Internet Connectedness and its Social Origins: An Ecological Approach to Postaccess Digital Divides

Joo-Young Jung

This study examines the influence of sociocultural factors on the level of “Internet connectedness.” The Internet Connectedness Index (ICI), composed of five items, is modified and applied to measure disparities in the ways in which people use the Internet. With a dataset of 384 randomly selected telephone survey respondents, the ICI is regressed on various social indicators. The result indicates that technological environments, social environments, and the scope and intensity of Internet-related goals significantly influence individuals’ Internet connectedness. This finding highlights that even after people gain access to the Internet, the ways they incorporate the Internet into their everyday lives differ, and that the differences reflect disparities in the multiple dimensions of the social context in which individuals are situated.

Keywords: Communication Technology; Digital Divide; Internet Connectedness; Internet Use; Media System Dependency Theory; Social Context; Social Environment

So called “digital divide” studies have been prolific in the last decade. Do we still have more to explore on this topic? The author says yes and proposes an empirical research that is based on a multidimensional index that measures ways in which people use the Internet. The research focuses on the influence of social and technological environments and the Internet-related goals of the individual on the level of “Internet connectedness.”

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Measuring the Digital Divide

Weakness of Prior Studies

The majority of early digital divide studies focused on reporting descriptive results of the disparities in individuals’ Internet access (The Benton Foundation, 1998; Hoffman & Novak, 1996; UCLA Center for Communication Policy, 2001; U.S. Department of Commerce, 1995, 1998). Several studies argued that access itself is not the end of the digital divide, but that we have to consider disparities that exist in the ways in which people use the Internet (Castells, 1999; Gibbs, Ball-Rokeach, Jung, Kim, & Qiu, 2004; Lievrouw, 2000; Patterson & Wilson, 2000; Van Dijk, 1997).

Despite the recent scholarly opinion that the digital divide exists beyond access to Internet technology, very few studies have developed a systematic empirical tool to measure such postaccess disparities. A majority of Internet studies relied on the amount of time spent online as a measure to indicate people’s Internet use (e.g., Kraut et al., 1998; Nie & Erbring, 2000). Because of its simplicity in measuring and analyzing, the time measure does not take into account why people go online and what they do on the Internet (Jung, Qiu, & Kim, 2001; Moy, Scheufele, & Holbert, 1999; Robinson, Kestnbaum, & Neustadtl, 2002).

Several recent studies developed ways to measure the digital divide beyond access/nonaccess and the time measure (Bonfadelli, 2002; Hargittai, 2002; Patterson & Wilson, 2000; Shah, Kwak, & Holbert, 2001). For example, Hargittai (2002) examined disparities in people’s online skills, or what she calls the “second-level digital divide.” By assigning search tasks to a random sample of Internet users, she found a considerable difference in whether people could find various types of content on the Internet and how long it took them to find it. Bonfadelli (2002) also argued that the “double digital divide” existed in current Internet access and usage patterns in Europe (p. 65).

Internet Connectedness

The concept of “Internet connectedness” was first proposed from a discontent in the existing measures of the digital divide (Jung et al., 2001). In the Jung et al. study, the Internet Connectedness Index (ICI) was compared to time measure. From a statistical comparison, the authors showed that people’s ICI scores had linear associations with socioeconomic and demographic inequalities, while the amount of time spent online did not reflect those inequalities (Jung et al., 2001). After this initial study, several studies have included the ICI to measure ways in which people use the Internet with regard to the influence of age (Loges & Jung, 2001), adolescents’ family and friendship network (Jung, Kim, Lin, & Cheong, 2005; Kim & Jung, 2002), geo-ethnicity (combined effect of where people live and what ethnicity they are; Kim, Jung, Ball-Rokeach, & Loges, 2002), and the September 11th crisis (Kim, Jung, Cohen, & Ball-Rokeach, 2004). In these studies, ICI was applied as a methodological tool to measure people’s Internet use.
However, a critical assessment about the validity of ICI was not the focus of the past studies. Also, the theoretical origin of the measurement was not discussed in those studies.

In the current paper, the author first articulates the concept of “Internet connectedness” with regard to its theoretical origin, media system dependency theory (Ball-Rokeach, 1985, 1998; Ball-Rokeach & DeFleur, 1976). Second, the ways in which the measurement has been developed to the current state are discussed. Third, hypotheses regarding the influence of sociocultural variables on the Internet connectedness are proposed and the results are presented.

