Internet Use Patterns in the United States

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ABSTRACT: Few studies have explored the factors influencing general adult population's Internet use in the United States. This study analyzes data from the U.S. National Opinion Research Center 2000-2004 General Social Survey to determine who is more or less likely to use the Internet for activities other than e-mail. In the valid sample of 1,895 US adults, respondents ranged in age from 18 to 89 years; the average age was 46.3 years. Of these respondents, 54.2% were male, and 78.7% were white. Statistics were calculated using bivariate correlation and logistic regression. Results of the study showed that demographics (such as age and race) and socio-economic status variables (such as education level and household income) play significant roles in predicting the patterns of Internet use. The respondents who were older or African-Americans were more likely to use the Internet for activities other than e-mail. Those with higher levels of education or family income were less likely to use the Internet in this manner. Gender, marital status, region, and employment variables appeared to have no influence. The findings will be helpful to understand people's behaviors and patterns of using the Internet other than email, and may assist local governments, schools and higher education, libraries, information centers, and other agencies when making policies regarding future information technology; distance education programs; and digital resources, services, and tools.

I. Introduction

Access to the Internet and the World Wide Web is ubiquitous within the United States. Because online information is so readily available, the Internet has become a potential driving force of the economy, society, and education. People use the Internet to access the needed information. As a result, societal and educational organizations are challenged to use the Internet more efficiently. Given this climate, it is important to understand the patterns of Internet usage. Studies have been done on Internet technology, technological developments, and services, but there are few studies on individual Internet usage.

People in the United States use the Internet more than any other country in the world (Fusilier et al., 2005). What factors influence individuals who use the Internet for activities other than email? This study seeks to provide an answer, using data from the U.S. National Opinion Research Center 2000-2004 General Social Survey (GSS), and bivariate correlation and logistic regression analysis.

Technically speaking, the Internet is the network of networks. In this study, it also refers to the World Wide Web, one of the services available through the Internet. In the survey, the interviewers treated the Internet and World Wide Web as the same. The findings will be helpful to understand people's behaviors and patterns of using the Internet other than email, and may assist local governments, schools and higher education, libraries, information centers, and other agencies when making policies regarding future information technology; distance education programs; and digital resources, services, and tools.

II. Literature Review

To determine factors influencing Internet usage within the United States, including demographics and socio-economic and employment variables, a literature review of applicable and available research was conducted, focusing on the studies on the main factors related to individuals' use of the Internet or World Wide Web.

According to the literature, teachers and students are the main users of the Internet. Jones and Madden (2002) conducted a study on college students' Internet usage. Browsing the Internet was a daily activity; 73% of college students used the Internet more than the library for research. Seventy-nine percent of the students agreed "that Internet use has had a positive impact on their college academic experience" (Jones and Madden, 2002). Princeton Research Associates for the Pew Internet & American Life Project conducted nationwide telephone surveys, and analyzed how respondents penetrated the Internet. The data results show that all respondents (59%) of the general population did not penetrate the Internet more than those (86%) of college students (Jones and Madden, 2002). These studies seem to be limited because it is not known what factors influence people's Internet use.

Mehra and Papajohn (2007) surveyed 260 international teaching assistants at a representative state university in a semi-rural setting in the United Sates, and analyzed 130 returned surveys. The variables such as gender, marital status, and age were found to be significant predictors in explaining the correlations between communication and information intersections in international teaching assistants' use of the Internet.

Region has been used as an important factor to explore the regional variations in Internet use. Disparities existed in Internet usage by American adults (Spooner, 2003). For the highest rates of Internet penetration, 66% of the adult population used the Internet in New England. The South (48%) was far behind the other regions in use of

the Internet. "The largest proportion of female users is in the Mid-Atlantic (54%); the largest of male users is in New England (55%)" (Spooner, 2003).

Outside of the United States, Kumar and Kaur (2006) surveyed 792 teachers and 1,188 undergraduate students in India, and determined that the World Wide Web is an important tool for teaching, research, and learning. These researchers found that 1,587 (99 percent) respondents browsed the Internet for the World Wide Web. However, the study did not determine factors that influenced Internet usage.

In the studies, many variables were used to examine how people use the Internet. Taylor et al. (2003) conducted the computer-assisted telephone interviews to examine the factors that affected home Internet usage patterns in central Queensland, Australia. The variables such as age, gender, location, marital status, education level, family income, and employment status were used in that study. They found significant differences in variables such as gender and age. The males and the youngest group might use the Internet more at home for information search.

Few studies have explored the factors influencing general adult population's use of the Internet other than email in the United States. This study could be useful in providing more significant patterns of Internet use.

