

BEYOND ACCESS:
THE DIGITAL DIVIDE AND INTERNET USES AND
GRATIFICATIONS

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ABSTRACT

This research explores the relationship between Internet use and gratifications gained within the context of the digital divide framework. Analyses within sub-samples defined by age and socio-economic status reveal that there are notable differences in uses and gratifications across subgroups. For instance, those who are young and high in socioeconomic status are most likely to use the Internet to satisfy their motivations strategically and to gain the desired gratifications. They are most likely to engage in specific Internet behaviors—computer-mediated interaction, surveillance, and consumption uses—to achieve the particular gratifications of connection, learning, and acquisition.

In contrast, those who are young and low in socio-economic status were more likely to employ consumptive use of the Internet to attain connection gratifications. Similarly, regardless of age, both low socioeconomic status subgroups were likely to use computer-mediated interaction as a means to gain learning gratifications. Even as gaps in access are closing, gaps in usage and gratifications gained seem to persist.

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Increased access to computer-mediated-technologies, such as the Internet, has extended Americans' informational and interactive capabilities. The latest Department of Commerce/National Telecommunications and Information Administration (NTIA) data (collected as part of the Current Population Survey with over 50,000 households), show that for the first time, over 50% of all Americans have home "Internet access." The Bush administration has interpreted these data as evidence that there is no longer a "digital divide" in the U.S. Others vehemently disagree with this conclusion, citing the fact that roughly half of Americans remain "disconnected" at home (Borgida et al. 2002; Gil de Zúñiga 2003; Jackson et al. 2001).

As an increasing number of citizens use the Internet for communication, entertainment, shopping, and information, simple "connectedness" measures focusing on Internet access and time spent online are no longer sufficient to gauge whether a "divide" still characterizes the digital world. Although the varied features of the Internet and the ever-changing face of Internet technology makes it difficult to examine the use and effects of the Internet, research needs to re-conceptualize the digital divide to reflect the varied uses people make of the Internet and the specific gratifications gained from these interactions.

Based on national survey data collected by the Pew Internet and American Life Project during March of 2000, this article examines how differences in age and socio-economic status result in qualitatively different patterns of the Internet uses and gratifications derive from its use. These data provide rich measures of online activities, which this study attempts to relate to functional gratifications gained from various types of online behavior. We structure our analysis through the lens of recent work on the digital divide and more longstanding research on media uses and gratifications (e.g. Katz et al. 1974).

LITERATURE REVIEW: DIGITAL DIVIDE

The Internet and cyberspace may not have fully reached their potential to create the large-scale social change some have argued it would provide. However, rapid expansion has generated new social status (Schiller 2000) and added layers of opportunities to human relationships, communication, information and, ultimately, user behavior. This expansion of the new technologies has raised concerns about equitable access in under-served social sectors in what is known as the digital divide—i.e., the divide between those with access to the Internet and those without access to the opportunities such "connectedness" provides.

However, the digital divide is more than an issue of access. It is a sociological phenomenon reflecting broader social, economic, cultural, and learning inequalities. Most of the studies clearly illustrate that a range of factors and contextual characteristic are responsible for differences. No single factor—gender, age, race, education, income or geographic location—can alone shed sufficient light on the issue to fully explain the access gap (Wahl et al. 2000). Yet research has documented the importance of basic factors, individually

and in combination, on the digital divide (Hirt, Murray, and McBee 2000; Hoffman and Novak 1998, 1999; Howard et al. 2001; Kavanaugh and Patterson 2001; Nie and Erbring 2000).

In addition, recent research has attempted to expand the conception of the divide to move beyond access to consider issues of proficiency and satisfaction. Even if gaps have diminished in terms of access (Katz et al. 2001; Smolenski 2000), significant gaps may remain in terms of patterns of use and gratifications gained (Lazarus and Mora 2000; Norris 2001). Many researchers and technologists argue that these gaps remain a persistent problem to this day, especially in terms of age and socio-economic status, with the poor and elderly remaining the most “disconnected” from the virtual world. This article moves beyond the “access gap” to the “uses and gratifications gap” considering a motivational approach that has been employed to explore how people use the media and communication technologies.

USES AND GRATIFICATIONS PERSPECTIVE

According to the uses-and-gratifications perspective, communication needs interact with social and psychological factors to produce motives for media use (Rosengren 1974). In other words, people use media strategically. They employ different media for different purposes and, more importantly, they select among media choices based on how well each option helps them meet specific needs or goals (Katz, Gurevitch, and Haas 1973; Katz et al. 1974).

Underlying this perspective is the notion that people are motivated by a desire to fulfill certain *needs*. So rather than asking how media use influences users, a uses-and-gratifications perspective asks how users' basic needs influence users' media choices. It is important to note that the media choices that people make are motivated by the desire to satisfy a wide variety of functions: entertainment, diversion, social connection, personal identity, information and the like. Much of the research on uses and gratifications has been concerned with identifying the specific gratifications satisfied by the use of media (Rubin 1994; Swanson 1992). The first assessments on this topic were made by Herzog (1944), who coined the term “uses and gratifications” to explain the specific dimensions of satisfaction of the audiences, particularly on radio. Following this inquiry, mass communication scholars studied these effects on other media such as newspapers, television, VCRs, and electronic bulletin boards (Eighmey and McCord 1998; Rubin 1994); for a comprehensive summary of the literature (see Rubin 2002).

When a new medium is used for the same purpose as an older medium, the new medium potentially functions as an alternative to the older one. Audiences may choose between them by determining which one better satisfies particular needs (Rosengren and Windahl 1972; Williams, Rice, and Rogers 1988; Wright 1960; see also McCombs 1972). Thus, analysts must begin by identifying the social and psychological needs media can satisfy, and then assess

whether or not the Internet can satisfy those needs. Katz, Gurevitch, and Haas (1973) offer a typology of needs of media users that can be expressed as:

- *Cognitive Needs*—For information, knowledge, and understanding of our environment.
- *Affective Needs*—For aesthetic, pleasurable, and emotional experiences.
- *Personal Integrative Needs*—For credibility, confidence, stability, and personal status.
- *Social Integrative Needs*—For contact with family, friends, and the world.
- *Escapist Needs*—For escape, diversion, and tension release.