Theoretical Origin: Media System Dependency Theory

In media system dependency theory (MSD), the degree of media dependency is defined as the “degree of audience dependence on media information that is a key variable in understanding when and why media messages alter audience beliefs, feelings, or behavior” (Ball-Rokeach & DeFleur, 1976, p. 5). Ball-Rokeach (1985) argued that people’s relationships to media are “more readily conceived as a characteristic that is open to change when it is treated as a product of MSD relations than when viewed as a product of individual needs” (p. 23). Needs are based on individuals’ psychological and socioeconomic origins, while the dependency relations are not only based on psychological and socioeconomic origins but also on the personal and social environments that are constantly changing and affecting individuals.1

MSD theory has been used in many empirical studies to explain the relationship individuals form with a communication medium or with several different media (See Jung & Ball-Rokeach, 2004 for more discussion). When the recent new technology, the Internet, emerged and became popular, the author and other colleagues started examining the nature of dependency relations that individuals form with the Internet, and how different the dependency relations are from people’s relationships to previous media. In this process, a revision in the dependency concept and a proposal of a new terminology, connectedness, seemed timely and necessary due to several reasons.

First, the term “dependency” tends to have connotative meanings of the inherent asymmetric relationship between the two parties involved. When the main thrust of media system dependency is to examine the dynamic and changing nature of the relationships between individuals and media, naming the relationships as “dependency relationships” is likely to obscure the theoretical clarity. Connectedness is a more “neutral” term for characterizing individuals’ relationships with communication resources, neutral in the sense that the term itself does not connote any weight towards individuals nor to communication media. The important advantage of connectedness is that it connotes a relationship itself, rather than implying an agent’s characteristic.

Second, MSD theory mainly conceptualized media as “mass media” and characterized the relationship between individuals and media as asymmetric, meaning that the media system is in a better position than individuals to control resources in creating, gathering, and processing information. However, under the transformation of new communication technologies, the relationship between individuals and media
becomes a variable rather than a constant. That is, the dependency relations between individuals and communication media are likely to become more diverse, expanding the range of variations in individuals’ capacities to be involved in creating, gathering, and processing information. In such a media environment, the formerly assumed asymmetric relationship between individuals and media deserves a critical reconsideration. Connectedness encompasses a wider scope of resources in its referent, ranging from interpersonal communication, new and old media, and small and big media. Also, the nature of relationships between individuals and media are left open as a variable without any predisposition.

Antecedents of Digital Divide: Literature Review

What factors are likely to affect individuals’ Internet connectedness? The most commonly used antecedents of the digital divide in prior studies are socioeconomic status (SES; e.g., Howard, Rainie, & Jones, 2001; UCLA Center for Communication Policy, 2001; U.S. Department of Commerce, 2002), age (Cody, Dunn, Hoppin, & Wendt, 1999; Lenhart, 2000; Loges & Jung, 2001; Nie & Erbring, 2000; White & Weatherall, 2000), and ethnicity (Howard et al., 2001; Kim et al., 2002; Novak & Hoffman, 1998; Rios & Gaines, 1998; Spooner, 2001; Spooner & Rainie, 2000; U.S. Department of Commerce, 1998, 2002; Wilhelm, 2000). In these studies, people with higher income, higher education, who are younger and White are more likely to have access to the Internet and to better utilize it than their counterparts.

Social Environment

Beyond the socioeconomic and demographic variables, an important factor that is included in the current study is people’s social environment. A few past studies examined the influence of social environment on people’s Internet use (Allen & Rainie, 2002; Birnie & Horvath, 2002; Fong, Wellman, Kew, & Wilkes, 2001; Haddon, 2000; Joint Venture, 2002; Jung et al., 2005; Lenhart et al., 2003; Livingstone & Bovill, 2001; Matei & Ball-Rokeach, 2001; Murdock, Hartmann, & Gray, 1992; Shah et al., 2001; Wilhelm, 2000). For example, Matei and Ball-Rokeach found that those who have a larger social network in offline interpersonal relations tend to make more friends online. Based on a social network perspective, Birnie and Horvath (2000) found that frequency of contact with family and friends has positive effects on the frequency of Internet contact. Also, Internet users were twice as likely as nonusers to report that most people they know use the Internet; and just 4% of users compared to 27% of nonusers reported that none or very few of their acquaintances go online (Lenhart et al., 2003).

