4   ICT access and use among elderly people in the European High North

Kristin Smette Gulbrandsen[a)] and Michael Sheehan[b)]

a) Department of Human Geography, Lund University
b) Swansea University

Executive Summary

Digitalisation is rapidly changing the availability of information and services online. This is accompanied by cutbacks to physical services in an attempt to save costs and increase efficiency. Digital skills have thus become critical to accessing and benefiting from developments in the digital age. This may have implications for social inclusion in geographically peripheral and sparsely populated areas such as the European High North (EHN). To address this, we used a modified framework of human and cybersecurity. Analysis of our fieldwork data indicated that this framework supports some of the key insights in the literature on digital divides in rural areas. Firstly, digitalisation is seen as highly beneficial to the EHN because it enables people to live, study and work in peripheral areas. Secondly, people distinguish between different uses of information and communication technologies (ICTs). Some services, such as online banking, are perceived as more beneficial but also more complex than others. Thirdly, younger family members are an important resource to many elderly people when using digital technologies. Lastly, not all services are fully accessible, especially for people with visual impairments. Additionally, the provision of services in Sámi languages is often not prioritised. Overall, our findings show that digitalisation provides new solutions and opportunities

that are crucial in remote areas like the EHN. However, unless its limitations are seriously considered, sections of the population may be excluded from its full benefits.

4.1 Introduction

Our research explores the relationship between digitalisation and social inclusion/exclusion in the European High North (EHN). Specifically, we examine social exclusion from the perspective of human security, arguing that this should be incorporated into a broader conception of cybersecurity. This means that the enabling and constraining aspects of digitalisation and digital technologies can be considered at the individual and community level in terms of protecting citizens' freedoms from fear and want. In order to gather primary data for our case studies, we conducted fieldwork in northern Finland and Norway. Both field trips involved semi-structured interviews with key informants in the region. The qualitative data generated by the interviews support some of the key insights in the literature on digital divides in rural areas.

4.2 Theoretical framework

Our theoretical framework bridges the literatures on security and social exclusion, showing how exclusion can be thought of as an element of human security and why the security of individuals and communities should be integrated into the wider cybersecurity debate. We briefly define these concepts below and integrate them into a single research framework, which is then applied to the EHN case study.

4.2.1   Security

Traditional approaches to security within international relations focussed on military threats to sovereign states (Mearsheimer, 2001; Morgenthau, 1973; Waltz, 1979). This narrow understanding of security was proposed in the 1980s during the post-Cold War period due to the emergence of a broader security agenda encapsulating additional sectors, such as environmental, economic and societal security (Barnett, 2001; Buzan, 1991; Buzan, Wæver, & de Wilde, 1998; McSweeney, 1999). This transition from a state-centric and military focussed understanding was reinforced by the subsequent emergence of critical security approaches (Booth, 2007; Holland & Jarvis, 2015; Sheehan, 2005; Wyn Jones, 2007) and by the adoption of a human security approach by the United Nations Development Program (1994). These developments made it possible to address security not simply in terms of additional sectors but, crucially, to focus on the individual human being or sub-state communities as the referent object (Booth, 2005, p. 22).

4.2.2   Cybersecurity

When the concept of cybersecurity emerged, this too was initially narrow in scope, focussing on the identification and protection of critical infrastructures. The human being was generally excluded from the pool of potential referent objects and had the status of the weakest link, threat or victim (Dunn Cavelty, 2014, pp. 703–704). By shifting the referent object of cybersecurity to the human being, it became possible to analyse cybersecurity not simply in terms of the problematic dimensions of human cyber use but in terms of its enabling and constraining effects.

4.2.3 Human security

The 2003 report by the Commission on Human Security defined human security as:

> The protection of the vital core of all human lives in ways that enhance human freedoms and human fulfilment … [including] processes that build on people's strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity (p. 4).

Creating a framework for human cybersecurity requires a brief unpacking of the concept of freedom. In human security, freedom from fear and want corresponds to the notions of negative and positive freedoms (Alkire, 2003). As such, freedom from fear is concerned with survival and is protected by civil and political rights. In the digital world, therefore, threats to the freedom from fear component of human cybersecurity include threats to privacy and freedom of expression as well as theft and fraud. Subsequently, freedom from want is concerned with livelihood and dignity and is realised through economic, social and cultural rights. In the digital world, this covers issues such as economic and educational opportunities as well as access to services. Defined this way, the concept of human security embraces many of the dimensions prominent in the social exclusion literature. From this view, human security can be considered 'a comprehensive approach that integrates the notion of social exclusion and links it to an extended framework that includes economic security, health, education, conflict, governance and migration perspectives' (Sokoloff & Lewis, 2005, p. 6).

4.2.4   Social exclusion

There is no generally accepted definition of social exclusion, but some of the most widely used definitions have clear commonalities. Burchardt, Le Grand and Piachaud (2002) argued that an individual is socially excluded if they do not participate in key activities in the society in which they live, though this is a rather broad definition. Sen (1999) noted that social exclusion may result from a lack of the capabilities required to participate in the experiences that lead to social inclusion. Often, the concept is associated with explicit citizenship rights (Berghman as cited in Noll, 2002, p. 56). Levitas et al. (2007) offered the following definition:

> Social exclusion is a complex and multi-dimensional process. It involves the lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in society, whether in economic, social, cultural or political arenas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole (p. 9).

