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HUMANIORA

# **ICT DISPARITIES IN FINLAND**

## **ACCESS AND IMPLICATIONS**

by

**Matti Näsi**

TURUN YLIOPISTO  
UNIVERSITY OF TURKU  
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From the department of Social Research, Economic Sociology  
University of Turku, Finland

**Supervisors:**

Professor Pekka Räsänen  
Economic Sociology  
Department of Social Research  
University of Turku, Finland

Professor Leena Koivusilta  
University Consortium of Seinäjoki  
School of Health Sciences  
University of Tampere, Finland

**Pre-examiners:**

Professor James C. Witte  
Department of Sociology and Anthropology  
George Mason University, USA

Senior Lecturer Dr. Galit Nimrod  
Department of Communication Studies, and the Center for Multidisciplinary Research in Aging  
Ben-Gurion University of the Negev, Israel

**Opponent:**

Research Director Petteri Repo Ph.D. (Econ.) , Adjunct professor (docent)  
The National Consumer Research Centre, Finland

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## **Abstract**

The Internet and other new information and communication technologies (ICTs) have become an integral part of most Western societies, from the perspective of both individuals and organizations. In this dissertation the evolving role of the Internet and other new ICTs in Finland over the past decade is studied from the perspective of disparity. The ICT disparities are seen to be constructed from two interconnecting elements, access and implications. The main goal of this dissertation is to examine how access, different user purposes, as well as implications, reflect disparities among different socio-demographic and socio-economic population groups. For the purposes of this work, four research studies, each with its own, specific topic, were constructed. According to the results, age is clearly the most significant element associated with both access and implications for the new ICTs in Finland. Although other examined factors were also significant, they were often associated with individual research topics. In addition, the dissertation will also provide new research elements for future reference.

*Keywords:* Internet, ICT, Disparity, Access, Implications, Digital divide, Identification, Older adults, Media, Cognitive abilities, Age, Gender, Education, Social class



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## **List of empirical studies**

- I. Näsi M, Räsänen P & Lehdonvirta V. (2011) Identification with online and offline communities: Understanding ICT disparities in Finland. *Technology in Society* 33(1-2):4-11.
- II. Näsi M, Räsänen P & Sarpila O (2012) ICT Activity in Later Life: Internet Use and Leisure Activities among Senior Citizens in Finland. *European Journal of Ageing* 9(2):69-176.
- III. Näsi M & Räsänen P (2012) Changing media preferences? Comparing the perceived importance of Television, Newspapers and the Internet in Finland, 1999–2009 (accepted for publication in *Nordicom Review*)
- IV. Näsi M & Koivusilta L (2012) Internet and the Everyday Life – The Perceived Implications of Internet Use on Memory and Ability to Concentrate. *Cyberpsychology, Behavior, and Social Networking* 16(2): 88-93





## **1. Introduction**

The Internet and other new information and communication technologies (ICTs) have become an integral part of daily life, particularly in the Western countries. In many societies, everything from banking and booking a holiday can now be managed online, with most private and public organizations relying heavily on the new ICTs to serve as the backbone for everyday operations. Individuals have more opportunities to stay connected and wired to information, work, family and friends no matter the location. Although the “industrialization of the home” (Cowan 1976) in the Western societies already began decades earlier with different electronic home appliances and television becoming available for mass consumption in the 1940s and 1950s (Bittman et al. 2004), the introduction of ICTs has perhaps resulted in even greater changes in the household and leisure life.

In broader terms, the new ICTs construct from a variety of different devices. In the most typical form these include, for instance, personal computers (PCs), laptops, mobile phones, smart phones and tablet computers. In this thesis, however, the focus is on the Internet and ICTs in general, rather than any individual devices, which, to a large extent, serve as tools to access the Internet. Although the initial version of the Internet was already developed in the 1960’s (Leiner et al. 1997), it was not until the early 1990’s before it became more widely available for the masses through commercial distribution. While originally designed to serve the scientific community, the commercialization of the Internet led to wider adoption of the new information technologies in all segments of the society. Technological advancements, improved software and overall usability have expanded the role of the Internet and other new ICTs even further over the past decade.

The introduction of the new technologies has no doubt made many daily activities easier, more convenient and less time consuming. They have also become an important part of an individuals’ leisure life, with surfing on the Internet even passing as a leisure activity itself. The youngest generations have already been introduced to the different ICTs at a young age, thus there are increasing number of individuals that have been online since they were born. As a result, for many the new technologies are already almost mundane, albeit important tools in daily communication, entertainment, information access and self-expression. It could be

argued that the new technologies serve as types of management tools for the modern life. Overall, the transition into what is commonly referred to as information (e.g. Castells & Himanen 2002) or network societies (van Dijk 2012), has been seemingly rapid. As a result, a series of questions concerning the role ICTs in a societal context have been raised.

The broad question this dissertation aims to answer is how the role of the Internet and other new ICTs have evolved in Finland over the past decade. However, instead of trying to cover all the potential research dimensions, the intent is to approach these themes from the perspective of *disparity*, in the sense that despite all of the potential opportunities and benefits, a significant amount of people fail to gain many of the intended network society benefits. Witte and Mannon (2010) have examined similar issues in the context of the U.S. but with focus more on social inequalities associated with the Internet use.

The role of the ICTs in this dissertation is seen to construct from two central elements, *access* and *implications*. From the perspective of disparity, access to the Internet is a fundamental element. It is also commonly associated with what is referred to as the digital divide, a division between the information have's and have not's (Räsänen 2008a; Hargittai 2002; Norris 2001; Chinn & Fairlie 2007). That is, it has been argued that those accessing the Internet are in a more beneficial position in regards to information and services than those not in a position of access (Andersson et al. 1995). Access also comes with the question of what purposes are the ICTs accessed for. With increasing Internet penetration rates, the division of user purposes has become a central element of the digital divide (see e.g. Hargittai 2002), with information, communication, socialization or entertainment (Cummings & Kraut 2002; Haythornthwaite 2002; Mesch et al. 2006; Söderström 2009; Robinson et al. 2002; Robinson & Martin 2009; see also Baym 2010; Repo et al. 2006), for instance being closely associated with basic user purposes of the new ICTs. This then leads to the question of implications. How do the new technologies appear to shape existing habits and preferences and what are some of the long-term impacts of the ICT adoption. Have some of the early fears and concerns associated with the adoption of the new technologies materialized (e.g. Kraut et al 1998; Uslaner 2000; Swickert et al. 2002) or has greater access to the Internet provided greater societal consensus and opportunities?

By studying the impacts of how the new ICTs reflect disparities among the present day members of the information society, the intention is to complement our knowledge of how the role of the new technologies differ, not only among users and non-users, but also among the different socio-demographic and socio-economic population groups. Finland, a forerunner in technology adoption (Castells & Himanen 2002) therefore provides a good example for such an examination. Furthermore, the intention is also to provide new research themes and elements for future research. First, however, in order to understand the evolving role of the new ICTs, a non-country specific examination of some of the basic features of today's media landscape are introduced in the next chapter.

## **2. The evolving media landscape**

In broad terms, the core elements in network societies are commonly referred to as new media and social media (Van Dijk 2012). Both new media and social media, along with the concept of Web 2.0, serve as key features of the present day network societies. In this chapter a brief description of these features is provided in order to better understand what they are and what purposes they do serve.

### **2.1. New media**

The term new media has been adopted in both academic and popular discourse in reference to the growing presence of the Internet and the new ICTs (e.g. Lievrouw 2004). The new media(s) are also often viewed as a distinction between the new electronic media from old, traditional, print media and television (Lawson-Borders 2003). The term new media was first used in the 1980's in reference with the likes of VCRs (videocassette recorder), computer games or satellite television (Livingstone 1999). Therefore at the time, the new media consisted of different types of general digital technologies, whereas today, the concept is more evolved in the sense that it is not only used to describe particular digital tools, but rather in the present day, digitalized societies as a larger entity that can serve as a combination of both digital and traditional medias (see also Van Dijk 2012).