III. Study Framework and Hypothesis Development

Internet use depends on many factors. The above reviewed literature serves as the foundation for this study. Based on the available 2000 - 2004 GSS data, this study on Internet use patterns is to primarily test the relationships between people's using the Internet other than email and three types of variables: demographic, socio-economic, and employment variables. Testable hypotheses are proposed.

1. Demographic variables

Age, gender, race, marital status, and region of residence are very important in predicting people's Internet usage. A study on gender differences in use of the Internet illustrates that the gender divide has narrowed considerably (Dholakia, 2006). However, DeBell and Chapman (2006) found that there existed no difference between gender and overall Internet use rates. It is hypothesized that there is no relationship between gender and people's Internet use. According to Ortega Egea (2007), the middle-aged individuals in the European Union used the Internet most frequently. The elderly are hypothesized to be less likely to utilize the Internet. The "never-married" people were found to have a higher level of home Internet usage (Taylor et al., 2003). There existed racial differences of Internet users in some regions, and 7% of the Internet users in the Upper Midwest were African-American or Hispanic (Spooner, 2003). It is hypothesized that the unmarried, African-Americans, and racial minorities are less likely to use the Internet other than email.

According to Spooner (2003), people in New England used the Internet more than those in the South. It is hypothesized that compared with the Internet users in the Northeast, those in the South are less likely to utilize the Internet.

2. Socio-economic status

Socio-economic status is considered in the analyses of Internet use. A study on home Internet usage reveals socio-economic disparities (Taylor et al., 2003). It is expected that those with higher education levels are more likely to use the Internet because they may have more skills and chances to go online. Those with lower income and occupation prestige score are more likely to use the Internet because they may need more information on employment and occupations.

3. Employment variables

Compared with government employees, private employees are more likely to use the Internet because their working environments are more dynamic and flexible. In comparison with working full-time employees, working part-time and other types of labor status are more likely to use the Internet. Compared with regular and permanent employees, irregular and temporary employees are more likely to use the Internet. The fact that a person has enough time to get the job done shows that he or she may have more leisure time and utilize the Internet more for varieties of needed information.

IV. Data and Methods

The GSS conducts basic scientific research on the structure and development of American society by using a data-collection program designed to monitor social change within the United States. This study used the survey that asked whether respondents ever used the Internet for activities other than email (Davis and Smith 2005). The sample size studied was 1,895 people between the ages of 18 and 89 years.

The dependent variable of this study, using the Internet for activities other than email, is dichotomous. The independent variables consist of three categories:

1. Demographics: dummy variables for gender, race, marital status, region of residence, and a continuous variable for age.
2. Socio-economic status: education level, family income, and occupational prestige score.
3. Employment: dummy variables for government or private employee, labor force status, work arrangement at main job, and an ordinal variable for having enough time to get the job done.

The fundamental model was first examined using demographics, then socio-economic status variables, and finally employment variables. Using this method, the study could

determine the factors that influenced a dependent variable and how the effect of a predictor changes when new variables are included.

Given the dichotomous dependent variable, logistic regression was used to analyze the data. The sample sizes for the logistic regression models varied because some independent variables did not apply.

V. Findings and Discussion

A total of 1,895 respondents participated in the GSS survey used (Davis and Smith 2005, 979) (Table 1, Appendix 1). Of this number, 86.3% used the Internet for activities other than email. Respondents ranged in age from 18 to 89 years; the average age was 46.3 years. Of these respondents, 54.2% were male. Ethnicity was noted as 78.7% white, 14.6% African-American, and 6.7% other races. The average year of schooling was 13.4 years, which seems low, and implies that some respondents were not well-educated. The mean family income was 15.9, which indicates that the average family income of the respondents was between $30,000 and $34,999, which seems low, and implies that people who responded to the survey were not rich.

Table 2 (see Appendix 2) reports the estimates of three nested logistic regression models used to predict Internet usage for activities other than email. In Model 2, the model x^2 increases by 82.9 (= 159.1 - 76.2), which is extremely statistically significant at beyond the 0.001 level with a difference of 3 degrees of freedom. This suggests that socio-economic status is very important in predicting the Internet use other than email. The employment variables are added up in Model 3, and make the model x^2 decrease by 34.7. Model 2 is the best fitting model, on which the interpretations mainly focus.