Byrne (1999) also emphasised the deprivation of social goods as a form of exclusion. There are thus clear similarities between the social exclusion concept and the prominent criteria in various definitions of human security.

Restricted access to opportunities and limited capabilities to capitalise on these, along with reference to the social and economic dimensions of exclusion, seem to characterise most of the above definitions. Thus, social exclusion is more than material deprivation. Rather, it is the relative lack of economic, social and cultural capital required to realise human freedoms. Social exclusion therefore hinders freedom from fear and freedom from want and as a consequence constrains the individual's or community's

ability to access and capitalise on opportunities and achieve security. Below, we clarify what this means from a human cyber perspective.

4.2.5 Measuring social exclusion

When studying social exclusion, it is useful to view it through a constructivist lens. This highlights that the concept is highly normative; many definitions of social exclusion refer to exclusion from activities that are normal or available to the average or majority of citizens. Because of the relative and normative nature of social exclusion, there is reason to question some of the quantitative indicators often used to measure it. For example, van Regenmortel et al. (2016, pp. 333–334) argued that the operationalisation of social exclusion varies between cases, as the experience of social exclusion is context dependent. A universal measure of social exclusion variables will not be appropriate or applicable in all cases, which is the case with existing research on social exclusion and the elderly. For example, labour market participation among older people who receive old age pensions can differ from country to country. Continuing to work after pension age may signify financial stress, but for others, it may be a result of high work satisfaction. Thus, labour market participation as an indicator of social exclusion ignores the motivation behind the participation.

By emphasising agency, the notion of social exclusion can be problematised further. For example, a study that took place in rural Northern Finland found that youth narratives contradicted and contested the dominant discourse of social exclusion. They emphasised that people choose to live there and can experience life satisfaction differently. The young people in the study wanted the researchers to recognise that 'staying in a rural village can

indicate a successful life' (Lanas, Rautio, & Syrjala, 2013, p. 393). Similarly, a growing body of literature on elderly people's relationship to digital technologies has shown that motivation might be one of the most important reasons for little or no use (Dahlberg, 2012; Lüders & Brandtzæg, 2016; 2017; Slettemeås, 2014). Older people may not feel the need to use digital technologies, or they may choose to prioritise other activities. In this view, choosing not to engage with digital technology is not necessarily a sign of social exclusion but may instead be a deliberate choice about how to spend one's life and how to achieve individual wellbeing. Thus, while self-exclusion from opportunities only available through the use of ICTs or proximity to an urban area may lead to some forms of objective material deprivation, they do not necessarily lead to feeling socially excluded. However, as Reneland-Forsman (2018, p. 335) pointed out, the notion of agency is a difficult one from a structural point of view, 'as "choice" is clearly embedded within a social context and expectations that will shape what is often referred to as "choices"'.

4.2.6 Digital divides

During the 1990s, a new dimension of social exclusion began to be discussed; this idea of social exclusion resulted from limited access to ICTs and is referred to as the digital divide. The divide is understood in terms of access to and usage of digital technologies, or a divide between the information poor and information rich (Wresch, 1996). It is an example of social exclusion because 'digital exclusion involves the unequal access and capacity to use … [ICTs] that are seen as essential to fully participate in society' (Hope, Martin & Zubairi, 2016, p. 2). Today, the field has moved

from the exclusively access-based digital divide research to a greater focus on variations in skills and usage (Scheerder, van Deursen, & van Dijk, 2017).

As argued above, there is a clear component of relativity and self-perception in how social exclusion is experienced. This extends to digital exclusion as well; Helsper (2017) therefore adopted a relative deprivation model to digital inequality. She suggested that an individual may be relatively deprived in the objective sense but may not experience subjective (self-perceived) relative deprivation. If a person sees no value in digital technology, does not expect to adopt it in the future and does not have the abilities needed to use it, they might not feel like they are at an unjust disadvantage. This could help to explain why 71% of Norwegian elderly non-users feel that they cope just fine in their everyday lives (Slettemeås, 2014, p. 74).

As with social exclusion, digital exclusion/inclusion is mediated by an individual's economic, cultural and social capital. Selwyn (2004) therefore used the term technological capital, which includes aspects of traditional capital (Bourdieu, 1986) but also highlights their relevance to the digital world. Thus, economic capital includes the 'economic capacity to purchase ICT hardware and software', cultural capital is the 'participation in ICT education and training' and social capital encompasses 'networks of "technological contacts" and support' (Selwyn, 2004, p. 355). The technological capital of an individual influences their digital access on all levels (motivation, access, skills and usage), producing unequal outcomes which have implications for social exclusion (see Figure 1). Digital outcomes that enable participation and enhance capital can facilitate social

inclusion, whereas digital processes which essentially reproduce offline inequalities constrain human opportunity and security.
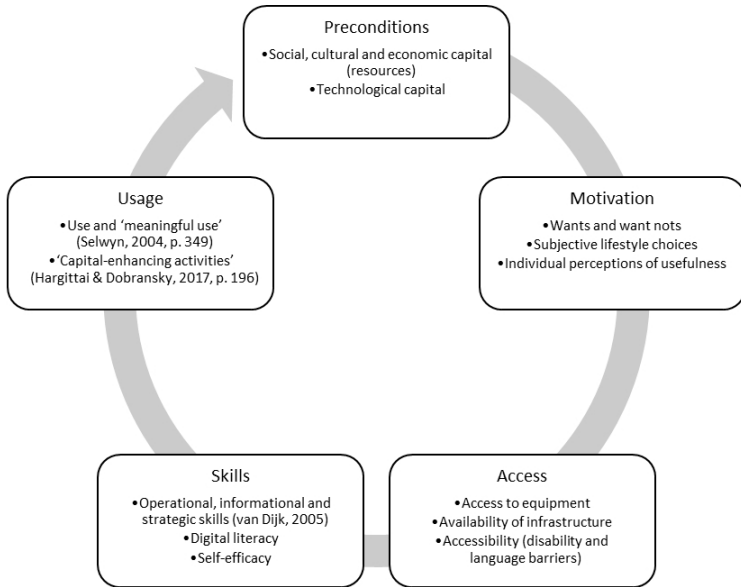

Figure 1. Levels of ICT access and its relationship to offline circumstances (van Dijk, 2005).

