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DISCONNECTED, DISADVANTAGED, AND DISENFRANCHISED:

EXPLORATIONS IN THE DIGITAL DIVIDE

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The interpretation of the data are solely the responsibility of the author.

BACKGROUND AND METHODOLOGY

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The mass diffusion of digital media and the explosive growth of the Internet are reshaping the lives and lifestyles of many Americans. Over the last decade, the rise of digital technologies has fundamentally altered how people work, play, communicate, socialize, and otherwise engage their communities. Major transformations in the American media landscape have accompanied these changes. In response to these trends, the Digital Media Forum, a media policy consortium funded by the Ford Foundation, funded a large scale study of American's Internet attitudes and behaviors, and their policy preferences concerning digital media. To ensure this research was objective and systematic, the study was designed and conducted independently by Professor Dhavan Shah, Ph.D., of the School of Journalism and Mass Communication, University of Wisconsin-Madison.

The resulting study relies on national survey data collected in February 1999 and June 2000 from a single panel of respondents to address a variety of issues that these changes in electronic media have introduced. Topics examined by the broader study include: the extent of the digital divide in America, support for programs to increase public access to the Internet, opinion concerning electronic privacy and the restriction of media content, preferences about "broadband" and digital television, levels of support for non-commercial uses of the Internet, the connection between the Internet and civic life, and concerns about media mergers and Internet open access. The last of these topics is the focus of this report.

The February 1999 data were collected as part of an annual mail survey — the "Life Style Study" — conducted by Marketfacts on behalf of DDB-Chicago, an international marketing communications company. Via mail, a massive number of people were asked to express their willingness to participate in mail or telephone surveys, and if so, to provide basic demographic information. A balanced sample was then drawn from among the 500,000+ people agreeing to become part of the pre-recruited "mail panel." In order to ensure representativeness, the starting sample of approximately 5,000 mail panelists was adjusted within the subcategories of race, gender, and marital status to compensate for expected differences in return rates. The sample was also drawn to reflect demographic distributions within the 9 Census divisions of household income, population density, panel member's age, and household size. Applying this stratified quota sampling method, of the roughly 5,000 Life Style surveys distributed to mail panelists, **3,388** usable responses were received, for a response rate of **67.8** percent. This rate of response is considerably higher than the typical national survey.

For the June 2000 wave of the study, we engaged Marketfacts to recontact the individuals who completed the February 1999 survey. Due to some erosion, 2,737 questionnaires were mailed out to 1999 Life Style Study respondents. To ensure a high response rate — and a more representative sample — a substantial incentive was offered for completing the survey. The response rate for this survey was **70.1%,** with **1,902** respondents completing the questionnaire. The data presented in this report focuses on the respondents who completed both waves of the study. The margin of error for the results is about **±3.0%** when using the full sample. For a validation of these Life Style data against other national survey data, see Putnam (2000, Appendix 1).

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EXECUTIVE SUMMARY

From the first moment that the Internet showed potential as a commercial medium and as a platform for public communications, policymakers have been debating the question of whether differential access to the Internet poses a public policy problem. The public policy debate over the digital divide stems from concerns that the denial of access to the emerging digital society diminishes the economic chances or restricts the ability to participate in civic and political life of those who are excluded from online activity. Furthermore, it is a concern that certain demographic groups are systematically excluded from participation.

This paper uses the results of a large and detailed national survey to explore the nature and impact of the digital divide.

- With a precise empirical definition, it documents the existence of the digital divide and demonstrates that it is not likely to disappear any time soon.
- A direct comparison of a broad range of cyberspace and physical space activities for commerce, information gathering, education, civic discourse and political participation, shows that the disconnected are, in fact, disadvantaged and disenfranchised.

THE DIGITAL DIVIDE EXISTS AND PERSISTS

The ***Fully Connected*** constitute 36% of the population with an Internet Service Provider or high speed Internet access at home.

The ***Partially Connected*** constitute 17% with basic Internet or e-mail service at home.

The ***Potentially Connected*** constitute 21% who have no Internet service, but do own a computer at home or have a cellular phone.

The ***Disconnected*** constitute 26% who do not have any Internet service and do not have a computer or a cell phone.

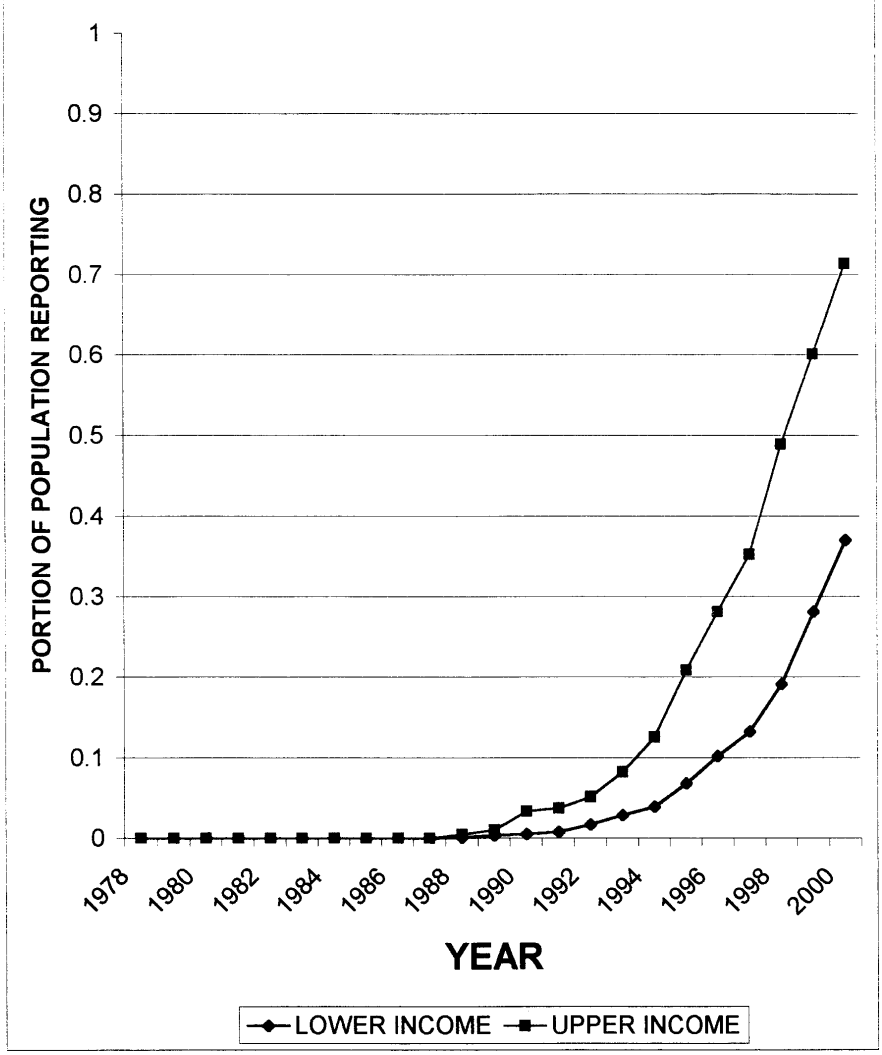
There are sharp differences in demographics across the groups, which can be highlighted by contrasting the disconnected to the fully connected (see Table ES-1). Lower income, elderly and minorities are more likely to be among the disconnected.

TABLE ES-1: DEMOGRAPHICS OF THE DIGITAL DIVIDE

	DISCONNECTED	FULLY CONNECTED
MEAN INCOME ($000)	25.5	45.2
AT LEAST COLLEGE GRAD (%)	13	46
BLACK (%)	12	7
AGE (Years)	53	44
MANAGERIAL OCCUPATION (%)	8	33

Patterns of connection to the Internet in the recent past (see Figure ES-1) and intentions to get connected in the near future support the conclusion that, while digital technologies are spreading through the population, the divide persists for some groups and is not likely to disappear in the near future. The diffusion of Internet use indicates that those in

FIGURE ES-1:
DIFFUSION OF INTERNET USE
HOUSEHOLDS ABOVE/BELOW MEDIAN INCOME,
(YEAR OF FIRST USE OF CURRENT, HOME USERS)



the bottom half of the income distribution are lagging behind by a half decade and that a substantial part of the population will remain disconnected. Forty percent of the respondents say they do not have the Internet at home today and they do not intend to get connected in the next four years.