It would seem that the Internet is actively used to satisfy many of these needs because most Internet navigation is motivated by the desire to locate content via search engines by clicking on the hypertext links that appear on most pages. These acts are indicative of how active the typical Internet user is. Unlike television use, where it could be argued that viewers are often guided by habit, convenience, or inertia rather than by self-reflective selection, Internet use is characterized by frequent choice and greater reflection on the value of what is encountered in relation to the gratification sought. In this way, the Internet may be a medium that more readily allows users to meet their desires, whether for good or ill.

GRATIFICATIONS GAINED FROM INTERNET USE

The arrival of any “new technology” stimulates hypotheses about the future implications of its use and its contribution to society. For the Internet, scholars have staked opposite extremes, with some welcoming its arrival (Rheingold 1994; Newhagen and Rafaeli 1996; Morris and Ogan 1996) and others fearing it (Calcutt 1999; Cuban 1986; Healy 1998; Oppenheimer 1997). Although there has been a tremendous amount of speculation about the social and personal consequences of Internet use, little research has systematically examined the implications of the unique uses that individuals make of the Internet. It is in these differences that research can document the broader implications of sociological disparities in Internet use.

For example, December (1996) identifies three broad categories for why people use the Internet: communication, interaction, and information. Likewise, Eighmey and McCord (1998) find some support for their contention that people employ the Internet to satisfy the same needs that they bring to their consumption of other media. Newhagen and Rafaeli (1996) have suggested that Internet usage may have high utility because of its “mutability,” or what Newhagen calls its “chameleon-like character.” The diversity of content is much greater on the Internet than on traditional electronic media. While television,

radio, and (to a lesser degree) print media are subject to regulatory and societal scrutiny, the Internet is virtually unregulated. Because of this, the Internet quite literally has something for everybody. The fact that this range of material is available at schools, libraries, workplaces and at home would suggest that people can use the Internet to satisfy a diverse set of motives across a range of social contexts.

The salience of information seeking, or what is referred to as *learning gratification*, has been well documented in explaining Internet use and its consequences (Chen and Wells 1999; Shah et al. 2001). This is also true of the *connecting gratification*, as suggested by scholars interested in computer-mediated communication and social connectedness (Gershuny 1983). Indeed, among the first examinations of the Internet from a uses-and-gratifications perspective by Rafaeli (1986) sought to establish the needs satisfied by electronic bulletin boards. Since then, different research has focused on a relatively narrow set of gratifications: Eighmey and McCord (1998) emphasized informational and social uses; Korgaonkar and Wolin (1999) added entertainment and escapism; Ko (2002) supplemented this with diversion and interactivity. Leading uses-and-gratifications scholars (see Ferguson and Perse 2000; Papacharissi and Rubin 2000) focused on the following functions: information, entertainment, personal utility, and interpersonal integration.

To date, research has only related motivations with certain uses; the gratifications gained from these uses remaining unclear, especially within the context of factors that have predicted the access divide. This issue will be examined with two primary research questions:

RQ1: How do patterns of Internet use relate to specific gratifications gained from these uses?

RQ2: Do these patterns change within subgroups as defined by age and socio-economic status?

METHODS

Data: The data analyzed in this study were collected as a part of the Pew Internet and American Life Study in 2000. Telephone interviews were conducted with a probability sample of 43,224 adults, 18 years of age or older over the year of 2000. A variant of random digit dialing was used in order to include unlisted numbers in the sample (see Pew Internet and American Life Study 2000 for more details). The Year 2000 Tracking Dataset catalogues the attitudes and activities of Americans who used the Internet.

Data collected particularly in March 2000 were selected for the present analyses because March data provide the richest sets of measures for Internet activities and gratifications gained. Then, our analyses were limited to respondents who were Internet users, for two reasons: 1) the focus is not on the digital divide as traditionally defined in terms of access, but in terms of patterns

of use, and 2) it makes little sense to examine the gratifications gained from Internet use among people who do not use the medium with any regularity. Accordingly, the analysis focuses on patterns of Internet use and gratifications defined by the most persistent digital divide categories of age and socioeconomic status. These individuals ($n=2,752$) constituted 45 percent of the total sample in March survey.¹

MEASURES

Criterion variables: Internet use gratification was measured by a battery of items tapping how much respondents thought the Internet had improved diverse abilities. Three gratifications were identified from the factor analysis that paralleled three of the four gratifications outlined in prior research: gratification related to social connection, learning, and personal acquisition.

Subsequent tests for reliability of each index indicate acceptable values for Cronbach's alpha and mean inter-item correlation. Connection gratification was calculated by summing up the scores of two items: connections to members of one's family and connections to one's friends ($\alpha = .70$; mean inter-item $r = .54$). Learning gratification was measured by two items ($\alpha = .54$; mean inter-item $r = .37$). Respondents were asked how much the Internet had improved the way they got information about health care and their ability to learn about new things. Acquisition gratification was measured by two items as well: ability to shop and the way respondents manage their finances ($\alpha = .52$; mean inter-item $r = .35$).

Control variables: There were two sets of control variables: demographics and basic access factors. Five demographic variables were included as exogenous controls in our model—respondent's gender (dummy variable with female coded 1), age, race (dummy variable with white coded 1), level of education, and income (See Appendix A: Question Wording for exact wording). Basic access factors were also controlled to rule out their potential impact on the relationship among the variables of our interest. Internet access location (whether or not respondents used the Internet at home), frequency of Internet use (how often respondents used the Internet), length of Internet use (how long respondents have used the Internet), and email use (whether or not respondents used email) were controlled.

Antecedent variables: Both exploratory factor analysis and reliability tests were performed in order to identify patterns of Internet use. Three types of Internet activities were identified in the factor analysis: surveillance use, consumption uses, and social interaction uses. Surveillance use of the Internet was measured by using five items ($\alpha = .55$; mean inter-item $r = .20$). Respondents were asked if they ever did any of the following when they went online: 1) got news online, 2) did research for school or training, 3) checked

weather reports and forecasts, 4) worked or researched online for one's job, and 5) looked for news or information about politics and the campaign. An additive scale was created based on these five items.