4.3   Case study: Elderly in the EHN

4.3.1   Background

The peripheral geographical location of the EHN represents several challenges and the potential for cumulative disadvantages. Its remote location (in comparison to its populated southern centres) and long distances mean that restricted or missing mobility can become a barrier to opportunities in general and to community inclusion specifically (Kenyon, Lyons, & Rafferty, 2002; Kilpeläinen & Seppänen, 2014). As physical

public services are withdrawn, those who cannot or will not engage online are at a greater risk of exclusion (Hodge, Carson, Carson, Newman, & Garrett, 2017; Warren, 2007). Inequality of access in terms of bandwidth, technology and literacy is a persistent problem across the Arctic (Arctic Council, 2016), yet the Nordics are generally high scoring in terms of digitalisation statistics. Moreover, the Norwegian, Swedish and Finnish national and local governments have adopted strategies to improve broadband coverage (Eskelinen, Frank, & Hirvonen, 2008; Norwegian Ministry of Local Government and Modernisation, 2016; Randall, Berlina, Teräs, & Rinne, 2018), but the general trend shows an increasing gap in digital infrastructure quality between commercially profitable (mainly urban) and unprofitable (remote) areas due to the catch-up effect (Salemink, Strijker, & Bosworth, 2017). The issue of poor internet speed is not a problem limited to the EHN, however (Statistics Norway, 2017a). It is therefore important not to overstate infrastructure problems. Yet, as the rural social exclusion literature suggests, rural populations are at a disadvantage because of long distances, sparse populations and lack of proximity to public services. Warren (2007) argued that because of this, the potential benefits of being connected are high in rural areas, as are the disadvantages of non-use. As public services become more difficult to access, internet connectivity (as well as competency) becomes more important for gaining the benefits of the ongoing digitalisation process.

4.3.2 The elderly

Elderly people are considered to be vulnerable to social exclusion and to suffering from multiple disadvantages (van Regenmortel et al., 2016). They

are also thought to be the most vulnerable to digital exclusion because they constitute the majority of non-users and weak users (Slettemeås, 2014). For elderly people facing multiple disadvantages (such as geographical location, mobility issues, poor health, old age and shrinking social networks), the total sum of experienced barriers to societal participation may lead to a higher risk of social exclusion. It is not clear whether digitalisation increases or reduces this risk. On the one hand, it is hoped that digital technologies can lessen the demographic pressures on welfare services as well as reduce the risk of social exclusion, but on the other hand, digitalisation has the potential to create unintended exclusion for weak or non-users.

4.3.3   Digital access

As outlined above, varied access to ICTs can be viewed in terms of different stages, as proposed by van Dijk (2005, p. 22). In Figure 1, we chose to illustrate this as a circle to highlight its effect in terms of producing and reproducing the preconditions for access. This model demonstrates that access consists of motivation, physical accessibility, skills and forms of use. Each form of access has implications for the utilisation of ICTs and is grounded in offline circumstances. This section evaluates the different components of access in order to shed light on the question of what problems elderly people face in their ICT use, from individual motivation and physical access to ICT skills and types of usage. This literature review serves as the theoretical starting point for an empirical investigation of digital divides in the EHN.

4.3.3.1 Motivation

Motivation determines a person's willingness to adopt and use ICTs (van Dijk, 2005, p. 27). Studies have found that many elderly people are simply not interested in using digital tools. For example, Slettemeås (2014, p. 69) reported that a perceived lack of need to use the internet and a lack of interest in it are the two main reasons why elderly Norwegians choose not to use the internet. Furthermore, Dahlberg (2012, p. 14) found that even those who have used digital tools in the past may choose not to in old age because their priorities change and digital participation is no longer seen as important to their lifestyles. Lüders and Brandtzæg (2016, p. 1) also noted a divergence in what they termed 'cultures of communication', reflecting a generational gap wherein online communication is experienced or perceived as less authentic. Some age groups, especially the elderly, might also feel that they are too old to learn how to use a computer (Nøhr, 2006, p. 85). In short, motivation is the first aspect of ICT use and necessarily affects the level of engagement a person has with digital technology.

4.3.3.2 Access

The next step to ICT use is material access. This aspect is closely associated with the traditional digital divide literature, which distinguished between computer and internet haves and have-nots (van Dijk, 2005, p. 45). The internet access gap has to a large extent been closed in the Nordics and other highly developed information societies (see European Commission, 2018), and compared to the rest of Europe, usage rates are higher in the Nordics, even among older people (Dahlberg, 2012, p. 14). While the elderly demographic is less likely to own a computer, gaps are being closed

as new tech-savvy generations begin to age. In 2014, 74% of elderly in Norway reported owning a computer with internet access in their home (Slettemeås, 2014, p. 15). However, geographically, there are some remaining urban-rural gaps in infrastructure, and demographically and socio-economically, some sections of the population are disadvantaged in terms of physical access to digital technologies.