THE DISCONNECTED ARE DISADVANTAGED AND DISENFRANCHISED

The digital divide is an important policy issue because the Internet has already become a significant means of communications and commerce in society. Households with access use it for important personal, cultural and civic activities while those without access are at a disadvantage in conducting similar daily activities. They cannot shop as effectively or conveniently, are not offered attractive pricing plans, cannot gather information or contact public officials and other people as effectively. They become less effective consumers and citizens relative to their fellow consumers who have access.

Table ES-2 shows that there are very substantial differences between groups in their use of the Internet. If using the Internet is helpful for conducting the economic and political activities identified in Table ES-2, it is quite clear that the disconnected are at a disadvantage and are being disenfranchised.

At the same time that the data document the dramatic difference between participation in physical space and cyber space, they also show that the difference in participation in cyberspace is not a mere reflection of a lower level of participation among these groups in real space. The disconnected and potentially connected households do participate a little less in physical space, but not nearly as much less as they do in cyberspace. With the shift of activity to the Internet that has already occurred and the prospect of even more dramatic shifts in the future, the threat that the disconnected are disadvantaged and disenfranchised grows.

- The problem is not that the disconnected do not participate in physical space, it is that they cannot participate in cyberspace. People who are able to participate in physical space are becoming disadvantaged and disenfranchised in cyberspace.

The respondents recognize this as a potential problem. Almost two-thirds of respondents express the concern that technological progress can have the effect of increasing the gap between rich and poor (see Table ES-3). Those not intending to get connected express the greatest concern about this gap (68 percent agree), but even those currently connected express concern (60 percent). Being left behind by the "information revolution" is also a concern expressed by 57 percent of the respondents. Most interestingly, the group which expresses the greatest concern about this gap (71 percent) is the group that intends to get connected in the near future.

TECHNOLOGY ATTITUDES AND THE DIGITAL DIVIDE

The existence and persistence of the gap is not for lack of appreciation among those who are disconnected that they are missing out on something important (see Table ES-3). Respondents have a very strong appreciation for the importance of technology in general and computers in particular. Those who intend to get connected express exactly the same level of appreciation as the currently connected. This pattern holds for both computers and the Internet.

TABLE ES-2
CONSEQUENCES OF BEING DISCONNECTED
ACTIVITIES IN PHYSICAL SPACE AND CYBERSPACE
(Percent of Respondents Reporting Activity; Cyberspace in Bold)

	Disconnected	Potentially	Partially	Fully
BASIC SKILLS				
Ever used the Internet	**49**	**65**	**95**	**97**
Don't have a clue what the Internet is about	**58**	**42**	**14**	**12**
Use Internet at work	**11**	**27**	**43**	**47**
Use Internet in public	**7**	**15**	**18**	**15**
PERSONAL PRODUCTIVITY				
Searched for a Job online	**14**	**13**	**23**	**28**
Searched for business info online	**21**	**30**	**46**	**52**
COMMERCIAL ACTIVITY				
Made an online purchase	**11**	**19**	**53**	**57**
Visited website seen in an Ad	**14**	**25**	**64**	**62**
Visited website seen in a Program	**17**	**28**	**65**	**67**
INFORMATION GATHERING				
Read a newspaper	92	94	97	97
Obtained news or sport results online	**25**	**30**	**60**	**65**
Read a news magazine	62	67	72	79
Visit a news website	**18**	**25**	**62**	**70**
Attended a lecture	29	44	55	55
Obtained educational information online	**26**	**42**	**72**	**73**
INTERACTING WITH GOVERNMENT				
Contacted a local public official	31	35	40	40
Visited website of a gov't agency	**13**	**17**	**36**	**40**
CIVIC DISCOURSE				
Wrote a letter to the editor	20	18	24	27
E-mailed a Newspaper	**8**	**6**	**15**	**16**
Discussed politics with a neighbor	46	47	56	50
Discussed politics in an e-mail	**7**	**4**	**9**	**12**
POLITICAL EXPRESSION				
Circulated a petition for a politician	10	11	12	12
Signed or forwarded a petition online	**5**	**5**	**9**	**14**
Attended a political rally	22	23	18	19
Visited a politician's website	**8**	**7**	**18**	**19**

TABLE ES-3
ATTITUDES TOWARD TECHNOLOGY

	INTERNET STATUS		
	NOW	IN 4 YEARS	NOT 4 YEARS
TECHNOLOGY AND THE DIVIDE			
Technology advances increase the gap between rich and poor	60	63	68
I worry that some people will be left behind by the "information revolution"	55	71	63
TECHNOLOGY IMPORTANCE			
If you want to be successful nowadays, you need to understand technology	91	91	83
Children learn more when they have access to technology	87	87	84
COMPUTERS			
We'd be better off without computers (disagree)	87	87	68
Computer skills are vital for tomorrow	96	96	93
INTERNET/ACCESS			
I feel the Internet can help enhance my career	83	82	51
I feel the Internet can help enhance my education	59	62	32
TECHNOLOGY SKILLS			
I consider myself computer-savvy	57	30	21
I Don't' have a clue what the Internet is about and what it can do for me (disagree)	87	70	56
The Internet is too expensive	52	65	66

The disconnected appear somewhat different in their attitudes toward technology. They express slightly less appreciation for the importance of technology and computers, but a great deal less belief that the Internet can do them good. While about half of those on the Internet say it is too expensive, about two-thirds of those not on the net feel this way.

There are much larger differences across the groups in terms of knowledge and command of the technology. The disconnected do not have the resources and they lack the skills. They fully appreciate technology and computers, but less so the Internet. Their limited experience may account for the latter difference.

In fact, the computer appears to play a key role in getting on line. Four fifths of those who have computers are on the Internet. Among those who do not have a computer, respondents who say they will get connected within the next four years, also say, overwhelmingly (86 percent), they will get a computer in that same time period. Among those who do not have a computer and who say they will not get connected in the next four years, the overwhelming majority (81 percent) also say they will not get a computer in that time period. In essence getting people PC hardware and training is the key.

CONCLUSION

As an empirical investigation into the nature of the digital divide, this study does not offer a specific set of policy recommendations. The objective is to establish an appreciation of the nature and impact of the digital divide.

- While computer ownership and Internet use continue to grow, the "digital divide" that separates those Americans connected to the Internet from those who are not persists and is not likely to disappear any time soon.
- The gap puts millions of Americans at a serious disadvantage in our increasingly “online” society.
- The more important online activity becomes, the more problematic the digital divide will be if it persists.
- Those at risk are in vulnerable groups – lower income, elderly and minorities.

Understanding that these vulnerable groups are harmed by their lack of access to technology becomes the starting point for seeking cost-effective avenues to address this deprivation. The steps to be taken to overcome the digital divide emerge from the attitudes toward and experience with information-age technologies.

- The digital divide is not the result of a failure of those without access to appreciate the importance of technology, rather it results from a maldistribution of skills and opportunities.
- Public policy to close the digital divide must give people the human capital skills to use information age technologies, the experience to make them comfortable with these technologies and the resources to obtain the necessary hardware at home, where they conduct their daily activities.

I. INTRODUCTION

A. GROWING CONCERN ABOUT THE DIGITAL DIVIDE

From the first moment that the Internet showed potential as a commercial medium and as a platform for communications, policymakers have been debating the question of whether differential access to the Internet poses a public policy problem. Reactions to a *Washington Post* article summarizing the findings of a mid-1999 report on the digital divide suggest how prominent the debate has become. In a front page story, the newspaper summarized a report from the National Telecommunications Information Administration as follows:

> Despite plummeting computer prices and billions of dollars spent wiring public schools and libraries, high-income Americans continue to predominate in the online world.

The findings were immediately cast in highly charged public policy terms by President Clinton:

> There is a growing digital divide between those who have access to the digital economy and the Internet and those who don't, and that divide exists along the lines of education, income, region, and race... If we want to unlock the potential of our workers, we have to close that gap.

