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Introduction

While the rise of sociological mobility research took place in Europe at the turn of the new millennium, the first Finnish book devoted to mobility research was published only in 2013.[1] Apart from its introduction, this edited volume, *Liikkuva Maailma* [Moving World], is only vaguely linked with international theoretical scholarship on mobility research. Information and communication technologies (ICTs) are not explicitly tackled in the book. However, Finnish scholars wrote about the birth of the mobile information society for the first time in the early 2000s. Around the same time, the first EU-funded research projects on mobile entertainment and culture were launched.[2] The source of inspiration for these projects was the success of mobile communication businesses, especially Nokia, but a scientific approach to mobilities was still unclear. Scholars working on mobility foresaw that people's social relations would increasingly be defined and mediated by ICT. Hence, people's lifestyles could also be increasingly understood in terms of their daily computer-mediated mobility.[3] Finnish cultural historians saw new mobile media and entertainment technologies as a way to reduce the tedium of mundane traveling.[4] Despite these early efforts, the paradigmatic shift toward the study of a wide range of mobilities did not manage to make a real breakthrough in the Finnish social sciences at that time. Comparatively small investments in basic transport

infrastructure (e.g. road, railroads, and air traffic), the unprofitability of many regional airports, and difficulties in providing fast broadband networks in the least urbanized areas, among other things, probably restrained scholarly interest in advancing this area of research.

The aim of this essay is to review the most recent studies on the relationship between ICT and mobility in Finland. The review is predominantly limited to international publications that were published in the 2010s. However, some excursions into older literature are made to relate this later research to its historical roots. In regards to ICTs, studies on portable devices as well as technologies and applications that enable the movement of information are included in the review. The essay is organized around three thematic sections. The review ends with a concluding section which presents arguments on the current state of research. One key argument is derived from each thematic section.

Contextualization of ICT mobility research

Historically, the Nordic welfare state, which provided a highly-skilled labor force by means of a free education system, and a determined research and innovation policy, contributed greatly to the rise of the mobile communication business in the 1980s and 1990s.[5] The role of the Finnish welfare state was most outstandingly acknowledged in *The Information Society and the Welfare State: The Finnish Model* written by Castells and Himanen.[6] Although this historical backdrop is widely recognized by researchers, the policies that are framed to promote the development, adoption, and use of ICTs have received considerably little scholarly attention in Finland. Niemi and her colleagues have described how the government has guided the development and the use of ICT in the education system.[7] More recently, Finland's information society strategies have been analyzed to understand how mobilities are

politically promoted in the country.[8] Taipale's study on this reveals two key findings. First, people's needs for new portable (communication) technologies and sustainability in mobility are politically well recognized. Second, despite this recognition there is no political agenda that promotes the use of ICT for person-to-person communication in Finland. According to Taipale, mostly mobilities that are considered beneficial for the national economy are highlighted and endorsed only in the national strategy documents.

Besides historical contextualization, many studies show how the use of ICTs is linked with the social and geographical contexts of use. For example, Strandell's ethnographic study that explores the use of cell phones for renegotiating the boundaries and identities of place in after-school centers.[9] According to Strandell, the boundaries of these "safe places," where children are kept while their parents work, commute, or travel, are continuously redefined through mobile telephony. Her article shows that mobile interaction can and should be investigated without detaching it from physical surroundings, which is an integral condition of interaction. Kinnunen, Suopajärvi and Ylipulli argue in their review article that the micro-mechanisms of power and the bodily expression of power are still insufficiently theorized in mobile communication research.[10] This study clearly indicates the significant impact of ubiquitous mobile communication technologies on social power structures. Also Villi's study on visual mobile communication shows how photographs incorporate time and place more firmly into mobile phone communication.[11]