Another dimension of material access is accessibility, by which we mean barriers to use stemming from disability. Users in this category may have the motivation, basic access and skills to use digital technologies but experience exclusion due to material barriers other than those previously mentioned. According to Slettemeås (2014, p. 10), 14% of elderly internet users with a disability feel that their disability hinders them from fully using the internet and digital equipment, and 38% feel they gain extra benefits from using the internet and digital services, showing that when accessible, people benefit from its use. Despite legislation in this area, there is still a lack of awareness about accessibility standards, and a study found that not all commonly used e-health sites, which would be of particular benefit to many groups, are fully accessible (Holthe, 2016, pp. 12–14).

However, access alone does not eliminate the inequality of digital opportunities (Tsatsou, 2011). Digital skills and how people use technology matter. Certain usages are believed to have more benefits than others, reflecting the widely reported 'rich get richer' effect (van Dijk, 2005, p. 126).

4.3.3.3 Competency

As more aspects of life are digitalised and more people than ever have access to ICTs, digital skills are becoming necessary for full participation in society. Using the internet has in fact become a critical competency in Norway due to high levels of access and use (Staksrud, 2011). Likewise, in Sweden there has been a 'shift in rhetoric from "access" to citizens' skilful "use" of digital resources' in government agendas (Reneland-Forsman, 2018, p. 336). Digital skills, which can be broadly divided into operational, informational and strategic skills, are therefore an important part of the ICT puzzle (van Dijk, 2005, p. 73).

Some early literature on digital divides adhered to a narrative of digital natives and digital immigrants, in other words, those born in the digital age and those who entered it as adults (Prensky, 2001). This suggests that young people today acquired a high level of digital competency from a young age. There is some truth to this. As Lüders and Brandtzæg (2016, p. 2) noted, using digital media technologies requires a combination of cognitive, sensory and motor skills as well as the knowledge of cultural and social norms and practices that are attached to these technologies. Reported barriers for older people were that computer language is difficult to understand (36%), they are dependent on guidance from others (23%) or they are afraid of making mistakes (22%; Slettemeås, 2014, p. 10).

However, the development of digital skills and literacy is closely related to existing offline skills and capital. In light of this, the digital native/immigrant narrative is not as empirically valid as first thought. For example, a recent study looked at the relationship between age, education

level and digital experience/skills (Fjørtoft, 2017). An interesting finding was that the relationship between age and digital skills was mitigated by education level; among people in the 55–74 age group with a high level of education, there was a larger proportion of people with good digital skills (41%) than adults in the 35–54 age group with lower levels of education (29%). This shows that people who are introduced to ICTs earlier in life do not automatically acquire higher levels of digital skills; rather, their digital competency reflects their overall educational resources. Thus, generational divides alone do not explain the gap between digital natives and immigrants (Helsper & Eynon, 2010). We must therefore avoid the simplification that young people are automatically digitally competent and instead look at the *type* of competency acquired.

Operational skills are basic digital competencies that allow the user to utilise digital equipment. Some researchers have examined the digital skills of elderly people from this perspective. For instance, Karahasanović et al. (2009, p. 662) found that older people feel less comfortable than younger people with tasks such as downloading software to their computers, creating a webpage and programming; however, they found no significant difference in terms of age regarding the use of text editor applications and spreadsheets. Similarly, of respondents in a different survey, 48% claimed to need help from family or friends to buy digital equipment, 68% to install software, 67% to choose settings on their device, 56% to connect digital equipment, 63% to solve technical problems, 45% to download programmes or apps and 50% to update virus protection (Slettemeås, 2014, p. 10).

As society becomes more digitalised, higher levels of technological competence are becoming increasingly important to actualise citizens' rights

and reap the benefits of digitalisation. These informational and strategic skills are a different set of competencies than strictly operational skills. This is not a new problem but rather an issue of traditional information inequality being applied to a new medium, ICTs (van Dijk, 2005). As a result, digital inclusion/exclusion is closely related to users' offline circumstances (Helsper, 2012). Thus, we can hypothesise that some of the apparent skill gaps between the young and elderly may be a result of different skillsets. While children today might have a high level of operational skills from a young age, this should not be mistaken for a higher level informational and strategic competency.

Lastly, digital skills are often thought of as individual attributes. The reality is that users, especially elderly people, rely on their networks of friends and family to navigate the digital world (Rasi & Kilpeläinen, 2015). These so-called proxy users may be family members or caregivers, and they often perform formal online tasks for people who cannot do so themselves (Selwyn, Johnson, Nemorin, & Knight, 2016). Thus, despite computer and internet use being widespread in Norway compared to the EU average, many elderly are dependent upon family and friends to undertake tasks such as buying products online, setting up and installing equipment and software, troubleshooting issues and choosing the right settings (Dahlberg, 2012; Slettemeås, 2014; Statistics Norway, 2017b). This also has implications for the uses of welfare technologies or telecare equipment such as sensors, pendant alarms and GPS tracking devices, as elderly people often rely on their support networks in order to incorporate these technologies in their daily life (Koivunen, 2014). As we have shown, there are different types of

ICT-related skillsets that a person can have or acquire through their social network. These skills affect how a person makes use of digital technologies.