The development of the network societies in recent years has been rapid, largely due to the technological improvements on the online platform and affordability of the different ICT devices. The Internet during its early years served largely as a platform where users played relatively passive roles, as options for social participation were much more limited. Gradually, however, with the resulting technological improvements, usability and increasing user numbers, user (inter)activity has become a core feature of the network societies. Therefore such developments are a result of the transformation in the way in which the Internet and the ICTs are accessed and used.

### **2.2. Web 1.0 vs Web 2.0**

The Internet, in its initial stage Web 1.0 (Beer & Burrows 2007), was constructed from content that was mostly accessed for reading, learning or entertaining oneself. Thus, to an extent, Web 1.0 served similar purposes as the more

traditional media (such as newspapers, books, or television), but only in a digital form. Web 2.0, on the other hand, is not a technological upgrade to Web 1.0, but rather an update in the way in which the Internet is used because of its more interactive nature (O'Reilly 2005).

One of the key dimensions in the emergence of Web 2.0 is the development of the new ICT devices (smartphones, tablet computers, for instance). Before, the Internet was mainly accessed using personal computers (PC) or laptops, and mobile phones were used primarily as phones with very few extra features. Furthermore, with the emergence of different social networking services (i.e. MySpace, Facebook) the interactive nature of the Internet has evolved even further.

**Table 1.** Schematic differences between Web 1.0 and Web 2.0

Dimensions of difference	Web 1.0 (1993-2003)	Web 2.0 (2004 - beyond)
Mode	Reading	Writing and contributing
Primary unit of content	Page	Post/record
State	Static	Dynamic
Viewed through	Web browser (on PC or Laptop)	Anything (computers, smart phones, tablet computers etc.)
Content created by	Webmaster	Everyone
Domain of	Web designers	A new culture of research?

Source: Beer & Burrows (2007)

In the above table, the key dimensional differences between the Web 1.0 and Web 2.0 are illustrated (see also Witte & Mannon 2010:13). What the Web 2.0 initially constructs from is a platform where a far greater number of individuals act as content creators, commentators, collaborators or information sources. This has been cited as the “wisdom of the crowds” (Easley & Kleinberg 2010:394). Creating a website or starting a blog is no longer solely in the hands of webmasters and web designers, as the transition to Web 2.0 has meant that the Internet is more accommodated to any individual. Therefore the technological advancements have not only made the Web a major hub of information, interaction and thought expression, but also a tool for managing professional and personal networks and

relationships regardless of one's location. In essence, what has really changed, are the social implications of the technologies.

### **2.3. Social media**

Nowadays much of the discussion associated with the Internet focuses on the rising importance of the social media. According to Kaplan and Haeland (2010), the term social media was first used in the 1960's, but the more widespread adoption of the Internet has led to registering the different social media as largely a new millennia phenomenon. Although the emergence of social media is closely associated with the development of Web 2.0, the two serve as distinctively different things. In simple terms, Web 2.0 serves as an "ideological and technological foundation" (Kaplan & Haenlein 2010:61) for the platform hosting the different websites and services, including those of the different social media. In essence, the social media serve as embodiment of the Web 2.0.

According to Kaplan and Haenlein (2010) there are six types of social media. These are:

- 1) Social networking sites (e.g. MySpace, Facebook)
- 2) Video sharing sites (e.g. YouTube)
- 3) Wiki sites (information sites that can be freely accessed and edited by users, e.g. Wikipedia)
- 4) Different forms of blogs (personal or micro blogging sites such as Twitter)
- 5) Virtual communities (e.g. Second Life)
- 6) Online game communities (e.g. World of Warcraft).

In many ways, the different social media serve as a platform for users to share their personal self. Although most share their self largely with friends and family, plenty of users share their thoughts, photos or videos with a (potentially) much wider audience. It has also been argued that for the youngest users, social media serves as an important tool for structuring their self-identity, as they can both express themselves, and also receive feedback that influences their identity formation (Buckingham 2008; Kaplan & Haenlein 2010).

In the modern network societies individual users have vast opportunities to interact and engage with other users, persons of interest, and even decision

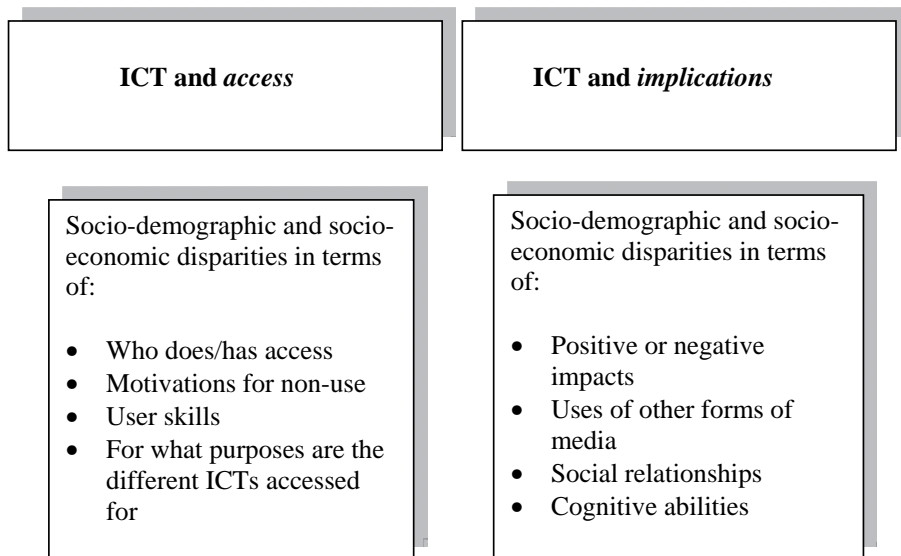
makers, through discussion forums, social media, personal websites, blogs and micro-blogs in order to share information, gain knowledge on issues of interest or just to voice one's opinion. However, despite all of the opportunities the network society offers, it is necessary to acknowledge that not everyone ceases to realize them. In order to gain a more comprehensive understanding of the characteristics of disparity, the next chapter introduces different perspectives on ICT disparities in both Finland and the international context.



### 3. Alternative perspectives to ICT disparities

The literature concerning the Internet and ICTs in general is multidimensional, as it can span from introduction into basic coding via social media into complex algorithms for building complex computational security systems. However, in this dissertation the main interest is on the social implications of the new technologies. Therefore the intention in this chapter is to introduce alternative perspectives of ICT disparities, both in terms of access as well as implications.

#### 3.1. Interconnecting the ICT disparities



**Figure 1.** *Theoretical framework of the ICT disparities*

Figure 1 provides an overview of the interconnecting ICT disparities examined in this study. As it can be clearly seen, these disparities can be a reflection of just one, or several different elements, combined with an individuals' age, education, societal position or experience with new technology. Access and implications are to an extent interconnected, but at the same time, separate sources of disparity. With increasing Internet penetration statistics, both access and user purposes provide valid information regarding the social implications of the ICTs among different socio-demographic and socio-economic population groups. Access itself

has created the first level of division between the information have's and have not's. This has then been extended further with the division of user purposes. Therefore, raising the question of implications, what sort of impacts does the ICT adoption have, not only among the users, but also between the users and non-users. In order to gain a more comprehensive understanding of these disparities, the following sub-chapters provide a more detailed overview.

### **3.2. Digital divide**

At the end of 2011 there were almost 2.3 billion recorded Internet users worldwide (Internet World Statistics 2012), with most of the users holding a socio-economically privileged position compared to those that had never accessed the Internet (Talukdar & Gauri 2011; Notten et al. 2009; Reisdorf 2011). In research literature, this division of access is commonly referred to as the digital divide (Hargittai 2002; Chinn & Fairlie 2007). However, the divide regarding the ICTs does not limit only on access, as user purposes (Dimaggio & Hargittai 2001; Räsänen 2008a) have become an increasing source of disparity.