Statistical social research in Finland has also noticed the significance of the context of ICT use. Statistical inquiries indicate that the context of use – separated into ubiquitous context (the presence of digital/virtual services), social context, and work/task context – does not sufficiently account for the use of mobile social media services in Finland. However,

these contextual factors are considerably more powerful predictors for the use of mobile entertainment and messaging services.[12]

These studies clearly re-assert the role of contextual factors as predictors of mobility patterns and mobile communication. However, what they do not make apparent is that new location-based ICT services also have potential to make service users (not only researchers) more aware of their physical whereabouts and social surroundings. For instance, mobile services that visualize the geographical location of a person or that of his/her friend on a map, or personalized location-based ads that pop up while browsing the Internet en route, make the ambient geographical (and to some extent also social) surroundings of a user easier to grasp.

Inkinen's study on the use of wireless technology and networks in the distribution of travel information sheds some light on this issue.[13] However, his study shows that the use of online services which provide information on nearby places through wireless technologies in Helsinki, Finland, is still in its infancy. Similarly, studies that investigate the use of interactive displays in the city of Oulu, Finland, show that the utility of such displays is questioned by users.[14] Overall, it turns out that although context matters in the use of ICT, the intended uses of many new location-based services and the actual utilization of these services does not easily converge.

The immateriality of ICT mobility

Current literature shows that researchers are, as in the past, geared to analyzing and understanding mobile ICTs as conduits of information – something that is thoroughly immaterial by its nature.[15] This characteristic deserves more scholarly attention as it is definitely not only typical of the investigated Finnish research. If we consider ICT tools as

physical and concrete objects, it appears that they provide many affordances other than information and data.[16] These affordances are typically studied by scrutinizing what kinds of properties users associate with the object (e.g. a smart phone is small, thin, fits in a pocket). Such analyses have, however, remained few in Finland, although work on the so-called new or neo-materialism is on the rise.[17]

Strandell's article, mentioned above, is a step in this direction. In her analysis the immateriality of communication and the physical space of cell phone use are tightly tied together. Also the study of Vartiainen and Hyrkkänen, which presents findings on the electronic tools used by locally and globally mobile employees, includes information on how the material aspects of ICT tools are connected to their usage patterns in work.[18] According to this study, globally mobile people mainly use very basic and common devices, such as cell phones, PCs, and laptops. However, this population carries them not only to their second work place, but often to their third. By contrast, mobile workers moving at a local level, utilize more specific ICT tools (such as multipurpose PDAs) and take them fewer places. This shows that beyond their capacity to convey information, the physical properties of digital tools (size, weight, portability etc.) affect their usefulness in locally and globally mobile work.

Taipale's study on the affordances of paper/pen and screen/keyboard in reading and writing puts the main focus on the materiality of digital technologies. He shows that although college students in Finland appreciate the portability of electronic reading and writing tools such as laptops, tablets and cell phones, they associate many deficiencies with them as well. When compared with paper and a pen, for instance, the dependency on electricity, poor

usability outdoors and in sunlight, and a certain lack of personality are, according to the

studied students, the defects of digital reading and writing tools.[19]

From usage and consumption to sustainability?

As foreshadowed above, researchers seem to have a continuous aspiration to investigate what

functions of ICTs are actually used, and by whom. Such studies typically follow the lines of

market segmentation research and consumption studies. For example, Sell and Walden with

their colleagues have found that mobile service users can be classified in five consumer

categories: the skilful, the efficient, the trendy, the basic and the social. Furthermore, their

research reveals that, owing to the almost full penetration of cell phones in Finland,

subjective attitudes have become more powerful predictors of mobile service usage than

socio-demographics. More recently, the same research team came up with another interesting

finding: although most cell phone users reported interest in mobile services, only 15 percent

are heavy service users. While 47 percent of sixteen- to sixty-four-year-old Finns can be

defined as inactive users and 38 percent use no advanced services with their cell phones at

all.[20]

A study written by Suominen, Hyrynsalmi and Knuutila adds to this same tradition of

work on mobile technology consumers.[21] By analyzing cell phone users with three waves of

cross-sectional surveys, researchers show that youth and young adults in Finland are

surprisingly conservative toward new mobile devices and services. Despite the rise of

smartphones, changes in consumer behavior have been notably small, if not non-existent.