By contrast, a spokesman for the ultraconservative Cato institute – Executive Vice President David Boaz – dismissed the notion of the digital divide:

> We've got a new technology spreading more rapidly than any new technology has spread in history. And of course, it doesn't spread absolutely evenly. Richer people have always adopted new technology first – and that's not news. There's no such thing as information haves and have-nots, there are have-nows and have-laters. The families that don't have computers now are going to have them in a few years.

Half a decade earlier, Manuel Castells, Professor of Sociology and Planning at the University of California, Berkeley and author of a three volume work on *The Rise of the Network Society*, anticipated this rancorous debate. He noted that timing in the distribution and adoption of technology is a critical factor in determining economic chances, especially in a digital age.

> There are large areas of the world, and considerable segments of the population, switched off from the new technological system . . . Furthermore, speed of technological diffusion is selective, both socially and functionally. Differential timing in access to the power of technology for people, countries, and regions is a critical source of inequality in our society (p. 34).

In the digital age, waiting "a few years" for technology to trickle down may seriously impede the economic aspirations of the "have laters." "Having later" may be almost as bad

as “having not” because the good opportunities are gone and the patterns of activity are set, leaving latecomers excluded and switched off.

The important point about the digital divide is not simply that some people have the technology and others do not, but that not having it puts people at a disadvantage and cuts them off from participation in important economic, social, cultural and political activities.

B. OUTLINE AND PURPOSE OF THE PAPER

This paper uses the results of a large and detailed national survey to explore the nature and impact of the digital divide.

Section II presents a new, empirical definition of the digital divide. It documents the existence of the divide.

Section III presents an examination of the demographic correlates and causes of the digital divide. While it is clear that digital technologies are spreading through the population, it is also clear that for some groups the divide persists and is not likely to disappear in the near future.

Section IV examines the consequences of the divide. By presenting a direct comparison of a broad range of commercial, informational, educational, civic and political activities of individuals in physical space to those in cyberspace, it shows that the disconnected are, in fact, disadvantaged and disenfranchised.

The intensity of the digital divide debate stems from the intersection of several factors. It is clear that the Internet and activities in cyberspace are transforming society powerfully and rapidly. Because the Internet has been an open and accessible place for new forms of expression, it was hoped (believed) that it would democratize society and equalize opportunity. The maldistribution of access to cyberspace flies in the face of that hope. In fact, because the opportunity to participate is less equally distributed in cyberspace than in physical space, the persistence of this problem may make matters worse. It is a new source of inequality in society.

At the start of the 20th century, an industrial age was underway. Economic growth was matched with a broad (but imperfect) expansion of economic opportunity and political participation. At the start of the 21st century, as the Internet age begins, we are faced with a similar challenge. Because things move so fast in cyberspace, the need to respond to the challenge is urgent.

The purpose of this study is not to assign fault for the digital divide, rather it is to understand its nature, persistence and consequences. Appreciation of the impact of the divide should convince policymakers that action is necessary to close it. An understanding of the causes of the divide should help choose the policies that will accomplish the goal of eliminating the divide effectively and quickly.

II. DEFINING THE DIGITAL DIVIDE

A. CONNECTEDNESS IN CONCEPT

About eighteen months ago, the Consumer Federation of America and Consumers Union published a report entitled *The Digital Divide Confronts the Telecommunications Act of 1996: Economic Reality vs. Public Policy*.[1] In that analysis households were divided into four categories primarily on the basis of their telecommunications usage – whether or not they had more than one phone line and a cell phone – as well as Internet usage.

Since that report was issued, the debate over the digital divide has been heated, with intensive scrutiny of a number of technology characteristics of population groups being considered. As the debate has shifted more toward the growth of e-commerce and the role of high-speed networks, attention has been focused on computer ownership, Internet usage, and the convergence of communications and video entertainment into interactive TV.

We believe it is now more relevant to focus on connectedness to computer networks in defining the digital divide. These categories correspond closely to our past categories of telecommunications usage, but provide greater focus on newer services. Accordingly, we developed a scale of actual and potential connection to the Internet using four categories:

> ***Fully Connected*** - Respondents who report that they have a commercial Internet Service Provider or high speed Internet access at home.
>
> ***Partially Connected*** - Those who have basic internet service or basic e-mail service at home.
>
> ***Potentially Connected*** - Those who have no Internet service, but do own a computer at home or have a cellular phone.
>
> ***Disconnected*** - Those who do not have any Internet service and do not have a computer or a cell phone.

We use cellular connectedness to supplement the assessment of potential Internet connectedness for two reasons. First, as the Internet moves increasingly to wireless Internet platforms, these people will have a device for connection to the Internet. Second, a cellular user's ability to pay the cost of a cell phone indicates a certain amount of discretionary income that the consumer is willing to spend on communications services.

B. TECHNOLOGY OWNERSHIP AND USE

Table 1 provides a description of the characteristics of these groups across four dimensions – demographics and each of the major technologies that are converging in the Internet Century. It also provides a comparison to our earlier discussion of the digital divide.

[1] February 1999.

TABLE 1
DIGITAL DIVIDE DEFINED BY INTERNET CONNECTION
(IN PERCENT, UNLESS OTHERWISE NOTED)

	Dis-Connected	Potentially Connected	Partially Connected	Fully Connected
DIGITAL DIVIDE DEFINED BY INTERNET/COMPUTER (2000)				
DEMOGRAPHICS				
POPULATION	26	21	17	36
MEAN INCOME (x1000)	$25.5	$34.3	$39.6	$45.2
AT LEAST COLLEGE GRAD	13	26	44	46
BLACK	12	11	4	7
AGE (in Years)	53	47	45	44
MANAGERIAL	8	22	26	33
HOUSEHOLD SIZE	2.1	2.5	2.7	2.8
COMPUTER/INTERNET				
COMPUTER	0	59	95	96
INTERNET COMMERCIAL	0	0	0	100
INTERNET BASIC	0	0	100	69
MODEMS	0	30	75	84
COMMUNICATIONS				
CELL PHONES	0	72	58	69
FAX	2	16	22	33
LONG DISTANCE	71	85	88	89
VIDEO ENTERTAINMENT				
CABLE TV	56	64	63	78
DIGITAL CABLE	4	7	4	15
SATELITE	8	15	23	20
MVPD HOUSEHOLDS	62	73	78	87
DIGITAL DIVIDE DEFINED BY COMMUNICATIONS (1999)				
DEMOGRAPHICS				
POPULATION	45	16	15	24
MEAN INCOME (X1000)	$22.5	$41.2	$35.8	$53.8
COMPUTER/INTERNET				
INTERNET	0	0	62	87
COMMUNICATIONS				
CELL PHONES	0	100	10	91
FAX	5	10	28	50
VIDEO ENTERTAINMENT				
MVPD HOUSEHOLDS	63	76	74	86

Just over one-quarter (26 percent) of the respondents are disconnected, having no Internet service at home, no computer and no cellular phone. Just over one-fifth (21 percent) are potentially connected (having either a computer or a cell phone, but no Internet). Just over one-sixth (17 percent) of the respondents are partially connected. Over one-third (36 percent) of households are fully connected.

The categories of connectedness correlate with a number of technology and other household characteristics. There is a steady rise of possession/consumption of each of the categories of technologies as one moves from the disconnected to the fully connected.

Among the fully and partially connected, computers are ubiquitous, with 96 percent reporting a computer at home. Modems are also widespread in these two groups, with over three quarters possessing this communications device. Fifty-nine percent of the potentially connected have a computer and half of these have a modem.

Embedded in these numbers is the fact that 81 percent of those who have a computer are either fully or partially connected. In other words, once respondents have a computer, they are very likely to be connected.

Twenty-nine percent of the disconnected respondents report they do not have a long distance telephone service (they may use dial-around) and 38 percent do not have a multichannel video service (cable or satellite). Among the fully connected, 11 percent say they do not have a long distance service (they may use a dial-around service or their cell phones). Thirteen percent say they do not have a multichannel video service.

Although different characteristics were used to create the definition of the digital divide in this paper (here, Internet-based v. rates of telecommunications usage in the earlier paper), there are strong similarities with the characteristics of the groups identified in the earlier study. The 'have-nots' in each analysis have much lower levels of consumption of each of the technologies.