The reason digital divide has been such a central element in past academic research relates to the notion that the divide serves to further isolate those less well off from the various opportunities Internet connection may provide compared to those that are in the position of regular access (Anderson et al. 1995).

#### **3.2.1. Digital divide by access**

It has been found that in countries with lower Internet penetration numbers those that better off are the likeliest of users (Chen et al. 2002) and that those with higher education tend to benefit more from the different information online as a result of their user preferences (Hargittai & Hinnant 2008). Robinson and colleagues (2003) found that the college-educated were in a much more beneficial position in terms of obtaining occupational benefits and educating oneself by using the Internet compared to those with only high school education.

During the early days of the Internet, education, and the subsequent higher income, played an important role due to the costs of new technology as early adopters of the Internet and ICTs included young adults and those in socio-economically better positions (De Marez & Verley 2004; Räsänen 2008b; Chen et

al. 2002). According to statistics, Finland has reported higher than average Internet penetration numbers throughout the 2000's, with some age groups recording over 90 per cent penetration statistics since the early 2000's (Statistics Finland 2006). Overall, the Finnish population is rather homogenous due to relatively small income differences, along with relatively small number of immigrants or other ethnic minority groups (Statistics Finland 2012). Therefore the division of access is largely centered on age, similarly to the other Nordic countries (Statistics Finland; Reisdorf 2011), with only the oldest age groups recording significant numbers of non-users (Statistics Finland 2011). In the US, for instance, white Americans are commonly the most likely users of the Internet, whereas those from African-American and Hispanic backgrounds are less likely users (Pew Internet 2010a). The same statistics also reveal that those with less than high school education or income less than 30,000\$ per year were even less likely to access the Internet (Pew Internet 2010a).

In order to try to diminish the divide altogether, in 2008 the Finnish government (2008) initiated plans to connect every household in Finland with high-speed broadband Internet by 2015. Similar to Finland, in countries such as U.K. and Spain providing access to all of their citizens has been one of the priorities in the political agenda (see Tryhorn 2009; Reardon 2009). By providing access to all citizens, governments are trying to provide equal opportunities in terms of accessing information and services and therefore to tackle the potential social inequality.

Along with Finland and the other Nordic countries, a number of European countries, U.S., Japan and Australia tend to post some of the highest Internet penetration statistics in the world; whereas Africa and large parts of Asia record the lowest numbers of Internet access (Internet World Statistics 2012). In terms of non-users of the Internet in high penetration countries, the main motivation has often been cited as simply that they just were not interested in using the Internet (Pew Internet 2010b; Reisdorf 2011). Peacock & Künemund (2007) examined the motivations for non-use among senior citizens in a number of European countries. According to their findings, the high cost of the required technology was among the main reasons for not using the Internet. However, despite the fact that the Internet is seen as key technology in narrowing the existing information division and

inequalities, it is necessary to realize that the division of access is not the only element in the present day digital disparities.

### **3.2.2. Digital divide by use purposes**

If taking the view that the digital divide would largely be a question of access, the gap would be relatively straightforward to close. A decade ago, Esther Hargittai (2002) already examined how access alone does not narrow down the division, as the level of computer and Internet skills, along with user purposes, serve incrementally in the digital divide (See also van Dijk 2006). However, different socio-economic and socio-demographic factors tend to influence user motivation and skills, and as a result, the potential benefits of having online access. Although these same factors have been commonly associated with access itself, but with increasing Internet penetration rates their role has transferred more towards disparities associated with user purposes instead (e.g. DiMaggio & Hargittai 2001).

For instance, a recent study found that individuals with lower education or income tended to spend more time online, but only to conduct trivial tasks and to pass time since they had less financial opportunities to engage in more costly leisure activities (Goldfarb & Prince 2008). Moreover, Koivusilta and colleagues (2004) found in their study that Finns aged 18 or under whose parents were in a socio-economically higher position used ICT more for information purposes, whereas those respondents whose parents were in a socio-economically weaker position were more inclined to use it for entertainment purposes.

According to the European statistics, it appears that people in the Nordic countries are generally significantly more active in using the Internet for E-government services (i.e. digital interaction between the government and the citizen) or purchasing commercial goods, whereas people in countries such as Portugal, Romania or Bulgaria are far less inclined for such activities (Eurostat 2010; Eurostat 2012), although at the same time, also having a much lower Internet penetration rates than the Nordic countries. In terms of using the Internet for finding information, in the U.S. and U.K., for instance, a little over 60 per cent of Internet users were reading newspapers online (e.g. Office for National Statistics UK 2010; Newspaper Association of America 2011), whereas in Finland, the same statistic was 76 per cent (Statistics Finland 2011). Furthermore, age and education

continue to reflect differences in the Internet user purposes in regards of E-services, as those aged between 25 and 55 were more likely to use such services compared to the youngest and the oldest age groups. This was also the case among those with higher education compared to those with low education. Furthermore, Finnish young adults were more likely to use the Internet for entertainment purposes than the older age groups, yet the young adults were also more active in terms of accessing news and information (Statistics Finland 2011).

### **3.3. Social impacts**

The implications resulting from growing ICT adoption have also been examined from variety of perspectives. For instance, it has been found that the increasing time spent online has prompted negative implications on a variety of activities (e.g. Beutel et al. 2011), such as the Internet's time displacing role concerning different physical and social activities (Mannell et al. 2005; Nie et al. 2002), along with a negative impact on perceived quality of life (Leung & Lee 2005).

On the other hand, Robinson (2011) found little evidence that the Internet use would have a negative association with other leisure activities. Rather, heavy IT use was commonly associated with a more active leisure life. Wang and Law (2007) also found that active ICT users spent more time on recreational activities (out of house), as well as time used for travelling, compared to less active users. From the perspective of media, the Internet has become an important source for information and entertainment and thus the impact of the new media regarding traditional media such as newspapers and Internet have also come into question (see e.g. Räsänen 2008b). Robinson and colleagues (2002) also argued that the Internet is the first media since television to have a major impact on household leisure time allocation.

In terms of work, ICTs and access to the Internet have been argued to influence working hours and working life in general. With an Internet connection, work can be accessed at home or during travelling and this has been speculated to increase the amount of time people spend working, even after leaving the office (e.g. Coget 2011; Nie & Erbring 2000).

Furthermore, the new technologies have been particularly influential among adolescents. For instance, violent games, along with Internet addiction, as

well as safety issues (such as online predators), are viewed as potential threats for the young users of the new technology (Kaltiala-Heino et al. 2004; Gentile et al. 2004; Hinduja & Patchin 2008). Internet addiction has become a growing problem, perhaps most notably in Asia, where there have even been reported deaths caused by exhaustion after days of continuous usage (Block 2008). It has also been found that extensive use of the Internet has resulted in social isolation and depression among teens in particular (Gross 2004).

### **3.3.1. Sociability and social ties**

Despite the many perspectives associated with potential implications, perhaps one of the most central elements in research has been the relationship between the new technologies and social relationships. However, it has to be noted here that these same elements are at the same time also closely associated and interconnected with access and user purposes.

Family, friends and colleagues (e.g. at school or work) tend to form the closest social ties among most people (e.g. Söderström 2009) and the quality of these relationships is commonly used as an indicator of quality of life (e.g. Myers 1999; Albrecht & Devliger 1999). Yet, according to Putnam (1995), social capital, a term, which he refers to as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (1995:67), has been in steady decline for quite some time, particularly in the US. Hence, the once close-knit communities of family, neighbors and friends have been argued to be drifting apart (e.g. Quan-Haase & Wellman 2004). As a result, the role of the new ICTs in this change has gained significant attention. In fact, Wellman and colleagues (2001) approached the relationship of the Internet on individuals’ sociability and social ties from three possible perspectives: either the Internet “transforms”, “diminishes” or “supplements” people’s social capital (Wellman et al. 2001).