Consumptive use of the Internet was measured by three items ($\alpha = .62$; mean inter-item $r = .35$). Respondents were asked if they ever did any of the following when they went online: 1) got information about travel, such as checking airline ticket prices or hotel rates, 2) bought a product online, such as books, music, toys or clothing, and 3) bought or made a reservation for a travel service, like an airline ticket, hotel room, or rental car.

Social interaction use was measured by three additive items ($\alpha = .57$; mean inter-item $r = .31$). Respondents were asked if they ever: 1) sent "instant messages" to someone who's online at the same time, 2) took part in "chat rooms" or online discussions with other people, and 3) played a game online. Given that the variables are all dichotomous measures, the somewhat low alphas are not viewed as a threat to validity. Rather, the mean inter-item correlations indicate reasonable levels of internal consistency, even though some of these behaviors may preclude or displace others.

ANALYTIC FRAMEWORK

First, path-modeling techniques were employed among the sub-sample of Internet users to provide overall patterns of how different types of Internet use are associated with various gratifications gained. Then, the patterns of relationship between Internet use and gratification gained were examined for differences that depend on the two most important individual-level factors in the persistent digital divide—socio-economic status and age. Socio-economic status was constructed by combining income and education, both of which were standardized from 0 to 1. Socio-economic status and age were dichotomized at the median value. These two dichotomies create the four subgroups (shown in Table 1): high SES-young (N=547), high SES-old (N=745), low SES-young (N=749), and low SES-old (N=507).ⁱⁱ The path-modeling techniques were then re-applied to these four subgroups.

Results: Prior to examining the relationships among Internet uses and gratifications, simple descriptive statistics were computed to examine differences across the four sub-samples. Specifically, the degree to which these four groups differed in their patterns of Internet use was examined, along with the gratifications gained. These results are presented in Table 2, which presents the mean scores on the antecedent and criterion variables described above and

TABLE 1: DEMOGRAPHIC PROFILE FOR EACH SUBGROUP

Group	Education	(n)	Income	Age	Female
1. Low SES-Young	High School Graduate	(749)	30-40,000	27	54.1 %
2. Low SES-Old	High School Graduate	(507)	40-50,000	47	53.8 %
3. High SES-Young	College Graduate	(547)	50-75,000	29	50.5 %
4. High SES-Old	College Graduate	(745)	75-100,000	46	43.4 %
1. Entries for education, income, and age are median values.					
2. Entries for female are percentage of female.					

indexes these scores against the overall mean for all Internet users in the sample. The results indicate that young-high SES subgroup is characterized as using the Internet, mostly for the purpose of surveillance (mean=2.9) and consumption (mean=2.0), followed by the old-high SES. In contrast, old-low SES subgroup was the lowest for both surveillance (mean=2.3) and consumptive (mean=1.3) use of the Internet. When it comes to Internet use for interaction, young-low SES subgroup had the highest (mean=1.5), followed by young-high SES subgroup while the old-high SES showed the lowest mean score (.8). In contrast to the results for Internet uses, there are few differences in gratifications gained across the four subgroups with mean scores close to that for whole sample. Thus, the gaps in patterns of use do not extend to gratifications, raising the possibility that distinct uses contribute to multiple gratifications.

Path Analysis: Before relating these variables to one another, each measure was residualized on a set of controls as shown in Table 3. That is, in order to rule out potential confounding variables, a residualized covariance matrix was employed as input in the path models. To construct the residualized matrix, the six variables of our interest, Internet use and gratifications, were regressed onto the sets of control variables. These regressions produce residuals, the part not explained by the controls, with which a covariance matrix was constructed to be analyzed. In so doing, we can assume that the models control for the variables used to create the residuals. Outputs of the regression analyses were reported in order to note how much variance in the Internet use and gratification variables were explained by the control variables (See Tables 3-7 and Appendix B, Tables I-IV).

First, sizable amounts of variance in patterns of Internet use were explained by demographic variables (i.e., gender, age, income, education, and

TABLE 2: DIFFERENCES IN INTERNET USES AND GRATIFICATIONS GAINED ACROSS THE SUBGROUPS

	a) Patterns of Internet Use			b) Gratification Gained		
	1.Surveillance	2.Interaction	3.Consumption	4.Learning	5.Connection	6.Acquisition
Low SES-Young	2.6 (1.4)	1.5 (1.1)	1.5 (1.2)	2.6 (0.6)	2.7 (0.6)	1.9 (0.6)
Low SES-Old	2.3 (1.5)	1.0 (1.0)	1.3 (1.1)	2.6 (0.6)	2.7 (0.6)	1.8 (0.5)
High SES-Young	2.9 (1.4)	1.0 (1.0)	2.0 (1.3)	2.6 (0.5)	2.7 (0.6)	2.1 (0.6)
High SES-Old	2.8 (1.5)	0.8 (0.9)	1.9 (1.3)	2.6 (0.5)	2.7 (0.6)	2.0 (0.6)
Total Sample	2.7 (1.5)	1.1 (1.0)	1.7 (1.3)	2.6 (0.6)	2.7 (0.6)	2.0 (0.6)

Entries are mean values with standard deviations in parenthesis.

race) and basic access factors (i.e., Internet use frequency, length of Internet use, Internet access location, and email use). In the analysis of all Internet users, variance explained ranged from 16% to 22%. The amount of variance explained in patterns of Internet use differed considerably across the four subgroups. Both surveillance and interaction uses of the Internet were explained most in the young, high-SES subgroup (23% and 18% respectively) and least in the young, low-SES one (12% and 11% respectively). In contrast, consumptive use of the Internet was explained most in the old, high-SES subgroup (27%) and least in its low-SES counterpart (14%).

In terms of surveillance (column a1 in Table 3) uses, age, education, frequency of Internet use, and length of Internet use accounted for most of this variance in Table 3, with age being particularly important among older respondents and education particularly important among younger respondents. For consumptive uses (column a3), income, education, and basic access factors were dominant predictors, though the relative power of these variables differs considerably across subgroups. Finally, social interaction (column a2) via the Internet is negatively predicted by age and education and is positively predicted by frequency and location of Internet use. Education and home use consistently predicted consumptive uses of the Internet across all subgroups.