III. DEMOGRAPHIC CORRELATES AND CAUSES OF CONNECTEDNESS

The fact that there are differences between groups in their ownership and use of technology is not a major public policy concern in itself. Rather, the public policy debate over the digital divide stems from concerns that failure to participate in the emerging digital society constitutes a deprivation, imposes a hardship or diminishes the economic chances of those who are not participating. Furthermore, it is a concern that certain demographic groups are excluded from participation.

A. CURRENT CONNECTION

There are sharp differences in demographics across the groups on all dimensions. Table 1 lists several demographic characteristics that have an independent and significant effect on connectedness, as discussed below.

Income is lowest in the disconnected group ($25,500), highest in the fully connected group ($45,200). Those who are fully and partially connected are much more likely to have at least a college degree and be employed in managerial or professional occupations. The fully and partially connected are less likely to be black. Disconnected households are older and tend to be smaller.

The six demographic characteristics discussed above have statistically significant effects in a multiple regression analysis.[2] They explain about one-quarter of the variance in connectedness. Other demographics that were tested but did not have statistically significant effects once these variables are taken into account include gender, employment status, urban/rural location, residence tenure, and Hispanic origin.

Figures 1, 2 and 3 give a taste of the multivariate analysis for three demographic variables that are frequently invoked in public policy debates over the digital divide – race, age and the presence of children in the home. Figure 1 depicts the relationship between income, race and connectedness. Income is clearly the more important factor, but race is also significant. For the lowest income group and several of the highest, blacks are clearly more likely to be disconnected.

Figure 2 depicts the relationship between income, age and connectedness. Older respondents are much more likely to report being disconnected. For those 65 and over, the gap is quite large, particularly for middle income respondents, who report a gap of 20+ percentage points. Even for the middle-aged group (45-64) compared to the youngest group (18-44) there is a significant gap at all income levels.

Figure 3 shows that households with children are significantly more likely to have a computer, beyond the lowest income group. The differences are large (20 percentage points or more) for most income groups.

[2] The key results of the regression analysis are as follows.

CAUSES OF CONNECTIVITY
DEPENDENT VARIABLE = CONNECTEDNESS SCALE

	BETA	SIGNIFICANCE
INDEPENDENT VARIABLES		
INCOME	.288	.0000
AGE	-.189	.0000
EDUCATION	.153	.0000
RACE	-.063	.0074
HOUSEHOLD SIZE	.049	.0317
MANAGER	.048	.0383