Wilhelm (2000) argued from what he calls a “quasi-sociological perspective” that the ways in which one’s family members, friends, neighbors, or other social contacts perceive the value of the Internet and computers affect the person’s adoption and use of the Internet (p. 65). The author and her colleagues (Jung et al., 2005) found that the ease of obtaining Internet-related help had a significant influence on the quality
of Internet connectedness among East Asian adolescents. Kiesler, Zdaniuk, Lundmark, and Kraut (2000) examined the process in which a family member becomes the “family guru” in terms of computers and Internet use. The authors found that those with the highest level of computer skills, confidence, or enthusiasm became the most involved Internet users and this involvement led to solving computer-related problems for other family members and making requests to external support sources, which in turn led to increased Internet usage.

**Internet-Related Goals**

Another important antecedent variable that is directly related to people’s Internet use is the goals people have when going online. In explaining microlevel antecedents of media dependency relations, Ball-Rokeach (1985) proposed the term “goal” as an adequate concept, making a distinction from “need.” As she stated:

> Needs connote both rational and irrational motives, conscious and unconscious motives, and real and false interests. Goals, on the other hand, connote a problem-solving motivation more appropriate to a theory of media behavior based upon the dependency relation. (p. 494)

That is, goals are the key dimension of individual motivation preceding media dependency relations. Past studies have showed that the types of goals and the scope and intensity of goals people have when using certain media were important determinants of people’s media use (Ball-Rokeach, Rokeach, & Grube, 1984; Colman, 1990; Grant, Guthrie, & Ball-Rokeach, 1991; Kim & Jung, 2001; Loges & Ball-Rokeach, 1993).

**Hypothesis**

Based on the previous theoretical and empirical studies, three hypotheses are proposed with regard to individuals’ Internet connectedness.

First of all, the influence of socioeconomic status and demographic factors on Internet connectedness is tested.

H1: Socioeconomic status (income and education) and demographic characteristics (age, gender, and ethnicity) affect Internet connectedness such that persons with higher income, higher education, who are younger, male, and White are more likely to have higher scores in Internet connectedness than their counterparts.

Second, as reviewed earlier, individuals’ social environments are important variables that are likely to shape the ways in which people connect to the Internet. Particularly, family and friends with whom individuals have daily interactions are likely to influence one’s Internet use. Along with the social environment, the technological environment, in which a person’s communication context is formed, is likely to affect
the person’s Internet connectedness (DiMaggio, Hargittai, Celeste, & Shafer, 2004; Hargittai, 2002; Horrigan & Rainie, 2002).

**H2:** Social environment (degree of interactions with others in receiving or providing Internet-related help; and proportion of family members and friends who have Internet access) and technological environment (having a computer at home; number of available Internet access locations; and years of using the Internet) have positive effects on Internet connectedness, when socioeconomic status and demographic characteristics are controlled.

Finally, individuals’ goals for going online affect their connectedness relations with the Internet (Ball-Rokeach, 1985, 1998). The degree of importance of certain goals and the breadth of goals that people have are likely to shape Internet connectedness.

**H3:** Internet goal scope and intensity have positive effects on Internet connectedness, when socioeconomic status, demographic characteristics, technological environment, and social environment are controlled.

**Methodology**

**Data**

This study was based on a telephone survey conducted in the Los Angeles area as part of ongoing research by the Metamorphosis Project at the Annenberg School for Communication at the University of Southern California. Eight ethnically diverse residential areas located within 10 miles of the Los Angeles Civic Center were studied between 1998 and 2002. In the first seven areas, one ethnicity that shaped the tone and character of the area was selected to draw a sample. The study areas and target ethnicities included White/plurality Protestants in South Pasadena, White/plurality Jewish on the Westside, African American in Greater Crenshaw, Korean origin in Koreatown, Chinese origins (Mainland, Taiwan, and Hong Kong) in Monterey Park, Mexican origin in East LA, and Central American origins in Pico Union.

