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Reshaping Digital Inequality in the European Union: How Psychological Barriers Affect Internet Adoption Rates

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Abstract

In the past years, scholars have assessed the social differences that the Internet has generated from its use (or its non-use). The issue has been largely referred to as Digital Divide, describing the social division between those who are using the technology and those who are not; or in other words, the "haves" and "have nots" of the Internet. Generally, the phenomenon has been explained from a perspective in which infrastructural and demographics aspects are considered as the main barriers to overcome in order to narrow this digital inequality. Albeit partially true, this trend of research does not consider people's perceptions toward the Internet and how they can also explain connectivity, or lack thereof. Analyzing data from 1) the 55th Eurobarometer collected by the EU Commission (N = 16,134); and 2) data collected from the National Statistical Institutes of each State Member of the European Union, this paper suggests that there is a necessity to approach the problem from another perspective. This does not mean that the other trend was wrong, but rather, one explanation of the problem is not enough. Thus, this research enlightens how psychological barriers are involved in impeding EU citizens' complete adoption of the Internet. For instance, perceptions of what opportunities were missed by not accessing the WWW, perceptions of the kind of content that should be on the Net and perceptions of how the Internet would change their daily lives were all factors that indicated that not only demographical or structural obstacles were involved. In a sense, people do not think that they are missing many Job-Training, Consumption or improvement of Social Integration opportunities by not being connected to the Internet. In addition, the content that should be available over the Net is not appealing enough to induce them to seek out Internet access.

Keywords

Internet; Digital Divide; European Union; Mass communication; Socio-technological inclusion; Europe

Introduction

The *Digital Divide* (DD) can be understood as the existing division among those who have digital information and those who do not. The DD has commonly been explained in terms of access. That is those who do and those who do not have access to a personal computer and to an Internet connection (Van Dijk, 2005). More recently, authors have begun to

discern distinct levels of DD such as access, user skills, power-knowledge and global economy (Chen & Price, 2006; Crenshaw & Robison, 2006; Hargittai, 2006) but the DD argument is continuously attached to demographical and infrastructural variables. The *New York Times* database shows that the term *digital divide* was first used in 1996 and became increasingly common in the successive years. However, Webber and Harmon claim to have coined the term in 1995 in order to describe the social division between those who were using technology and those who were not (Irving, 2001). This paper examines the status and implications of the DD in Europe. Likewise, it seeks to identify the factors that explain this phenomenon and the ultimate applicability of this research in assisting policy makers to bridge the DD.

In the context of non-access, further exploration into other dimensions of this important issue is necessary (Lazarus & Mora, 2000). This study proposes that structural and demographic aspects are not the sole factors impacting the DD issue. More importantly, Analyzing data collected from 1) EU Commission's Eurobarometer, and 2) National Statistical Institutes of each State Member of the EU, this paper suggests that psychological barriers are involved in impeding EU citizens' complete Internet adoption. Perceptions of 1) opportunities were missed by not accessing the Internet, 2) the kind of content that should be on the Web and 3) of how the Internet would change their daily lives were all factors that indicated that not only demographical or structural obstacles were involved.

The Digital Divide in the United States

The urgency of the 'digital divide' problem has become extremely relevant to North American society, as demonstrated by the efforts of the National Telecommunications and Information Administration (NTIA) to overcome this problem. Currently, among that agency's main concerns is bridging the technology gap (NTIA reports, 2000 & 2006).

Some key factors that merit examination and discussion in the US context are gender, race, education, income, geography, and age. By 2002, the DD among North American males and females had entirely disappeared, leaving only a difference of 3% in 2006 (Pew Internet and American Life, 2002 & 2006). With regard to race, there exist marked differences in levels of Internet use from one ethnic group to another (NTIA report, 2000; Pew Internet and American Life, 2006), but the overall number of whites, Hispanics and blacks who are netizens has increased. Similar results are found if other studies' outcomes are collated (Pew Internet and American Life Project, 2002), or in even more recent reports made available by the Government (Cheeseman, Janus & Davis, 2005).

The relationship between education and technology and its role in the DD landscape has been the subject of much research (Howard et al., 2001; Kavanaugh & Patterson, 2001; Nie & Erbring, 2000; NTIA reports, 2000 & 2006; Pew Internet and American Life Project, 2002 & 2006). Generally, research demonstrates a positive correlation between years of education and access both to computers and to telephone lines, and by extension, levels of Internet penetration. Despite lower prices making new technology more widely available (Smolenski et al., 2000), the gap between higher and lower income households is still evident (Howard et al., 2001; Kavanaugh & Patterson, 2001; Nie & Erbring, 2000; NTIA reports, 2000 & 2006; Pew Internet and American Life Project, 2002 & 2006). For instance, in 2006 the households with an average income of $30,000 yield a connectivity ratio of 53%, while those with an income of around $70,000 obtained a figure of 91%. This gap also becomes evident upon examining patterns of Internet use among those who live in central cities, urban areas, or rural households. However, once controls for income are instated, this trend lacks salience, because Internet penetration stabilizes across geographical regions (NTIA report, 2000). The NTIA report (2000) readily claims that

people 50 and older have experienced the highest growth in Internet usage between 1998 and 2000 (53 percent), and concludes that the age has a minor effect on the DD. Nothing is further from reality. Looking at the bigger picture shows that the total number of Internet users in the 50-plus age group is only about 20 %. In comparison, 77.4% of 18 to 29 year olds and 67% of 30 to 49 year olds have access to the Internet (Pew Internet and American Life, 2002). In fact, even in 2006, although the figures have changed, the differences among groups are fairly similar: 88% of youngsters (18-29 years old) have Internet access, as compared to 52% for ages 50 or above (Pew Internet and American Life, 2006).

The Digital Divide in Europe and Its Unique Features

In order to analyze the DD in Europe, information was gathered from the National Institutes of Statistics of all EU members[1]. Considering the EU as a whole, only 40 percent of people are online, leaving an extremely large section of the population out of this new technological trend. The general outcomes are similar to what is seen in the US or perhaps worse. This is the case regardless of the specific parameter used to test the existence of a digital gap.

Demographic and geographic factors can help to explain certain aspects of the DD. Although the gender gap in the US has now disappeared, it is still present in the EU (Data elaborated from the 15 National Institutes of Statistics -NIS-, 2002): 46% of men go online, as compared to 36% of women. Independent of other factors, figures show that connectivity is inversely related to age.[2] Education level also determines distinct levels of connectivity, with higher education levels correlating with higher connectivity rates. Additionally, with respect to the role of geographic factors, access to the Internet in metropolitan areas reaches 45%, with figures of 41% in urban zones and 35% in rural areas (15 NIS, 2002).