Multiple R = .48, R Square = .23

FIGURE 1:
INCOME, RACE AND CONNECTEDNESS

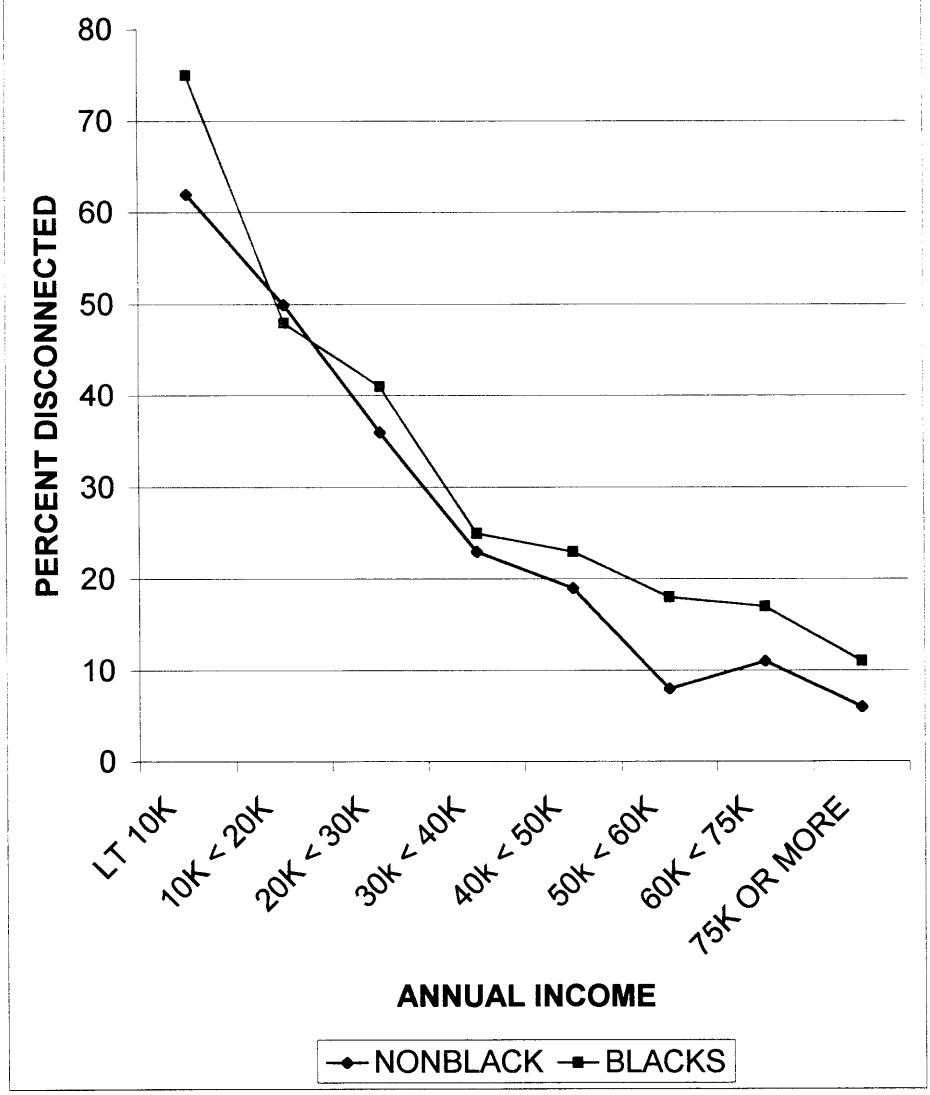


FIGURE 2:
INCOME, AGE AND CONNECTEDNESS

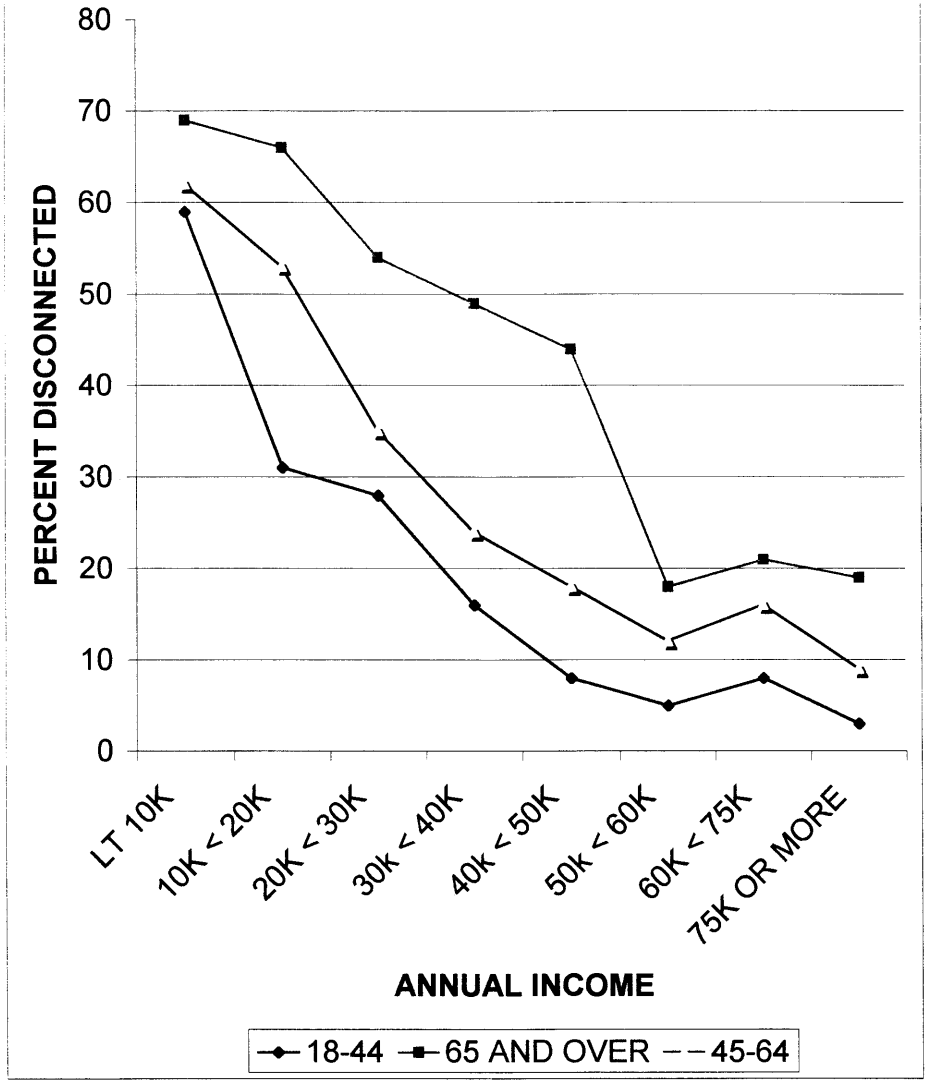
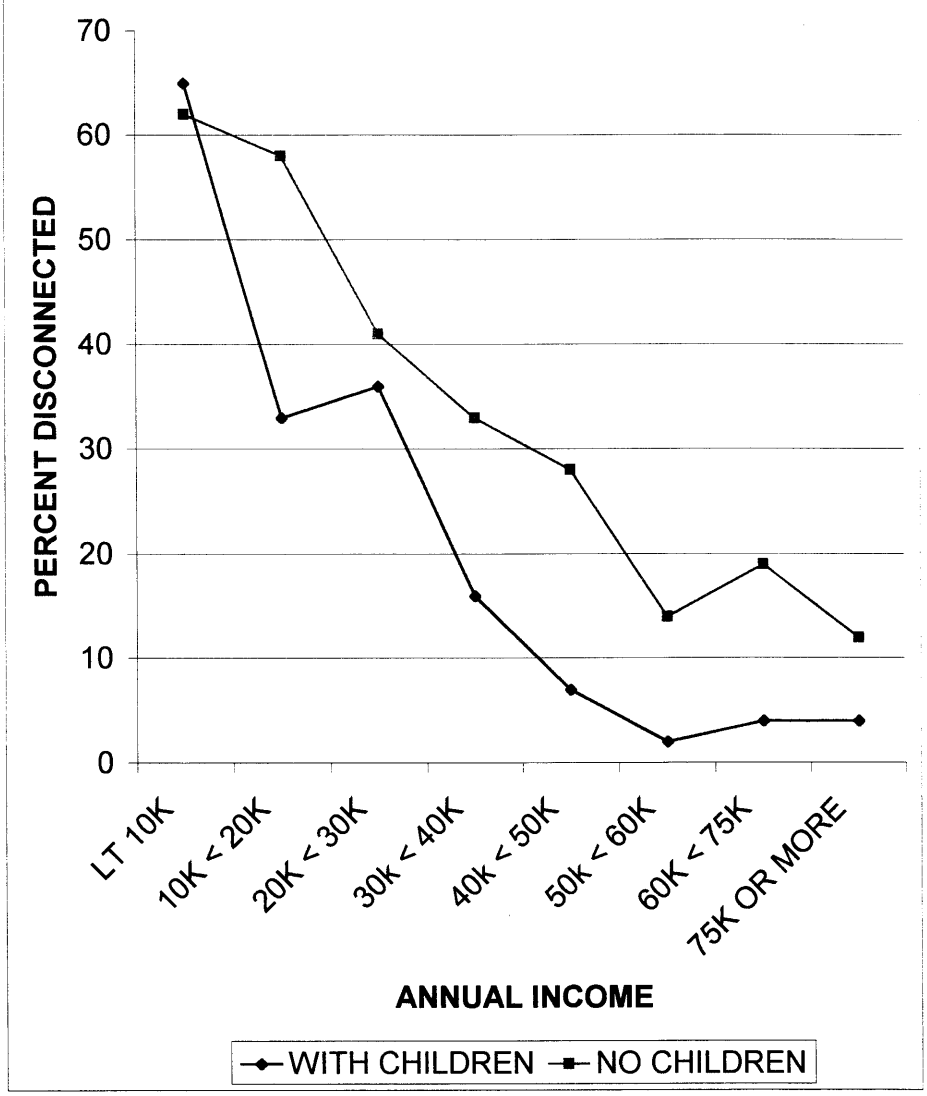


FIGURE 3:
INCOME, CHILDREN AND CONNECTEDNESS



B. INTENTION TO GET CONNECTED

As noted in the introduction, some argue that the gap between those who are connected and those who are not is closing rapidly and there is no need for public policy to intervene. These survey data do not support that optimism. Approximately 47 percent of the respondents are not connected today. Just one in eight of those respondents expects to be connected within four years (see Table 2). In other words, forty percent of the respondents do not expect to be connected four years from now. In cyberspace that is a long time.

TABLE 2
CURRENT AND FUTURE CONNECTEDNESS
(PERCENT OF TOTAL POPULATION)

	NOT NOW CONNECTED	WILL GET CONNECTED WITHIN 4 YEARS	WILL NOT GET CONNECTED WITHIN 4 YEARS
POTENTIALLY CONNECTED	21	5	16
DISCONNECTED	26	2	24
TOTAL	47	11	40

The potentially connected group is much more likely to say they intend to get connected. Just under a quarter of that group intends to get connected. In contrast, among the disconnected only one in thirteen expresses this intention. In the potentially connected group there is no significant difference between those who have a computer (23 percent) and those who have a cell phone (25 percent) in their intention to get connected.

While people's perceptions of their futures are not necessarily equivalent to their actual futures— they could get wired much more quickly than they expect— we believe that perceptions are critical. If people do not believe that getting online is realistic for them, they are less likely to pursue these kinds of opportunities.

Applying the same demographic model to future intentions to get connected as was applied above to current connectedness reveals a rather different outcome. While income, age and education remain significant factors, the other demographic factors are not significant. The magnitude of the effects are smaller as well. Overall, these demographic factors explain one-twelfth of the variance in intention to get connected. The impact of

income is cut in half and that of education reduced by about one-third. The impact of age remains about the same. [3]

Listening to what people say they intend to do is one indicator of what may happen in the years ahead. Looking at what people have done in the recent past is another indicator of what may happen. Figures 4, 5, and 6 show the diffusion curves for computers and Internet use for the total population and for the households above and below the median of household income. These are based on responses to questions that asked "when did you first get a computer" and "when did you first use the Internet." The charts reflect the date of first adoption for those who still have the technology. We choose income as the control variable in the analysis because it is far and away the most important causal factor in technology adoption.

Figure 4 shows rapid diffusion at the overall societal level. Figures 5 and 6 show that there is a substantial digital divide. Looking at the figures, one could argue that there is a five-year divide. That is, those with incomes below the median achieve adoption rates about five years after those with incomes above the median.

Figures 5 and 6 provide the empirical basis for the perception that the divide is growing. Measured in absolute terms, the gap has grown to 40 percentage points. The Figures also provide the basis for claiming that the gap will begin to close. Adoption among households with above median income will begin to top out. Adoption among households with incomes below the median will continue and start to close the gap, if the bottom half continues to behave as the top half did.

If the diffusion curve for below median income households follows that of households above median, we would expect a 50-60 percent penetration rate in the lower income groups in four years. At that point, this group might contribute about 20-25 percent of the total population to the not-connected group. The above median households will likely not get to 100 percent.[4] This group might contribute another 5 to 10 percent of the total population to the not-connected group. This suggests the disconnecteds would still constitute 25 to 35 percent of the population. Thus, the respondents may be a little

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[3] The key results of the regression analysis are as follows.

CAUSES OF INTENTION TO BECOME CONNECTED
DEPENDENT VARIABLE = PLAN TO GET INTERNET IN THE NEXT 4 YEARS

INDEPENDENT VARIABLES	BETA	SIGNIFICANCE
INCOME	.15	.0000
AGE	-.199	.0000
EDUCATION	.103	.0032

Multiple R = .30, R Square = .09

[4] For example, only 90 percent of the households with incomes above the median have a long distance company, while 77 percent of the below median income households do.

