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Assessing the Differences in Motivation, Opportunity, and Ability between Young and Aging Consumers to use the Internet

This study examines the motivation, opportunity, and ability in the use of the internet by comparing young and aging consumers in the essential infrastructure of an information oriented society. Previous studies have conducted surveys about using computers and the internet instead of measuring the digital divide by using multilateral approaches; however, this study examines digital divide in terms of motivation, opportunity, and ability. Results suggested age, gender, and education level influenced motivation, opportunity, and ability in the use of the internet by consumers; in addition, the motivation and ability were different depending on occupation. The results show that the digital divide was mainly influenced by motivation and ability in offering a difference between the two groups of young and aging consumers. This study contributes to illuminate the differences between young and aging consumers to use the internet and to suggest implications in the perspectives of motivation, opportunity, and ability.

The internet has created abrupt changes with new information technology becoming a driving force in the knowledge economy. The ability to access and use new information and communication technology has become an important key to economic success

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for individuals and communities. In this sense, new information and communication technologies play an important role in promoting individual development and improving the quality of life. However, while new information and communication technologies create opportunities, they also can aggravate the social and economic gap between individuals. There exists the potential for new information and communication technologies to lead to social disintegration or crisis rather than guaranteeing equal access to information (Castells, 2000).

The digital divide represents more than the simple situation of who possesses a computer and who does not, it has become an important focus of research (Wilson, Wallin & Reiser, 2003). Since 1990, many governments and scholars have made an effort to understand this digital divide. It is now increasingly recognized as an important issue on a national level (Cawkell, 2001; Gibson, 2003; Graham, 2002; Wilson *et al.*, 2003).

In Korea, high-speed internet subscribers represent 30.5% of the total public as of 2008, putting Korea well above the average for OECD countries (20%). Korea was found to have the top level of informatization for three consecutive years (2005–2007) in the “Digital Opportunity Index” conducted by the International Telecommunication Union (ITU, 2007) that measures three elements (diffusion of IT related infrastructure, opportunity to access IT, and degree of utilization). In addition, Korea recently came in second in the number of on-

line participants in a survey conducted by UN. This informatization has led to the creation of economic value. The weight of the IT industry as a share of GDP increased from 9.5% in 2000 to 15% in 2007 and (in particular) the weight of the IT industry as a share of exports accounted for 30% as of 2007. This shows that the IT industry has made great contributions to economic growth. As electronic commerce has been vitalized along with the informatization of industry, the "electronic commerce sales ratio" of Korean enterprises as of 2008 was found to be 37.4% in a survey conducted by the *Korea Institute for Electronic Commerce*. In addition, as the expanded diffusion of the internet has promoted financial informatization, the weight of the business process of banks in Korea through internet banking and tele-banking reached 36.8% as of 2008.

The transition to a digital economic system has brought positive effects in terms of market efficiency through information sharing and the generalization of knowledge. However, as advanced information technology such as information and communications equipment and the convergence of services have evolved rapidly, the 'digital divide' can significantly increase and cause those not familiar with the use of information technology to degenerate into information have-nots.

In the case of Korea, the digital alienation of seniors (who as a group are not familiar with information technology) is likely to become a social and economic problem as the aging of society has been accelerated due to the low birth rate and the development of medical technology that has increased the human life span. Many senior citizens do not have the chance to learn about information technology and are slow to learn how to use it when provided the opportunity. The digital alienation of seniors is becoming a social problem with the rapid aging of society and the increasing use of information technology in daily life. Senior citizens have fewer opportunities than young people to acquire new knowledge. While senior citizens have relatively easy access to technology that has low learning costs (such as mobile phones) they have difficulty in using information and communication

technology such as computers and the internet. This digital divide between age groups includes a primary problem (which is the alienation from social communication of those who are not familiar with information technology) and limits access to an economic environment that can create added value. This results in another social and economic problem of the widening of the gap between rich and poor as well as the intensification of polarization due to an inequality of opportunity. In particular, those who are alienated from the social aspects of the digital world (such as online communities) have the disadvantage of suffering from the loss of 'social networks' that include the loss of the opportunity to develop individual abilities, the alienation of communication with others, and the loss of preferential purchasing opportunities. Differences in terms of motivation, opportunity, and ability can be found in regards to the aging issue.