4.3.3.4   ICT Use

Use refers to the type of usage that is made of digital technologies, for instance, whether a person uses simple or advanced applications for entertainment, communication, information and so on (van Dijk, 2005, p. 95). This is closely related to competency, and both are considered second-level digital divides (Scheerder et al., 2017).

Slettemeås (2014, p. 52) found that common reasons among elderly respondents for using the internet were staying updated and informed (73%), using services from home (65%), staying in touch with family and friends (45%), for work (28%) and for entertainment (21%). More recent data show that among Norwegian internet users aged 67 to 79, 67% use e-mail, 6% read a blog, 48% use Facebook, 12% use other social media sites, 51% search for information, 24% look at advertisements, 24% find information about restaurants or events, 48% use online banking, 7% buy tickets for travel, 2% shop online, 13% use public services, 11% use other services and 10% watch television or videos on an average day (Vaage, 2017, pp. 66–67). Elderly people also use digital media to mobilise support and maintain existing relationships (Quan-Haase, Mo, & Wellman, 2017). Some of the positive aspects of technology mentioned by elderly people were its usefulness, convenience and supportiveness, for example, by allowing them to maintain independence and making their lives easier (Mitzner et al., 2010).

The examples above only illustrate the surface of the usage issue because in reality, access does not equate to use and use does not equate to meaningful engagement. This leads to 'inequalities of outcome' in the short and long term in terms of social inclusion (Selwyn, 2004, p. 351). A study in the Netherlands found that people with low levels of education used the internet more than those with higher levels of education; however, people with higher educational levels used the internet for more "objectively" beneficial purposes (van Deursen & van Dijk, 2014). Thus, the researchers argued, the internet and how we use it increasingly come to reflect offline inequalities and can potentially contribute to exacerbating exclusion. A more recent study on this connection found that the level of education as well as income can predict the internet skills of elderly people, with higher levels making them more likely to undertake more beneficial (defined as capital-enhancing) activities online (Hargittai & Dobransky, 2017).

The risk, according to Winterberg (2012, p. 27), is that two classes of elderly emerge based on their ability to use computers and the internet. This creates a situation wherein those who have the motivation, access and skills benefit from being able to capitalise on digital opportunities, whereas those who do not are at risk of increased dependence, isolation and lack of access to beneficial information and services. What, then, are the actual outcomes of differentiated access, skills and use? While the divide between first (access) and second (skills and use) levels have received much attention, Scheerder et al. (2017) argued that further research is needed on third-level digital divides (outcomes) and their implications for social inequalities.

4.4 Fieldwork and findings

In order to gather primary data about the consequences of differing motivations, access, skills and use among elderly populations in the EHN, we conducted two fieldwork trips. The first trip was made in May 2018 to Inari and Rovaniemi in northern Finland. A second trip was made to Kirkenes in northern Norway in September 2018. Both field trips involved interviews with key informants in the region who were selected because they represented key digitalisation stakeholders in the areas visited. This included a variety of people (n = 16) working in social and health care, municipal offices and non-governmental organisations, including organisations representing the elderly, indigenous people and people with disabilities. The interviews were qualitative and semi-structured. This allowed for the interviewees to discuss topics important to them in depth while still broadly covering the same range of questions in all the interviews. This was important for analysing the interview data later. The interviews were all transcribed and later coded by theme using an interpretive methodology. In the case of the Norwegian interviews, which were conducted in Norwegian, the interviews were translated after the first round of analysis in order to stay as close to the original meaning as possible. The Finnish interviews were conducted in English with the exception of one, for which an interpreter was present to facilitate the interview.

In the analysis of the interview data from the fieldwork trips, some important themes emerged:

- Respondents resisted the dichotomy of digital natives and immigrants. They pointed out that not all elderly are sceptical of digital technologies and that digital literacy varies among all age groups. Personal interest and engagement matter.

- There was a feeling that digitalisation benefits peripheral areas more than urban centres. It has been described as an equaliser, and respondents referred to a number of examples of how digital technologies have enabled them to live, study and work in the periphery.

- Perceived usefulness was important for participants' decision to adopt a digital technology.

- Lack of infrastructure and poor broadband access were only experienced in certain areas. In most places, respondents were perfectly happy about their internet coverage. However, the remaining unconnected areas will be very expensive to provide access to.

- Accessibility for people with disabilities, especially visual impairments, is still a challenge. Providing services in Sámi languages has also been under-prioritised.

- Respondents confirmed that younger family members are an important resource to elderly people when using digital technologies. Sometimes, this involved buying and setting up equipment. Other times, it required the elderly family members to relinquish control over their finances so that a family member could access online banking in their name. Banks recognise this and will sometimes ask elderly people whether they have a family member who can help them with certain tasks.

- Welfare technologies can enable independence and allow people to live at home for longer. However, not all respondents agreed that this was desirable, and some viewed it as a reflection of the underfunding of welfare services. A related concern was less

73

physical contact in health and social care as a result of digitalisation.

- Respondents made distinctions between types of use. For example, they pointed out that many elderly people use social media sites such as Facebook but have not learned how to use online banking and struggle to access their municipality's online services.