On the other hand, somewhat different patterns were detected in relation to gratifications gained. Two sets of variables, demographics and basic access factors, in the whole sample model explained 15% and 12% of variance in connection (column b5) and acquisition gratification (b6) respectively, but only 3% variance in learning gratification (b4). The same pattern was detected in the subgroup models shown in Appendix B, Tables i-iv. However, worth noting is that all types of gratifications were best explained in Table B ii for the old, low-SES subgroup (23%, 14% and 9% for connection, acquisition, and learning gratification respectively) while regression models on the young, low-SES subgroup explained the least amount of variances in connection (16%) and acquisition gratification (7%). Also, learning gratification was explained least in the young, high-SES subgroup model, shown in Appendix B, Table iii.

TABLE 3: DEMOGRAPHICS AND INTERNET USE PREDICTING PATTERNS OF INTERNET USE AND GRATIFICATION GAINED: INTERNET USERS

	a) Patterns of Internet use			b) Gratification gained		
	1.Surveillance	2.Consumption	3.Interaction	4.Learning	5.Acquisition	6.Connection
Demographics						
Gender (Female)	-.060**	.037#	.024	-.012	-.077***	.150***
Age	-.119***	-.103***	-.165***	-.017	-.116***	.010
Income	.045*	.151***	-.067**	-.041#	.167***	-.066**
Education	.114***	.137***	-.234***	-.005	-.019	.032
Race (White)	-.066**	.030	-.058**	-.033	.011	.012
Incremental R² (%)	6.4***	9.5***	9.9***	0.3	5.6***	2.5***
Internet Use						
Frequency	.221***	.142***	.129***	.083**	.210***	.199***
Length	.176***	.206***	.050*	.104***	.067**	.066**
Location	.047*	.153***	.142***	.091***	.098***	.141***
Email	.005	.085***	.115***	.002	-.008	.154***
Incremental R² (%)	9.5***	12.2***	7.2***	3.0***	6.3***	12.1***
Total (%)	15.9***	21.6***	17.2***	3.3***	12.0***	14.5***

Cell entries are standardized final regression coefficients.

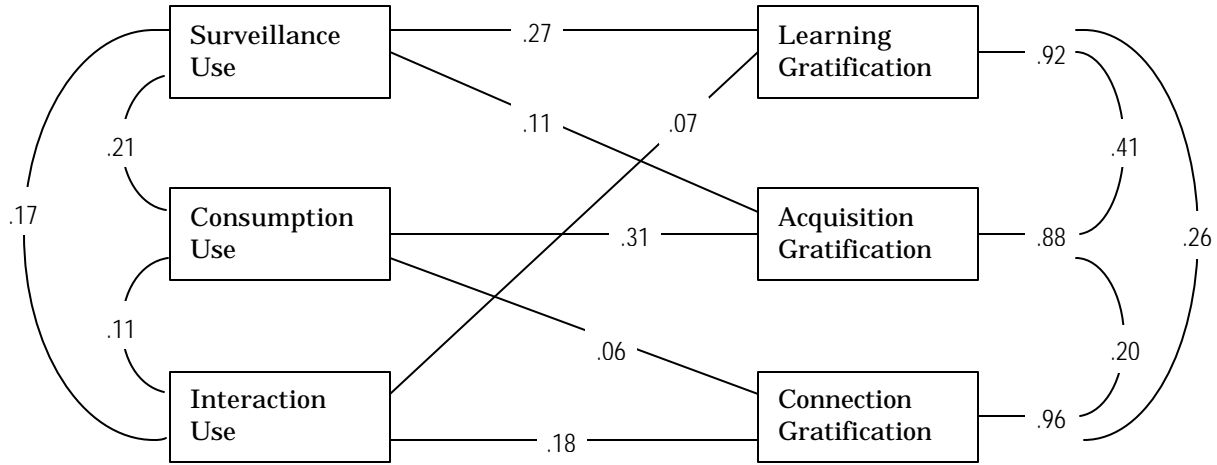
$p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

For connection gratification, four predictors accounted for most of the variance: female gender, frequent use of the Internet, use from home, and email use. Age negatively predicted connection gratification among younger, high-SES respondents but positively predicted it among older, high-SES respondents (Appendix B, Table IV).

Likewise, variance in learning gratifications was mainly explained by length and location of use, though there was considerable inconsistency across subgroups. Finally, for the acquisition gratifications, income and frequency of use were the two dominant factors, with income explaining variance among those with high-SES and frequency explaining variance among those with low-SES. Male gender also accounted for acquisition gratifications, but only among older respondents.

Since the variances explained by the control variables were already removed through residualization, the total variances explained by the following path models can be interpreted as amount of variances uniquely explained by patterns of Internet use. This article next presents the five path models: first a general model for all Internet users (Figure 1) and then the four subgroup models based on the above typology (See Appendix C, Figures I-IV).

FIGURE 1: WHOLE SAMPLE MODEL OF INTERNET USE AND GRATIFICATION



PATH DIAGRAMS

Connection Gratification. For the model of all Internet users, connection gratification was explained by both consumptive use ($\beta = .06, p < .001$) and social interaction over the Internet ($\beta = .18, p < .001$). These two types of Internet use explained 4 percent of variance in connection gratification with demographics and basic pattern of Internet use controlled. Analyses of the four subgroups in Appendix C defined by the fourfold typology demonstrate which subgroup drives the relationship between consumptive use of the Internet and connection gratification.

Learning Gratification. In the initial model, learning gratification was explained by surveillance use ($\beta = .27, p < .001$) and to a lesser degree by social interaction over the Internet ($\beta = .07, p < .001$). These two types of Internet use explained 8 percent of variance in connection gratification with demographics and basic pattern of Internet use controlled. Again, this general pattern appears to be driven by the patterns of use within certain demographic subgroups, shown in Appendix C.

Acquisition Gratification. In the initial model using all Internet users, acquisition gratification was explained by both consumptive use ($\beta = .31, p < .001$) and surveillance use of the Internet ($\beta = .11, p < .001$). These two types of Internet use explained 12 percent of variance in acquisition gratification, with demographics and basic pattern of Internet use controlled. This pattern in the whole sample analysis resonated across all four subgroups as shown in Appendix C.