Glendale, which is an ethnically diverse area located eight miles from the Los Angeles Civic Center, was the eighth area studied in 2002. Unlike previous study areas, multiple ethnicities were included to better understand cross-cultural and ethnic differences. The major Glendale ethnicities were Armenian origin, White, and Mexican origin (U.S. Census Bureau, 2000). Consistent with the previous Metamorphosis Project strategy of administering surveys in the respondents’ preferred languages, surveys in Glendale were conducted in multiple languages: English, Spanish, and Armenian. A reputable survey research firm, California Survey Research Services (CSRS), worked with the research team to conduct the survey interviews. The survey was programmed for Computer Assisted Telephone Interview (CATI) administration and the random digital dialing (RDD) was used to select respondents. The CSRS supervisory staff trained bilingual interviewers to administer the survey.
The survey response rate in Glendale was 54% when calculated by dividing the number of completed interviews by the number of theoretically eligible phone numbers. Total of 585 Glendale respondents completed the survey. Among these, 384 respondents who answered “yes” to the question, “Do you use the Internet? This could be from a computer at work, school, home, or anywhere else,” were included in this study.

Forty-four percent of Internet users in Glendale were males. The median age was 36. White respondents constituted 37%, Latino 29%, and Armenian 29% of the total Internet users. Fifty percent had college graduate degrees or higher educational achievement. Median income was between $35,000 and $45,000.

Dependent Variable: Internet Connectedness Index

The first Internet Connectedness Index (ICI) was published in August, 2001 (Jung et al., 2001) with nine items: number of years of home-computer ownership; number of tasks accomplished through Internet connections; number of Internet access sites; number of goals served by online connections; number of activities participated in while online; frequency of participation in online interactive activities (e.g., chat rooms); evaluation of the overall effect of the Internet on personal life; how much the person would miss his/her computer if it vanished one day; and how much the person would miss the Internet if it vanished one day. The reliability alpha was .71 for this nine-item scale.

Despite the ICI’s multidimensional nature, it had several limitations. Theoretically, the “connectedness” concept had not been fully established when the first version of ICI was developed, so that a clear rationale for including different items in the index and the coherence among the items were lacking. For example, after the author conducted a more comprehensive review of past literature, particularly examining media system dependency theory, number of years of home-computer ownership and number of Internet access sites items were considered more appropriate to be included as antecedent variables influencing Internet connectedness, rather than as one of the items in ICI. Also, the number of goals served by online connection was taken out of the index and put as an antecedent variable based on the media system dependency theory’s proposition that the goal people have for certain media serves as an important motivation for people’s connection to the media (Ball-Rokeach, 1985, 1998).

Methodologically, limitations were found in the ways questions were asked, which were modified when the survey was revised for Glendale area. For example, questions about Internet-related goals were modified from one question that allowed multiple answers (“What are the most common reasons why you participate in these online activities? Is it . . . ?”) to separate questions that asked degrees of importance of each goal (“On a scale from 1 to 5, where 1 is ‘not important at all’ and 5 is ‘very important,’ how important is the Internet for you . . . ?”). The earlier format was problematic because some people had tendency to choose multiple answers, while others tended to just choose one, which became a confounding factor when deriving a goal
scope variable from this question. By asking a separate question for each goal, this problem was minimized because people had to express their thoughts about the importance of every goal. For the same reason, the question about Internet activity was modified in the same way.

In response to the limitations mentioned above and reflecting the revised format of questions, the author derived a modified Internet Connectedness Index. The new Internet Connectedness Index composes of five items: scope of Internet activities; intensity of Internet activities; time spent on the Internet; computer miss; and Internet miss. The scope of Internet activities and the intensity of Internet activities were based on a set of questions of “Now I’m going to ask you about some different things you might do online. Have you ever used the Internet for . . .?” The items provided were chatting/Internet Reality Chat (IRC)/Internet Chat Query (ICQ) or instant messenger; email; playing games; listening to music; participating in mailing lists of listserves; maintaining a personal Web site; making Internet phone calls; participating in Multi-User Dungeon (MUDs)/Multi-User Object Oriented (MOOs); reading messages from Newsgroups/Usenet/Bulletin Board (BBS); surfing the Web; and watching a Webcast. The items were purposefully chosen to reflect different skills that are required to participate in the activities. As soon as a respondent answered “yes” to an item, a follow-up question was asked. “On a scale from 1 to 10, where 1 is ‘not important at all,’ and 10 is ‘very important,’ how important is this activity to you?” This question was asked for all the items that respondents answered “yes” in order to assess the intensity of their engagement in the activity. The number of affirmative answers to the 11 activities was counted to form the scope of Internet activities variable ranging from 0 to 11 (M = 5.16, SD = 1.96). The intensity of Internet activities variable was formed by averaging a respondent’s score on the importance of activities scale ranging from 1 to 10 (M = 4.65, SD = 2.25).