FIGURE 4:
DIFFUSION OF COMPUTER OWNERSHIP
AND INTERNET USE
(CURRENT AT HOME OWNERS)

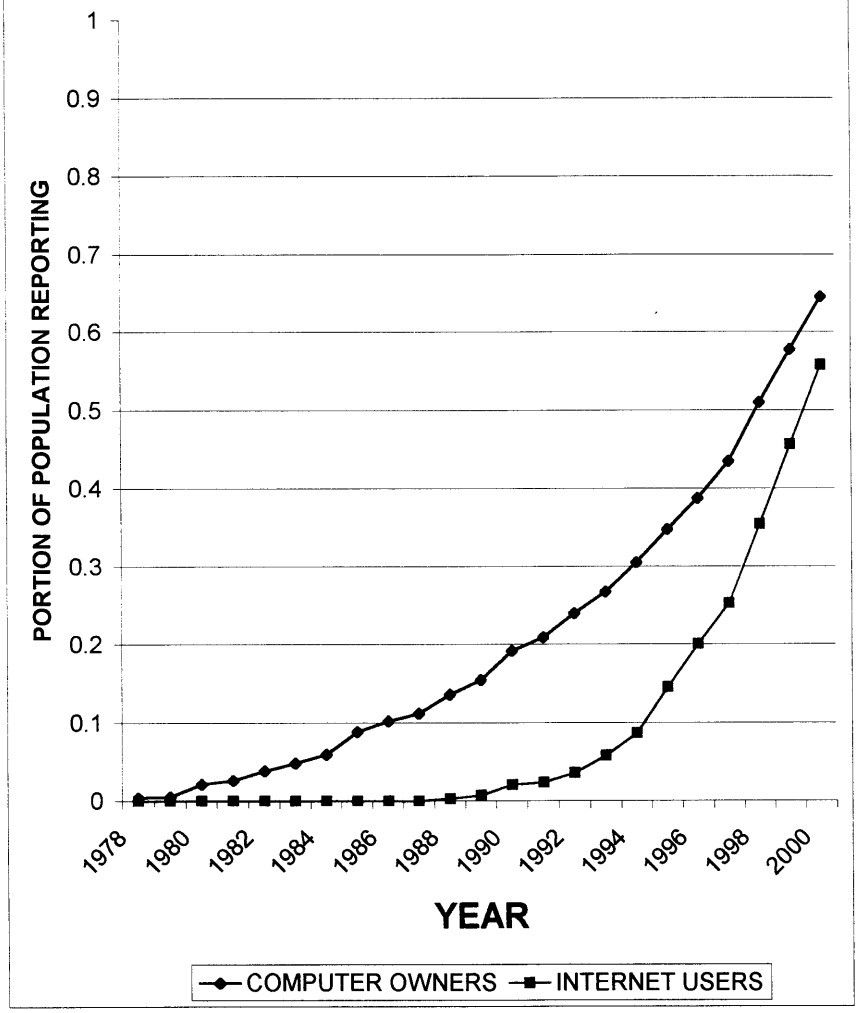


FIGURE 5:
DIFFUSION OF COMPUTER OWNERSHIP
HOUSEHOLDS ABOVE/BELOW MEDIAN INCOME

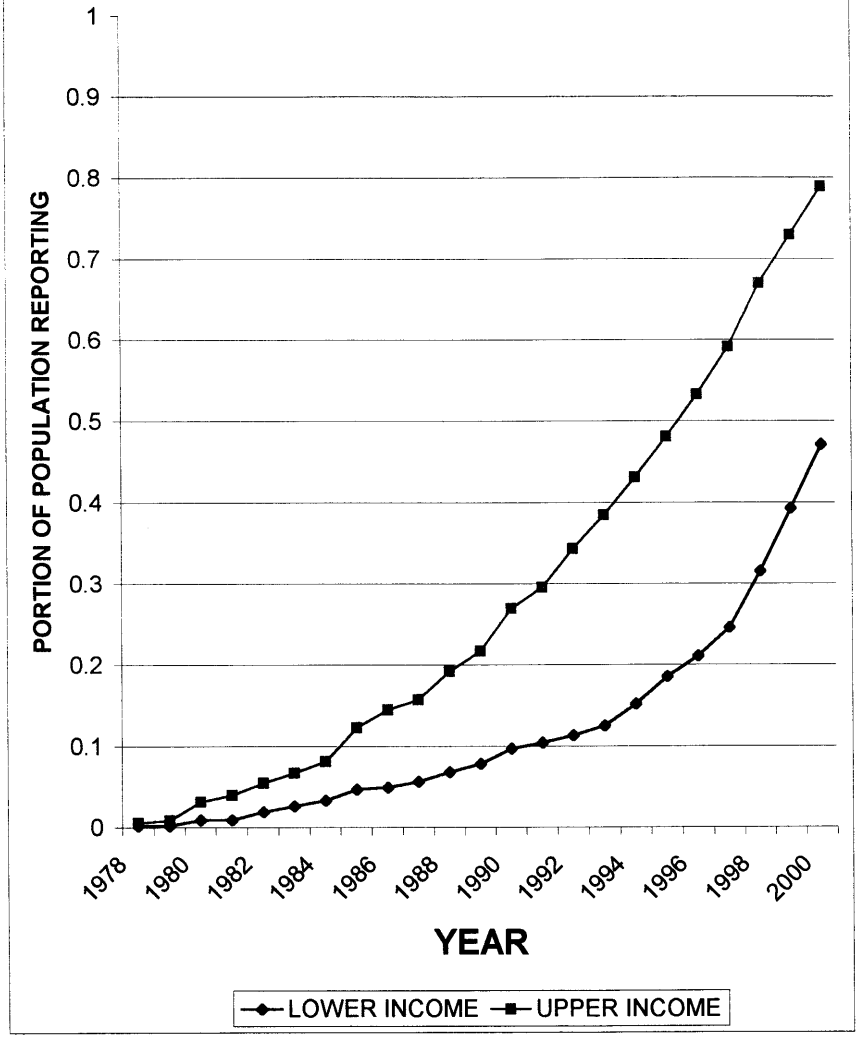
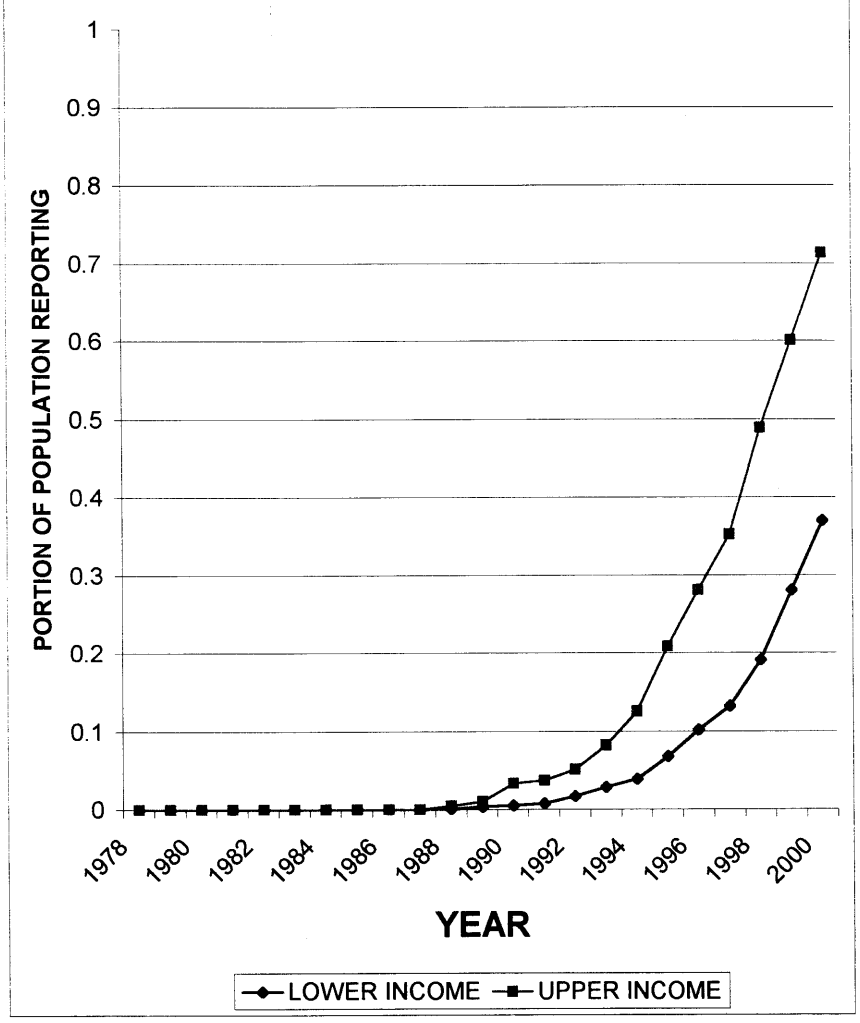