DISCUSSION

The results of this study highlight how patterns of Internet uses and gratifications reveal notable differences across subcategories defined by the demographic varieties of age and socioeconomic status. Even if gaps in overall access may be closing, differences in usage patterns and their relationship with gratifications gained may persist. As shown in Table 2, there are substantial differences in uses across the four subgroups, differences that likely reflect broader social, economic, and cultural inequalities. Further, the regressions conducted for residualization, shown in Appendix Tables Bi-Bv, support the view that there are substantial differences in the factors contributing to particular patterns of use and gratifications gained within each subgroup.

More important, the results of this study indicate that even after residualizing for factors thought to be central to the persistence of access gaps, and only testing relationships among individuals who used the Internet, unique patterns of uses and gratifications emerge across the four SES/age subgroups.

The data suggest that that the subgroup including those who are young and high in socioeconomic status are most likely to use the Internet to strategically satisfy their motivations and to gain the desired gratifications. First, this group is most likely to engage in specific Internet behaviors—i.e., computer-mediated interaction, surveillance, and consumption uses—to achieve corresponding gratifications—i.e., connection, learning, and acquisition, respectively. These individuals may be particularly efficient in using the Internet to satisfy the needs that they were seeking to fulfill. They are the most parsimonious in gaining gratifications from the Internet based on specific, highly correspondent uses.

In contrast, the groups that are thought to be relatively less “connected”—young and low SES, old and high SES, and furthest removed, old and low SES—were more apt to rely on multiple Internet behaviors to satisfy their needs. For example, respondents who were low in socio-economic status and young were particularly likely to employ consumptive use of the Internet to attain connection gratifications. Similarly, both low socioeconomic status subgroups (regardless of age) were likely to use computer-mediated interaction as a means to gain learning gratifications. This suggests that those newer to the Internet are still learning to navigate its complexity and often rely on alternative channels to satisfy basic needs. Nonetheless, the Table 2 data indicate that they are able to gain these gratifications at levels that correspond with the more highly “connected.” Apparently, these individuals may not be as efficient in their use of the Internet, but are still able to achieve their goals for use through a variety of usage channels.

More generally, this research reinforces the view that the digital divide should move beyond a simple consideration of access to examine more closely factors such as patterns of use and their connections to gratifications gained.

This study is one step in that direction, but unfortunately, it suffers from a number of problems; most of these can be dealt with in future research.

First and foremost, this was a secondary analysis of an existing study, which limited the scope of Internet behaviors considered and the types of gratifications gained. Future research can expand the scope of both of these categories particularly in terms of recreational uses and entertainment and diversion gratifications. Second, the present subgroup analysis focused only on the two major factors of age and socioeconomic status. Other factors may also structure patterns of Internet use and gratification gained: gender, race, location and speed of access, as well as length of time using the Internet.

Even with these limitations, there is much to be learned from these data, and much future research on digital divide and media uses and gratification can emerge from this foundation. In particular, these data suggest that even as the gap in Internet access closes, inequalities in Internet use and individuals' gains from these interactions may persist. These inequalities may not only be observed in levels of uses and gratifications, but also in the ability of individuals to use the Internet in ways that allow them to meet basic needs. Future research on the Internet should continue to examine these differences and the relationships among them to test whether the digital divide is closing with regard to uses and gratifications.

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APPENDIX A: QUESTION WORDING

[Demographics]

Age: What is your age?

Gender: Coded by Interviewer

Education: What is the last grade or class you completed in school?

1. None, or grades 1-8
2. High school incomplete (grades 9-11)
3. High school graduate (grade 12 or GED certificate)
4. Business, Technical, or vocational school AFTER high school
5. Some college, no 4-year degree
6. College graduate (B.S., B.A., or other 4-year degree)
7. Post-graduate training/professional school after college
9. Don't know/Refused

Income: Last year, that is in 1999, what was your total family income from all sources, before taxes. Just stop me when I get to the right category.

1. Less than \$10,000
2. \$10,000 to under \$20,000
3. \$20,000 to under \$30,000
4. \$30,000 to under \$40,000
5. \$40,000 to under \$50,000
6. \$50,000 to under \$75,000
7. \$75,000 to under \$100,000
8. \$100,000 or more
9. Don't know/Refused

Race: Are you, yourself, of Hispanic or Latino origin or descent, such as Mexican, Puerto Rican, Cuban, or some other Spanish background?

1. Yes
2. No
9. Don't know/Refused

IF (HISP DOES NOT = 1): What is your race? Are you white, black, Asian, or some other?

1. White
2. Black
3. Asian
4. Other or mixed race
9. Don't know or Refused

[Internet use]**Location:** Where do you go online from?

1. Online only at home
2. Online only at work
3. Online at work and home

Frequency: How often do you go online?

1. Several times a day
2. About once a day
3. 3-5 days a week
4. 1-2 days a week
5. Every few weeks
6. Less often
9. Don't know/Refused

Length: When did you first start going online? Was it within the last six months, a year ago, two or three years ago, or more than three years ago?

1. Within the last six months
2. A year ago
3. Two or three years ago or
4. More than three years ago
9. Don't Know/Refused

Email: Please tell me if you ever do any of the following when you go online. Do you ever send or read email?

1. Yes
2. No
9. Don't Know/Refused

[Antecedent Variables]**Surveillance Use:** Please tell me if you ever do any of the following when you go online. Do you ever: (Recoded Yes=1, No=0, DK/Refused=9)

1. Get news online
2. Do research for school or training
3. Check weather reports and forecasts
4. Not including email, do any type of work or research online for your job
5. Look for news or information about politics and the campaign

Consumptive Use: Please tell me if you ever do any of the following when you go online. Do you ever: (Yes=1, No=2, DK/Refused=9)

1. Get information about travel, such as checking airline ticket prices or hotel rates

2. Buy a product online, such as books, music, toys or clothing
3. Buy or make a reservation for a travel service, like an airline ticket, hotel room, or rental car

Interactive Use: Please tell me if you ever do any of the following when you go online. Do you ever: (Yes=1, No=2, DK/Refused=9)

1. Send “instant messages” to someone who’s online at the same time
2. Take part in “chat rooms” or online discussions with other people
3. Play a game online