Time spent on the Internet was based on a question of “Including email, approximately how many hours did you spend on the Internet last week?” (M = 9.71). Respondents’ answers to the open-ended question was recoded into five categories (M = 1.97, SD = 1.19). The computer miss item was derived from the question, “Imagine you woke up tomorrow to find that you could no longer use any computer. On a scale from ‘1’ to ‘10’ where 1 ‘means you wouldn’t miss it at all because your daily life could proceed as normal’ and 10 ‘means you would miss it an extreme amount,’ how much would you miss being able to use a computer?” (M = 6.69, SD = 3.14). The Internet miss item was based on the question, “Imagine that you woke up tomorrow to find that you could no longer use the Internet. Using a 10-point scale where 1 ‘means you wouldn’t miss it at all because your daily life could proceed as normal’ and 10 ‘means you would miss it an extreme amount,’ how much would you miss being able to go online?” (M = 5.53, SD = 3.18). Both computer miss and Internet miss variables range from 1 to 10.

A principal component analysis was conducted to examine whether the five variables (scope of Internet activities, intensity of Internet activities, time spent on the Internet, computer miss, and Internet miss) considered for the Internet Connectedness Index can be combined to a factor. 

Factor loadings of five items were all over
.70 (Table 1), and the Internet Connectedness Factor was derived. The reliability of the Connectedness Factor measured by Cronbach alpha is .79.

**Independent Variables**

**Internet goal scope and intensity**

Internet goal scope and intensity was based on the questions “On a scale from 1 to 5, where 1 is ‘not important at all’ and 5 is ‘very important,’ how important is the Internet for you . . . ?” The items provided were to stay on top of events that you care about/to get in touch with people when you’re looking for a job/to express yourself/to get your work done/to play or amuse yourself/to stay on top of what is happening in your community/to gain skills for career development/for social reasons like making friends/and to get advice on how to deal with other people such as doctors and health professionals. A respondent’s answers to the eight items were added and averaged to form the total intensity scale ranging from 1 to 5 ($M = 2.26$, $SD = 1.1$). For the scope variable, answers of a respondent for the same eight items were dichotomized into “0” for not important at all and “1” for the rest of the categories in the scale. Then, all scores for the eight items were added to form a scope variable ranging from 0 to 8 ($M = 5.89$, $SD = 2.44$). The correlation $r$ between goal scope and goal intensity variables was .89 and these two variables were reduced to a goal scope and intensity factor by the principal component analysis.

**Social environment**

Social environment was measured by four questions. The first two questions concerned people’s interactions with others in receiving and providing Internet-related help. The first question was, “When you are trying to figure out how to do something new on the Internet or on your computer, how easy is it for you to get help? On a scale from 1 to 10, where 1 is ‘very difficult’ and 10 is ‘very easy,’ how easy is it to get help?” ($M = 6.31$, $SD = 2.61$). The other question was, “How likely is it that others would approach you for help solving Internet- or computer-related problems? On a scale from 1 to 10, where 1 is ‘very unlikely’ and 10 is ‘very likely,’ how likely is it?” ($M = 4.91$, $SD = 2.91$). These two variables (correlation $r = .76$) were combined to derive the Internet-related help factor.
Proportions of family and friends who were connected to the Internet were asked for family and friends separately: “Thinking about your family members whether they live with you or not, how many of them use the Internet?” and “Thinking about your friends, whether they live in Glendale or somewhere else, how many of them use the Internet?” The response set given was “all of them,” “most of them,” “some of them,” and “none of them.” The responses were reverse coded to have none of them as “1” and all of them as “4” (Family: $M = 2.86$, $SD = 0.88$, Friend: $M = 3.13$, $SD = 0.77$). Running a principal component analysis with the two variables (correlation $r = .80$) derived a proportion of family and friends connected to the Internet factor.

