issue 4. Mason and Hacker also identify elements of various "structuration theories" of Giddens, Castells, Keane, and DeSanctis and Poole that are relevant

to greater theoretical understanding of digital divide debates. A particularly valuable section of this article reviews the impressive behavioral evidence that using IT has beneficial social outcomes, which of course reinforces the points made in the above articles about the positive consequences of Internet use, as well as access.

#### *DIGITAL DIVIDES IN SPECIFIC POPULATIONS*

Readers will find five new articles in this Issue 5 dealing with divides in use by the specific factors of gender and race.

*Gender:* The first two of these articles examine differences that continue to exist between men and women, even though most observers seem to feel that the gender gap between men and women has largely been overcome. Losh's article places these differences in the context of gender studies dating back two decades. Indeed, in 1980s national surveys, men were also heavier users of earlier information technology in the form of personal computers. Taking the important effects of user education level into account, Losh concludes that the gender (and education) gaps have remained relatively stable since then, reflected most recently in college educated men's usage of the Internet. However, women with graduate education had reached gender parity by year 2000.

Kennedy, Wellman and Klement also find important differences in IT use between men and women. Consistent with differences in roles and socialization patterns in the previous literature on gender roles, women in two large national surveys used the Internet more for social connections, while men used IT more for instrumental projects and for individual forms of recreation. Mothers' Internet time seems more restricted by family obligations than fathers, another finding consistent with previous (time-diary) studies showing women's household work time is more affected by marriage and family than men's housework time.

*Race:* The next three articles in this Issue 5 examine race and poverty divide issues. Alvarez first notes that both NTIA and GSS national surveys show that Blacks' lower IT access does reflect their lower incomes and levels of education, but that about half of the 20-point lower access by Blacks still remains after these status and other demographic predictors are taken into account. When examining user populations, however, he finds that Blacks and White users report rather similar levels of time spent online, of social support, of search strategies and of knowledge of IT terms. Moreover, Whites and Blacks were equally likely to visit capital-enhancing Websites, although Blacks visited education-related sites more, while Whites visited work, financial and political sites more.

Jackson and her colleagues at Michigan State University report results from their innovative HomeNetToo community project, in which 90 low-income families were given Internet technology in return for agreeing to have their us-

age recorded and completing multiple surveys. They find that race and age differences persisted throughout the project, while personal and situational factors affected use only in the first half of the project. Blacks and older participants used the Internet less than Whites, respectively. The infrequent use of email by participants, regardless of race or age, is attributed to their having few friends and relatives online. The authors conclude that the digital divide should be reconceptualized as a "use" divide and that future research should focus on cultural factors that influence IT use once access is obtained.

Gordo's article reports on the success of the Plugged In community project in the poorest part of Silicon Valley. This is a well-known success story and model of public policy intervention aimed at low-income populations at the grass-roots level, one affecting children as well as adults. Initially developed from one individual's inspiration ten years ago, the project has mushroomed to a million dollar per year effort by taking advantage of the unique resources in the area – and a site visit by President Clinton. Gordo identifies several elements of this project that are relevant to mounting parallel efforts around the country to bring the benefits of the Internet to the digitally disadvantaged.

*Other Divides:* In Issue 4, Donnermeyer and Hollifield found surprisingly few digital divide differences in the four distinct rural communities they surveyed, despite the fact that two of them had quite developed infrastructure for enhancing Internet access and use. The authors conclude by noting two factors that may affect how the Internet may affect rural users: 1) the diversity of income levels and lifestyles within the community and 2) the extent of economic and population growth across communities.

In the final Issue 4 article, Schement examined the specialized roles that libraries can play in bridging the digital divide. By locating the historical strengths of libraries that Thomas Jefferson envisioned and that Alexis DeTocqueville documented, libraries continue to offer unique avenues for information access with more than 95% of libraries being connected. Moreover, more than 60% of library patrons use them to go online, indicating the same needs for connectivity, capability and content to achieve democratic participation sought by America's early settlers.

#### *SOME OVERALL OBSERVATIONS*

A number of conclusions or themes emerge after reading these varied contributions to the continuing debate over the digital divide. First, there is considerable question about the conclusions from the NTIA 2002 report, particularly its implicit declaration that the digital divide problem was solving itself and that it was simply a matter of time before basic market forces would overcome the divide. The criticism is raised most strongly in Gordo's article, where she is able to back up her policy concerns with specific evidence from the successful Plugged In project in the poorest part of Silicon Valley. Here, a commu-

nity organization was able to move beyond the simple provision of computer hardware for its clients to develop the in-person “human software” programs to ensure that the needs of users matched the great capabilities of new information technologies.