4.5 Conclusion

By elucidating the relationship between the concepts of cybersecurity, human security and social exclusion, we have highlighted how social exclusion can be incorporated into a broader conception of human cybersecurity. This conceptualisation allows us to analyse the enabling and constraining aspects of digitalisation and digital technologies at the individual and community levels in terms of security of freedom from fear and want. Through our review of the literature, we showed how, in addition to referring to more than material deprivation, social exclusion is a highly normative and relative concept. As such, there is a high degree of self-perception involved in how social exclusion is experienced. This is also the case for digital forms of exclusion. By exploring access to digital technologies through van Dijk's (2005) multi-level framework, we illustrated how access – from motivation and physical access to digital competency and beneficial use – is mediated by an individual's technological capital (Selwyn, 2004). This alerts us to how certain digital outcomes can facilitate social inclusion, while other processes contribute to reproducing offline inequalities, thereby constraining human opportunity and security.

The elderly provide a pertinent case study of digitalisation in the EHN because they are seen as a group that is particularly vulnerable to exclusion. Together with the disadvantages associated with the peripheral geography of the EHN, there is a concern that weak and non-ICT users, who are often elderly, may not be able to make use of the opportunities provided by digital services. As such, there is simultaneously a hope that digital technologies can provide new and effective solutions and a concern that digitalisation may create exclusion where it otherwise would not exist.

Our findings point in this direction. Firstly, there is a recognition that digitalisation highly benefits peripheral areas such as the EHN. Some participants described the internet as an equaliser and gave examples of how digital technologies enable people to live, study and work in the EHN, reflecting the broader literature on digitalisation in rural areas (Warren, 2007). This, however, presupposes that everyone wants, can access and is able to use ICTs to the extent that is demanded by the public and private sector.

Secondly, interviewees made distinctions between different types of ICT use, which have also been noted in the literature (Hargittai & Dobransky, 2017; Selwyn, 2004). For example, many elderly competently use social media platforms like Facebook but struggle to use services that are perceived to be more complex or risky, such as online banking and municipal online services. This may indicate that certain groups are excluded from what some consider the most beneficial uses of ICTs, instead having to pay user fees or travel long distances to continue using non-digital alternatives.

Thirdly, younger family members (along with competent spouses and trusted friends) are an important resource for many elderly people when using digital technologies. Sometimes, this involves the more experienced family member buying and setting up equipment. Other times, it requires elderly individuals to relinquish control over their own finances so that a family member can access online banking in their name. Having family members act as proxy users is not an uncommon practice (Selwyn et al., 2016).

Lastly, we found that universal design requires further improvement regarding the accessibility of digital services, especially for people with visual impairments. The broader literature shows that despite legislation in this area, there is still a lack of awareness about accessibility standards (Holthe, 2016). Another barrier to use is that providing services in Sámi languages is often not prioritised. Our interviews revealed that under some circumstances, these barriers can lead to compound disadvantages. To conclude, our findings show that while digitalisation provides new solutions and opportunities that are crucial for areas like the EHN and are largely welcomed, the benefits of these developments will be unevenly distributed if its limitations are not taken into account.

References

Alkire, S. (2003). *A conceptual framework for human security* (CRISE Working Paper No. 2). Retrieved from Oxford University Research Archive website: https://ora.ox.ac.uk/objects/uuid:d2907237-2a9f-4ce5-a403-a6254020052d/download_file?file_format=application/pdf&safe_filename=workingpaper2.pdf&type_of_work=Working%20paper

Arctic Council. (2016). *Arctic resilience report*. M. Carson & G. Peterson (Eds.). Retrieved from Stockholm Environment Institute website: https://www.sei-international.org/mediamanager/documents/Publications/ArcticResilienceReport-2016.pdf

Barnett, J. (2001). *The meaning of environmental security: Ecological politics and policy in the new security era*. London, United Kingdom: Zed Books.

Booth, K. (2005). Introduction to part one. In K. Booth (Ed.), *Critical security studies and world politics* (pp. 21-25). London, United Kingdom: Lynne Rienner.

Booth, K. (2007). *Theory of world security*. Cambridge, United Kingdom: Cambridge University Press.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Westport, CT: Greenwood.

Burchardt, T., Le Grand, J., & Piachaud, D. (2002). Introduction. In J. Hills, J. Le Grand, & D. Piachaud (Eds.), *Understanding social exclusion* (pp. 1-12). Oxford, United Kingdom: Oxford University Press.

Buzan, B. (1991). *People, states and fear: An agenda for security analysis in the post-Cold War era* (2nd ed.). Boulder, CO: Lynne Rienner.

Buzan, B., Waever, O., De Wilde, J. (1998). *Security: A new framework for analysis*. Boulder, CO: Lynne Rienner.

Byrne, D. (1999). *Social exclusion*. Buckingham, United Kingdom: Open University Press.

Commission on Human Security. (2003). *Human security now*. Retrieved from RefliefWeb website:

https://reliefweb.int/sites/reliefweb.int/files/resources/91BAEEDB A50C6907C1256D19006A9353-chs-security-may03.pdf

Dahlberg, Å. (2012). Användning av IT-baserade tjänster i de nordiska länderna [Use of IT based services in the Nordic countries]. In Göransson, E.P. *Fokus på eldre i informasjonssamfunnet* [Focus on the elderly in information society]. (pp. 12–24). Retrieved from: http://www.diva-portal.org/smash/get/diva2:706911/FULLTEXT01 .pdf

Dunn Cavelty, M. (2014). Breaking the cyber-security dilemma: Aligning security needs and removing vulnerabilities. *Science and Engineering Ethics*, 20, 701–715.

Eskelinen, H., Frank, T., & Hirvonen, T. (2008). Does strategy matter? A comparison of broadband rollout policies in Finland and Sweden. *Telecommunications Policy,* 32, 412–421.