**Technological environment**

Technological environment was measured by three questions. The home-computer ownership question asked, “Do you have any type of personal computer, including laptops in your home?” (Yes = 90%). Second, respondents were asked to choose places where they can go online. Categories included home, school, work, a community center or organization, a public library, a cybercafe or Kinkos, and others. Multiple answers were accepted. Categories were trichotomized into home, school/work, and others. A respondent’s affirmative answers to the three categories were added to form a variable ranging from 1 to 3 ($M = 1.79$, $SD = 0.99$). Third, years of Internet use was based on the question, “How many years have you used the Internet?” ($M = 4.5$, $SD = 2.87$). Respondents gave open-ended responses. The three variables—home-computer ownership, number of places for Internet access, and years of Internet use—were put together in a principal component analysis. The three items loaded well into a factor (factor loadings: home-computer ownership $= .70$, number of places for Internet access $= .78$, and years of Internet use $= .68$), and a technological environment factor was created.

**Socioeconomic status and demographic characteristics**

Socioeconomic status was measured by income and education. Income data were obtained by asking for the household income for the previous year in a seven-category scale. The highest grade or year of school that a respondent completed was used to indicate educational level (asked in a seven-category scale). Income and education (correlation $r = .82$) was combined to form a socioeconomic status factor. Demographic characteristics were indicated by age, gender, and ethnicity. The respondent’s age on his or her last birthday was asked. Male gender was coded 1, and female was coded 0. Ethnicity was asked, “How do you usually describe your ethnicity?”

**Results**

The Internet Connectedness Index is regressed on independent factors in four nested multiple regression models (Table 2). Bayesian Information Criterion (BIC) is used for model selection. BIC is an indicator for comparing different steps of hierarchical
regression models and for selecting a model that has the best goodness of fit with the least number of independent variables (Raftery, 1995). BIC is more conservative than the R-square increment significance test, and it is especially sensitive to maintaining parsimoniousness. The lower (i.e., the more negative) the BIC, the better the model captures the main features of the data relative to other models (Biblarz, 2002; Raftery, 1995).

Table 2  Summary of Hierarchical Multiple Regression Analyses for Variables Predicting Internet Connectedness (Standardized Coefficients)

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<tr>
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<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Final Model</th>
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<td>SES and demographics</td>
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<tr>
<td>Socioeconomic status</td>
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<td>.01</td>
<td>.11*</td>
<td>.12*</td>
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<tr>
<td>Age</td>
<td>-.31***</td>
<td>-.15**</td>
<td>-.10*</td>
<td>-.12*</td>
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<tr>
<td>Gender</td>
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<td>Latino</td>
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<td>-.11*</td>
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<td>Armenian</td>
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<td>-.14**</td>
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<tr>
<td>Social and technological environment</td>
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<tr>
<td>Proportions of family and friends using the Internet</td>
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<td>Receiving and giving Internet-related help</td>
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<tr>
<td>Technological environment</td>
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<td>Goal scope and intensity</td>
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<td>Internet goal scope and intensity</td>
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<td>.45</td>
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<td>BIC</td>
<td>-1.17</td>
<td>-27.86</td>
<td>-54.71</td>
<td>-66.04</td>
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</tbody>
</table>

\( N = 330. \)
\( * p < .05. \)  \( ** p < .01. \)  \( *** p < .001. \)

H1: Socioeconomic Status and Demographic Characteristics

In the first model in Table 2, where socioeconomic status and demographic variables are included, socioeconomic status (income and education) (\( \beta = .11, p < .05 \)) and age (\( \beta = -.31, p < .001 \)) have significant effects on Internet connectedness. People with higher SES and those who are younger have higher scores in the Internet connectedness index. Gender and ethnicity do not have significant effects on Internet connectedness. The BIC (Bayesian Information Criterion) of this model is -1.17.

H2: Social and Technological Environments

In the second model, where variables of technological and social environments are added, proportions of family and friends who are connected to the Internet
(β = .11, p < .05), degree of interactions in receiving and giving Internet-related help (β = .29, p < .001), and technological environment (β = .27, p < .001) have positive effects on Internet connectedness, when socioeconomic and demographic characteristics are controlled (Table 2). Age remains a significant variable in this model. The BIC of this model is −27.86, which is lower than the BIC of model 1, indicating that the addition of technological and social environments has a significant contribution to predicting Internet connectedness.