[Criterion Variables]

Connection Gratification: How much, if at all, has the Internet improved... a lot, some, only a little, or not at all? (A lot=1, Some=2, Only a little=3, Not at all=4, DK/Refused=9)

1. Connections to members of your family
2. Connections to your friends

Learning Gratification: How much, if at all, has the Internet improved... a lot, some, only a little, or not at all? (A lot=1, Some=2, Only a little=3, Not at all=4, DK/Refused=9)

1. The way you get information about health care
2. Your ability to learn about new things

Acquisition Gratification: How much, if at all, has the Internet improved... a lot, some, only a little, or not at all? (A lot=1, Some=2, Only a little=3, Not at all=4, DK/Refused=9)

1. Your ability to shop
2. The way you manage your personal finances

APPENDIX B: PATH ANALYSIS FOR THE FOUR SES/AGE GROUPS

TABLE I: DEMOGRAPHICS AND INTERNET USE PREDICTING PATTERNS OF INTERNET USE AND GRATIFICATION GAINED: SUBGROUP ANALYSIS—LOW SES AND YOUNG USERS

	a) Patterns of Internet use			b) Gratification gained		
	1.Surveillance	2.Consumption	3.Interaction	4.Learning	5.Acquisition	6.Connection
Demographics						
Gender (Female)	.016	.042	.017	.062	-.015	.111**
Age	.020	-.010	-.102**	-.084*	-.087*	.000
Income	.100*	.134**	-.035	-.042	-.042	-.098*
Education	.131**	.177***	-.193***	-.014	-.052	.052
Race (White)	-.110**	.055	.011	-.043	.059	-.007
Incremental R² (%)	3.7***	6.6***	4.8***	1.5#	2.1*	4.2***
Internet Use						
Frequency	.217***	.114**	.078*	.061	.194***	.154**
Length	.182***	.233***	.084*	.106*	.042	.056
Location	.042	.034	.130**	.089*	.015	.047
Email	-.016	.109**	.113**	.023	.069#	.237***
Incremental R² (%)	8.7***	10.0***	6.1***	2.8**	5.3***	11.3***
Total (%)	12.3***	16.5***	10.9***	4.3**	7.4***	15.5***
1. Cell entries are standardized final regression coefficients.						
2. #p<.10 *p<.05 **p<.01 ***p<.001						

TABLE II: DEMOGRAPHICS AND INTERNET USE PREDICTING PATTERNS OF INTERNET USE AND GRATIFICATION GAINED: SUBGROUP ANALYSIS—LOW SES AND OLD USERS

	a) Patterns of Internet use			b) Gratification gained		
	1.Surveillance	2.Consumption	3.Interaction	4.Learning	5.Acquisition	6.Connection
Demographics						
Gender (Female)	-.069	-.013	.041	-.057	-.149**	.159***
Age	-.238***	-.093*	-.078#	-.063	-.150**	.051
Income	-.074	.153**	-.026	-.133*	.023	-.077
Education	.067	.088#	-.209***	-.050	-.114*	-.078
Race (White)	-.011	-.007	-.132**	.043	.068	.105*
Incremental R² (%)	7.0***	3.3*	6.9***	2.3#	7.6***	4.2**
Internet Use						
Frequency	.192***	.175***	.243***	.162**	.203***	.323***
Length	.166***	.128**	-.040	.131**	.096*	.163***
Location	.083#	.180***	.163***	.115*	.127**	.157***
Email	-.114*	.051	.083#	-.143**	-.091#	.037
Incremental R² (%)	7.6***	10.1***	10.8***	6.2***	6.7***	11.3***
Total (%)	14.5***	13.5***	17.6***	8.5***	14.4***	22.9***
1. Cell entries are standardized final regression coefficients.						
2. #p<.10 *p<.05 **p<.01 ***p<.001						

TABLE III: DEMOGRAPHICS AND INTERNET USE PREDICTING PATTERNS OF INTERNET USE AND GRATIFICATION GAINED: SUBGROUP ANALYSIS—HIGH SES AND YOUNG USERS

	a) Patterns of Internet Use			b) Gratification Gained		
	1.Surveillance	2.Consumption	3.Interaction	4.Learning	5.Acquisition	6.Connection
Demographics						
Gender (Female)	-.072#	.126**	-.019	-.007	-.066	.112*
Age	-.056	.014	-.188***	-.061	.009	-.209***
Income	-.005	.058	-.067	.096#	.205***	.006
Education	.172***	.076	-.200***	.127*	.007	.129**
Race (White)	-.044	.002	-.056	-.007	-.022	.073#
Incremental R² (%)	8.1***	3.0*	10.2***	2.4#	7.0**	8.4***
Internet Use						
Frequency	.278***	.229***	.148**	.085#	.252***	.226***
Length	.227***	.165***	.067	.036	.036	-.067
Location	.036	.246***	.144**	.053	.127**	.104*
Email	-.030	.002	.104*	-.019	-.081#	.179***
Incremental R² (%)	15.1***	15.5***	7.7***	1.1	7.4***	10.9***
Total (%)	23.2***	18.5***	17.9***	3.5#	14.4***	19.3***

1. Cell entries are standardized final regression coefficients

2. # $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

TABLE IV: DEMOGRAPHICS AND INTERNET USE PREDICTING PATTERNS OF INTERNET USE AND GRATIFICATION GAINED: SUBGROUP ANALYSIS—HIGH SES AND OLD USERS

	a) Patterns of Internet Use			b) Gratification Gained		
	1.Surveillance	2.Consumption	3.Interaction	4.Learning	5.Acquisition	6.Connection
Demographics						
Gender (Female)	-.153**	-.009	.075#	-.108**	-.127**	.188***
Age	-.209***	-.087*	-.017	-.080*	-.034	.099**
Income	.066#	.162***	-.102*	-.061	.116**	.050
Education	.015	.078*	-.208***	-.048	-.073#	.009
Race (White)	-.067#	.039	-.096*	-.097*	-.041	-.075*
Incremental R² (%)	8.7***	6.9***	5.0***	2.4*	5.9***	4.2***
Internet Use						
Frequency	.189***	.105**	.118**	.043	.208***	.152***
Length	.167***	.250***	.037	.118**	.062	.037
Location	.040	.227***	.178***	.083#	.160***	.257***
Email	.146***	.144***	.142***	.099*	-.006	.116**
Incremental R² (%)	11.4***	20.2***	9.0***	4.5***	8.1***	13.1***
Total (%)	20.1***	27.1***	14.0***	6.9***	14.0***	17.4***

