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1. Introduction

Fortunati and Vincent (2014) show that Italian college students describe many affordances of reading/writing on paper compared with reading/writing digitally. On the whole, they describe Italian students having a favourable picture of paper-based communication. Without a comparative study from another country, it is difficult to evaluate how much of their results are determined by the national culture and for instance by the timing and intensity of digitalization in the Italian education system. This study will investigate the impact of digital technologies on reading and writing in Finland and hence allows this comparison.

Besides many cultural differences between Finland and Italy, the rationale behind the country comparison lies in the unsynchronised adoption of digital technology. The adoption of information and communication technologies (ICTs) has followed different trajectories and occurred at a different pace globally (Hilbert et al., 2010; Cruz-Jesus et al., 2012). The 2003 Programme for International Student Assessment (PISA) survey shows that 50 per cent of 15 year-olds in Finland had used a computer more than five years in the early 2000s. In Italy, the same figure was just above 20 per cent (OECD, 2005, p. 19). Today, these students are around 25 years old, and on behalf of their age belong to the target group of this study. Another study shows that as early as 1998, already 100 per cent of Finnish primary and secondary school students used computers as part of their studies. In Italy the corresponding figure was 79 per cent (Kankaanranta and Puhakka, 2008). Given their longer experience of using a computer it could be hence supposed that Finnish students have become more rooted in the world of digital reading and writing.

Literature shows how the uses of new technologies become stabilized-for-now (Schryer, 1993) when they are entrenched in daily practices. This study begins from the theory of Technological Frames developed by Orlikowski together with Gash (Orlikowski and Gash, 1994; Orlikowski, 2000), while trying to understand how some of digital reading and writing practices may become reinforced and institutionalised in one country but not in another. Technological frames have resemblance to cognitive schemas (Neisser, 1967; Barlett, 1932). Different technological frames imply different ways of making sense of a technology and divergent manners of acquiring knowledge of this technology. Technological frames guide people's interpretations and expectations related to the new (Davidson, 2006). Orlikowski and Gash (1994) claim that the frames are primarily held and applied by individual actors. They also point out that social cognitive studies clearly show that these frames arise from education, work experience and interactions within relevant communities and social groups (such as classmates or a work organization). These wider, pre-existing cultural systems, which are likely to be different in Italy and Finland, provide orientation and guidance for the use of new technologies.

Another important feature in Orlikowski's thinking is that technologies should be studied in practice, not as artefacts in isolation from their actual usage. Orlikowski (2000) maintains that in daily practices people "recursively instantiate and thus reconstitute the rules and resources that structure their social action" (p. 409). Such repetitive habitual use of a technology reinforces the same *technology-in-practice* over time to the extent that it may become taken for granted (Orlikowski, 2000, p. 410) or institutionalised (Berger and Luckmann, 1967). Orlikowski's notion, technology-in-practice, owes much to Giddens' structuration theory that aims to bridge the gap between human agency and social structures. Furthermore, it is closely linked to sociological theories of everyday life as a series of practices. These sociology-as-practice scholars argue that customary practices, such as

routines and bodily movements, influence people's behaviour more than values and attitudes (Reckwitz, 2002; Warde, 1995).

By investigating reading and writing technologies in practise and their recurrent uses, the study aims to evaluate if these practices differ in the two countries. If the digital technologies have become a more inseparable part of students' lives in Finland than in Italy, reading and writing digitally should be portrayed as relatively routinised practices in student responses. The article begins by introducing the concept of affordance and the media richness theory, which will be linked to the theory of technological frames. Then, research questions are posited for the study. Research material and methods are illustrated before presenting the findings. Lastly, results are presented and discussed in light of theories and literature. The article ends with some theoretical conclusions.

1.1 The affordances of paper versus digital reading and writing

A technological frame guides what affordances are actually perceived in a technology. The term "affordance" is applied here by referring to the perceived properties of a technology that enable communication and social action (Dourish, 2004; Hutchby, 2001; Hutchby, 2001). Sociological studies have taken this notion from James J. Gibson (1986), who proposes that "the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill" (p. 127). In this definition, Gibson brings out the polarity of affordances: while positive affordances are potentially advantageous, negative affordances shall be seen as defects.

The functional value of the affordance thus depends on the perception of an observer that is, in turn, guided by the observer's technological frame. Hence, affordances studies typically begin by analysing how an observer describes the physical properties of the object (Arminen, 2002). For example, paper may be described tangible, thin, light, flexible, while a laptop is portable, affords moving pieces of text and images, as well as other technical aids such as grammar and spelling check (Sellen and Harper, 2002). By comparing two countries, this study may also reveal if some affordances remain "unnoticed" (because the non-use or the habitualised use of a technology) in one country but are perceived in the other.