Similar criticisms of the NTIA conclusions are raised in the articles by Jackson et al., by Alvarez and by Mason and Hacker. However, the most articulate and concerted arguments are brought out in Martin’s lead article. Authors of the NTIA report clearly needed to recognize the limitations of the inequality measures they employed in their 2002 report, and more at issue, to use measures like the odds ratio that are more familiar, recognized and accepted by economists and sociologists who study issues of inequality more generally. Employing these measures leads to almost opposite conclusions to those reached in the NTIA report, and Martin’s final diagrams, showing that the “catch-up” of lower income groups could take up to two decades, further suggests the need for a broader array of measures than those employed in the NTIA 2002 report. One hopes that these additional measures can be incorporated into the next NTIA report of their data, since it is clear that, with increased population access in 2003, reapplying the Gini and other measures will probably support the same overly optimistic conclusions.

The need for more sophisticated measurement is also evident in the Lenhardt and Horrigan article’s distinctions both among the Internet’s haves (broadband and dialup users) and the have-nots (former users, proxy users and never users). Again, it is hoped that these are distinctions that can be brought out in the next NTIA report from the data they will be collecting.

*Beyond Access:* Several articles in the second section of the issue on specific gaps note how the gaps by race and gender continue to be an issue, further calling into question the conclusions of NTIA 2002. It has generally been assumed that gender gaps have been closed (as noted in the opening of the Jackson et al. article), but both Losh and Kennedy et al. document the persistent gender gaps that remain – Losh concentrating on access and overall use gaps in historical context, and Kennedy et al. on the different types of content and purposes which men and women seek as they browse the Web. Both articles remind one that, as powerful as new IT may be, they still have to function in a society with deeply ingrained social attitudes and behaviors.

With regard to racial issues, Alvarez documents the Black lower access rate that cannot be explained by demographic predictors of Internet use. Jackson et al. document how low-income Black novice users appear to find it less useful than a matched sample of Whites. More hopeful are the Alvarez findings of minimal differences between Black and White users once they are online (suggesting that access may be of main concern in decreasing the racial divide) and Gordo’s findings of how the Plugged In project has managed to develop social programs to ensure more meaningful interfaces with IT for low-income and

minority users. It could be that the differing results across the three articles could be due to differences between low-income and more affluent Blacks.

Several articles provided support for the proposition implicit in the call for papers for this issue of *IT&Society*, namely that Internet access marks only the initial concern about the digital divide and that the same social processes that underlie adoption of technology continue to be at work in how the technology is *used*. In other words, those already well informed will not only gain access to new technology but will use it to increase their advantages over those less well informed. This proposition is given support in the Robinson, DiMaggio and Hargittai article who use the many measures collected by the GSS to indicate advantages of one group over another in using the technology after purchase. While not all of the measures show the college educated gaining more from use than the less educated, that increasing gap is most evident in the types of Internet sites visited. The college educated are clearly more likely to visit sites that enhance their chances for life success rather than to provide diversion and entertainment. Similar evidence can be found in the deHaan article in the Dutch cultural context.

*Longer-term Implications:* Do these digital divides make a difference in people's lives? One of the more valuable elements of the Mason-Hacker literature review is its documentation from several studies of the clearly positive social and psychological benefits of being online. To this, one can add the positive results from the Robinson-Neustadt panel study showing greater *gains* in the pro-social attitudes of Internet users and new users compared to nonusers in terms of trust in people; social observers concerned about the negative influence of television might also be encouraged by the evidence of lower TV viewing among users in that article. Parallel positive evidence of Internet benefit comes from deHaan's demonstration that heavier and earlier users in the Netherlands were more adept in making new social contacts and availing themselves of the benefits of online shopping.

The greater gains among users are also evident from the increased indicators of Internet user's usage between GSS 2000 and GSS 2002, as shown in Table 1. Despite the fact that newer users might be less serious users, and hence average less time online overall estimated time online increased about 15% from 2000 to 2002 across all users, new and old. This reflects increases both in email time and other Webuse time – and time spent in both uses at home, at work and in other locations (except for email use at home). (It should be noted that these subtotal times do not add up to total figures because they are derived from different questions asked of different types of users).