In early studies, it was found that greater Internet use was associated with declining social communication and participation, along with increasing perceived depression. (Kraut et al. 1998; see also Engelberg & Sjöberg 2004). Nie and Erbring (2000) found that the more time people spent on the Internet, the less they are engaged with “real people”. Furthermore, Kubey and colleagues (2001) found that

college students who were more engaged in recreational Internet use recorded, not only weaker academic success, but also increasing levels of loneliness and tiredness. At the time Fischer (2001), however, was a little less adamant over the state of social capital and activity, arguing that rather than contributing to the erosion, social interaction is merely changing, not diminishing. However, in a more recent study, Lehdonvirta and Räsänen (2011) assessed the role of sociability and social ties through perceived identification. They examined teenagers' identification experiences between online and offline communities in Japan, U.K. and Spain, noting that in Japan and in the U.K. users were more inclined to form more affectionate relationships among the members of an online community compared to users in Spain. The level of identification with an online community was almost as strong as the level of identification with their family (Lehdonvirta & Räsänen 2011).

The Internet today serves as one of the central means of communication. Thus, instead of replacing the traditional offline relationships, the new ICTs have rather been argued to serve as a complementary means of communicating and staying in touch with different social groups, than a replacement for traditional social ties (Amichai-Hamburger & Hayat 2011; Söderström 2009; Haythornthwaite 2005; Boulianne 2009). It has also been noted in time allocation studies that active Internet users possessed more active social lives compared to the non-users (Robinson et al. 2000). Räsänen and Kouvo (2007) found in their four country comparative study that personal Internet use had a positive impact on the respondents' formal and informal sociability. Haythornthwaite (2002) also argued that the Internet as a new communication medium would have positive impacts on previously weak social ties, along with enhancing the already existing ties.

Online communication in general offers a different means to interact with others. That is, sociability is commonly associated with face-to-face interaction, whereas the Internet is often argued to be impersonal in nature. However, for some this is in fact the preferred way to socialize (due to social anxieties, for instance) (Valkenburg & Peter 2009). Furthermore, online connection has made specific interest groups more accessible for people coming from various backgrounds. Yet, for much of the same reasons, online anonymity and accessibility can also have negative implications, for instance in the form of cyber bullying or

other anti-social behavior, concerns which are particularly associated with adolescents (Valkenburg & Peter 2009). The Internet has also been argued to serve as a platform for meeting other people (di Gennaro & Dutton 2007). It has also been noted that active online communicators have been found to share a greater number of social ties than non-active communicators (Zhao 2006), and that Internet users were far more active in the local community and social events and other local activities than the non-users (Stern and Dillman 2006).

### **3.3.2. ICT and information overload**

It appears that most of the past research regarding the implications of ICTs is associated with individuals' daily tasks, leisure life and social contacts. However, as the new technologies are becoming more and more integrated as part of everyday life, new research perspectives have begun to emerge. One particular question is associated with the relationship between individuals and their cognitive abilities.

Despite the new ICTs having significantly increased efficiency in many aspects of the life, their presence, both in leisure and professional context, has led to speculations that this might not come without consequences. Although in a sense, examining the impacts of ICTs on cognitive abilities is not a completely new research area. However, during the early days of the Internet, views over the potential impacts were described to having taken "almost utopian forms" (DiMaggio et al. 2001). At the time, some of the more popularistic studies provided predictions where the young "native" users would grow up different from that of the older "immigrants", particularly in terms of their ability to learn and conduct different daily tasks associated with the new ICTs (Prensky 2001; see also Tapscott 1999). Although many of such notions have been argued to have little grounding in scientific research (see e.g. Hargittai 2010; Jacobsen & Forste 2011). However, on a similar note, some of the other popularistic work has expressed concerns over the implications of the ICTs on some of the key cognitive abilities (see Carr 2008).

Recently it has been noted that the excessive amounts of online information, along with the growing use of the different information systems at work place, have resulted to what is referred to as the information overload (Bawden et al. 2009; Chen et al. 2011; Beaudoin 2008). This refers to a brain that



has difficulties in processing information, as well as declining cognitive abilities such as the working memory (Müller 2010; Klingberg 2009).

However, the influence of Internet and other ICTs in cognitive abilities has commonly been examined from the perspective of support tools for those with existing disabilities (such as brain injury, paralysis) (e.g. Egan 2010; Bergquist et al. 2009). There appears to be relatively little research concerning the long-term impacts of the new technology among those using the technology in their daily life. Jones and colleagues (2004), for instance, examined how information overload influences message dynamics in online interaction. They found that individuals who experience information overload tend to simplify their online behavior, be less active in online conversations and respond to messages that are generally simpler. Sparrow and colleagues (2011) found that individuals tend to use the Internet, or Internet search engines, as a type of external hard drive, which they access when they need information (Sparrow et al. 2011). Furthermore, it has been found that active Internet use increases brain activity among older users, even after being online for a long period of time (Small et al. 2009). Nicholas and colleagues (2011) examined generational differences in Web behavior, and according to their findings, the youngest users (the so called “Google generation”) recorded, for instance, much weaker working memory than older Internet users, along with being far less focused on online activities such as searching for information. On the other hand, Lui and Wong (2012) examined the effects of multitasking media use and found that it in fact had a positive association with better multisensory integration.

The existing research findings are, in general, still limited, particularly in terms of population level findings. Therefore, gaining more information regarding these issues is important for the future, as they will help to tackle some of the problematics associated with, for instance, wellbeing at work (e.g. Mano & Mesch 2010; Day et al. 2010).

## **4. The objective and research questions**

The objective in this dissertation was to study the role of ICTs in Finland from the perspective of disparity. To support this, the dissertation had two sets aims it was seeking to reflect the objective in more detailed research.

### **4.1 Aims of the research**

- Firstly, the aim was to provide an overview of how the role of the digital divide has evolved in Finland, both in terms of access and user purposes, and how they reflect ICT disparities among Finns, particularly in reference to leisure activities, as well as identification experiences.
- Secondly, the aim was also to provide a better understanding of the implications resulting from the increasing adoption of ICTs. Both in terms of the evolving role of the new technologies over the period of the past decade, particularly in reference to traditional media, but also from the perspective of new research opening associated with the potential impacts.

As a result, four studies, each one from its particular research perspective associated with ICT related disparities were constructed. The four perspectives are: identification experiences, the Internet and leisure activity among senior citizens, changing media landscape, as well as the Internet and cognitive abilities.

### **4.2. Research questions in the sub-studies**

Identification experiences in this context are associated with social ties and sociability. The role of identification is also examined from the perspective of access and user purposes, as in the study the focus was on comparing individuals' identification experiences between traditional social ties (e.g. family, friends, colleagues) and online communities. Therefore, also reflecting how access and user purposes of the new ICTs are associated concerns, such as potentially diminishing face-to-face contact and the resulting negative impacts on sociability and social relationships. The following research questions were constructed to provide better

understanding of the identification experiences between traditional social groups and online communities:

*i) Are there differences in the strengths of identification between online and offline communities among Finnish adult population?*

*ii) Are there distinct socio-demographic profiles of identification with an online community?*

**(Study 1)**

The Internet and leisure activity among senior citizens considers two different elements. Firstly, it takes into consideration the older-age adults, their Internet use and how ICT penetration and non-penetration reflects in their cultural participation. Therefore, it subsequently also addresses the role of the digital divide, as older users are commonly considered the least active ICT users. The comparison between the differences among users and non-users of the Internet and its role in leisure activity then provide more information regarding the disparities between users and non-users. The more detailed research questions examining these elements were:

*i) How does the frequency of leisure activities connect with the frequent Internet use amongst Finnish senior citizens?*

*ii) Is the relationship between leisure activity and frequent Internet use significant when taking into account basic socio-demographic factors?*

**(Study 2)**

The changing media landscape then reflects the relationship between old media versus new media, and how the adoption of the Internet has influenced the position of more traditional media. For the purposes of this, the following research questions were formulated:

*i) How did the perceived importance of television, newspaper and the Internet evolve among Finns in 1999, 2004 and 2009?*

*ii) What kind of socio-demographic differences existed in media preferences among Finns between the years 1999, 2004 and 2009?*

**(Study 3)**

The Internet and cognitive abilities on the other hand serve to reflect how Finns perceived the impacts of Internet adoption, particularly on their memory and ability to concentrate. This allows one to study some of the perceived implications of the Internet adoption and use on individuals' key cognitive abilities on a population level. For these purposes, the following research questions were formulated:

*i) What kind of self-perceived implications Internet user history and perceived computer skills have on Finns in terms of memory and ability to concentrate?*

*ii) What kind of socio-demographic differences exist among the perceived implications in terms of memory and ability to concentrate?*

**(Study 4)**

## 5. Data and Methods

In this chapter the main sets of data and research methods of each of the four studies are introduced in more detail.