From October 2000 to June 2002 the proportion of households with access to the Internet increased in all countries of the EU (Muir & Oppenheim, 2002). In fact, five countries now exceed the 50% penetration rate: the Netherlands, Denmark, Sweden, Luxembourg, and Finland. While promising, this continued increase in Internet access is not found in all of the Member States. Greece is the country with the lowest penetration rate (only 9%). Other low penetration rates are found in countries including Spain (barely 30%), Portugal (31%), Italy (35%) and France (36%). Therefore, the southern countries of the EU must make considerable progress in order to attain the same levels as the rest of the EU Members (Data elaborated from the 15 NIS, 2002).

Aside from access, other factors can create a DD. For instance, Internet usage is ultimately inherently personal (Gil de Zuniga, 2002). Because of the variety of benefits obtained from the Internet, access cannot be the sole measure of a potential DD. Psychological or perceptual factors, such as the type of use and users' level of gratification once the access barrier is surpassed also become important considerations. The most popular uses of the Internet in the EU from greatest to least are: sending and retrieving e-mail (79%), seeking news and topical items (74%), seeking travel-related information (63%), improving one's education or training (46%), seeking health-related information and advice (38%), seeking jobs along with online banking (31% for both), booking tickets for shows and events (29%) and participating in forums and/or discussions (24%).

The Qualitative Difference of the Digital Divide

The numbers shown above clarify the status of the DD problem both in the US and the EU, and to some extent, why citizens do not use the Internet. However other efforts need also to be highlighted in explaining this phenomenon from a much more qualitative perspective

(Chinn & Fairlie, 2004; Gandy, 2002; Gaspar, 2004; Johnston, 2006; Martin, 2003; Murdock, 2004; Warschauer, 2003). That is, other factors behind the socio-structural realm, such as differences in the use of technology and perceptions of technology, may also intervene in the big picture of the DD (Cho et al., 2003; Dutton et al., 2004; Mossberger et al., 2003; Norris, 2002; Selwyn, 2004; Servo, 2002). Along these lines, some authors have pointed to the importance of achieving a better understanding of the attitudes, practices and needs of those not connected to the Internet to fully overcome the DD problem (Reddick, Boucher & Groseilliers, 2001). Others have tried to include gender (Shade & DeChief, 2004; Shade & Crow, 2005), ethnicity (Soker, 2005) and community integration (Selwyn, 2003) gaps within the framework of the other layers of the DD as perceptions and uses of technology. However, none of these examples are based in the European context. Additionally, both structural and perceptional variables must be included in the same model, which is one of the goals of this paper.

Uses and Gratifications Perspective

Due to the significant differences in uses and gratifications among the members of the EU, it is essential to examine the potential interference of psychological perspectives in the DD discourse when analyzing how the Internet is perceived and used. In order to do so, the key concept of Uses and Gratifications Theory needs to be further developed.

Relying on the classic uses-and-gratifications perspective, communication needs interact with social and psychological factors to produce motives for communication (Rosengren, 1974). In other words, users select media based on how well each one helps them meet specific needs or goals (Katz, Gurevitch & Haas, 1973; Katz et al., 1974). Elementary to this perspective is the assumption that people base their choices on evaluations of available media options. A new medium used for the same purpose as older medium is a functional alternative to the older medium, and audiences should choose between them by determining which one better satisfies particular needs (Rosengren & Windahl, 1972; Williams, Rice, & Rogers, 1988; Wright, 1960; see also McCombs, 1972).

This model asks how people use the media, with the underlying idea that people are motivated by a desire to fulfill, or gratify certain *needs*. Hence the Uses and Gratifications approach is concerned with identifying how people use the media to *gratify* their needs (McQuail, 1990). Much of the research on this approach has been concerned with identifying the specific gratifications satisfied by the use of media (Rubin, 1994; 2002; Swanson, 1992). One of the most common gratifications is information-seeking or surveillance (e.g., Greenberg, 1974; Katz et al., 1973; Rubin, 1984; Wenner, 1986).

Using this approach requires identification of the Web user's Social and Psychological needs, and evaluation of whether the Web has content that can satisfy them.

It would seem that the Internet is an excellent example of a medium that people actively use to fulfill many of these needs. With written text hyperlinks as an integral part of navigating the Internet, Web surfing is characterized by an active choice, requiring an engagement in the information contained in the link in order to move on to another site.

Uses and Gratifications on the Internet

As a 'new technology,' the Internet has had a polarizing effect among scholars, ranging from skepticism (Calcutt, 1999; Cuban, 1986; Healy, 1998; Oppenheimer, 1997; Stoll et al., 2001), to fascination (Morris & Ogan, 1996; Newhagen & Rafaeli, 1996; Rheingold, 1995; Turkle, 1996). Although there has been a tremendous amount of discussion in the popular press about how the Internet is changing all facets of social life, research on the impact of the Internet has only begun to emerge.

Newhagen and Rafaeli (1996) have suggested that the Internet may be especially useful because of its 'mutability', or what Newhagen calls its 'chameleon-like character.' The Internet's greater diversity of content with respect to traditional electronic media gives it a popular appeal. While other popular media are subject to regulatory and societal scrutiny, the Internet is virtually unregulated. The Internet's wide availability also suggests that its range of potential uses may far exceed those provided by other media.

It has been well documented that the salience of information seeking, or what is referred to as learning gratification, can explain Internet use (Chen & Wells, 1999; Maddox, 1997; Nielsen Media Research, 2002); this is also the case of the Internet as a connector in interpersonal communication (Gershuny, 1983). However, little has been done to explore the uses and gratifications approach with respect to the Internet beyond how certain motivations contribute to certain online behaviors.

One of the first attempts to look at the Internet from a uses and gratifications perspective was provided by Rafaeli (1986), in which he tried to establish the needs satisfied by electronic bulletin boards. Subsequent research has pointed out some of the different gratifications that users seek: information and personal information (Eighmey & McCord, 1998); information, entertainment, escapism (Korgaonkar & Wolin, 1999); entertainment, pastimes, relaxation, and social information (Ferguson & Perse, 2000); information, interpersonal, entertainment, convenience and pastimes (Papacharissi & Rubin, 2000); and information, escape, pastimes, interactivity (Ko, 2002), with the type of behaviors engaged online (e.g., type of web site visited). Kaye & Johnson (2002) have also explored how personal characteristics, such as feelings of political efficacy, evolve towards certain motivations (guidance, surveillance, entertainment and social utility). Current research relates motivations to certain uses, but overlooks an underlying psychological issue to be included in the DD discourse.

Hypotheses

Macro-level hypothesis

As previously stated, it is the belief of this research that simple structural and demographic characteristics are not the only barriers to adoption of the Internet. However, being congruent with DD literature the first hypothesis revolves around the predicting effect of structural and demographical variables.

H^1: Macro structural variables and demographics will predict Internet use.
H^{1B}: Macro level Psychological variables will predict Internet use in the EU beyond the effects of structural and demographic variables.