European Commission. (2018). *Connectivity: Broadband market developments in the EU*. Retrieved from https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=52245

Fjørtoft, T. O. (2017, June 6). Digitale ferdigheter i ulike aldersgrupper: Unge og høyt utdannede er flinkest foran PC-en [Digital skills in different age groups: The young and highly educated are best in front oft he PC]. *Statistics Norway*. Retrieved from http://www.ssb.no/teknologi-og-innovasjon/artikler-og-publikasjoner/unge-og-hoyt-utdannede-er-flinkest-foran-pc-en

Hargittai, E., & Dobransky, K. (2017). Old dogs, new clicks: Digital inequality in internet skills and uses among older adults. *Canadian Journal of Communication*, 42, 195–212.

Helsper, E. J. (2012). A corresponding fields model for the links between social and digital exclusion. *Communication Theory*, 22, 403–426.

Helsper, E. J. (2017). The social relativity of digital exclusion: Applying relative deprivation theory to digital inequalities. *Communication Theory*, 27, 223–242.

Helsper, E. J., & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal*, 36, 503–520.

Hodge, H., Carson, D., Carson, D., Newman, L., & Garrett, J. (2017). Using internet technologies in rural communities to access services: The views of older people and service providers. *Journal of Rural Studies*, 54, 469–478.

Holland, J., & Jarvis, L. (2015). *Security: A critical introduction*. London, United Kingdom: Palgrave.

Holthe H. (2016). *Nettbaserte helsetjenester for alle. Hvordan utvikle og implementere allment tilgjengelige e-helsetjenester i Norge* [Online health services for all. How to develop and implement publicly available e-health services in Norway] (Project Report No. 3). Retrieved from Nasjonalt senter for e-helseforskning website: https://ehealthresearch.no/files/documents/Prosjektrapporter/NSE-rapport_2016-03_Nettbaserte_helsetjenester_for_alle.pdf

Hope, S., Martin, C. and Zubairi, S. S. (2016). *The role of digital exclusion in social exclusion*. (Ipsos MORI Scotland & Carnegie UK Trust report). Retrieved from: https://d1ssu070pg2v9i.cloudfront.net/pex/carnegie_uk_trust/2016/09/LOW-2697-CUKT-Digital-Participation-Report-REVISE.pdf

Karahasanović, A., Brandtzæg, P. B., Heim, J., Lüders, M., Vermeir, L., Pierson, J.,…Jans, G. (2009). Co-creation and user-generated content – Elderly people's user requirements. *Computers in Human Behavior*, 25, 655–678.

Kenyon, S., Lyons, G., & Rafferty, J. (2002). Transport and social exclusion: Investigating the possibility of promoting inclusion through virtual mobility. *Journal of Transport Geography*, 10, 207–219.

Kilpeläinen, A., & Seppänen, M. (2014). Information technology and everyday life in ageing rural villages. *Journal of Rural Studies*, 33, 1–8.

Koivunen, E. (2014). *Telecare and older people's social relations* (Working Paper No. 3). Retrieved from AKTIVE website: http://www.aktive.org.uk/downloads/AKTIVE_Paper-3.pdf

Lanas, M., Rautio, P., & Syrjala, L. (2013). Beyond educating the marginals: Recognizing life in northern rural Finland. *Scandinavian Journal of Educational Research*, 57, 385–399. https://doi.org/10.1080/00313831.2012.656283

Levitas, R., Pantazis, C., Fahmy, E., Gordon, D., Lloyd, E., & Patsios, D. (2007). The multi-dimensional analysis of social exclusion. Retrieved from IOE *Digital Education Resource Archive website*: https://dera.ioe.ac.uk/6853/1/multidimensional.pdf

Lüders, M., & Brandtzæg, P. B. (2016). Når alt sosialt blir flyktig: En kvalitativ studie av hvordan eldre opplever sosiale medier [When everything social becomes fleeting: A qualitative study of how older people experience social media]. *Norsk Medietidsskrift*, 23(2), 1–18.

Lüders, M., & Brandtzæg, P. B. (2017). 'My children tell me it's so simple': A mixed-methods approach to understand older non-users' perceptions of social networking sites. *New Media & Society*, 19, 181–198.

McSweeney, B. (1999). *Security, identity and interests: A sociology of international relations*. Cambridge, United Kingdom: Cambridge University Press.

Mearsheimer, J. (2001). *The tragedy of great power politics*. New York, NY: Norton.

Mitzner, T. L., Boron, J. B., Fausset, C. B., Adams, A. E., Charness, N., Czaja, S. J. … Sharit, J. (2010). Older adults talk technology: Technology usage and attitudes. *Computers in Human Behavior*, 26, 1710–1721.

Morgenthau, H. (1973). *Politics among nations: The struggle for power and peace* (5th ed.). New York, NY: Knopf.

Nøhr, Ø. N. (2006). De kompetente eldre: Aldring og digital kompetanse – konflikt eller lykke? [The competent elderly: Ageing and digital competence – conflict or happiness?]
(Research Report No. 128). Retrieved from Brage Open Knowledge Archive website: https://brage.bibsys.no/xmlui/handle/11250/144887

Noll, H. H. (2002). Towards a European system of social indicators: Theoretical framework and system architecture. *Social Indicators Research*, 58, 47–87.