### 5.1. Data and Indicators

Five different sets of survey data collected between the years 1999 and 2011 are used. All the data sets were collected by researchers at the department of Economic sociology at the University of Turku. Three of them are surveys that focused on Finnish consumer lifestyle: “Finland 1999”, “Finland 2004” and “Finland 2009” (for “Finland 2009” see also Sarpila et al. 2010), collected between the years 1999 and 2009. In addition, the “Cultural Capital, Consumption, and Social Networks among Older Adults” data set was collected in 2010 and the “Everyday life and wellbeing” data were collected in 2011. A description of the data is given in table 2.

DATA	YEAR	RESPONDENTS (AGE)	SAMPLE SIZE	N	RESPONSE RATE (%)	STUDY
“Finland 1999”	1999	18-74	4,001	2,417	61	Study 3
“Finland 2004”	2004	18-74	6,000	3,574	60	Study 3
“Finland 2009”	2009	18-74	2,500	1,202	49	Study 1 and 3
“Cultural Capital”	2010	60-79	800	542	68	Study 2
“Everyday life”	2011	15-64	2,000	908	48	Study 4

**Table 2.** Descriptions of the data sets

The reason quantitative methodology was chosen serves to reflect the interest in examining the commonality of the studied phenomena on broader population level, along with making comparisons between different population groups.

## **Dependent variables**

In study 1, the respondent's identification experiences with online and offline social groups were measured. In the questionnaire this was done through self-evaluation of "How strongly do you feel part of the following groups?" The respondents had six different groups to select for the evaluation:

- a hobby group
- an online community
- residential neighborhood
- colleagues at work or at school
- friends
- family

The respondents gave their answers using a five-point Likert-type scale (ranging from 1=not at all to 5=very much).

Study 2 examined whether high-frequency Internet use associates with a high frequency of other leisure activities among the Finnish senior citizens. In the questionnaire the respondents were asked to evaluate their personal Internet/e-mail use for leisure purposes. The original variable concerning Internet/e-mail use had a total of eight frequency categories: 1 = every day, 2 = several times a week, 3 = once a week, 4 = several times a month, 5 = once a month, 6 = less than once a month, 7 = never use and 8 = no access. For the purposes of analysis, the variable was recoded into two categories: frequent users, those who used the Internet every day or several times a week, and others, who used it less often or not at all.

In study 3, the perceived importance of newspapers, television and the Internet over a period of a decade was examined. In the questionnaire, the respondents were asked "How important (necessary) are the following items in your everyday life?" The original list of items had a total of 12 options (various consumption commodities from cars and dishwashers to videogames and television). Out of these items, three measures were selected for analysis:

- television
- newspapers
- the Internet

The three items were selected on the basis of representing different forms of either traditional or new media. These items and their perceived importance were measured in three separate measuring points, 1999, 2004 and 2009. The three-point scale measuring the perceived importance was: 1 = very important, 2 = slightly important and 3 = not at all important.

In study 4, the respondents' self-evaluations of the impact Internet had on their memory and ability to concentrate since first adopting its use were examined. In the questionnaire it was asked "Since adopting Internet use, how do you perceive the impacts on the following aspect in your everyday life?" The original question included seven items:

- social relationships
- general knowledge
- participating in cultural or sporting events
- memory
- ability to concentrate
- purchase consumption goods
- entertainment

Out of those, the two dependent variables, memory and ability to concentrate, were selected. The respondents were asked whether they perceived the changes as: 1 = increased/improved, 2 = decreased/weakened, 3 = no change and 4 = unable to say.

### **Independent variables**

For study 1, independent background variables included four demographic variables: age, gender, residential area and education. Age was specified in the questionnaire as the year of birth and it was categorized into six groups: 18–25, 26–35, 36–45, 46–55, 56–65, and 66–74. Residential area was measured by asking the respondents whether they lived in urban or non-urban area. The respondents' measure of education was labeled under four categories: unskilled, vocational school, tertiary level and academic degree (bachelor's degree [BA] or higher).

In study 2, independent variables included leisure activity, age, gender, education, health, and participation in working life. In terms of different types of

leisure activity (activities undertaken outside of work, in one's free time), a total of 20 items were listed in the questionnaire. Respondents then selected those activities they had undertaken within the past 12 months. The activities listed in the questionnaire were: reading, listening to music, gardening, watching television, watching sporting events, writing, painting, exercising, outdoor activities, going to theatre performances, playing a musical instrument, going to concerts, going to museums or galleries, going out to eat, going to movies, making arts and crafts, singing, travelling, using the computer and educational tours. The variable was then recoded into two groups based on the median number of activities, with the first group included respondents who had participated in more than nine activities, and the second group consists of those who had participated in nine or less activities. Age was categorized into three groups: 60–64, 65–69 and 70–79. That is, the 60–64 year olds were considered as economically active (though only 2 in 5 were actually still working), and hence also potentially in a better financial position than people aged 65 and older. Those aged 65-69 were seen to represent the “young” retirees and 70-79 as “older” retirees, with potentially different levels of leisure activity. Education was categorized in three groups: bachelor/higher, secondary and primary. The respondent's participation in working life was measured by asking whether he or she was still working for pay or not. Lastly, the respondent's self-evaluated measure of health was also included in the analysis. The respondents were asked to evaluate whether their health was very good, good, fair or poor. These categories were then re-categorized into two groups, those who rated their health as very good or good and those that rated their health as fair or poor.

In study 3, independent variables included age, education, gender, place of residence and social class. Age was specified as the year of birth and it was categorized into four groups: 18–30, 31–45, 45–60, and 60 or older. The respondent's education was measured as vocational education and then classified under four categories: unskilled, vocational school, intermediate level and academic degree (bachelor's degree [BA] or higher). Place of residence was categorized either as urban/densely populated or rural. Social class had four categories, upper class, higher middle class, lower middle class and working class. In addition, the variable also had a category labeled as “other”, which included



those respondents that were unwilling to label their class position. For the analyses, upper class and higher middle class were merged and re-named as upper middle class.

In study 4, independent variables included Internet-use years (how many years has the respondent been using the Internet), perceived computer skills, gender, age, education and employment status. The respondents' year of birth was recoded into four categories, 15-30, 31-45, 46-60 and 60 or older. Education was categorized as primary education, secondary and BA and higher. Employment status was categorized as work and non-work (the original item included the following options: employed, unemployed/looking for work, retired, student, parental leave, stays home mother/father). Internet use years were inquired using an open-ended question. User years were then recoded into two categories, less-experienced and experienced based on the median years of use. The self-rated computer skills were based on the grading system used in the Finnish school system (4-10). Grades 8, 9 and 10 were coded as good skills and grades 4 to 7 were coded as poor/average skills. Overall, both dependent and independent variables and the justifications for their use have been explained in more detail in each of the four studies.

## **5.2 Statistical methods**

The methods of statistical analysis consisted of analysis of variance (study 1), binary logistic regression analysis (studies 2 and 3), and multinomial logistic regression analysis (study 4). Further descriptive analysis, which included frequency analysis and/or cross-tabulation was also applied.