Micro-Level and Psychological Hypothesis

Broad differences in terms of access or no-access are influenced by individuals' perceptions. Psychological variables will predict Internet access while controlling for demographics and it is assumed that they will explain some incremental variance in predicting access. It is also expected to encounter differences among countries and/or particular cases, which will also be appraised:

H^2: Psychological variables will predict Internet use by country beyond the effects of structural and demographic variables.

Methodology

Data

This study is based on secondary analysis the 55th Eurobarometer performed by the EU Commission: *Science and technology, agriculture, the euro, and internet access*, 2002. It is focused on respondents' views of science and technology, the Internet, agriculture, and the single European currency, the Euro. This set of the Eurobarometers Series was chosen because there were items that elicited respondents' views on the measurement of both the perceived outcomes of what the Internet provides according to those who are connected, or would provide according to those who are not connected. In addition, demographic data on respondents include nationality, political affiliation, marital status, education, gender, age, occupation, and income. As for the universe of the data, there are citizens of the EU aged 15 and over residing in 15 EU member countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. The sampling was obtained via multistage national probability samples. All interviews were face-to-face, in people's homes, and in the appropriate national language.

Measures

Control variables. Two sets of control variables have been utilized: demographics and the basic DD structural issues. Demographics include: Age, Education, Income, Gender, and Ethnicity. Additionally, the locations from which they log on to the Net (if applicable) are controlled.

Independent Variables. In order to identify the construct validity of the perceptional variables reliability tests have been performed:

Question 57→ *Which opportunities do you believe people who do not use the Internet are missing*? Two types of opportunities are included in the model: Job-Training opportunities and Consumption opportunities. The former was measured by three items (Cronbach α = .65). Respondents were asked if they missed opportunities by not using the Internet for 1) getting a job, 2) improving one's job, and for 3) education and training. The latter was measured by four items (Cronbach α = .74). The subjects were asked if they missed the following opportunities by not using the Internet: 1) Online buying and selling, 2) Selecting good or services, 3) Use of online services, 4) Cheap communication via e-mail.

Question 62→ *Which of the following Information and Services would you like to find on the Internet*? Again two different groups of information and services that people wanted to obtain through the Internet were included in the model: Social Services, and Cultural and Tourism Information, achieving robust reliability results. As for social services, five questions were used in order to create the scale (Cronbach α = .83): 1) Equal opportunity information, 2) Services and assistance to families and the youth, 3) Services and assistance to minorities, 4) Services and assistance to people with disabilities, and 5) Services and assistance for low-income groups. In addition, two items were used to measure the second group (inter-item r = .55): 1) Cultural items, and 2) Tourism information.

Question 63a→ *In what way has the Internet changed your daily life*? This question was asked of all the subjects who had access to the Internet. Four different scales are used in the analysis: Personal Gains (inter-item r = .310) which include responses such as: 1) It is easier for me to use public services or utilities, 2) I save money, and 3) I save time; Social Isolation scale (inter-item r = .222) where respondents were asked if 1) I feel less integrated in where I live, 2) I feel less informed about the relevant issues for my daily life, and 3) It is more difficult for me to use public services or utilities; Social Integration group

(inter-item r = .218), by using the following three items: 1) I have more contact with people, 2) I feel more integrated where I live, and 3) I feel more included in society; and Personal Losses (inter-item r = .275) including the following two items: 1) I spend more money, and 2) I waste time. The questions described so far were asked to those who were connected to the Internet, but the same questions were asked in a hypothetical fashion to those who were not connected. These respondents were asked to reply to question 63b: *In what way do you think would the Internet change your daily life*? For this question, the same four groups as in the previous set were utilized: Social Integration (Cronbach α = .86) with the same three items as before, 1) I would have more contact with people, 2) I would feel more integrated where I live, and 3) I would feel more included in society; Social Isolation (inter-item r = .166) consisting of these items 1) I would feel less integrated in where I live, 2) I would feel less informed about the relevant issues for my daily life, and 3) It would be more difficult for me to use public services or utilities; Personal Gains (inter-item r = .274) involving 1) It would be easier for me to use public services or utilities, 2) I would save money, and 3) I would save time; and finally, Personal Losses (inter-item r = .381) also with two items, 1) I would spend more money, and 2) I would waste time.

Analytic Framework

A hierarchical regression equation weighted by the countries' samples was performed in order to develop predictions about what facilitates Internet adoption. Since the dependent variable, Internet access, was a binomial variable, the sample was weighted in order to acquire robust and reliable results.

Internet access was considered as the dependent variable, and both a macro-sociological analysis and a micro-level analysis were used. For the former, two regressions needed to be discerned. The first one entailed just one block of macro structural measures (Eurostat, 2003) for the fifteen countries including Gross Domestic Product (GDP) per capita, number of cell phones per hundred inhabitants, and a 'dummy variable' that was created to account for the use of the Minitel electronic device in France. Subsequently, another regression was drawn from the sample (N=16,134), which had not one, but three different blocks: (1) the first block entailed the same macro structural variables mentioned above; (2) secondly, a set of demographic variables such as gender (1=male and 2=female), Age, Education, Income[3] and Population Density was included; (3) in the end, a third block of psychological variables is added: Opportunities Missed (Job and Training, Consumption, Social Integration, Social Isolation, Personal Gains and Personal Losses) and Desirable Content (Culture and Tourism and Social Services). With respect to the micro-level analysis, a separate hierarchical regression was used for each country.

Results

Macro-Level

H^1 & H^{1B}: These hypotheses have been supported. They analyze the predictors for Internet use from a global macro perspective. In accordance with previous research (Norris, 2002), it was expected that structural and demographic variables would be important factors in predicting the use of the Internet. Norris ascertains a *Global Divide* in which richer nations are positioned ahead of undeveloped societies in terms of Internet access. However, those aspects not only create the digital gap but also people's perceptions of the medium. GDP is a strong predictor of Internet use (.764 $p < .05$). Individuals with higher education are more likely to get online. Conversely, neither cell phone penetration nor the extent of Minitel use in France seems to be relevant in explaining Internet use.

Table 1. Regression predicting Internet Access with MACRO STRUCTURAL MEASURES

Internet Access	
Structural Factors	**Block 1**
GDP per capita	.764*
Cell Phone penetration	-.867
Minitel (dummy)	-.907
Total R^2 (%)	41.5***

1. Cell entries are standardized regression coefficients (Betas)
2. P-Values with 2-tailed significance: * p < .05, ** p < .01, *** p < .001
3. N = 15.