1. Cell entries are standardized final regression coefficients.

2. # $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

APPENDIX C: DIFFERENT MODELS FOR DIFFERENT SUBGROUPS

Connection Gratification: For the subgroup representing young, low socio-economic status respondents, both consumptive ($\beta = .18, p < .001$) and interaction uses of the Internet ($\beta = .15, p < .001$) were positive predictors of connection gratification among all Internet users. In this subgroup, the two types of Internet use uniquely explained 6 percent of total variance in connection gratification. For the older, low socio-economic status respondents, connection gratification was associated with only social interaction over the Internet ($\beta = .21, p < .001$), with 4 percent of total variance explained after taking controls into account. For the subgroup of young, high socio-economic status respondents, interaction use of the Internet is a single factor to explain connection gratification ($\beta = .18, p < .001$). In this model, 3 percent of variance in connection gratification was uniquely explained by the single factor. For the older, high socio-economic status respondents, connection gratification was also associated with interaction over the Internet ($\beta = .20, p < .001$). A total of 4 percent of variance in connection gratification was explained. To summarize, findings indicate that social interaction over the Internet was a main factor explaining connection gratification across all subgroups. It is worth highlighting that consumptive use of the Internet was also strongly associated with connection gratification particularly in a subgroup representing young, low socio-economic status individuals. Thus, the significant relationship between consumptive use and connection gratification ($\beta = .06, p < .001$) in the initial analysis is driven by this particular subgroup.

Learning Gratification: For the subgroup representing young, low socio-economic status people, both surveillance ($\beta = .23, p < .001$) and social interactive uses of the Internet ($\beta = .13, p < .001$) were positive predictors of learning gratification, with 9 percent of total variance in learning gratification explained. An almost identical pattern was found in the older low socio-economic status subgroup: learning gratification was explained both by surveillance ($\beta = .28, p < .001$) and interaction use of the Internet ($\beta = .12, p < .001$) with 10 percent of total variance explained. In contrast, for the subgroup of young, high socio-economic status respondents, surveillance ($\beta = .30, p < .001$) was a single predictor of learning gratification. In this model, 9 percent of variance in learning gratification was uniquely explained by this single factor. Similarly, for the older, high socio-economic status subgroup, learning gratification was explained by surveillance use only ($\beta = .27, p < .001$). A total of 8 percent of variance in learning gratification was explained by this factor. Overall, surveillance use of the Internet was the most important predictor of learning gratification across all subgroups. However, interaction over the Internet was also significantly related to learning for low socio-economic subgroups, regardless of age.