The univariate analysis of variance (ANOVA) method applied in study 1 was used to examine the differences between socio-demographic groups in their level of identification with an online community. Further, the proportion of variance explained was measured by R-squared ( $R^2$ ) (Tabachnick & Fidell 2001).

Binary logistic regression analysis is used to predict how the chance of belonging to one of the two categories of the dependent variable might be influenced by the values of independent variables (Hosmer & Lemeshow 2000). In study 2, this was done in order to describe the effects independent variables had on belonging to the category of frequent Internet users. The effects of the different

values of the independent variables on the chances of the respondent belonging to this category were presented as odds ratios ( $\exp \beta$ ). The statistical significances of the different models were indicated by likelihood ratio Chi square statistics ( $\chi^2$ ). For study 3, the binary logistic regression analysis made it possible to predict how independent variables influenced the respondents' changes of perceiving the Internet, television or newspapers as very important (or a necessity). The effects of the different values of the independent variables were presented as odds ratios ( $\exp \beta$ ), further pseudo-coefficients of the determination (Nagelkerke Pseudo  $R^2$ ) of the models were also reported in both studies 1 and 2.

In study 4, multinomial logistic regression analysis was applied (Hosmer & Lemeshow 2000). The reason multinomial regression analysis (rather than binary logistic regression analysis) was applied was that it allows one to predict more than just two values of the outcome (e.g. change – no change). In the study, which was aiming to examine the respondents' perceived impacts of Internet adoption on their memory and ability to concentrate, it was possible to measure the perceived (potential) change in both directions, that is, if the respondents perceived change in their abilities, was this change an increase or decrease compared to no change/unable to say. The model parameters were presented as odds ratios ( $\exp \beta$ , or ORs), with statistical significances and 95% confidence intervals (CI).

## **6. Overview of the four studies**

This dissertation is based on four individual empirical studies that were constructed to support the overall objective and research aims of this work. In this chapter a short overview of each of the four studies is provided.

### **Study I: Identification with online and offline communities: Understanding ICT disparities in Finland**

At the turn of the millennia, the growing popularity of the new information and communication technologies (ICTs) prompted a debate concerning the potential implications. One of the main issues associated with elements such as sociability and existing social ties, and how the increasing Internet adoption would reflect on these.

According to statistics in Finland, for instance, young adults aged 16–34 years are by far the most active users of ICTs, while other age groups are becoming more and more involved (Statistics Finland 2011). In order to learn more about some of the possible impacts of the increasing access and user purposes of the Internet and other ICTs, the study drew from the notion of perceived identification with different offline social groups, as well as with an online community. Thus, by examining the levels of perceived identification, it was possible to compare which of these social groups were valued the most and which the least.

The different offline communities tend to consist from more traditional networks, such as family and friends, work and study colleagues, members in hobby groups and neighbours. Online communities, on the other hand, tend to be vaguer in their description. Typically, such communities consist of a groups of users, who have agreed to interact and share information with each other through certain technical platforms such as *Facebook*, *MySpace*, *Twitter* or a more designated site for users sharing a particular interest. In a more traditional view such communities may also include social networking sites, multiplayer online games or message boards, for instance.

The main focus was to examine how online and offline communities or social groups compare in terms of perceived identification according to the respondents' age, gender, residence and education. According to the results, family is the primary source of social identity for the general population. Other traditional

ties, such as friends, school or work colleagues, neighbors and hobby groups were all perceived more important compared to an online community. However, age played a significant role in terms of the identification experience, as the youngest age group (18 to 25) felt the strongest association to online community, with the connection diminishing in stages with the older age groups.

## **Study II: ICT Activity in Later Life: Internet Use and Leisure Activities among Senior Citizens in Finland**

Although senior citizens represent an ever-growing proportion of the population in many societies, information regarding their ICT abilities and use is still relatively lacking. A constant finding has been that the young are more likely users of the new ICTs than older people. This observation applies to time spent on computers, the Internet, and other related appliances as well as their use frequencies (e.g. Statistics Finland 2011). Therefore the study also looks at the relationship between users and non-users of the new ICTs.

The approach in this study was to examine whether high-frequency Internet use associates with a high frequency of other leisure activities among the Finnish senior citizens. That is, is a senior who is engaged in many different free-time activities more likely to log on than those with only few activities? Therefore, the aim in this study was to gain a better understanding of the connection between online activity and general leisure activities, and how this is reflected between frequent and infrequent users. The intention was to provide new information about the relationship between Finnish seniors and the Internet, with particular interest in the interconnections between Internet-use frequency and general leisure activity.

What has been established earlier is that social activity in general tends to have positive impacts on seniors' health and quality of life (e.g. Harrison & Ryan 2011). However, much of the past Internet-related research has focused merely on social activity and how that reflects on everyday life, particularly on that of the general population. To date, very little research exists on the relationship between the Internet and leisure activities.

According to the results, frequent Internet users were more likely to report higher number of other leisure activities compared to less-frequent users. Those

aged between 60 and 65 years, those with higher education, those with better reported health, as well as participation in working life, were also more likely to be frequent Internet users, hence also more active during their leisure time. The results bring up the fact that active Internet use appears to reflect on other leisure activity. Seniors who have a variety of different leisure activities are far more likely to be active users of the Internet than those less active during their days.

### **Study III: Changing media landscape: A study of media preferences in Finland, 1999-2009**

One of the main questions regarding the role of new technology in the turn of the millennia was reflected in the possibility that the Internet, computers and ICTs could possibly be replacing some of the traditional media, such as television and newspapers, as a means of information and entertainment altogether. The Internet is the first medium since television with a major impact on the general household leisure time-use preferences according to time use studies (Robinson et al. 2002). Yet the impacts of the new ICTs on television viewing, for instance, have appeared non-existent (e.g. Finnpanel 2011). It has even been speculated that in the U.S., increasing television viewing has in fact had a negative impact on the time spent on other traditional media, such as the newspapers (Robinson & Martin 2009).

In the past, traditional media provided information and entertainment in a pre-set schedule and people had more limited options for news sources. This also meant that news providers possessed more control regarding the kind of news people would consume and when. The Internet and the different ICT tools have, however, changed this as most users nowadays have access to information and entertainment around the clock. This means that ICT users have a constant flow of information available, and multiple providers from which to choose from. Thus, as media preferences in general had not faced major changes for decades before the Internet, examining the changing media landscape has become all the more timely.

In order to address the topic of a changing media landscape, this study focused on examining how media preferences in Finland have changed over the past ten years (1999-2009) by reflecting the perceived importance of television, newspapers and the Internet during this time.

According to the results, in 1999, newspapers served as the most valued medium with only 20 per cent perceiving the Internet as “very important” at the time. However, by 2004, changes in the perceived importance of the different media had started to occur, particularly in regards to the Internet as its perceived importance was increasing. By 2009, the Internet was perceived as the most important of the three media types. Older respondents appeared to place more value on newspapers than online news, whereas younger respondents perceived online news as more important.

#### **Study IV: Internet and the everyday life - The perceived implications of Internet use on Memory and Ability to Concentrate**

Lately, the presence of new technology, the Internet in particular, has appeared more and more influential in daily life beyond the traditional questions of access or sociability. There are, for instance, early findings linking the increasing use of different information systems, along with general information overload at the work place with decreasing working memory at a relatively early age (Müller 2010; Kauppinen et al. 2010). There is also early evidence of changing memory structures in relation to the use of Google (or Internet search engines) that reflect on users' memory, and other brain activities among the more active users (Sparrow et al. 2011).

In reference to this, the focus of this study was to examine how Internet users themselves perceived the impacts of adopting the use, particularly in terms of their cognitive abilities of memory and ability to concentrate. Rather than carrying out psychological and performance measurements, this study relied on the participants' self-evaluation in terms of how they perceived the influence of the Internet in their life.