The model explicated 41.5 % of the variance. GDP strength as a predictor for Internet use explains a large part of the adoption of the Internet. Nevertheless, no other aspects were controlled due to the short number of cases for this regression (N = 15). That led to the further verification of these findings and the attempt to replicate them and then examine the influence of this study's variables over demographics. In the second least square weighted hierarchical regression drawn from this study's sample (N = 16,134, see Table 2), the model explained 40.1% of the variance. The crucial result, however, is that while the variables typically utilized in the classic explanation of the DD, such as structural aspects (GDP, mobile phone penetration) and demographics (gender, age, education, income and population density), explained 3.2% and 24.9% of the variance respectively, the proposed perceptional variables reached an incremental R^2 of 12.0% above the other two blocks.

Structural and the demographic factors remain important in terms of predicting Internet access but are not the sole indicators. For instance, all of the structural variables explain Internet access to some degree. GDP (.076***) and cell phone penetration (.054***) have a positive impact toward predicting Internet access. On the other hand, the use of the Minitel device in France is negatively correlated with the use of the WWW (-018**). In other words, people who utilize these means of 'surfing' fulfill certain needs related to the use of the Internet, and therefore tend to gain access to a lesser degree. In terms of demographics, men tend to connect more than women (-.040***). Also, age shows a negative relationship with Internet access (-.149***). Education also explains connectivity, but with a positive relationship to use of the WWW (.209***), see Table 2 for complete results.

Regarding the *opportunities missed factors*, the first result indicates that the integration opportunities faction (i.e., the belief that going online affords Social Integration opportunities) is positively correlated with the prediction of Internet access (.022***). Additionally, the perception of missed Job-Training and Consumption opportunities by neglecting to use the Internet is a good and positive predictor of the acquisition of Internet access. The desire for Job-Training has a much more moderate effect (.061***) than the Consumption group (.252***), although both are positively correlated with Internet access.

Table 2. Regression predicting Internet Access with Macro Structural Measures and Psychological variables for EU

Internet Access			
Block 1 - Structural Factors	**Block 1**	**Block 2**	**Block 3**
GDP per cap.	.136***	.097***	.076***
Cell phones	.096***	.087***	.054***
Minitel	.006	-.018**	-.019**
Incremental R^2 (%)			**3.2*** **
Block 2 - Demographics			

Gender		-.062***	-.040***
Age		-.212***	-.149***
Education		.300***	.209***
Income		.139***	.093***
Population Density		.039***	.023***
Incremental R² (%)			**24.9*** **
Block 3 - Psychological Aspects			
Opportunities Missed			
Job-Training Opportunities			.061***
Consumption Opportunities			.252***
Social Integration			.022***
Social Isolation			-.028***
Personal Gains			.036***
Personal Losses			-.062***
Desirable Content			
Culture-Tourism Information			.116***
Social Services			.025**
Incremental R² (%)			**12.0*** **
Total R² (%)			**40.1*** **

1. Cell entries are standardized regression coefficients (Betas)
2. P-Values with 2-tailed significance: * p < .05, ** p < .01, *** p < .001
3. Weighted Least Squares Regression.
4. N = 16,134

By the same token, people who perceive that using the Internet is going to provide them with *Personal Gains* tend to acquire Internet (.036***). On the other hand, both *Social Isolation and Personal Losses* are negative predictors of the use of the Internet (-.028*** and -.062***).

In relation to the *desirability of content* that should be posted on the Internet, all of the aspects turned out to be good predictors of Internet access. Subjects who claimed that they would find Social Services on the Internet appealing were more likely to seek out access to the Web (.116***). Similarly, Cultural-Tourism typology of desired information online is also positively correlated with adopting Internet access, but to a lesser degree (.025**).

Micro-Level and Psychological Results

H²: As hypothesized, beyond demographic factors, citizens' perception of the Internet is again essential in explaining connectivity. Psychological variables play a crucial role in determining the degree of Internet access, even if they vary depending on the country examined.

The regressions explain more than 40% of the variance in five countries: 41.3% in Germany, 47.5% in Portugal, 42.4% in Austria, 42.4% in Sweden, and 45.3% in Finland. For the rest of the European members, a wide variety of variances are explained, ranging from the lowest one in the Netherlands (27.7%) to the closest one to the 40 barrier in Luxembourg (39.6%). The rest of the figures are: Belgium with 36.9% of the variance explained, Greece with 32.4%, France with 31.5%, Ireland with 35.5%, Italy with 36.1%, Spain with 39.6% and finally, the United Kingdom with 37.5% (see Table 3a through 3d). It is worth noting the differences of variance explained by the block of demographics and the R² added by the psychological block. For instance, demographic aspects are extremely important in explicating a substantial amount of variance when predicting Internet access in Denmark (34.3%), Luxembourg (30.1%), Portugal (44.9%), Sweden (35.6%) and

Finland (38.0%). However in these same countries, the R^2 provided by psychological aspects is less than in the rest of countries: 12.6% for Denmark, 9.5% for Luxembourg, 2.6% for Portugal, 6.8% for Sweden and 7.3%for Finland. In the rest of the countries demographic block does not explain as much of the variance, but it still has a vital role. In addition, psychological aspects obtain higher figures in terms of the R^2 variance they explain[4].

Psychological Aspect Block

Job-Training Opportunities. People's perception of missed Job-Training opportunities as a result of not joining the virtual world is a reasonable predictor of gaining access in Belgium (.072***) and Germany (.179***), among other EU members (see Table 3a).

Table 3a. Regression predicting Internet Access with Psychological Variables for Belgium, Denmark, Germany and Greece

Internet Access				
Block 1 - Demographics	**Belgium**	**Denmark**	**Germany**	**Greece**
Gender	-.034	-.053**	-.033*	-.068**
Age	-.084**	-.230***	-.133***	-.157***
Education	.267***	.160***	.131***	.141***
Income	.081**	.211***	.141***	-.012
Population Density	-.005	.072**	-.002	.100***
Incremental R^2 (%)	**24.7*** **	**34.3*** **	**22.7*** **	**22.3*** **
Block 2 - Psychological Aspects				
Opportunities Missed				
Job-Training Opportunities	.072**	.021	.179***	-.002
Consumption Opportunities	.212***	.194***	.271***	.237***
Social Integration	.148***	-.072**	.046**	.104***
Social Isolation	.016	-.090***	-.037**	-.109***
Personal Gains	-.018	.117***	-.004	.071**
Personal Losses	-.097***	-.123***	-.072***	-.050*
Desirable Content				
Culture-Tourism Information	.078**	.199***	.101***	.090**
Social Services	.023	-.006	.021	-.055
Incremental R^2 (%)	**12.2*** **	**12.6*** **	**18.6*** **	**10.1*** **
Total R^2 (%)	**36.9*** **	**46.9*** **	**41.3*** **	**32.4*** **

1. Cell entries are standardized regression coefficients (Betas)
2. P-Values with 2-tailed significance: * p < .05, ** p < .01, *** p < .001
3. Weighted Least Squares Regression.
4. Belgium: N = 1,027; Denmark: N = 999; Germany: N = 2,032; Greece: N = 1,012.