Also users' unwillingness to invest more than a small amount of money in mobile

communication is evident. The same study also re-confirms that men still value more

technical features in cellphones – even if they do not always use them – and that female users appreciate design and practicality. Haverila has also explored gender differences in the preferences and use of smartphone functions among nineteen- to twenty-five-year-old undergraduate students in Finland. While for women price, aesthetics, design, and safety (in terms of radiation) matter more than for men, men report higher levels of business use than women.[22]

A slightly different approach to the use of ICT (and physical) mobilities is presented by Taipale.[23] He examines how the form and frequency of travel is linked with the use of ICT tools. The findings reveal that the use of traditional private modes of traveling, especially that of a private car, is combined with the use of fewer and more stationary large-sized ICTs. On the other hand, younger people prefer public transportation and combine such traveling with the use of small-size and portable ICTs. While the former group of users is mainly illustrative of carbon-intensive mobility, the latter takes advantage of clearly sustainable forms of public transportation. Overall, recent literature is dominated by approaches that elaborate the form and volume of ICT use. By contrast, the socio-ecological implications of the increased ICT consumption and sustainability have received considerably little attention up till now.

Concluding remarks

This last part of the essay shortly elaborates the state of the reviewed field of research and presents three arguments in order to pave the way for future research. First, it is obvious that researchers are well aware of the need to situate ICT mobility studies in terms of geographical place and the social context of use. However, a somewhat distorted view that ICTs are otherwise used in a universalistic manner that overcomes the limits of time and

space persists. This partly stems from the technological standardization that unifies ICT experiences in a number of countries. In can be argued that national and regional differences in the cultural history of ICT were more obvious in the past. For example, before the Global System for Mobile Communications (GSM), the Nordic countries had their own Nordic Mobile Telephone (NMT) network, which made visible the peculiarity of Nordic countries. Today a GSM standard and few competing operating systems (Android, iOS, Windows) are dominant across the world. Hence, technological standardization seems to contribute to the suppression of the local cultural history of technological development. In recent Finnish literature on ICTs, this is manifest in the almost categorical ignorance of the role of local, regional, and national cultures as well as that of history and language. In this regard, a recent book edited by Kangas is an exception as it shows some cultural differences in the use of new media between Finland, Japan and South Korea.[24] More generally, this phenomenon is reflected in sociological interpretations that propose there is a worldwide need for autonomy and connection that makes people adopt personal communication technologies in a similar manner.[25]

Second, a constant analyzing of portable ICT tools as the media of digital mobility and as the reshapers of social structures has also blinded researchers to recognizing the significance of the materiality of ICTs. Related to this, third, the field of ICT mobility research has not yet seriously begun to investigate the most tangible and concrete consequences of such mobility in Finland. There are some investigations on the non-material consequences of ICT use, such as cyberbullying, yet sociological studies on issues such as electronic waste are still to be conducted.[26] This review also revealed a distinct incongruity between the politically recognized needs for sustainable ICT and the recent literature that has

stuck to studying the increased consumption of ICT tools and applications. More research along these lines is needed as the lifespan of new ICT tools is shortened and the socio-ecological impacts of ICT use in general, and new applications in particular, remain nebulous.

Sakari Taipale is an Academy of Finland Research Fellow at the University of Jyväskylä, Finland. He is also an Adjunct Professor at the University of Eastern Finland. Taipale has published numerous articles on new media, the Internet, mobile communication, and mobilities in journals such as *British Journal of Sociology*, *Social Science Research, Telecommunications Policy*, *European Journal of Communication*, and *Mobilities*.