Norwegian Ministry of Local Government and Modernisation. (2016). *Digital agenda for Norway in brief: ICT for a simpler everyday life and increased productivity*. (Report to the Storting No. 27). Retrieved from https://www.regjeringen.no/contentassets/07b212c03fee4d0a94234b101c5b8ef0/en-gb/pdfs/digital_agenda_for_norway_in_brief.Pdf

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon*, 9(5), 1–6.

Quan-Haase, A., Mo, G. Y. and Wellman, B. (2017). Connected seniors: how older adults in East York exchange social support online and offline. Information, *Communication & Society*, 20(7), 967–983.

Randall, L., Berlina, A., Teräs, J., & Rinne, T. (2018). *Digitalisation as a tool for sustainable Nordic regional development: Preliminary literature and policy review*. Retrieved from Nordregio website: http://www.nordregio.org/wp-content/uploads/2018/03/ Digitalisation_Discussion-Paper_Jan-31.pdf

Rasi, P., & Kilpeläinen, A. (2015). The digital competences and agency of older people living in rural villages in Finnish Lapland. *Seminar.net: International Journal of Media, Technology and Lifelong Learning*, 11, 149–160.

Reneland-Forsman, L. (2018). 'Borrowed access' – The struggle of older persons for digital participation. International *Journal of Lifelong Education*, 37, 333ç344.

Salemink, K., Strijker, D., & Bosworth, G. (2017). Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas. *Journal of Rural Studies*, 54, 360–371.

Scheerder, A., van Deursen, A., & van Dijk, J. (2017). Determinants of internet skills, uses and outcomes. A systematic review of the second- and third-level digital divide. *Telematics and Informatics*, 34, 1607–1624.

Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, 6, 341–362.

Selwyn, N., Johnson, N., Nemorin, S., & Knight, E. (2016). *Going online on behalf of others: An investigation of 'proxy' internet consumers*. N. Clark (Ed.). Sydney, Australia: Australian Communications Consumer Action Network.

Sen, A. (1999). *Development as freedom*. Oxford, United Kingdom: Oxford University Press.

Sheehan, M. (2005). *International security: An analytical survey*. Boulder, CO: Lynne Rienner Publishers.

Slettemeås, D. (2014). *Eldres bruk av digitale verktøy og internett: En landsdekkende undersøkelse av mestring, støttebehov, motivasjon og hindringer [The elderly's use of digital tools and the internet: A country wide examination of mastery, need for support, motivation*

and barriers] (Report No. 5). Retrieved from the Norwegian Directorate for Children, Youth and Family Affairs website: https://bufdir.no/globalassets/global/slettemeas_2014_eldres_bruk_av_digitale_verktoy_og_internett.pdf

Sokoloff, C., & Lewis, R. (2005). *Denial of citizenship: A challenge to human security*. (Issue Paper No. 28). Retrieved from European Policy Centre website: http://www.epc.eu/documents/uploads/724318296_EPC%20Issue%20Paper%2028%20Denial%20of%20Citizenship.pdf

Staksrud, E. (2011). Norske barn på Internett: Høy risiko - liten skade? [Norwegian children on the internet: High risk – low harm?] *Nordicom Information*, 33(4), 59–70.

Statistics Norway. (2017a). Internett-målinga 20. november 2017 [The internet measurement 20. November 2017]. Retrieved from https://www.ssb.no/inet

Statistics Norway. (2017b). Ni av ti surfer på nettet hver dag. [Nine out of ten surf the web every day.] Retrieved from http://www.ssb.no/teknologi-og-innovasjon/artikler-og-publikasjoner/ni-av-ti-surfer-pa-nettet-hver-dag

Tsatsou, P. (2011). Digital divides revisited: What is new about divides and their research? *Media, Culture & Society*, 33, 317–331.

United Nations Development Program. (1994). *Human development report*. Retrieved from http://hdr.undp.org/sites/default/files/reports/255/hdr_1994_en_complete_nostats.pdf

Vaage, O. F. (2017). Norsk Mediebarometer 2016 [Norwegian Media Barometer 2016]. (Statistics Norway report). Retrieved from http://www.ssb.no/kultur-og-fritid/artikler-og-publikasjoner/_attachment/303444?_ts=15c1173e920

van Deursen, A., & van Dijk, J. (2014). The digital divide shifts to differences in usage. *New Media & Society*, 16, 507–526.

van Dijk J. (2005). *The Deepening Divide: Inequality in the Information Society*. London: Sage Publications.

van Regenmortel, S., de Donder, L., Dury, A., Smetcoren, A., de Witte, N., & Verté, D. (2016). Social exclusion in later life: A systematic review of the literature. *Population Ageing*, 9, 315–344.

Waltz, K. N. (1979). *Theory of international politics*. New York, NY: Random House.

Warren, M. (2007). The digital vicious cycle: Links between social disadvantage and digital exclusion in rural areas. *Telecommunications Policy*, 31, 374–388.

Winterberg, E. (2012). Et digitalt A- og B-hold? [A digital A and B team?] In Göransson, E.P. *Fokus på eldre i informasjonssamfunnet [Focus on the elderly in information society]*, (p. 27). Retrieved from http://www.diva-portal.org/smash/get/diva2:706911/FULLTEXT01 .pdf

Wresch, W. (1996). *Disconnected: Haves and have-nots in the information age*. New Brunswick, NJ: Rutgers University Press.

Wyn Jones, R. (2007). Message in a bottle? Theory and praxis in critical security studies. In B. Buzan & L. Hansen (Eds.), *International security* (pp. 299–319). Los Angeles: SAGE Publications.