Comparatively speaking, this is an exceptionally important predictor in Germany.
Consumption Opportunities. As mentioned previously, the index of consumption opportunities is the strongest predictor of attaining Internet access, regardless of which country is being examined. Therefore, the Standardized coefficients Betas are particularly high, revealing this relationship in Belgium (.212***), Denmark (.194***) and others (see Table 3a); for Portugal a Beta of .103*** was obtained, the weakest across the 15 EU countries. The demographic block explained a much greater variance, with the case of education being particularly strong (.562***); for the United Kingdom a .153*** was obtained; .281*** for Austria; and .175*** and .116*** for Sweden and Finland

respectively. The consumption aspect of opportunities missed is the strongest predictor in Austria.

Social Integration. Perceptions of opportunities to become more socially integrated through the Internet have a germane influence in eight out of the fifteen countries of the EU. They were of special salience in Belgium (.148***) and Denmark (-.072**), and in other EU member nations (see Table 3a). In Belgium the perception of missing the opportunity of being more socially integrated by not going online becomes the main reason to get online.

Social Isolation. In some EU member nations[5] there is a negative relationship when predicting the acquisition of the Internet; people who perceive the Internet as isolating them from the rest of society do not gain access.

Table 3b. Regression predicting Internet Access with Psychological Variables for Spain, France, Ireland and Italy

Internet Access				
Block 1 - Demographics	**Spain**	**France**	**Ireland**	**Italy**
Gender	-.084***	-.061**	-.071**	-.025
Age	-.079**	-.066**	-.150***	-.165***
Education	.297***	.241***	.272***	.242***
Income	.033	.068**	.035	.071**
Population Density	.043	.058**	.068**	-.007
Incremental R² (%)	**29.9*** **	**21.6*** **	**25.7*** **	**25.3*** **
Block 2 - Psychological Aspects				
Opportunities Missed				
Job-Training Opportunities	.001	.074**	.123***	.136***
Consumption Opportunities	.229***	.232***	.115***	.218***
Social Integration	.095***	-.026	.083**	.004
Social Isolation	-.003	-.004	-.023	-.030
Personal Gains	.095***	.029	.044	-.050
Personal Losses	-.024	-.085***	-.058**	-.060**
Desirable Content				
Culture-Tourism Information	.074**	.109***	.132***	.127***
Social Services	-.018	.036	.013	.018
Incremental R² (%)	**9.2*** **	**9.9*** **	**10.6*** **	**10.8*** **
Total R² (%)	**39.1*** **	**31.5*** **	**35.5*** **	**36.1*** **

1. Cell entries are standardized regression coefficients (Betas)
2. P-Values with 2-tailed significance: * p < .05, ** p < .01, *** p < .001
3. Weighted Least Squares Regression.
4. Spain: N = 1,022; France: N = 1,032; Ireland: N = 1,026; Italy: N = 1,075.

Personal Gains. The perception of opportunities missed by not connecting online is statistically significant in Denmark (.117***) and Greece (.071**), among others (see Table 3a). In all of these countries people tend to acquire the Internet if they perceive that it will provide them personal benefits.

Personal Losses. As occurred with the fear of being socially isolated by not going online, personal losses negatively predicted Internet connectivity. People who perceive the medium as pernicious will not log on. This aspect of opportunities missed is important and statistically significant in most EU members except Spain, Luxembourg and Portugal (see Table 3b).

Desirable Content

Two different indexes of content were discerned: Culture-Tourism Information and Social Services Information. The former is the strongest predictor of Internet access. In contrast, Social Services is only applicable in the Netherlands, where it is a positive predictor of gaining access (.088**) (see Table 3c).

Table 3c. Regression predicting Internet Access with Psychological Variables for Luxembourg, Netherlands, Portugal and UK

Internet Access				
Block 1 - Demographics	**Luxembourg**	**Netherlands**	**Portugal**	**UK**
Gender	.015	-.083**	.003	-.063**
Age	-.297***	-.167***	-.030	-.196***
Education	.148***	.122***	.562***	.197***
Income	.071**	.121***	.036	.121***
Population Density	.028	.127***	.011	-.004
Incremental R² (%)	**30.1*** **	**15.9*** **	**44.9*** **	**27.2*** **
Block 2 - Psychological Aspects				
Opportunities Missed				
Job-Training Opportunities	-.026	-.010	.064**	.098***
Consumption Opportunities	.260***	.203***	.103***	.153***
Social Integration	.019	.093***	.005	-.034
Social Isolation	-.151***	.010	.028	-.071**
Personal Gains	.022	.028	.031	.065**
Personal Losses	-.057	-.067**	.029	-.077***
Desirable Content				
Culture-Tourism Information	.067	.126***	.033	.160***
Social Services	-.034	.088**	-.030	.016
Incremental R² (%)	**9.5*** **	**11.7*** **	**2.6*** **	**10.3*** **
Total R² (%)	**39.6*** **	**27.7*** **	**47.5*** **	**37.5*** **

1. Cell entries are standardized regression coefficients (Betas)
2. P-Values with 2-tailed significance: * p < .05, ** p < .01, *** p < .001
3. Weighted Least Squares Regression.
4. Luxembourg: N = 439; Netherlands: N = 1,067; Portugal: N = 1,078; UK: N = 1,277.

Culture-Tourism Information. Ruling out both Luxembourg and Portugal, where this type of information does not become an influential factor in explaining Internet access, the rest of the EU's countries have positive and statistically significant Betas with respect to Culture-Tourism information. Hence, it was found that culture-tourism information is appealing enough to people to get them online (see Table 3d).

Table 3d. Regression predicting Internet Access with Psychological Variables for Austria, Sweden and Finland

Internet Access			
Block 1 - Demographics	**Austria**	**Sweden**	**Finland**
Gender	-.066**	-.056*	-.028
Age	-.118***	-.378***	-.327***
Education	.165***	.115***	.181***
Income	.066**	.235***	.141***
Population Density	.034	.043	.025
Incremental R² (%)	**22.7*** **	**35.6*** **	**38.0*** **

Block 2 - Psychological Aspects			
Opportunities Missed			
Job-Training Opportunities	.130***	-.018	.028
Consumption Opportunities	.281***	.175***	.116***
Social Integration	.124***	.019	-.025
Social Isolation	-.042	-.011	-.039
Personal Gains	-.040	.040	.111***
Personal Losses	-.056*	-.059*	-.086***
Desirable Content			
Culture-Tourism Information	.182***	.138***	.151***
Social Services	-.028	.012	.024
Incremental R^2 (%)	**19.7*** **	**6.8*** **	**7.3*** **
Total R^2 (%)	**42.4*** **	**42.4*** **	**45.3*** **

1. Cell entries are standardized regression coefficients (Betas)
2. P-Values with 2-tailed significance: * p < .05, ** p < .01, *** p < .001
3. Weighted Least Squares Regression.
4. Austria: N = 1,016; Sweden: N = 1,006; Finland: N = 1,026.