FIGURE I: HIGH SES-OLD SUBGROUP MODEL OF INTERNET USE AND GRATIFICATION

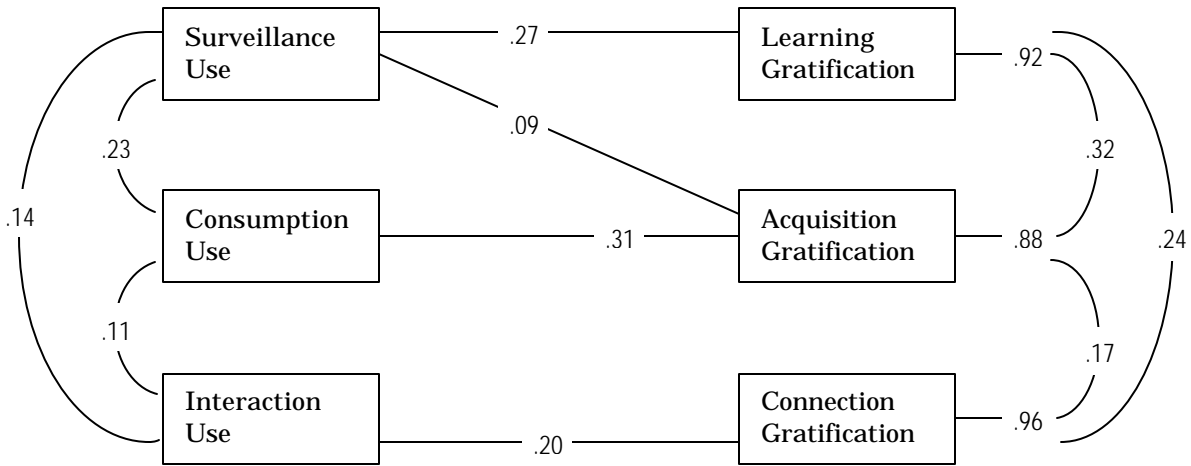


FIGURE II: HIGH SES-YOUNG SUBGROUP MODEL OF INTERNET USE AND GRATIFICATION

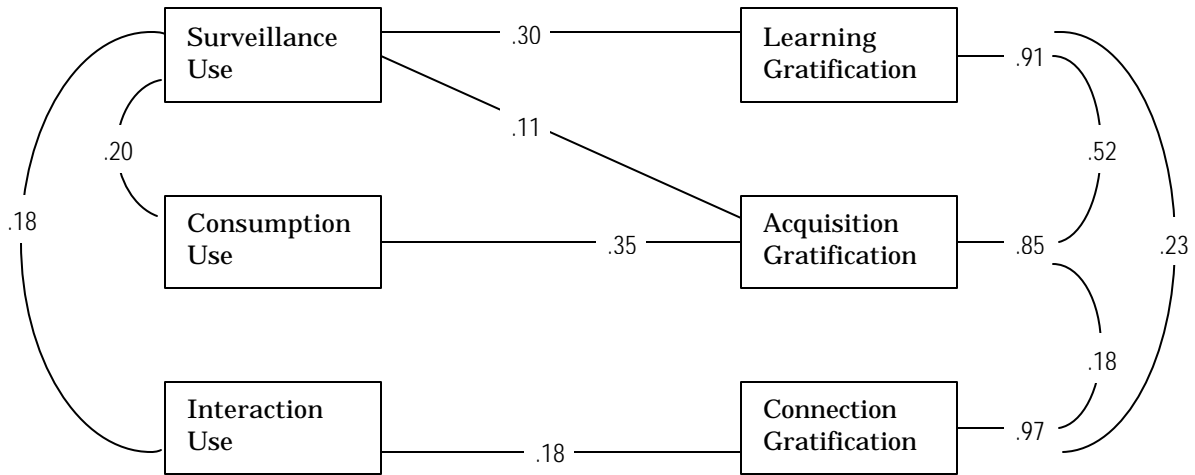


FIGURE III: LOW SES-OLD SUBGROUP MODEL OF INTERNET USE AND GRATIFICATION

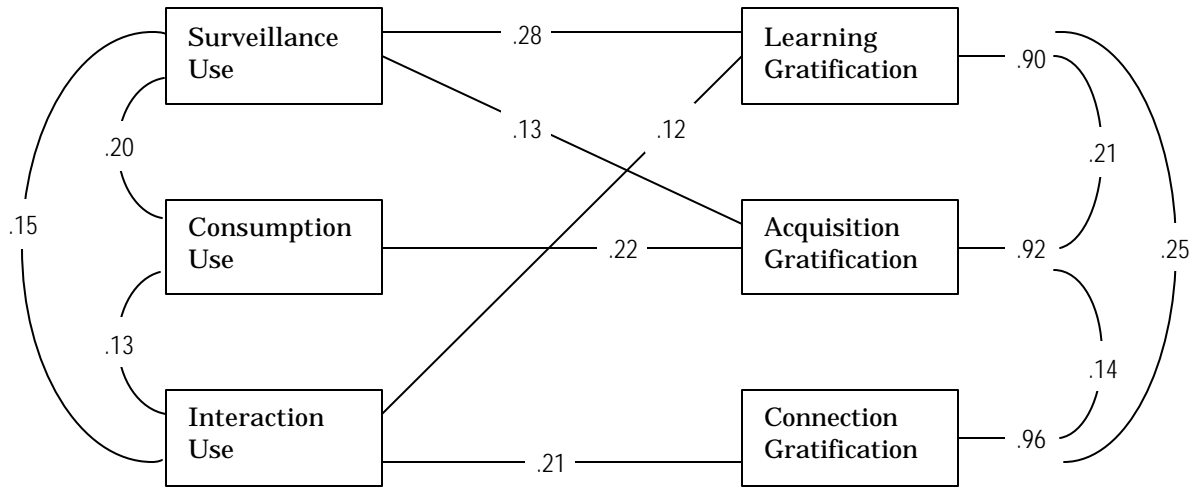
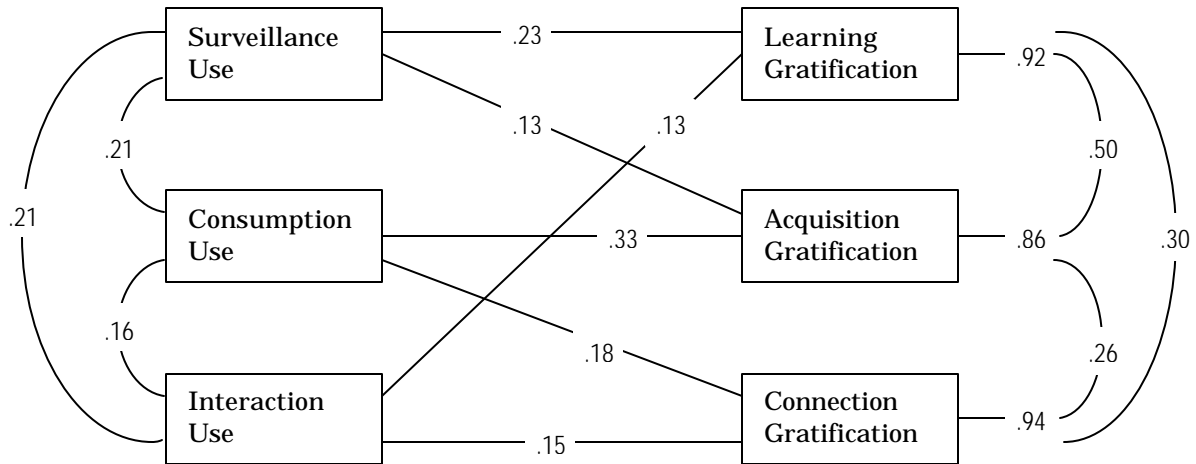


FIGURE IV: LOW SES-YOUNG SUBGROUP MODEL OF INTERNET USE AND GRATIFICATION



Acquisition gratification: For the subgroup representing young, low socio-economic status people, consumptive ($\beta = .33, p < .001$) and surveillance ($\beta = .13, p < .001$) use of the Internet were positive predictors of acquisition gratification. In this model, the two types of Internet use uniquely explained 14 percent of total variance in acquisition gratification. For the older, low socio-economic status subgroup, acquisition gratification was explained by again both consumptive use ($\beta = .22, p < .001$) and surveillance use ($\beta = .13, p < .001$) of the Internet, with 8 percent of total variance explained. Similarly, for the subgroup for young, high socio-economic status respondents, both consumptive ($\beta = .35, p < .001$) and surveillance ($\beta = .11, p < .001$) use of the Internet explain acquisition gratification. In this model, 15 percent of variance in acquisition gratification was explained by these two factors. For the older, high socio-economic status subgroup, acquisition gratification was explained by consumptive use ($\beta = .31, p < .001$) and surveillance uses ($\beta = .09, p < .001$) as well. A total of 12 percent of variance in acquisition gratification was explained by these two factors. In sum, acquisitive gratification was explained by two factors, consumption and surveillance over the Internet, consistently across all subgroups. Worth noting here is that acquisitive gratification was explained most in two younger subgroups, high SES and low SES, and least in low socio-economic and old subgroups.

ⁱ In some analysis, further reductions in sample size occurred because of missing data for certain variables.

ⁱⁱ Due to moderate correlation between socio-economic status and age, sample sizes in these four subgroups are not equal.