As shown in Model 2, age has an extremely significant and positive effect on the dependent variable. This result contradicts the expectation. The older the respondents are, the more likely they are to use the Internet other than email. For each additional year increase in age, the probability of using the Internet other than email would increase by 3.9 percent. Compared with the whites, African-Americans are more likely to use the Internet other than email. This contradicts the hypothesis. There is extremely significant and negative relationship between education level and the Internet use. For each additional level increase in schooling, the probability of using the Internet decreases 14.0 percent. This also contradicts the expectation that those with higher education levels are more likely to use the Internet. The relationship between family income and the Internet use is significant and negative. For each additional level increase in family income, the probability of the Internet use decreases 4.3 percent. In addition, there is extremely significant and negative relationship between the Internet use and occupational prestige score. For each additional level increase in occupational prestige score, the probability of the Internet

use decreases 3.4 percent. These confirm the hypothesis that those with lower income and occupational prestige score are more likely to use the Internet.

In Table 3 (see Appendix 3), bivariate correlations show that there are many significant relationships between the variables and the Internet use other than e-mail. The variables of male, living in the Midwest, unmarried, educational level, family income, occupational prestige, and having enough time to get the job done are negatively correlated with the Internet use. The other variables such as age and employment variables are positively correlated with using the Internet other than email. The results of the correlation matrix indicates that age has the strongest correlation with the Internet use (r =0.167) and confirms that the older people are more likely to use the Internet other than email in this study.

VI. Conclusion

Using the 2000-2004 GSS data, with a large national sample size, the study is able to examine many factors that affect Internet use. The main findings in this study show that demographics (such as age and race) and socio-economic status variables (such as education level and household income) play significant roles in predicting patterns of the Internet usage for activities other than email.

In this study, older respondents and African-Americans are more likely to use the Internet in this manner. Those with higher levels of education or family income are less likely to use the Internet. Gender, marital status, region of residence, and employment do not appear to be significant factors affecting Internet usage.

Internet usage may also vary between computer owners and computer users. Further research is needed to shed more light on behaviors and patterns that affect Internet usage.

References

Davis, James Allen, & Smith, Tom W. (2005). *General social surveys, 1972-2004* [machine-readable data file]. Chicago, IL: National Opinion Research Center.

DeBell, Matthew, & Chapman, Chris. (2006). *Computer and Internet use by students in 2003* (NCES 2006-065). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Dholakia, Ruby Roy. (2006). Gender and IT in the household: Evolving patterns of Internet use in the United States. *Information Society, 22*(4), 231-240.

Fusilier, Marcelline; Durlabhji, Subhash; Cucchi, Alain; & Collins, Michael. (2005). A four-country investigation of factors facilitating student Internet use. *CyberPsychology & Behavior, 8*(5), 454-464.

Jones, Steve, & Madden, Mary. (2002). *The Internet goes to college: How students are living in the future with today's technology*. Washington, DC: Pew Internet & American Life Project.

Kumar, Rajeev, & Kaur, Amritpal. (2006). Internet use by teachers and students in engineering colleges of Punjab, Haryana, and Himachal Pradesh states of India: An analysis. *Electronic Journal of Academic and Special Librarianship, 7*(1). URL: http://southernlibrarianship.icaap.org/content/v07n01/kumar_r01.htm. (Accessed on 21 January 2007).

Mehra, Bharat & Papajohn, Dean. (2007). "Global" patterns of communication-information convergences in Internet use: Cross-cultural behavior of international teaching assistants in a culturally alien information environment. *The International Information & Library Review*, 39, 12-30.

Ortega Egea, Jose Manuel; Menendez, Manuel Recio; & Gonzalez, Maria Victoria Roman. (2007). Diffusion and usage patterns of Internet services in the European Union. *Information Research, 12*(2). URL: http://InformationR.net/ir/12-2/paper302.html. (Accessed on 21 January 2007).

Spooner, Tom. (2003). *Internet use by region in the United States*. Washington, DC: Pew Internet & American Life Project.

Taylor, Wal J.; Zhu, Grant X.; Dekkers, John; & Marshall, Stewart. (2003). Socio-economic factors affecting home Internet usage patterns in central Queensland. *Informing Science Journal*, 6: 233-246.

Appendix 1

Table 1. Descriptive Statistics of Variables Used in the Analysis, U.S. Adults

Variable	Percent/Mean	S.D.
Dependent Variable		
R use www other than email	86.3%	
Independent Variables		
Age	46.3	17.4
Male	54.2%	
Race		
White	78.7%	
African-American	14.6%	
Other	6.7%	
Never married	25.6%	
Region		
Northeast	21.4%	
Midwest	24.7%	
South	34.6%	
West	19.2%	
Years of schooling	13.4	3.0
Family income (23-point scale)	17.0a	22.0b
Occupational prestige score (points 17-86)	43.9	13.9
Private employee	82.2%	
Labor force status		
Working fulltime	51.8%	
Other	48.2%	
Work arrangement at main job		
Regular, permanent employee	80.6%	
Other	19.4%	
R has enough time to get the job done	2a	3b