FIGURE 6:
DIFFUSION OF INTERNET USE
HOUSEHOLDS ABOVE/BELOW MEDIAN INCOME,
(YEAR OF FIRST USE OF CURRENT, HOME USERS)



pessimistic in what they say about their intentions to connect, but they are not too far off from the historical pattern. There will still be a substantial gap well out into the future for lower income households.

The big ifs in the analysis are – when do the curves start to top out? Will the below median group sustain the same rate of diffusion as the above median income group? The answers to these questions will hinge on factors like income growth, the cost of hardware to get connected and the price of being connected.

IV. CONSEQUENCES OF BEING DISCONNECTED

What does it matter if a household is disconnected from the network? The Internet has already become an important means of communications and commerce in society and households that do not have access have more difficulty conducting their daily activities. They cannot shop as effectively or conveniently, are not offered attractive pricing plans, cannot gather information or contact public officials and other people as effectively. They become less effective consumers and citizens relative to their fellow citizens who have access.

The deprivation is not only relative, it may be absolute. They may be cut off from important personal, cultural and civic activities. Businesses may effectuate market segmentation by restricting their activities to cyberspace, since this screens out less attractive customers. For example, instead of 800 numbers, advertisers may give web sites for further information; jobs may be listed on websites, but not advertised in physical space. As the Internet becomes the dominant means of communication and commerce in the 21st century, the cost of being cut off would rise in relative and absolute terms.

To examine this issue we looked at activities in which respondents engage in cyberspace and compared them to activities in physical space. Given the general orientation of the debate over the digital divide, we have focused on what might be called economic and political activities, rather than social activities. For example, economic activities include basic skills for using the Internet, personal productivity improvement and commercial activity. Political activities include civic discourse and political expression. Information gathering and interacting with government could be considered to fall in both categories.

A. PARTICIPATING IN CYBERSPACE

Table 3 shows that there are very substantial differences between groups in their use of the Internet. It is interesting to note that half of the disconnected and two-thirds of the potentially connected report that they have used the Internet at some time. This is in contrast to virtually all of those who are partially or fully connected. Although the disconnecteds have used the Internet, they are more likely to say they do not understand what it is about.

TABLE 3
CONSEQUENCES OF BEING DISCONNECTED
ACTIVITIES IN PHYSICAL SPACE AND CYBERSPACE
(Percent of Respondents; Cyberspace in Bold)

	Disconnected	Potentially	Partially	Fully
BASIC SKILLS				
Ever used the Internet	**49**	**65**	**95**	**97**
Don't have a clue what the Internet is about	**58**	**42**	**14**	**12**
Use Internet at work	**11**	**27**	**43**	**47**
Use Internet in public	**7**	**15**	**18**	**15**
PERSONAL PRODUCTIVITY				
Searched for a Job online	**14**	**13**	**23**	**28**
Searched for business info online	**21**	**30**	**46**	**52**
COMMERCIAL ACTIVITY				
Made an online purchase	**11**	**19**	**53**	**57**
Visited website seen in an Ad	**14**	**25**	**64**	**62**
Visited website seen in a Program	**17**	**28**	**65**	**67**
INFORMATION GATHERING				
Read a newspaper	92	94	97	97
Obtained news or sport results online	**25**	**30**	**60**	**65**
Read a news magazine	62	67	72	79
Visit a news website	**18**	**25**	**62**	**70**
Attended a lecture	29	44	55	55
Obtained educational information online	**26**	**42**	**72**	**73**
INTERACTING WITH GOVERNMENT				
Contacted a local public official	31	35	40	40
Visited website of a gov't agency	**13**	**17**	**36**	**40**
CIVIC DISCOURSE				
Wrote a letter to the editor	20	18	24	27
E-mailed a Newspaper	**8**	**6**	**15**	**16**
Discussed politics with a neighbor	46	47	56	50
Discussed politics in an e-mail	**7**	**4**	**9**	**12**
POLITICAL EXPRESSION				
Circulated a petition for a politician	10	11	12	12
Signed or forwarded a petition	5	5	9	14
Attended a political rally	22	23	18	19
Visited a politician's website	**8**	**7**	**18**	**19**

If using the Internet is helpful for conducting the economic and political activities identified in Table 3, it quite clear that the disconnected are at a disadvantage and are being disenfranchised. The ability of the disconnected to improve their lot, conduct commercial activity, gather information, interact with government, engage in civic discourse and political expression is restricted relative to online members of their community. This is over one-quarter of the population. The potentially connected also suffer the disadvantage and disenfranchisement, albeit at a slightly lower level than the disconnected. This is more than one fifth of the population.

B. CYBERSPACE MAY BE INCREASING INEQUALITY OF OPPORTUNITY

Finding that households that are disconnected are much less likely to make use of the Internet for a variety of activities considered important for personal improvement, economic advancement and civic/political participation does not necessarily demonstrate a digital divide. After all, these households are less educated and have lower incomes. This difference in participation in cyberspace might simply be a reflection of their lower levels of participation in real space. This would still be a public policy concern, but it would not be a uniquely digital divide issue.

On the other hand, if cyberspace activity is much less evenly spread across the population than physical space activity, then it is a uniquely cyberspace problem and it could be very significant as the role of online activity expands in the "Internet Century." People who are not disadvantaged or disenfranchised in physical space are becoming so in cyberspace. As society shifts more of its important activities into cyberspace, the inequality between people grows. The deprivation may be relative and absolute. People can still do their physical space activities, but they are at a disadvantage compared to those who can get things done more easily. Eventually, they could be cut off as certain activities come to exist only in cyberspace.

In fact, there is a dramatic difference between participation in physical space and cyber space. The disconnected and potentially connected households generally participate a little less in physical space,[5] but not nearly as much less as they do in cyberspace. The data are consistent with the disadvantage/disenfranchisement argument. <u>The problem is not that the disconnected do not participate in physical space, it is that they cannot participate in cyberspace.</u>

The existence and persistence of the gap is not for lack of appreciation among those who are disconnected that they are missing out on something important (see Table 4). Respondents have a very strong appreciation for the importance of technology in general and computers in particular. Those who intend to get connected express exactly the same level of appreciation as the currently connected. This pattern holds for both computers and the Internet.

[5] The one clear exception is the percentage of disconnected who report attending a lecture.

TABLE 4
ATTITUDES TOWARD TECHNOLOGY

	CURRENTLY CONNECTED	WILL GET CONNECTED	WILL NOT BE CONNECTED
TECHNOLOGY IMPORTANCE			
If you want to be successful nowadays, you need to understand technology	91	91	83
Children learn more when they have access to technology	87	87	84
TECHNOLOGY AND THE DIVIDE			
Technology advances increase the gap between rich and poor	60	63	68
I worry that some people will be left behind by the “information revolution”	55	71	63
COMPUTERS			
We’d be better off without computers (disagree)	87	87	68
Computer skills are vital for tomorrow	96	96	93
INTERNET/ACCESS			
I feel the Internet can help enhance my career	83	82	51
I feel the Internet can help enhance my education	59	62	32
I would like to receive Internet service through my television	37	64	33
TECHNOLOGY SKILLS			
I consider myself computer-savvy	57	30	21
Don’t’ have a clue what the Internet is and what it can do for me (disagree)	87	70	56
The Internet is too expensive	52	65	66

The disconnected appear somewhat different in their attitudes toward technology. They express slightly less appreciation for the importance of technology in general and computers, but a great deal less belief that the Internet can do them good. While about half of those on the Internet say it is too expensive, about two-thirds of those not on the Internet feel this way.