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[1] The mobility paradigm was framed in: John Urry, *Sociology Beyond Societies: Mobilities for the Twenty-First Century* (London: Routledge, 2002). Mikko Lehtonen (ed.), *Liikkuva Maailma* [Moving World] (Tampere: Vastapaino, 2013).

[2] For example, see http://www.mgain.org/

[3] For example, see Timo Kopomaa, *The City in Your Pocket: The Birth of the Mobile Information Society* (Helsinki: Gaudeamus, 2000); Jukka-Pekka Puro, "Finland: a Mobile Culture," in James E. Katz and Mark Aakhus (eds.) *Perpetual Contact: Mobile Communication, Private Talk, Public Performance* (Cambridge: Cambridge University Press, 2002), 19-29; Virpi Oksman, "Young People and Seniors in Finnish "mobile information society,'" *Journal of Interactive Media in Education* 2 (2006): 1-21.

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[5] Sakari Taipale, "Mobilities in Finland's Information Society Strategies from 1995 to 2010," *Mobilities* 8:2 (2012): 293-311; Mats Benner, "The Scandinavian Challenge: The Future of Advanced Welfare States in the Knowledge Economy," *Acta Sociologica* 46:22 (2003): 132-49.

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[8] Sakari Taipale, "Mobilities in Finland's Information Society Strategies," 293-311.

[9] Harriet Strandell, "Mobile Phones in Children's After-School Centres: Stretching of Place and Control," *Mobilities* (2013) (online early).

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[11] Mikko Villi, "Visual Mobile Communication: Camera Phone Photo Messages as Ritual Communication and Mediated Presence," Publication Series A 103. (Helsinki: Aalto University, 2010)

[12] Anna Sell, Mark de Reuver, Pirkko Walden, and Christer Carlsson, "Context, Gender and Intended Use of Mobile Messaging, Entertainment and Social Media Services," *International Journal of Systems and Service-Oriented Engineering,* 3:1 (2012): 1-15.

[13] Tommi Inkinen, "Urban Travel Information and Wireless Technologies in Helsinki, Finland," *Journal of Urban Technology*, 17:2 (2010): 57-75.

[14] J. Ylipulli, T. Suopajärvi, T. Ojala, V. Kostakos, and H. Kukka, "Municipal WiFi and Interactive Displays: Appropriation of New Technologies in Public Urban Spaces," *Technological Forecasting & Social Change* (2013) (online early); Hannu Kukka, Vassilis Kostakos, Timo Ojala, Johanna Ylipulli, Tiina Suopajärvi, Marko Jurmu, and Simo Hosio, "This is Not Classified: Everyday Information Seeking and Encountering in Smart Urban Spaces," *Personal and Ubiquitous Computing*, 17 (2013): 15-27.

[15] Examples from the past, see Timo Kopomaa, *The City in Your Pocket*; I. Koskinen, *Mobile Multimedia in Action* (New Jersey: Transaction, 2007); Ilpo Koskinen, Esko Kurvinen, and Turo-Kimmo Lehtonen, *Mobile Image* (Helsinki: IT Press, 2002); Ilkka Arminen, "Sequential Order and Sequence Structure: The Case of Incommensurable Studies on Mobile Phone Calls," *Discourse Studies*, 7:6 (2005): 649-62.

[16] The concept of affordance refers to the perceived properties of a technology that enable immaterial communication and social action. See James Gibson, *The Ecological Approach to Visual Perception* (Hillsday: Lawrence Elbaum, 1986); Ian Hutchby, *Conversation and Technology: From the Telephone to the Internet* (Cambridge: Polity, 2001); Sakari Taipale, "The Affordances of Reading/Writing on Paper and Digitally in Finland," *Telematics and Informatics* (2014) (online early).

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[24] Sonja Kangas (eds.), *Digital Pioneers* (Helsinki: Nuorisotutkimusverkosto/

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[25] For example, see James E. Katz and Mark Aakhus (eds.), *Perpetual Contact.*

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