Year 2002 users also report 30% more emails sent and almost double the number of emails received; moreover, these significant increases were also found for personal, one-to-one messages and not just more general or spam messages. Further GSS questions indicated increases in proportions contacting immediate

Table 1: Changes in Internet Users in GSS 2000 and GSS 2002

	2000	2002
1) Overall Access (Home, Work, or Other)	48%	59%
2) Overall weekly hours of use (among users)	8.8 hrs.	10.3 hrs.
a) Email	4.1	4.7
b) Web browsing	4.7	5.6
3) a) Work	3.7 hrs.	4.5 hrs.
Email	2.1	3.8
Browsing	2.8	2.4
b) Home	3.4	4.0
Email	.8	1.0
Browsing	1.2	1.4
4) a) Emails sent (personal)	8.8 (5.5)	13.0 (7.6)
b) Emails received (personal)	15.3 (8.0)	28.4 (10.4)

family members, friends and organization members in 2002. More GSS 2002 respondents reported meeting a spouse or other romantic partner over the Internet. More Internet users also reported visiting political Websites that changed their minds or stimulated them into some form of political participation. The numbers with health or job-seeking concerns increased enough to make the Internet the major source of both types of information across the entire population.

At the same time, it is important to note that there were many activities that showed no gains in the 2002 GSS:

- 1) Meeting personally anyone met online
- 2) Visits to most types of Websites (e.g., news, government, science)
- 3) Proportions seeking political or arts information
- 4) Strategies for navigating the Web (except for the increase in using bookmarks)

Thus, there seems no across-the-board increasing gaps among users in 2002 in contrast to 2000 users that might be expected from Table 1.

Nonetheless, the considerable evidence about Internet benefits identified by Mason and Hacker and by other authors of articles in Issues 4 and 5 makes it more difficult to dismiss concern over the implications of the digital divide. Coupled with the impressive evidence presented here that Internet access also continues to be unequal, it makes a powerful case that the digital divide is far from disappearing as a problem of national concern.

**APPENDIX A: ATTITUDE AND BEHAVIOR QUESTIONS EXAMINED IN ROBINSON AND NEUSTADTL ISSUE 4 PAPER ON GSS PANEL DATA**

1 ATTITUDES

**Tolerance**

And what about a man who admits that he is homosexual . . .

[SPKHOMO] Suppose this admitted homosexual wanted to make a speech in your community. Should he be allowed to speak, or not?

Yes, allowed..... 1  
 Not allowed ..... 2  
 DON'T KNOW ..... 8

[COLHOMO] Should such a person be allowed to teach in a college or university, or not?

Yes, allowed..... 4  
 Not allowed ..... 5  
 DON'T KNOW ..... 8

[LIBHOMO] If some people in your community suggested that a book he wrote in favor of homosexuality should be taken out of your public library, would you favor removing this book, or not?

Favor ..... 1  
 Not favor ..... 2  
 DON'T KNOW ..... 8

Or, consider a person who believes that Blacks are genetically inferior.

[COLRAC] If such a person wanted to make a speech in your community claiming that Blacks are inferior, should he be allowed to speak, or not?

Yes, allowed..... 1  
 Not allowed ..... 2  
 DON'T KNOW ..... 8

[LIBRAC] If some people in your community suggested that a book he wrote which said Blacks are inferior should be taken out of your public library, would you favor removing this book, or not?

Favor ..... 1  
 Not favor ..... 2  
 DON'T KNOW ..... 8

**Sex Attitudes**

[PREMARSEX] There's been a lot of discussion about the way morals and attitudes about sex are changing in this country. If a man and a woman have sex relations before marriage, do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?

Always wrong ..... 1  
 Almost always wrong ..... 2  
 Wrong only sometimes ..... 3  
 Not wrong at all..... 4  
 DON'T KNOW ..... 8

[TEENSEX] What if they are in their early teens, say 14 to 16 years old? In that case, do you think sex relations before marriage are always wrong, almost always wrong, wrong only sometimes, or not wrong at all?