Discussion, Implications and Further Research

The classic discourse maintained continuously by scholars in relation to the DD considers that demographical and structural problems are the main explanations for a lack of Internet use. This study argues that there are psychological variables that also explain the phenomenon beyond demographical and structural issues. Therefore, results in this paper suggest that the map that explains the DD has to be expanded. There are also psychological barriers to EU citizens' total adoption of the Internet. For example, perceptions of which opportunities were missed by not accessing the Internet, perceptions of the kind of content that should be on the Internet, and perceptions of how the Internet would change their daily lives were all indicative factors beyond demographical or structural obstacles.

People who are not connected to the Internet do not appear to display a perception of missed Job-Training, Consumption, or improvement of Social Integration opportunities. In addition, the content that should be available over the Internet is not appealing enough for them to seek Internet access when all other variables are controlled. Likewise, they do not believe that getting connected would significantly change their lives for the better. In fact, they think that Internet usage brings personal losses or social isolation. Above all, these attitudes are prevalent in countries with fairly low rates of connectivity, which makes this point even more compelling.

This paper has also clearly examined how real Internet access is obtained through psychological factors. When people perceive that going online will not increase or improve their engagement with the community, they are more likely not to gain Internet access, believing that community must be achieved through live interactions. However, users that perceive that not being online creates a lack of job training and consumption opportunities tend to gain Internet access, believing that the Internet provides a broader field of opportunities for their daily lives. Likewise, when people believe that the Internet will provide personal benefits such as saving time, money, or making more efficient use of utilities, they tend to get connected to the virtual world. The Internet also fulfills certain gratifications or needs for being informed about social and services, cultural-tourism and more, leading them to join the technological trend of gaining Internet.

These findings represent important implications for both EU policy makers and scholars of the DD. In terms of demographics, previous studies and findings have been replicated in this study. Gender, age, education, and income are crucial factors that cannot be disregarded. However, although these demographic factors remain important, our findings also highlight the importance of incorporating psychological aspects in the model.

Being aware and informed of missed opportunities by not going online (consumptive, job, or training) or of the potential gratification of finding desired content on the Internet is what encourages people to get connected.

To sum up, by the beginning of the twenty-first century, this paper's numbers showed that only a moderately-sized population in the US had Internet access. In the EU, these figures were even less promising, with countries only reaching a 30 to 50% connectivity ratio. In less developed countries, Internet connectivity was only acquired by a few privileged people (Norris, 2002).

This picture of the use of the Internet is partially explained by demographical issues. Generally differences in race, gender, education, income and age are the characteristics that reveal the largest gaps in acquiring the Internet. However, some of these gaps have been narrowing to the extent of almost disappearing. Likewise, academics found that other structural variables, such as geographical factors, also explained gaps in the digital divide, with higher connectivity rates in urban centers than in rural zones. That said, as "access" gaps are narrowing, a recent trend of research has emerged to assess newly created gaps related to usability concerns. With gaps related to how people utilize the Internet widening (Cho et al., 2003; Shah et al., 2005) the importance of users' interaction with the medium recovers significance since this type of digital divide stratifies users according to proficiency. This creates a second level of divide based on various uses of the Internet. Thus, the DD can be understood as having an initial level determined by accessibility to the Internet (do I have it or not); a second level dependent on users' proficiency, skills or knowledge about the medium (do I know how to do certain things or not); and lastly, gaps caused by psychological barriers.

If as research suggests (McLeod et al., 2001; Price & Capella, 2002), the Internet serves as a valuable tool of democratic function, then, due to the digital divide gaps created in society, there is a sector of the population that lacks such a tool. Any of the three levels of the above-analyzed gaps will segregate society into 1) a favored group that will learn more, communicate more and participate in civic and political life more; and 2) another group of people who will not take part in all of these advantages. This creates gaps of social power, separating users who actively participate in social life and those who do not. Perhaps more importantly, if society aims to create a truly egalitarian marketplace of ideas in which opportunities are universally available to participate in, opine about and form part of a democracy, then the problem becomes obvious. This digital divide gaps work to the detriment of such a setting. In fact, existing gaps in society where poorer, less educated and rurally-based citizens usually are less participatory of civic and political life will be fostered, exacerbated and accelerated by the digital divide.

References

- Calcutt, A. (1999). *White noise*. New York: Saint Martiris Press.
- *Centraal bureau voor de statistiek*, Nederland (2002). Available at: http://www.cbs.nl
- *Central Statistics Offices Ireland*, Ireland (2002). Available at: http://www.cso.ie
- Cheeseman, J., Janus, A., & Davis, J., (2005). Computer and Internet use in the USA: 2003. Government Census Report. *Current Population Reports*. Available at: http://www.census.gov/prod/2005pubs

- Chen, J.Q, & Price, V. (2006). Narrowing the digital divide: Head start teachers develop proficiency in computer technology. *Education and Urban Society*, 38(3), 283-289.
- Chen, Q., & Wells, W. D. (1999). Attitude toward the site. *Journal of Advertising Research*, 39(5), 27-38.
- Chinn M., & Fairlie R. W. (2004). The determinants of the global digital divide: A cross-country analysis of computer and Internet penetration. Discussion paper # 881, Yale University Economic Growth Center, Yale University, New Haven, CT.
- Cho, J., Gil de Zuniga, H,. Rojas, H., & Shah, D., (2003). Beyond access: The digital divide and Internet uses and gratifications. *IT & Society Journal*, 4, 46-72.
- Crenshaw, E.M, & Robison, K., (2006). Globalization and the digital divide: The roles of structural conduciveness and global connection in Internet diffusion. *Social Science Quarterly*, 87 (1).
- Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press.
- Dutton, W. H., Gillett, S. E., McKnight, L. W., & Peltu, M. (2004). Bridging broadband Internet divides: Reconfiguring access to enhance communicative power. *Journal of Information Technologies*, 19, 28-38.
- Eighmey, J., & McCord, L. (1998). Adding value in the information age: Uses and gratifications of sites on the World Wide Web. *Journal of Business Research*, 41(3), 187-194.
- Eurostat (2003). European Union Agency for Statistics and Statistical Office for European Communities. Available at: http://www.europa.eu.int/comm/eurostat
- Ferguson, D. A., & Perse, E. M. (2000). The World Wide Web as a functional alternative to television. *Journal of Broadcasting & Electronic Media*, 44(2), 155-174.
- Gandy, O. H. (2002). The real digital divide: Citizens versus consumers. In: L.A. Lievrouw, & S. Livingstone (Eds.), *Handbook of New Media: Social Shaping and Consequences of ICTs* (pp. 448-460). London: Sage.
- Gaspar, P. (2004). Factors and impacts in the information society: A prospective analysis in the new member states and candidate countries in the EU. Synthesis Report European Commission Joint Research Center and IPTS Report.
- Gershuny, J. (1983). *Social innovation and the division of labor*. New York: Oxford University Press.
- Gil de Zuniga, H., (2002). Is the Internet inherently personal? How its use influences our lives. Binaria. Universidad Europea de Madrid. Madrid.
- Greenberg, B. (1974). Gratifications of television viewing and their correlates for British children. In: J.G. Blumler & E. Katz (Eds.), *The uses of mass communication: Current perspectives on gratifications research* (pp. 71-92). Beverly Hills, CA: Sage.
- Hargittai, E. (2006). Hurdles to information seeking: Spelling and typographical mistakes during users' online behavior. *Journal of the Association for Information Systems*, 7(1), Article 1.
- Healy, J. (1998). *Failure to connect: How computers affect our children's minds- for better and worse*. New York: Simon & Schuster.
- Howard, P.E.N., Rainie, L., & Jones, S. (2001). Days and nights on the Internet: The impact of a difÂ¬fusing technology. *American Behavioral Scientist*, 45, 382-404.
- *Institut National de la Statisque et des Etudes Economiques*, France (2002). Available at: http://www.insee.fr
- *Instituto Nacional de Estadistica*, Spain (2002). Available at: http://www.ine.es
- *Instituto Nacional de Statistica*, Portugal (2002). Available at: http://www.ine.pt
- *Instituto Nazionale di Stadistica*, Italy (2002). Available at: http://www.istat.it
- Irving, L., (2001). Quoted at public information network. Available at: http://www.rtpnet.org