This study examines the motivation, opportunity, and ability in the use of internet by comparing the activities of young consumers and aging consumers in the essential infrastructure of an information-oriented society. Previous research in this field has simply involved conducting surveys about the use of computers and the internet (Hubregtse, 2005; Huang & Russell, 2006; Rice & Katz, 2003) instead of measuring the digital divide through the use of multilateral approaches. Therefore, in order to measure digital divide more systematically, this study measures the digital divide in terms of motivation, opportunity, and ability as proved by MacInnis *et al.* (1991).

The research problems selected in this study to understand the actual status of the digital divide between young consumers and aging consumers (i.e., middle-aged and elderly consumers) are as follow:

1. What are the differences in motivation, opportunity, and ability in the use of the internet between young consumers and aging consumers (i.e., middle-aged and elderly consumers)?
2. What are the motivations, opportunities, and abilities in the use of the internet according to the individual variables of consumers?

DIGITAL DIVIDE IN THE PERSPECTIVES OF MOTIVATION, OPPORTUNITY, AND ABILITY

Consumer motivation, ability, and opportunity are discussed as antecedent conditions for information processing. Motivation, ability, and the opportunity to process information influence the level of information processing (Batra & Ray, 1986; MacInnis, Moorman, & Jaworski, 1991).

Motivation has been defined as readiness (Bumkrant, 1976; Bumkrant & Sawyer, 1983; Moorman, 1990), willingness (Roberts & Maccoby, 1973), interest (Celsi & Olson, 1988), goal-directed arousal (Park & Mittal, 1985), and the desire or readiness of the consumer to process information (MacInnis, Moorman, & Jaworski 1991). Lutz, MacKenzie, and Belch (1983) argue that respondents who are high in motivation are also high in knowledge. High motivation entails that consumers are willing to allocate processing resources to information (MacInnis, Moorman, & Jaworski, 1991). In addition, a number of studies (Papacharissi & Rubin, 2000; Sun, Rubin, & Haridakis, 2008) have discussed motivations for using media and technologies, and focused on the effectiveness of analyzing motivations for using media that include the use of computers and the Internet, and mobile communications devices.

Rubin (1984) contributes to clarifying the variability of audience activity and provides a conceptualization and operationalization of communication motivation, principally in the context of television viewing. Papacharissi and Rubin (2000) discussed the relationships among media uses and effects, attitude, and social and psychological contexts across media.

Motivations for using new media and high technology, such as cable transmissions, remote-control devices, and mobile communication technology as an emerging multimedia device also are studied (e.g., Leung & Wei, 2000). Research on motivations for using new media provides a "how and why" perspective to understanding media use motivations.

Several researchers have suggested that people use the Internet to fulfill their interpersonal and media needs (e.g., Charney & Greenberg, 2002;

Papacharissi & Rubin, 2000). Flaherty, Pearce, and Rubin (1998) discuss a variety of motives for using the internet, including affection, entertainment, and meeting others in the context of interpersonal needs and media needs (Sun, Rubin, & Haridakis, 2008). Furthermore, motivations for using mobile communication devices have been examined (e.g., Leung & Wei, 2000). Leung and Wei and communication technology findings that motivations for using mobile communication technology are initially influenced more strongly by user perceptions about the expected use, which is more task-oriented. Consumers can easily use mobile communication devices simultaneously for personal and business purposes that slowly eradicate the boundary between work and personal life (Peters & Allouch, 2005).

Opportunity and ability might play a significant role in determining access, rather than motivational factors such as the interest in using new technology and attitudes towards computers. Opportunity refers to the extent to which exposure time influences the attention of consumers to information (MacInnis, Moorman, & Jaworski, 1991). High opportunity means that the amount of attention allocated to information is facilitated (MacInnis, Moorman, & Jaworski, 1991). The focus on distraction and limited exposure time is consistent with other discussions of opportunity (Batra & Ray, 1986; Petty, Wells, & Brock, 1976; Wright, 1980).

Ability is defined as the skill or proficiency of consumers in using information. The availability and accessibility of relevant knowledge structures provide the foundation for processing ability (MacInnis, Moorman, & Jaworski, 1991). High ability means that prior knowledge is necessary to process information (MacInnis, Moorman, & Jaworski, 1991).