H3: Goal Scope and Intensity

Finally, the Internet-related goal scope and intensity factor is included in the equation. When all the variables included in the previous models are controlled, the goal scope and intensity factor has a highly significant effect on Internet connectedness (β = .48, p < .001). That is, those who have more intense and broader motivation to seek goals on the Internet are more likely to have higher connectedness to the Internet. In this model, socioeconomic status, age, ethnicity, receiving and giving Internet-related help, and technological environment have significant effects on Internet connectedness (Table 2). Along with a higher goal scope and intensity, higher SES, younger age, being White, receiving and giving Internet-related help to/from others, and having a better technological environment have a positive association with having higher scores in the Internet connectedness index. The BIC of this model is −54.71, which is lower than the previous model, indicating that the addition of the goal scope and intensity factor increased the goodness of fit of the model.

Final Model

Based on the results of model 1 to 3 in Table 2, a model with the lowest BIC is derived as a final model. Because the proportions of family and friends who are connected to the Internet factor was not significant in the full model (model 3), a regression model is run excluding the factor. The BIC of this model is −66.04, which is lower than the BIC of the full model (−54.71). Therefore, this model is selected as a final model. Significant factors in the final model are socioeconomic status (β = .12, p < .05), age (β = −.12, p < .05), Latino ethnicity (β = −.13, p < .01), Armenian ethnicity (β = −.15, p < .01), receiving and giving Internet-related help (β = .16, p < .001), technological environment (β = .19, p < .001), and Internet-related goal scope and intensity (β = .48, p < .001).

Discussions

In the current paper, both conceptual and empirical aspects of the Internet connectedness are examined. First, the concept of “Internet connectedness” was articulated with regard to its theoretical origin, media system dependency theory (Ball-Rokeach, 1985, 1998; Ball-Rokeach & DeFleur, 1976). Second, a new version of the Internet Connectedness Index (ICI) was proposed and the ways in which the ICI has been
developed to the current state were discussed. Third, the ICI was regressed by various social variables. The result of this study supports the hypotheses that among those who already have access to the Internet, higher socioeconomic status, younger age, and being White (compared to both Armenians and Latinos) were associated with higher Internet connectedness scores. When these socioeconomic and demographic characteristics were held constant, the social environment (higher interactions with others regarding giving and receiving Internet-related help; proportions of family and friends who use the Internet) and the technological environment (having a computer at home, the number of places for going online, and length of experience with the Internet) were significantly associated with higher Internet connectedness. Lastly, having broader and intense goals for going online was found to have a significant influence on Internet connectedness.

**Implications of the Findings**

This study is the first work to empirically examine the influence of multiple variables on ICI in a single regression model. That is, the influences of social, technological, and motivational factors on the Internet connectedness are examined in relation to other factors. Also, ICI was found to have significant relationships with independent variables, which indicates that ICI was able to reflect postaccess digital divides in the ways people use the Internet.

Highlighting empirical results, the technological environment was found to have a highly significant effect on Internet connectedness. Among the three variables constituting the technological environment factor, home-computer ownership (e.g., Hargittai, 2002; Horrigan & Rainie, 2002) and years of Internet use were consistently found to be important variables that influence people’s Internet access and use in the past studies. The number of Internet access places, on the other hand, has not been explored to the same extent in previous research (c.f., Jung et al., 2005). The communication infrastructure that individuals are located in (Ball-Rokeach, Kim, & Matei, 2001) and the capacities of individuals to make use of the technological resources available to them in their environments are likely to affect the ways in which individuals incorporate the Internet into their everyday lives. For example, those who only use the Internet at work are likely to have a different pattern of connectedness when compared to others who use it at home, work, and a community center. The scope of activities is likely to be wider if the Internet is used from multiple locations, and the kinds of activities engaged in online are likely to be different (DiMaggio et al., 2004). The result of the current study emphasizes that the place where people go online is a significant factor that affects what people do online.