- Johnston, P. (2006). Towards a knowledge society and sustainable development. Deconstructing the WSIS in the European Policy Context. In J. Servaes, & N. Carpintier (Eds.), *Towards a Sustainable Information Society* (pp. 203-206). Bristol, UK: Intellect.
- Katz, E., Blumler, G., & Gurevich, M. (1974). Utilization of mass communication by the individual. In J.G. Blumler & E. Katz (Eds.), *The uses of Mass Communication: Current Perspectives on Gratifications Research*, p. 19-32. Beverly Hills, CA: Sage.
- Katz, E., Gurevitch, M., & Haas, H (1973). On the use of the media for important things. *American Sociological Review*, 38, 164-181.
- Katz, J. E., Rice, R. E., & Aspden, P. (2001). The Internet, 1995-2000: Access, civic involvement, and social interaction. *American Behavioral Scientist*, 45(3), 405-419.
- Kavanaugh, A. L., & Patterson, S. J. (2001). The impact of community computer networks on social capital and community involvement. *American Behavioral Scientist*, 45(3), 496-509.
- Kaye, K., & Johnson, J,. (2002). Online and in the know: Uses and gratifications of the web for political information. *Journal of Broadcasting & Electronic Media*, 46 (1), 54-71.
- Ko, H. (2002). A structural equation model of the uses and gratifications theory: Ritualized and instrumental Internet usage. Paper presented to the Communication Theory and Methodology Division of the Association for Education in *Journalism and Mass Communication Annual Conference*, Miami, August, 2002.
- Korgaonkar, P., & Wolin, L. (1999). A multivariate analysis of web usage. *Journal of Advertising Research*, 39 (2), 53-68.
- Lazarus, W., & Mora F. (2000). Online content for low-income and underserved Americans: The digital divide's new frontier. The Children's Partnership. Available at: http://www.markle.org
- Maddox. M., & Metha, D. (1997). The role of web addresses in advertising. *Journal of Advertising Research*, 37, 47-59.
- Martin, P. (2003). Is the digital divide really closing: A critique of inequality measurement of the nation online. *IT & Society*, 1 (4), 1-13.
- McLeod, J., Zubrick., J., Keum, H., Despandhe, S., Cho., J., Stein, S., & Heather, M. (2001). Reflecting and connecting: Testing a communication mediation model of civic participation. Paper presented to *AEJMC*. Washington DC.
- McCombs, M. E. (1972). Mass media in the marketplace. *Journalism Monographs*, 24, 1-104.
- McQuail, D. (1990). Rethinking communication, paradigm issues. *Journal of Communication*, 40, 130-138.
- Morris, M., & Ogan, C. (1996). The Internet as mass medium. *Journal of Communication*, 46, 39-50.
- Mossberger, K., Tolbert C., & Stansbury M. (2003). *Virtual inequality: Beyond the digital divide*. Washington D.C.: Georgetown University Press.
- Muir, A., & Oppenheim, C., (2002). National information policy developments WorldWide I: Electronic government. *Journal of Information Science*. Amsterdam.
- Murdock, G. (2004). Past the posts: Rethinking change, retrieving critique. *European Journal of Communication*, 19(1), 19-38.
- *Nationaal Institute voor de Statistiek*, Belgium (2002). Available at: http://www.statbel.fgov.be
- *National Statistics*, United Kingdom (2002). Available at: http://www.statistics.gov.uk
- National Telecommunications and Information Administration (US Commerce Department). (2000). Falling through the Net. Toward digital inclusion. Available at: http://www.ntia.doc.gov/ntiahome/digitaldivide/