Based on the results, it appears that people tend to differ significantly in terms of the way in which they perceive the impacts of Internet adoption. Albeit most of the respondents perceived no change in regards of their memory or ability to concentrate since first adopting the Internet, there was still a significant amount of respondents who either felt changes, one way or another, or were unsure about the possible implications. The more experienced users were more likely to perceive decreased memory compared to the less experienced users, whereas the

younger respondents were more likely to perceive improved memory compared to the older users. However, in terms of the ability to concentrate, the youngest respondents were more likely to perceive decreased ability to concentrate instead.

## **7. Main findings**

In this chapter the main findings from the four studies that were constructed to provide a better understanding of the interconnecting nature of disparities associated with the adoption of the ICTs are presented.

### **Study 1 (Identification with online and offline communities: Understanding ICT disparities in Finland)**

The disparities associated with ICT adoption and user purposes were studied in relation to social ties and sociability. For these purposes, a measure of identification was chosen as a way of establishing how strong different social connections actually were.

According to the findings, age was clearly the most significant factor in the identification process. Considerable generational differences in terms of identification became evident, as the younger generations appeared to have a stronger tendency towards identifying with online communities. Gender, education and residential area appeared to have a less significant role. What was noteworthy, however, was that at the population level the more traditional offline communities, such as friends and family, hobby groups and neighbours are valued more.

The findings also contributed to the on-going debate concerning the implications of wide scale ICT adoption (see for instance Räsänen & Kouvo 2007; Söderström 2009; Mesch & Talmud 2006) by having access to reliable statistics of user percentages of different online and digital databases. However, it was not possible to estimate the differences in the strength of identification between the users who visit online communities regularly and those who do not, but it was possible to provide an overview of the socio-demographic profiles of identification with various social groups. In this way, the results show clearly that online communities do not offer a strong source of belongingness to the Finnish adult population.

The results also show differences in identification experiences, even among the youngest users. Therefore, different socio-demographic groups tend to possess largely different levels of digital abilities and interests. Furthermore, it is possible to argue that the digital divide in the case of Finland is largely related with user



purposes rather than access itself. Thus the results are similar to those of Hargittai (2002). However, although online communities seem to offer fairly little belongingness among the general population, it would be interesting to discover whether the youngest generations, those of whom have been associated with the new ICTs from very young age - and those who were also possessing the strongest identification with online communities - continue to value their online connections even after they grow older.

### **Study 2 (ICT Activity in Later Life: Internet Use and Leisure Activities among Senior Citizens in Finland)**

The digital divide has been one of the major issues connected with the increasing presence of the new ICTs. Initially, this was focused on concerns related to the division of access between the information have's and the have not's (e.g. Räsänen 2008a). Older adults tend to be the least active user groups in most countries when it comes to new technology. For instance in Finland, the older age groups are the only ones with significant numbers of non-users with almost 50 per cent of Finns aged 60 and older belonging to this group (Statistics Finland 2011). Therefore, the digital divide was approached by examining the elderly Finns' access to the Internet and how this reflected on their leisure participation compared to those that never access the Internet.

According to the findings, it appears that active Internet use also reflects on general leisure activity. Seniors who had a variety of leisure activities appeared far more likely to be active users of the Internet than those less active during their days. The relationship between Internet use and leisure activity, however, is somewhat two-fold. Those already active in their leisure time might be prone to adapting new types of activities, such as Internet use, in their lives. In these cases, general leisure activity can also be viewed as the incentive for Internet use, rather than other way around. However, it is perhaps feasible to conclude that the new ICTs can provide possibilities to engage with other activities just as likely as engagement with various activities may increase the likelihood of using the given technologies.

The results also reflected the elderly respondents' educational and socio-economic background. It is also possible that as older people are becoming more

active ICT users, their behaviour is beginning to increasingly resemble that of their younger counterparts. This means that older people are also more engaged with active lifestyles in the contemporary consumer society (e.g. Jones et al. 2008; Gilleard & Higgs 2008). Furthermore, those now entering retirement age are also expected to live longer than the age cohorts before them. In this sense, it is necessary to stress that the Internet is increasingly becoming a more important tool in improving the services offered by public sector organisations (as noted in Nimrod 2009). That is, it appears that for more and more of the public, as well as others, services are becoming Internet-based (see e.g. Bélanger & Carter 2009). The results also indicate that providing senior citizens with tools and means to use online services can potentially pay off in the societal context, as general activity is usually associated with better health (e.g. Coleman & Iso-Ahola 1993).

### **Study 3 (Changing media preferences? Comparing the perceived importance of Television, Newspapers and the Internet in Finland, 1999–2009)**

As television and newspapers had long been the dominant media for news and entertainment, the growing presence of the ICTs led to a speculation about how this would reflect on the relationship between the new and the old media (see e.g. Gilster 1997; Lin 2001). In order to examine the relationships between traditional media compared to emerging new media, the perceived importance of television, newspapers and the Internet were examined.

According to the findings, it was apparent that factors such as age, education and social class influenced media preferences over the past decade. The older respondents were more likely to hold newspapers in higher value than online news, whereas young respondent were, instead, more likely to favour online papers. In terms of social class, those identifying with the upper middle class were more likely to perceive newspapers and the Internet as very important, than those in the working class. Television has held its position as the favourite medium in the 2000's (see also Robinson & Martin 2009), but those with higher education level have, nonetheless, decreased their television viewing (see e.g. Finnpanel 2011), even though ageing societies in general watch more and more television. The perceived importance of the Internet according to age, education, gender, place of residence or social class has been on a steady increase over the past decade (see

also Räsänen 2008b), however, the findings show that the other media preferences have not radically changed over the period of a decade. It also appears that the older generations were less likely to alter their media habits. That is, although the new ICTs do add a host of new dimensions for information and entertainment consumption, traditional media manages to operate alongside new media rather well. In many cases, television, newspapers and the Internet serve different purposes throughout the day. It is also clear that Finnish media preferences are no longer as class dependent as they were a decade earlier. Further, newspapers in particular, but television to a certain extent, have been integrated as part of the Internet and various ICT tools are commonly used to access electronic news or television programs available online. Therefore, similarly to the findings of Nguyen and Western (2006), the Internet seems to serve largely as a complementary technology also among Finns.

#### **Study 4 (Internet and the Everyday Life–The Perceived Implications of Internet Use on Memory and Ability to Concentrate)**

As a result of the increasing reliance and use of the new ICTs, both at work as well as during leisure, questions concerning the impacts this may have on different cognitive abilities have become all the more timely. For such purposes the perceived impacts of the Internet on memory or ability to concentrate since first adopting the new technologies were studied.

According to the findings, most of the respondents perceived no change in regards to their memory or their ability to concentrate. Despite this, however, almost 40 per cent of the respondent's perceived change, either increased or decreased, or were unable to say whether there in fact were any changes. According to the results, age seems to be a significant factor in terms of the perceived impacts on the cognitive abilities. Younger (as well as less experienced) skilled-users were more likely to perceive increased memory, whereas older and the more experienced skilled-users were more likely to perceive decreased memory instead. Hence, there appears to be generational differences among the skilled computer users regarding the perceived impacts on memory, with longer use subjecting to more likely perceptions of decreased memory. In terms of ability to concentrate, younger users were more likely to perceive decreasing ability,

perhaps due to being subjected with the growing number of different ICTs from very early on. Employment status was the only variable that remained significant in terms of both memory and ability to concentrate. Those people that were in the working life were less likely to perceive either increased memory or ability to concentrate than those not working. This might be the case because those in the working life could be more likely to be subjected to potential information overload than those not in the working life.

Nonetheless, the findings are a reflection of the respondents' subjective evaluation, rather than measurements conducted in a laboratory setting. In other words, the results are also a measurement of that attitude users have towards the new technology and the impacts of using them. These attitudes could then potentially influence the use of new technology if a high enough level of perceived (negative) impacts is reached.

Examining such cognitive features, such as memory or ability to concentrate in relation with the new ICTs, is challenging. For such purposes, controlled research settings and more advanced measurement methods are necessary to get a more complete picture of the potential implications. However, by providing information concerning people's perceptions regarding the impacts of the ICTs on some of the main cognitive abilities does provide understanding of the users attitudes, thus serving as a basis for future studies.