Also to be highlighted in this study is the consideration of the social environment. Unique variables included in this study were the proportions of family and friends using the Internet and the degree of interactions with others regarding receiving and giving Internet-related help. In the final model of Internet connectedness (Table 2), the degree of interaction with others regarding Internet-related help was found to have a significant effect on Internet connectedness, even when
socioeconomic, demographic, and other variables in the model were controlled. This indicates that when other conditions are equal, individuals who have social ties that they can reach for help in resolving Internet-related problems are more likely to engage in broader and more intense Internet activities and to perceive the Internet to be more central to their everyday goal attainment. This result extends the argument made by scholars emphasizing the concept of social capital (Coleman, 1998; Putnam, 2000), in which people’s social network is considered a crucial resource, or capital, that is likely to provide individuals with meaningful benefits in leading their social lives and career. This study showed that the social capital available in people’s everyday lives is one of the important factors that affect the quality of people’s Internet experience.

The largest variation in individuals’ Internet connectedness was explained by Internet goal scope and intensity. As discussed in the media system dependency theory, goals are one of the most important motivations for individuals to connect to certain communication media (Ball-Rokeach, 1985). Past studies showed that goals people have affected what media or genre people choose to view (Coleman, 1990; Grant, Guthrie & Ball-Rokeach, 1991; Loges & Ball-Rokeach, 1993). Based on these past studies, it was assumed that for the Internet, where people have more degree of freedom to choose their activities and to decide how often or how long they are going to be engaged in the activities when compared to traditional media, the scope and intensity of goals that people have when going online are likely to shape what they actually do online. The current study showed that this was true. The Internet connectedness was largely shaped by the scope and intensity of goals for going online. That is, if a person has a broader scope of goals that he or she perceives the Internet to be useful for, the person is likely to engage in broader scope of activities on the Internet to fulfill the goals. Also, if a person perceives an Internet-related goal to be highly important in his or her life, the person is likely to engage intensively in an Internet activity that helps attain the goal. The current study was the first effort to examine the relationship between scope and intensity of goals and Internet connectedness.

Limitations and Future Research

Limitations exist. First, individual items in the ICI have not been analyzed separately. In addition to the total scores of the index, analyzing each item separately will allow the researcher to examine the relationships between social factors and each aspect of people’s Internet connectedness.

Second, the connectedness measure was only applied to the Internet. In future research, it may well be applied to other media including traditional media and new media. Applying a similar measure to different media will allow researchers to compare and contrast what each communication medium means for individuals vis-à-vis other media.

Third, the result of this study relies on the cross-sectional analysis in which multiple variables are analyzed at the same time. The nature of this analysis may obscure
the direction of causality between dependent and independent variables. Although the direction of causality in this study is based on the theoretical framework and past studies, caution should be applied when interpreting the result. Also to be noted is that this study relies on self-described data from a telephone survey. Items such as time spent online may not be as accurate as the data acquired by time-diary method.

Fourth, the analyses in this paper focused mostly on disparities in individuals’ connections to the Internet. Another dimension of inequality relating to the Internet is how the resources obtained on the Internet are utilized in people’s social and political lives and career. This area, however, is more challenging to examine empirically because how the Internet resources are actually utilized in real-life occasions should be monitored and observed. In addition, the consequence of the Internet connections should be studied not only at a microlevel but also at meso- and macrolevels. The ways in which the Internet is applied to people’s goal achievement in occupational and community settings, and also how the Internet is being incorporated at organizational, intermedia, and community levels are open for future research.

Notes


[2] The well-known RDD sample advantages of bias reduction are particularly evident in the Los Angeles area. It is estimated that 50% of Los Angeles household phone numbers are unlisted. Thus, the financial and procedural advantages of employing phone (or other) directories, while considerable, are outweighed by the advantages of the RDD procedure. This is particularly the case when the research design objective is to gain access to representative samples of geographically located area residents.

[3] Eligible phone numbers were calculated by examining the total number of study phone numbers excluding phone numbers for which eligibility could not be determined, inappropriate/duplicate phone numbers, nonqualified household phone numbers (e.g., outside the study area) and the estimated number of initial refusals not likely to qualify for the study.

[4] Principal Component Analysis (PCA) was chosen over Principal Factor Analysis (PFA) because the purpose of the analysis here was to derive an Internet Connectedness Index factor by reducing five variables into one factor. PCA is usually used to reduce the number of variables while PFA is used to detect structure in the relationships between the variables (Pedhazur & Schmelkin, 1991).

[5] The formula for deriving BIC for multiple regression is $BIC = n \ln (1 - R^2) + p \ln n$, where $n$ is the sample size, $R^2$ is the value of $R^2$ for the model of interest and $p$ is the number of independent variables in the model.

References