Motivation, opportunity, ability, and general attitudes towards science and technology can be expected to vary between different societies and different demographics. There might be systematic differences between social groups in motivation, opportunity, ability, and attitudes towards computer technology. Many have expressed concern about the development of a social divide (Norris, 2002), referring to the inequalities of internet access and use by disadvantaged groups within society, even in

countries at the forefront of the information society.

Differences regarding motivation, opportunity, and ability, generate a digital divide that refers to the invisible boundary that separates those who can afford Information and Communication Technologies (ICTs) and those who cannot (Ahmed, 2004, 2006, 2007; Marcelle, 2004; Mansell & When, 1998; Nulens *et al.*, 2001; Walsham, 2000). In developed countries, there is a rapidly-growing body of literature on the potential of innovative ICT applications, and on the organizational, social, political, and economic conditions that are likely to support their effective use. (Dutton, 1997/1999; Mansell & When, 1998.)

One of the most important issues generating widespread concern in the emergent Information Age have been the indications of a growing digital divide between social groups (Jackson *et al.*, 2007; Norris, 2002). A social divide is apparent in the internet access available in each nation (Norris, 2002). A demographic divide is also emerging between those who do and do not use internet resources to engage, mobilize, and participate in public life. Jackson *et al.* (2007) highlighted a digital divide by race and gender. While a demographic divide is important, there have been limited studies on the age-related digital divide.

There is a growing need for theoretical and empirical research that examines the digital divide. At present there is little systematic research that addresses its permutations in different societies despite the growing importance of the digital divide. Based on the theoretical frameworks of motivation, opportunity, and ability, this study investigates the digital divide in the use of computers, the internet, and technology. This study is focused on identifying the differences of motivation, opportunity, and ability by age.

METHODS

This study used a secondary data analysis to investigate research questions. The data for this study was obtained from the 2009 digital divide index data of the *Korea National Information Society Agency* (NIA). Since 2002, the NIA has collected data

to survey the actual status of the digital divide experienced by underprivileged people. This data includes diverse items such as the general characteristics of those surveyed, the actual status of the use of computers and the internet, and the status of use. A total of 5,300 consumers residing in sixteen cities in Korea were selected through multi-stage stratified random sampling and (particularly in the case of middle aged and elderly consumers) a sample size proportional to the population over the age of 50 residing in metropolitan cities was allocated.

The data of NIA includes various items related to the use of computers and the internet. However, we analyzed three items (motivation to use the internet, opportunity to use the internet, and ability to use the internet) as this study examined the information gap between young consumers and middle aged and elderly consumers in terms of motive, opportunity, and ability.

Table 1 shows the demographics of the samples to be analyzed. A total of 46.7% of respondents were male, 20.7% were young consumers aged in the teens to the forties, while 79.3% were middle aged and elderly consumers. In terms of the educational background of respondents, 25% of respondents were elementary school or middle school graduates, while 10.9% were college graduates or higher. In terms of the job distribution of the sample, managerial positions and clerical positions accounted for a relatively lower percentage, while self-employed consumers and housewives accounted for a relatively higher percentage. In terms of monthly average income, 62.4% had incomes of USD \$1,000 dollars or less, accounting for the highest percentage of respondents. In terms of the distribution of residences, 44.6% of the respondents resided in large cities, while 55.4% of respondents resided in small & medium-sized cities.

Measures

This study analyzed the digital divide in terms of motivation, opportunity, and ability to use the internet. In relation to the motivation for using the internet, five areas (information retrieval, information exchange, transaction processing [bank, reservation and advance purchase, administrative work], electronic