Notes: [a] Median, [b] range

Table 2. Logistic Regression Estimates for Determinants of Using WWW Other Than Email

Predictors	Model 1		Model 2		Model 3	
	B	Exp(β)	*B*	exp(β)	*B*	exp(β)
Demographic characteristics						
Age	0.037***	1.037	0.039***	1.040	0.049***	1.050
	(0.005)		(0.006)		(0.008)	
Male	-0.308*	0.735	-0.135	0.874	-0.098	0.907
	(0.139)		(0.158)		(0.187)	
Race (White=ref.)						
African-American	0.716***	2.046	0.481*	1.618	0.090	1.094
	(0.195)		(0.219)		(0.2720	
Other	0.483	1.620	0.373	1.452	0.386	1.470
	(0.270)		(0.292)		(0.339)	
Never married	0.069	1.071	-0.070	0.933	0.037	1.038
	(0.186)		(0.213)		(0.238)	
Region (Northeast = ref.)						
Mid-west	0.120	1.127	-0.059	0.943	-0.143	0.867
	(0.203)		(0.229)		(0.270)	
South	0.031	1.031	0.000	1.000	-0.119	(0.888)
	(0.188)		(0.211)		(0.252)	
West	-0.226	0.797	0.115	0.891	-0.051	0.950
	(0.222)		(0.242)		(0.287)	
Socio-economic status						
Years of schooling			-0.140***	0.869	-0.147***	0.863
			(0.031)		(0.037)	
Family income			-0.043*	0.958	-0.067*	0.935
			(0.017)		(0.023)	
Occupational prestige			-0.034***	0.966	-0.040***	0.961
			(0.007)		(0.008)	
Employment variables						
private employee					-0.098	0.906
					(0.248)	
Not working fulltime					-0.426	0.653

					(0.245)	
Not regular, permanent employee					0.184 (0.231)	1.202
R has enough time to get the job done					-0.059 (0.109)	0.943
Constant	-3.460*** (0.319)	0.031	0.552 (0.546)	1.737	1.287 (0.756)	3.621
-2 log likelihood	1439.2		1180.4		861.8	
Model x^2	76.2***		159.1***		124.4***	
df	8		11		15	
N	1895		1698		1275	

Notes:
The *B is* the logistic regression coeffcient; exp (*B)*or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001.
Source: The 2000 – 2004 General Social Survey.

Appendix 3

Table 3. Correlation Matrix for Variables Used in the Analysis, U.S. Adults (part 1)

	Using www	Male	African-American (race)	Other (race)	Age	Midwest	South	West	Unmarried
Using www	1.000								
Male	-.055*	1.000							
African-American	.076***	-.108***	1.000						
Other	.007	.019	-.111***	1.000					
Age	.167***	-.040*	-.074***	.107***	1.000				
Midwest	.003	.007	-.070***	.063***	-.040*	1.000			
South	.025	.010	.137***	-.046*	.032	-.417***	1.000		
West	-.040	-.009	-.123***	.160***	-.040*	-.280***	-.355***	1.000	
Unmarried	-.057*	-.063***	.134***	.019	-.437***	.023	-.068***	.021	1.000
Schooling	-.187***	.047*	-.123***	.005	-.116***	-.003	-.078***	.067***	.022
Income	-.127***	.205***	-.201***	-.012	-.050*	-.011	-.049*	.048*	-.208***
Prestige	-.171***	.006	-.111***	-.044*	.050**	-.053**	.003	.018	-.083***
Private	.013	.027	.001	.009	-.086***	-.034	.038	.012	.050*
Not full-time	.030	-.086***	-.008	-.003	.346***	.005	-.049**	.024	-.072***
Not permanent	.046	.049*	-.043	.030	.145***	-.023	.009	.024	-.057*
Enough time	-.055*	-.009	-.070**	-.028	-.013	-.017	-.043	.054*	-.035

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Source: The 2000 – 2004 General Social Survey.

Table 3. Correlation Matrix for Variables Used in the Analysis, U.S. Adults (part 2)

	Using www	Schooling	Income	Prestige	Private employee	Not full-time	Not permanent	Enough time
Using www	1.000							
Schooling	-.187***	1.000						
Income	-.127***	.376***	1.000					
Prestige	-.171***	.496***	.343***	1.000				
Private	.013	-.169***	-.051*	-.228***	1.000			
Not full-time	.030	-.164***	-.325***	-.144***	-.003	1.000		
Not permanent	.046	.013	-.062*	-.016	.099***	.227***	1.000	
Enough time	-.055*	.168***	.137***	.166***	-.126***	-.137***	-.125***	1.000

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Source: The 2000 – 2004 General Social Survey.

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