



# A new dimension of the digital divide: Exploring the relationship between broadband connection, smartphone use and communication competence



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## ABSTRACT

The study explores group differences in demographic characteristics; Internet usage (device ownership, Internet availability, and frequency of weekly Internet use); and communication competence (instrumental, creative, and networking skills) between people who have and who do not have wired and/or wireless broadband connections and smartphones. The results of the one-way ANOVA and Scheffe's post-hoc comparisons demonstrate significant differences in groups with different network connection types across demographic lines, different levels of Internet usage, and different communication competences. The results of the multinomial regression show significant differences across the variables between wired-only users and wired and smartphone users as well as between wired-only users and wired, wireless, and smartphone users. However, group differences between wired and smartphone users and wired, wireless, and smartphone users are significant only in device ownership and creative skill. We concluded that smartphone use was likely to aggravate the gaps of demographics, access, and skills in the seamlessly connected media environment. Meanwhile, access gap made the most impact on information, communication, leisure/entertainment, and financial management activities online, followed by skill and demographic gaps. The findings imply that access and skill gaps could be higher barriers to the active engagement in diverse online activities and consequently create an overlapping effect on the established divide.

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## 1. Introduction

An emerging communication technology has been at the center of an ongoing controversy over whether it contributes to bridging the digital divide or widening it. In the case of the Internet, the impact of Internet adoption and use on the digital divide has been debated since the late 1990s. Some communication scholars have argued that the Internet reinforces social inequality already established in the social structural division (DiMaggio et al., 2004; Norris, 2001; van Dijk, 2006). Some have argued that the advantageous characteristics of open networks and interactive communication modalities inherent in the Internet and the resultant users' enhanced empowerment can contribute to more participation in civic and political life (D'Alessandro and Dosa, 2001; Jenkins et al., 2009; Katz et al., 2001). Meanwhile, others have advocated that the notion

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of the digital divide should encompass multiple dimensions in a more refined way that comprehensively considers the scope of access to participation in diverse Internet uses (Hargittai, 2010; Pearce and Rice, 2013).

As such, whether the digital divide will increase or reduce social inequality still remains at the heart of the debate. Nevertheless, we need to bear in mind Selwyn's point that although the disputed arguments surrounding the discourse on technology evolution are inevitable in the evaluation of technology's effect on socio-economic growth, the positive prospects of the technology effect tend to provoke "techno enthusiasm" (Selwyn, 2004, p. 342). Being aware of making this problematic diagnosis, we need to evaluate aspects of the digital divide from a critical point of view.

While the adoption and access rates of broadband connections are leveling off, the gap in physical access to the Internet is steadily narrowing. For instance, Korea has high fixed and mobile broadband penetration rates, and about 84 percent of the population uses the Internet, ranking first in use and skills sub-indices (International Telecommunication Union, 2012). Korea's broadband Internet subscriptions per 100 people equal 36.9 percent, taking fourth place among 144 countries; its mobile broadband subscriptions per 100 people equal 105.1 percent, taking second place (Bilbao-Osorio et al., 2013).

In an over-saturated environment of Internet connections, academic focus on the digital divide has shifted away from physical access to Internet skills/usage and creative production/sharing. One reason for the shift in focus is that high-speed fixed and mobile broadband adoption, including smartphones and tablet computers, can redouble the number of seamlessly networked connections. The other reason is that the immersion of broadband connections nationwide and worldwide has made online activities that require skills more available. This increased Internet activity means communication competence has a greater influence on effective online activities; therefore, even with the increase in user experience of Internet use, instrumental and creative skills between stratified Internet users play a more important role in increasing the second level of the digital divide (Correa, 2010; Hargittai and Walejko, 2008; van Dijk, 2006), which means a discrepancy in Internet usage and skills (Hargittai, 2002).

In addition to different methods of accessing the Internet, more ways of networking through social media have emerged as another important factor that may deepen the digital divide. In particular, the rise of social network sites (SNSs) is intensifying the use of participatory online activities through interactive communication between users who in turn maintain existing social relations and make new social relations online (Boyd and Ellison, 2007).

The main purpose of the present study is to investigate the scope and magnitude of the digital divide between the haves and have-nots of wired and/or wireless broadband connections and smartphones. Subsequently, the study evaluates the importance of communication competence, including instrumental, creative, and networking skills, depending on different types of broadband access. As a result, the study will shed light on the question of whether wired and wireless broadband plus smartphones could create a new dimension in the digital divide.

The other purpose is to examine the effect of the new dimensions of digital divide on online activities. As broadband connections have reached saturation levels in various population segments, Internet users have had more opportunity to experience diverse online activities ranging from surfing, information seeking, and entertaining to real-time communicating, shopping and banking. Since the introduction of the Internet, the demographic, access, and skill gaps have been identified as the main causes of a wide range of on- and offline activities, which were expected to widen the discrepancy between haves and have-nots (Hargittai and Hinnant, 2008; Horrigan and Rainie, 2002). The smart media environment, however, could change the relationships between these gaps and online activities because it reinforces the accessibility to and availability of different network types. Hence, the study will reveal how demographic, access, and skill gaps influence diverse online activities by observing the relationships between the gaps and online activities.

## 2. Literature review

### 2.1. Demographics of the digital divide

The demographic characteristics of the digital divide refer to inequality in gender (males and female), race (Whites and non-Whites), age (older and younger), income (rich and poor), and education (more educated and less educated) in the adoption and use of new communication technologies. Previous studies show that the early stage of communication technology adoption is more likely than later stages to be closely associated with unequal demographic profiles even in advanced countries, albeit the effects of demographic disparities are not equal (Chaudhuri et al., 2005; Horrigan and Rainie, 2002; Leung and Wei, 1999; Yogesh and Banita, 2007).

Broadband adoption and use illustrates demographic inequality. In the United States, levels of household income and education were strongly associated with broadband subscriptions (Chaudhuri et al., 2005). Broadband users in the US were more likely than dial-up users to be male, wealthier, and better educated (Horrigan and Rainie, 2002). The UK presents similar correlations between broadband adoption and the socio-economic characteristics of age, income, education, and occupation, which were determinants of broadband adoption and non-adoption (Yogesh and Banita, 2007). In the case of mobile phone adoption in Hong Kong, non-adopters' profiles were more likely than adopters to be female, older, less affluent, and less educated (Leung and Wei, 1999).

However, prior research has revealed that the widespread penetration and dissemination of communication technology have the potential to reduce demographic disparities (Horrigan, 2007; Ono and Zavodny, 2003; van Dijk and Hacker, 2003). For instance, the gender gap in Internet use disappeared by 2000, although men were more likely than women to increase

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