Table 1. *Descriptive Sample Characteristics (n=5,300)*

Personal characteristics	Frequency
Gender (%)	
Male	46.7
Female	53.3
Age (%)	
Teens	5.3
Twenties	4.5
Thirties	5.3
Forties	5.6
Fifties	36.6
Sixties	25.2
Seventies	17.5
Education Level (%)	
Graduation of Elementary School or Lower	25.7
Graduation of Middle School	25.8
Graduation of High School	37.5
Graduation of College or Higher	10.9
Occupation (%)	
Agriculture/Forestry/Fishery	9.2
Self Employed	24.1
Sale/Service	7.0
Production/Technology	4.1
Unskilled Position	7.4
General Clerical Position	5.9
Managerial Position	.4
Professional Position	.5
Housewives	23.4
Student	16.7
Unemployed	10.9
Monthly Average Income (%)	
\$1,000 or less	62.4
\$1,001~\$2,000	21.9
\$2,001~\$3,000	10.6
\$3,001~\$4,000	3.3
\$4,001~5,000	1.1
More than \$5,001	.4
Residing District (%)	
Large Cities	44.6
Small and Medium Sized Cities	55.4

commerce activity and communication) were measured with a 4 point Likert scale. For opportunity, consumer access to the internet in their normal

environment was measured as follows: "Can you conveniently use the internet when you need to? (in the surrounding consumer environment that included the home, workplace, and public places)", "Can you use the internet in your home?", "Do you own a computer (notebook/desktop) that can connect to a wireless internet?", "Do you have a mobile phone that can connect to a wireless internet?", And "Do you have PDA/PMP/SMART PHONE that can connect to a wireless internet?" A "yes" response to a question was processed as 1 point and a "no" response was processed as 0 points. For opportunity, the total scores can be expressed from 0 (the lowest) to 5 (the highest) since the points of the five items above were added. For ability, ten areas (web-browsing, data & information retrieval, chatting through a messenger program, email, on-line games, internet-based multimedia, transaction processing, electronic government & social participation, operation of a homepage and blog, and the purchase of goods and services) were measured. If the respondents were unable to use one, it was scored as 0 points, while the basic grade was processed as 1 point, the intermediate grade processed as 2 points, and the advanced grade processed as 3 points.

RESULTS

The Difference in Motivation, Opportunity and Ability in the use of Internet between Young consumers and Aging Consumers

Table 2 shows the result of a t-test that was used to verify research problem 1. According to the result of the T-test, the scores of young consumers were higher in the areas of motivation, opportunity, and ability than for aging consumers.

For motivation, the score for young consumers was 1.56, while those for aging consumers were .90; the difference was statistically significant. For opportunity, the score for young consumers was .62, while those for aging consumers were .58; the difference was not significant. In the case of ability, the score for young consumers was 1.64, while those for aging consumers were .87; the difference between the two groups was statistically significant.

In summary, there was no significant difference found between young consumers and aging consumers in the opportunity to use the internet when examining the difference between young consumers and aging consumers in terms of motivation, opportunity, and ability in the use of

internet. However, there was a significant difference between young consumers and aging consumers in the motivation and ability regarding the use of internet.

Motivation, Opportunity, and Ability in the use of the Internet By Consumers According To Demographic Variables

Table 2. Differences in Motivation, Opportunity, and Ability between Young Consumers and Aging Consumers

	Motivation	Opportunity	Ability
Young consumers	1.56	.62	1.64
Aging consumers	.90	.58	.87
T value	23.95	11.39	31.52
pr > t	.000	.089	.000

The result of the regression analysis concerning motivation, opportunity, and ability in the use of the internet by consumers according to the demographic variables is shown in Table 3. The factors that influenced the motivation to use the internet were age, income, education level, and occupation. Young consumers showed a higher score in the motivation

Table 3. Results of Regression Analysis for Motivation, Opportunity, and Ability in the use of Internet

Dependent Variable	Effect	B	SE	Beta	t	p
Motivation	Constant	.677	.049		13.695	.000
	Aging Consumer	-632	.026	-.410	-24.200	.000
	Male	.046	.027	.030	1.696	.090
	Income	.067	.014	.093	4.677	.000
	Education	.234	.017	.261	13.835	.000
	Residing In Large Cities	.031	.025	.021	1.269	.204
	Clerical/Managerial/Professional Positions	.244	.040	.112	6.078	.000
Opportunity	Constant	.536	.006		84.463	.000
	Aging Consumer	-032	.004	-.131	-8.158	.000
	Male	.011	.004	.049	2.940	.003
	Income	.006	.002	.054	2.942	.003
	Education	.025	.002	.214	11.904	.000
	Residing in Large Cities	.000	.003	-.001	-.060	.952
	Clerical/Managerial/Professional Positions	.001	.007	.004	.225	.822
Ability	Constant	1.072	.045		23.787	.000
	Aging Consumer	-755	.024	-.507	-31.292	.000
	Male	.116	.025	.080	4.697	.000
	Income	.057	.013	.081	4.297	.000
	Education	.135	.015	.159	8.806	.000
	Residing in Large Cities	-.033	.023	-.022	-1.433	.152
	Clerical /managerial /professional Positions	.162	.038	.075	4.277	.000