- National Telecommunications and Information Administration (US Commerce Department). (2006). Technical and economic assessment of Internet protocol, Version 6 (IPv6). Available at: http://www.ntia.doc.gov/reports.html
- Newhagen, J. E., & Rafaeli, S. (1996). Why communication researchers should study the Internet: A dialogue. *Journal of Communication*, 46, 4-13.
- Nie, N. H., & Erbring, L., (2000). Internet and society: A preliminary report. Stanford Institute for the Quantitative Study of Society (SIQSS), Stanford University, and InterSurvey Inc. Available at: http://www.stanford.edu/group/siqss/
- Nielsen Media Research. (2002). Internet demographics survey. Available at http://www.commerce.net/information/surveysexec_sum.html
- Norris, P. (2002). *Digital divide: Civic engagement, information poverty and the Internet in democratic societies*. New York: Cambridge University Press.
- OMDanmarks Statistik, Denmark (2002). Available at: http://www.dst.dk
- Oppenheimer, T. (1997). The computer delusion. *The Atlantic Monthly*, 280(1), 45-62.
- Papacharissi, Z. & Rubin, A. M. (2000). Predictors of internet use. *Journal of Broadcasting and Electronic Media*, 44 (2), 175-196.
- Pew Internet and American Life Project, (2002). Use of the Internet at Major Life Moments. Available at: http://www.pewinternet.org
- Pew Internet and American Life Project, (2006). Who is online: Last trends. Available at: http://www.pewinternet.org/trends.asp
- Price, V., & Cappella, J. (2002). Online deliberation and its influence: The electronic dialogue project in campaign 2000. *IT & Society*.
- Rafaeli, S. (1986). The electronic bulletin board: A computer-driven mass medium. *Computers and the Social Sciences*, 2, 123-136.
- Reddick, A., Boucher, C., & Groseilliers, M. (2001). *Rethinking the information highway: Rethinking the dual digital divide*. Ekos Research Associates Inc. Available at: http://dsp-psd.communication.gc.ca/Collection/RH34-17-2001E.pdf
- Rheingold, H. (1995). The creative challenge of the Internet. *Graphics*, 296, 144-164.
- Rosengren, E. (1974). Uses and gratifications: A paradigm outlined. In J. G. Blumler & E. Katz (Eds.), *The uses of Mass Communication: Current Perspectives on Gratifications Research*, p. 269-286. Beverly Hills, CA: Sage.
- Rosengren, K. E., & Windahl, S. (1972). Media consumption as a functional alternative. In D. McQuail (Ed.), *Sociology of mass communications: Selected readings* (pp. 166-194). Middlesex, England: Penguin.
- Rubin, A. M. (1984). Ritualized and instrumental television viewing. *Journal of Communication*, 34(3), 67-77.
- Rubin, A. M. (1994). Media uses and effects: A uses and gratifications perspective. In J. Bryant & D. Zillman (Eds.), *Media effects: Advances in theory and research* (pp. 417-436). Hillsdale, NJ: Erlbaum.
- Rubin, A.M. (2002). The uses and gratifications perspective of media effects. In J. Bryant & D. Zillmann (Eds.) *Media Effects: Advances in Theory and Research*. New Jersey: Lawrence Erlbaum.
- Selwyn, N. (2003). Apart from technology: Understanding people's non-use of information and communication technology. *Technology in Society*, 25 (1), 99-116.
- Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media and Society*, 6 (3), 341-362.
- Servo, L. (2002). *Bridging the digital divide: Technology, community and public policy*. US: Blackwell Publishing.
- Shade, L., & Crow, B. (2005). Gender, digital divides and ICT agendas in Canada. *Critical perspectives on the World Summit on the Information Society (WSIS): Civil Society Participation and Issues*. Oxford Internet Institute, 4th March 2005.

Available at: http://www.oii.ox.ac.uk/collaboration/seminars/20050304_Shade_and_Crow_Paper.pdf
- Shade, L., & DeChief, D. (2004). Canada's SchoolNet: Wiring up schools? pp. 131-144, in *Global Perspectives on E-learning: Rhetoric and Reality*, edited Ali Carr-Chellman. Thousand Oaks: Sage Publications.
- Shah, D. V., Cho, J., Eveland, W.P., & Kwak, N. (2005). Information and expression in a digital age: Modeling Internet effects on civic participation. *Communication Research*, 32(5), 531-565.
- Soker, Z. (2005). Age, gender, ethnicity and the digital divide: University student's use of web based instruction. *Electronic Journal of Sociology*, Available at: http://www.sociology.org/content/2005/tier1/soker.html
- Smolenski, M. (2000). The digital divide and American society: A report on the digital divide and its social and economic implications for our nation and its citizens. Available at: http://www.gartner.com/public/static/techies.html
- STATEC, Luxembourg (2002). Available at: http://www.statec.goverment.eu
- *Statischer Bundesant Deutchland*, Germany (2002). Available at: http://www.destatis.de
- *Statistik Austria*, Austria (2002). Available at: http://www.statistik.at
- *Statistiska Centralbyran*, Sweden (2002). Available at: http://www.scb.se
- Stoll, D., Leisching P., Bock H., & Richter A. (2001). Metropolitan DWDM: A dynamically configurable ring for the KomNet field trial in Berlin. *IEEE Communication Magazine*, 39, 106-113.
- Swanson, D. L. (1992). Understanding audiences: Continuing contributions of gratifications research. *Poetics: Journal of Empirical Research on Literature, the Media and the Arts*, 21, 305-328.
- Tan, A. (1985). *Mass communication theories and research*. New York: John Wiley & Sons.
- *Tilastokeskus*, Finland (2002). Available at: http://www.tilastokeskus.fi
- Turkle, S. (1996). *Identity in the age of Internet*. London: Weidenfeld and Nicolson.
- Van Dijk, J. (2005). *The deepening divide: Inequality in the information society*. London: Sage Publications.
- Warschauer, M. (2003). Demystifying the digital divide. *Scientific American*, 289 (2), 42-48.
- Wenner, L. A. (1986). Model specification and theoretical development in gratifications sought and obtained research: A comparison of discrepancy and transactional approaches. *Communication Monographs*, 53, 160-179.
- Williams, F., Rice, R. E., & Rogers, E. M. (1988). Adoption of new media. In Research methods and the new media (pp. 70-90). New York: Free Press.
- Wright, C. R. (1960). Functional analysis and mass communication. *Public Opinion Quarterly*, 24, 605-620.
- *Εμηνικη λημοκρατια Υπορτειο*, Greece (2002). Available at: http://www.statistics.gr

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Footnotes

1. Austria (Statistik Austria, 2002), Belgium (Nationaal Institute voor de Statistiek, 2002), Denmark (OMDanmarks Statistik, 2002), Finland (Tilastokeskus, 2002), France (Institut National de la Statisque et des Etudes Economiques, 2002), Germany (Statischer Bundesant Deutchland, 2002), Greece (Εμηνικη λημοκρατια Υπορτειο, 2002), Ireland (Central Statistics Offices Ireland, 2002), Italy (Instituto Nazionale di Stadistica, 2002), Luxembourg (STATEC, 2002), Nederland (Centraal Bureau voor de Statistiek, 2002), Portugal (Instituto Nacional de Statistica, 2002), Spain (Instituto Nacional de Estadistica, 2002), Sweden (Statistiska Centralbyran, 2002) and the United Kingdom (National Statistics, 2002).

2. In the EU 15 to 24 year olds have a 58 % rate of connectivity; 52% for 25 to 39 year olds; 47% for ages 40 to 54; and finally, for ages 55 and above, barely 18 % are connected (15 NIS, 2002).
3. Since this variable was created based in the mean within each particular country rather than just a specific value of X thousand Euros, the 'Don't Know' was recorded as the average to obtain a more reliable measure.
4. For Belgium demographics account for 24.7% of the variance and the perceptions R^2 of 12.2% when predicting Internet access. Germany has 22.7% and 18.6% explained respectively; 22.3% and 10.1% for Greece; for Spain 29.9% and 9.2% were explained; in France 21.6% and an R^2 of 9.9% were explained; for Ireland 25.7% and 10.6%; Italy with 25.3% and R^2 of 10.8% explicated through the psychological block; 15.9% and 11.7% respectively for Netherlands; 27.2% and 10.3% for the United Kingdom; and finally, Austria achieves a 22.7% for demographics and R^2 of 19.7% explained by psychological variables.
5. Denmark (-.123***), Germany (-.037***), Greece (-.109***), Luxembourg (-.151***), and the United Kingdom (-.071**)

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