There is also a strong sense that technological progress can have the effect of increasing the gap between rich and poor, with almost two-thirds of respondents expressing this sentiment. Those not intending to get connected express the greatest concern (68 percent agree), but even those currently connected express concern (60 percent). Being left behind by the "information revolution" is also a concern expressed by 57 percent of respondents. Interestingly, while 55 percent of the currently connected express this concern and 63 percent of those not intending to get connected do, 71 percent of those who intend to be connected express this concern.

This suggests that the intention to get connected may be spurred by the urgent desire not to be left behind. Consistent with this interpretation is the fact that they are much more likely to state that they would like to have the Internet over their TV (64 percent). In contrast, only 37 percent of the currently connected and only 34 percent of those not intend to get connected say they want the Internet over their TV.

There are much larger differences across the groups in terms of knowledge and command of the technology. The disconnected do not have the resources and they lack the skills. They fully appreciate technology and computers, but they are less likely to see the value of the Internet to them. Their limited experience may account for the latter difference.

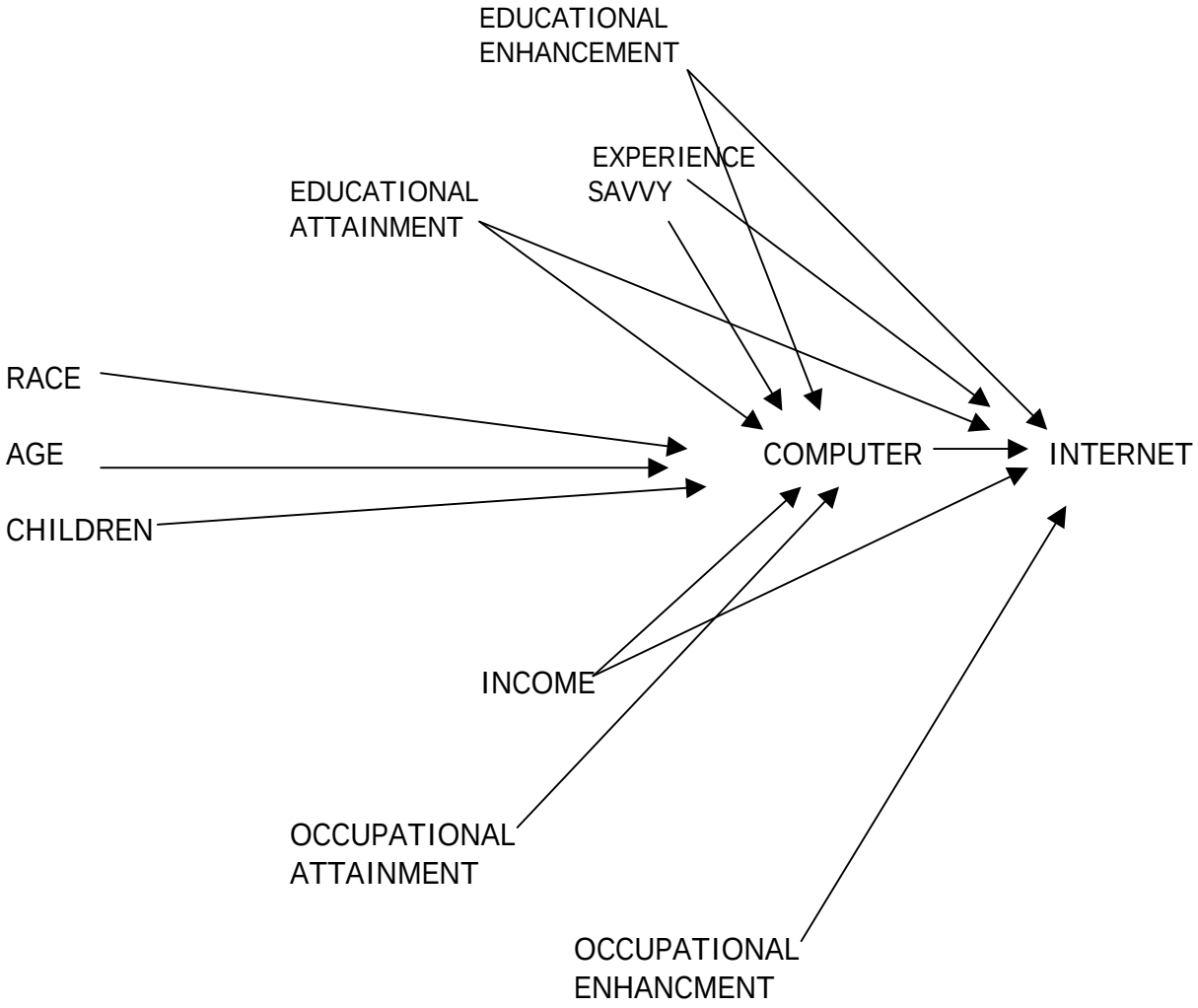
The very large differences of opinion between those who intend to get connected and those who do not on the prospects for educational or career enhancement are striking. This may reflect the fact that these technologies do not play a large or apparent role in the current occupation/situation of the disconnected. Those who intended to get connected are twice as likely to be in managerial or administrative occupations (24 percent to 12 percent) and much more likely to have graduated from college (33 percent to 19 percent).

The computer appears to play a key role in getting on line. Among those who do not have a computer, respondents who say they will get connected within the next four years, also say, overwhelmingly (86 percent), <u>they will get a computer</u> in that same time period. Among those who do not have a computer and who say they will not get connected in the next four years, the overwhelming majority (81 percent) also say <u>they will not get a computer</u> in that time period. This is perfectly consistent with the earlier observation that 81 percent of those who have a computer are connected.

In essence, getting people PC hardware and training is the key, since once they have one, they get online, as suggested earlier. This may be driven by the perception and current reality that the computer is an extremely important device for personal skills. While other means of connection to the Internet may evolve, the computer is likely to continue to be an important tool for activities other than getting connected. For the immediately relevant time frame of public policy analysis, it appears to be the lever for connectedness.

Combining the earlier discussion of demographic factors with this analysis of attitudinal factors, we can construct a "conceptual model" of future Internet adoption (see Figure 7). The relationships included have been discussed in the earlier analysis in and are also statistically significant in a multivariate analysis.

FIGURE 7
CONCEPTUAL MODEL OF FUTURE INTERNET ADOPTION COMBINING DEMOGRAPHIC AND ATTITUDINAL FACTORS



Intention to get a computer is far and away the most important factor affecting intention to get on line. Income affects both the intention to obtain a computer and the intention to get on line. It is by far the largest effect on both. It provides the resources. Educational attainment and prospects for educational enhancement also affect both. Computer savvy affects the intention to get a computer, as does occupational attainment. Prospects for occupational enhancement affect intention to get connected. Race, age and children affect the intention to get a computer.

V. CONCLUSION

As an empirical investigation into the nature of the digital divide, this study does not offer a specific set of policy recommendations. The objective is to establish an appreciation of the nature and impact of the digital divide.

It is clear that, while computer ownership and Internet use continue to grow, the "digital divide" that separates those Americans connected to the Internet from those who are not persists and is not likely to disappear any time soon. This gap puts millions of Americans at a serious disadvantage in our increasingly “online” society. Those at risk are in vulnerable groups – lower income, elderly and minorities.

Understanding that these vulnerable groups are harmed by their lack of access to technology becomes the starting point for seeking cost-effective avenues to address this deprivation. The disconnected are disadvantaged and disenfranchised.

The steps to be taken to overcome the digital divide emerge from the attitudes toward and experience with information-age technologies. The digital divide is not the result of a failure of those without access to appreciate the importance of technology, rather it results from a maldistribution of skills and opportunities. Public policy to close the digital divide should build human capital by giving people the capital skills to use information age technologies, the experience to make them comfortable with these technologies and the resources to obtain the necessary hardware at home, where they conduct their daily activities.