to use the internet when compared to aging consumers. Higher income and education showed a higher motivation to use the internet. In terms of occupation, the clerical, managerial, professional groups had a higher motivation to use the internet than other groups.

The factors that influenced the opportunity to use the internet were age, gender, education level, and income level. Young consumers showed a higher score for the opportunity to use the internet when compared to aging consumers. A higher education level showed an increased score in the opportunity to the use of the internet. There was no significant difference in terms of occupation.

When examining the results of ability to use of internet, there were differences according to age, gender, income, education level, and job. Young consumers showed a higher score in the ability to use the internet when compared to aging consumers. In the case of gender, males had higher scores in the area of ability to use the internet. A higher income and education level showed an increased score for ability. In the case of occupation, the score of the clerical, managerial, professional group was higher than other groups in the ability to use the internet.

When examining motivation, opportunity, and ability to use the internet in terms of demographic characteristics, in the area of opportunity to use the internet, age, gender, income level and education level had an influence. However, in the situation of motivation and ability, there were differences depending on age, income level, education level, and occupation. The different results were shown according to demographic variables. In the case of ability, there were differences by gender; males showed a higher score than females in the motive to use the internet. The degree of the influence to use the internet based on age, income level, and education level was verified by existing research (*The U.S. Census Report*, 2001; Gruwald Association, 2002; AECF, 2002). In this study, it was found that motivation to use the internet and ability to use the internet can vary depending on occupation as shown by the clerical, managerial, professional, and student groups that had a higher motivation and ability than other groups.

CONCLUSIONS AND IMPLICATION

This study examined the differences in motivation, opportunity, and ability in the use of internet for young consumers and aging consumers by using NIA data. The the results of this study can be summarized as follows.

First, motivation, opportunity, and ability in the use of internet by young consumers and aging consumers showed statistically significant differences. However, while the differences in motivation and ability between the two groups were significant, the difference in opportunity was less significant in comparison. Therefore, the digital divide in the use of the internet between these two groups can be attributed to motive and ability to use the internet.

Second, the motivations, opportunities, and abilities of consumers were somewhat different depending on demographic variables. Age, gender education level, and income level influenced opportunity, age, income, education level and occupation influenced motivation and ability to use the internet. In particular, the ability to use the internet was different depending on gender and the result shows that there exists a digital divide among young consumers depending on demographic characteristics. This study examined motivation, opportunity, and ability in the use of the internet to grasp the digital divide between young consumers and middle aged & elderly consumers. In terms of opportunity, there was no significant difference found between the two groups; however, there were significant differences between the two groups in terms of motivation and ability that confirmed that the digital divide was mainly caused by motivation and ability. In addition, the differences dependent on occupation were newly identified, in addition to income, education, and age factors that were listed as reasons for the digital divide in previous research (Keith, 2010; Martin, 2010; Whaley, 2004). Young consumers and middle aged & elderly consumers, clerical, managerial, professional and student groups showed higher scores than the other groups in motive and ability. It was found that occupation could be considered as a factor that generated a digital divide. In this study, differences according to

region (which had been listed as factors of digital divide in previous research) were not found. This was attributed to the fact that regional differences in internet access are fairly minimal, as informatization has progressed rapidly with the diffusion of high-speed communication networks and the ubiquitous use of mobile services in Korea.

It is noteworthy that motivation, opportunity, and ability to use the internet show differences between young and aging consumers. The implications of this study show that digital device education programs to increase motivation and ability should be considered for aging consumers. Inexpensive digital devices and user-friendly devices for aging consumers should be developed and offered to provide digital device usage opportunities for aging consumers. Differences in motivation, opportunity, and ability to use the internet should be considered in the development of public policies and digital related education systems for the reduction of the digital divide between young and aging consumers.

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