Always wrong ..... 1  
 Almost always wrong ..... 2  
 Wrong only sometimes ..... 3  
 Not wrong at all..... 4  
 DON'T KNOW ..... 8

[XMARSEX] What is your opinion about a married person having sexual relations with someone other than the marriage partner—is it always wrong, almost always wrong, wrong only sometimes, or not wrong at all?

Always wrong ..... 1  
 Almost always wrong ..... 2  
 Wrong only sometimes ..... 3  
 Not wrong at all..... 4  
 DON'T KNOW ..... 8

[HOMOSEX] What about sexual relations between two adults of the same sex—do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?

Always wrong ..... 1  
 Almost always wrong ..... 2  
 Wrong only sometimes ..... 3  
 Not wrong at all..... 4  
 DON'T KNOW ..... 8

**Gender Roles**

[FEPOL] Tell me if you agree or disagree with this statement: Most men are better suited emotionally for politics than are most women.

Agree..... 1  
 Disagree ..... 2

NOT SURE.....	8
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<b>Life Assessment</b>	
[HAPPY] Taken all together, how would you say things are these days—would you say that you are very happy, pretty happy, or not too happy?	
Very happy .....	1
Pretty happy.....	2
Not too happy .....	3
[FINRELA] Compared with American families in general, would you say your family income is—far below average, below average, average, above average, or far above average? (PROBE: Just your best guess.)	
Far below average.....	1
Below average .....	2
Average.....	3
Above average .....	4
Far above average.....	5
DON'T KNOW .....	8

<b>Trust</b>	
[TRUST] Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?	
Most people can be trusted .....	1
Can't be too careful.....	2
Other, depends (Vol.) .....	3
Don't Know .....	8
No answer .....	9
Not applicable.....	BK
[HELPFUL] Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?	
Try to be helpful .....	1
Just look out for themselves.....	2
DEPENDS .....	3
DON'T KNOW .....	8
[FAIR] Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?	
Would take advantage of you .....	1
Would try to be fair.....	2
DEPENDS .....	3
DON'T KNOW .....	8

2 BEHAVIORS

[SEXFREQ] About how often did you have sex during the last 12 months?	
Not at all .....	0
Once or twice .....	1
About once a month .....	2
2 or 3 times a month .....	3
About once a week .....	4
2 or 3 times a week .....	5
More than 3 times a week .....	6
Don't know .....	8
No answer .....	9
Not applicable.....	BK
Would you use this card and tell me which answer comes closest to how often you do the following things . . . READ EACH ITEM. CODE ONE FOR EACH.	
[SOCREL] Spend a social evening with relatives?	
Almost every day .....	1
Once or twice a week .....	2
Several times a month .....	3
About once a month .....	4
Several times a year .....	5
About once a year .....	6
Never .....	7
DON'T KNOW .....	8
[SOCOMMUN] Spend a social evening with someone who lives in your neighborhood?	
Almost every day .....	1
Once or twice a week .....	2
Several times a month .....	3
About once a month .....	4
Several times a year .....	5
About once a year .....	6
Never .....	7
DON'T KNOW .....	8
[SOCFRIEND] Spend a social evening with friends who live outside your neighborhood?	
Almost every day .....	1
Once or twice a week .....	2
Several times a month .....	3
About once a month .....	4
Several times a year .....	5
About once a year .....	6
Never .....	7
DON'T KNOW .....	8

[SOCBAR] Go to a bar or tavern?

Almost every day .....	1
Once or twice a week .....	2
Several times a month .....	3
About once a month .....	4
Several times a year .....	5
About once a year .....	6
Never .....	7
DON'T KNOW .....	8

[ATTEND] How often do you attend religious services? USE CATEGORIES AS PROBES IF NECESSARY.

NEVER.....	0
LESS THAN ONCE A YEAR.....	1
ABOUT ONCE OR TWICE A YEAR.....	2
SEVERAL TIMES A YEAR.....	3
ABOUT ONCE A MONTH.....	4
2-3 TIMES A MONTH.....	5
NEARLY EVERY WEEK.....	6
EVERY WEEK .....	7
SEVERAL TIMES A WEEK .....	8

[NEWSPAPER] How often do you read the newspaper—every day, a few times a week, once a week, less than once a week, or never?

Every day .....	1
A few times a week .....	2
Once a week .....	3
Less than once a week .....	4
Never .....	5

[TVHOURS] On the average day, about how many hours do you personally watch television?

NUMBER OF HOURS: \_\_\_\_\_