## **8. Conclusions and discussion**

The Internet, along with the growing number of other ICTs, serves as a central element in present day Western societies. In less than two decades these technologies have become everyday commodities for vast amounts of people, serving both business and entertainment purposes. Yet, the roles of ICT access and implications, both perceived and predicted, on the growing technology adoption have never been straightforward. The early literature concerning the new information and communications technologies was quick to establish a few key themes associated with these elements. In this dissertation, some of those elements were brought forward in order to examine, not only the developing role of the ICTs in Finland over a period of a decade, but also to evaluate some of these themes in more recent times.

Survey data collected between the years 1999 and 2011 served as the source of information concerning the role of the Internet and the ICTs within the past and present society. One of the greatest difficulties in examining how implementation of new technology is perceived in the society is its constant evolvement. Therefore Finland, as part of the Nordic countries which have often been referred as the forerunners in adopting the new technologies (e.g. Castells & Himanen 2002), provided a good example for detailing some of the consequences resulting from excessive technology adaptation. According to the main findings, it needs to be acknowledged that age appears to be the most significant element associated with the role of ICTs in this dissertation, both in terms of access and implications. Yet, at the same time, it can also be noted that many of the past predictions and beliefs associated with the new technologies were in many ways exaggerated, both the positive and the negative. In many ways, the new media and the new technologies have been complementary to already existing societal structures. However, the Internet and the new ICTs have not been a common household feature for very long. Therefore the implications, as well as the different sub-phenomena's need to also be observed in the future, as many of the long term impacts of the information societies will only be realized in the coming decades. The main notion for now is the fact that the adaptation and use of the new technologies vary between different socio-demographic and socio-economic groups, and so do the potential implications.

The study findings from the four studies also raised a number of elements for further discussion and future considerations. For instance, how will the societal divisions and disparities associated with the new ICTs evolve in the future, and how the different socio-demographic and socio-economic factors influence the societal implications of the new ICTs?

### **8.1. Access**

Despite the online communities offering very little sources of identification for the population at large, similar to the findings by Lehdonvirta & Räsänen (2011) the youngest age groups are the most likely to value and identify with such communities. It is possible that those under the age of 18 will continue, perhaps even increasingly, to find comfort from such communities than they do from some of the more traditional contacts. Therefore, it is important to examine the roles of the different online communities and the dynamics between active members in relation to less active members, and how this will influence identity formation and social participation (see also Witte & Mannon 2010), as it is probable that they become increasingly influential sources of social interaction and identity construction in the future. As a result, the boundaries between online and offline communities will blur in the future (since the same social networks will be present both online and offline) with certain age groups, particularly in a country such as Finland which only has relatively small number of individuals that have not accessed the Internet.

As already noted a decade ago by DiMaggio and Hargittai (2001), it appears that the socio-demographic and socio-economic disparities are going to be associated with user purposes even more in the future, particularly as the high levels of ICT penetration have meant that access alone has become a lesser issue. Although in the past, providing access to the Internet was seen as way to diminish the existing societal disparities, it does not appear that the disparities associated with user purposes are going to diminish. In fact, the user purposes may serve to signal other types of social disparities, such as the growing economic segregation between different population groups witnessed in Finland over recent years (see e.g. Kokko 2010).

Most Western societies are also in the position where their population is ageing. From the perspective of ICT research in Finland, the older age adults serve as an interesting population segment, being the only population group with a significant amount of non-users of new technology. As such, and at present, the older Finnish adults provide valuable information regarding how access might influence their leisure activity. It has been noted that leisure activity is commonly associated with wellbeing (Nimrod 2009; Harrison & Ryan 2011), and as the findings show, active ICT use tends to reflect on general activity. Therefore the ICTs could be argued to serve as source of wellbeing for Finnish senior citizens, particularly since information, organizing activities, as well as different services and goods associated with variety of different leisure activities, are increasingly present online. On the other hand, since the findings concerning teenagers have been the opposite (Gross 2004), this is a topic that needs to be attended to in future research as the young adults today will be tomorrow's senior citizens.

Furthermore, as the consumption habits of the older population groups have begun to resemble their younger counterparts (e.g. Jones et al. 2008), perhaps the role of age in relation to Internet and ICT use between certain age groups is likely to diminish in the future. However, from Finns aged 54 years or younger, 95 per cent have been accessing the Internet (Statistics Finland 2011), therefore it is likely that the groups of non-users in the near future will likely be random groups of people that choose not to participate in the use of ICTs rather than larger segments of senior citizens who might have different reasons for not using the new technologies.

## **8.2. Implications**

In terms of the implications, the evolving role of the media is particularly interesting. According to Dutton (2007), treating the Internet as a mere supplement for the existing information and entertainment sources would be an understatement. He argued that the Internet possesses similar features to television and newspapers, but at the same time offers opportunities that are beyond the scope of traditional media (Dutton 2007). Will the Internet and the ICTs thus continue to serve as complementary media or will traditional media simply integrate as part of the new online media through paywall on online

newspapers or through simply connecting televisions to the online network? Some of the Finnish newspapers (such as Helsingin Sanomat and Kauppalehti) have recently put in place the paywall system, this follows the trend set by some of the major international newspapers (such as the New York Times, The Times and Wall Street Journal). It will be interesting to see how the idea of the Internet as a source of “free information” will evolve in the future, if most of the major media houses will begin to charge for their content. Will information become “pirated” in the same sense that music, movies or television shows have?

Lastly, influential aspects of the future research in relation to the new technology are the impacts they will have on users’ cognitive abilities. Computers have replaced, or more accurately, altered many of the activities that were custom to office work, for instance. The Internet, along with different information systems and ICT tools have molded work, working conditions and requirements even further (Bawden et al. 2009; Chen et al. 2011), and even education systems have been re-evaluated as a result. Therefore, examining the impacts, implications and perceptions of the new technologies, not only in the short term, but also in the longer time frame is necessary. The impacts on cognitive abilities can only be realized with information from a longer period of time and with adequate sets of data from different age cohorts to be compared. Therefore this type of development is unlikely to diminish the already existing information overload (Beaudoin 2008), therefore the effects on different cognitive abilities, as well as overall wellbeing, need to be carefully monitored in the future. Some of the implications resulting from extensive ICT use might only begin to appear at later stages of life. In this sense, any research concerning the impacts ICTs have on both individual and societal level at current stage is still in its infancy, laying the basis on what we know and, more importantly, what we ought to know. In relation to this, in future research it might be a good idea to study the overall technologization of the Western societies from a much wider angle. For instance, controversial neuroscientist Susan Greenfield (see e.g. Greenfield 2009) has provided widely debated openings regarding the implications resulting from increasing ICT use.



### **8.3. Research limitations**

Finally, it is necessary that several research limitations regarding the studies are also acknowledged. In study 2, a more detailed frequency scale concerning the different leisure activities would have helped to provide potentially more accurate findings. In study 4 it has to be noted that the measure of experienced Internet users among 15-year old respondents is not ideal. However it is not uncommon in Finland that children as young as 3 or 4 years old are getting acquainted with using smart phones or computers.

Furthermore, most of the data was representative of only one country (Finland), and therefore comparative analysis between countries was not possible (in all four studies). In study 1 the main research limitation was that the study only applied cross-sectional data, hence the role of actual generational differences was not possible to establish. In studies 2 and 3, the limitation was that data from only one country was available, thus cross-country comparisons were not possible to examine whether similar findings could indeed be found elsewhere as well. In general, larger sample sizes would have provided better opportunities for more detailed analysis, along with data for longitudinal follow up studies. However, this is generally an issue of limited funding. In terms of study 4, qualitative methods, such as interviews, along with data that were collected in more controlled setting (e.g. laboratory) would provide more detailed and also comparative information at different levels about these implications.

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