Prior research on reading and writing digitally has largely concentrated on office work as Fortunati and Vincent (2014) correctly maintain. For example, Sellen and Harper (2002) examined the myth of the paperless office in their seminal study. They found many affordances explaining why paper persists in office work (e.g., people's aptitude for using two hands, their need to annotate while reading and to spread the pages of the article). The focus of this study is instead on a less-studied social group, students, who know from experience how arduous reading and writing tasks are. For students, seemingly small changes in reading and writing practices might have profound ramifications (Cull, 2011), for instance, in terms of time use and a better availability of electronic books. Being part of the same social group, the technological frames of reference through which they assess the affordances of reading and writing on print and digitally, can be supposed to be rather congruent within both countries.

Sociolinguistics and communication sociologists have vividly studied the shift from paper and pencil to keyboard-to-screen communication. Regarding writing, for instance, Thurlow (2006) brings out an important issue: while it is perhaps true that text-messaging and typing

damage formal writing, the criticism often targets old linguistic practices that are actually no longer used. Other studies have specified that the impacts of digitalization on writing are perhaps not particular devastating. It has been argued that texting would have a negative impact only on formal writing, while the impact on informal writing would be positive (Rosen et al., 2010; Massey et al., 2005). Naomi Baron (2008), while studying American college students, found that in general Instant Messaging and mobile phones, as well as Facebook and blogs, have surprisingly little influence on students' writing.

Drawing from these studies, Fortunati and Vincent (2014) build on Ronald Barthes and make a distinction between writers with a lower case W – amateur writers with a less engaged approach to writing – and Writers with a capital W – who are more determined in their way of writing, handling and revising manuscripts. Writers with a lower case W have become numerous with the explosion of texting, blog writing, tweeting and status updating in social media. A similar division between Reading (with a capital R) and reading (with a lower case R) can be made. Griswold (2008) writes about reading with a capital R, when referring to sustained reading for pleasure and information in one's leisure time. In knowledge-based economies, reading has become an increasingly integral part of education and work, too. For this reason, scholars also have started to analyse how ICTs influence reading (with a lower case R) more broadly in societies (Cull, 2011; Hillesund, 2010).

Regarding university students, many studies point out that students in different parts of the world still prefer reading on paper to digital (Cull, 2011). The information is searched online, but documents are rather read as printed. In China, some gender differences have also been found in relation to reading practices. Liu and Xiaobin (2008) found that women prefer paper to digital more than men. Women are also more linear, thorough and sustained readers than men. In the printed environment they also annotate more often than male readers.

From these theoretical premises and previous empirical findings emerge a broad picture of how digitalization affects the daily practices of reading and writing. What does not emerge is the balance between the perceived positive and negative affordances, which would indicate how much "living space" digital reading and writing has managed to occupy from paper and pen. Hence, the first research question (RQ) posited for the study is:

> RQ1. How do college students in Finland perceive the affordances of electronic reading/writing when compared to reading/writing on paper??

Further, when positive affordances of a technology are recurrently used, it can be assumed that shared cognitive structures (i.e. technological frames) concerning them are more widely adopted in a social group in question (Orlikowski and Gash, 1994, p. 200). Eventually, a continuously and habitually utilised affordance may transform into a taken-for-granted affordance. However, this may not occur simultaneously in different social groups and in different countries. To tackle this issue, the following research question is considered for the study:

> RQ2. In what respects, if any, are the perceived affordances in Finland different from those found by Fortunati and Vincent in Italy?

As Finnish college students have experienced digitalization in education earlier than Italians, some country differences can be expected to arise. Owing to their longer experience in using digital technologies in school, Finnish students may possess a different technological frame

and thus relate more affordances to digital reading and writing practices and fewer to paper and a pen than their Italian counterparts.

1.2 The richness of reading and writing experiences

A technological frame, through which more (positive) affordances are recognised and put into practice, can be expected to produce a richer media experience. To examine this, the study draws from the Media Richness Theory, originally developed by Daft and Lengel (1986). The key arguments of this theory present that 1) media differ in the level of "richness," with face-to-face communication being the richest and other media being capable of conveying fewer cues (e.g., gestures, posture, vocal inflections) and supplying slower feedback (e.g., e-mails, text-massages, memos), and 2) the performance improves when people (or business managers in Daft and Lengel's study) use richer media for equivocal tasks and leaner media for unambiguous tasks. From the perspective affordances, the richer media provides more affordances to covey a higher number of cues, which in turn should contribute to the efficiency of communication processes.

The Media Richness Theory evolved before the rise of the new digital media and has also confronted much scepticism (Barnard, 1991; Rice, 1992; Fann and Smeltzer, 1989; El-Shinnaway, 1997). New media technologies have been retroactively integrated in the framework of the theory (Rice, 1992; Dennis and Kinney, 1998) and criticism has led to revisited interpretations. For instance, Dennis and Kinley (1998) propose that this theory is perhaps good enough to study old media, but that new "lean" media may be rich enough to enable users to successfully communicate for relatively complex tasks. As Anandarajan et al. (2010) propose, it is worth asking if the perceived media richness should rather be studied side by side with use richness. This would mean a shift from the investigation of technical affordances to the study of technologies in practice. Previous studies hint that in practice, only a relatively small share of all available technical functions of new media are exploited by the masses (e.g., Fortunati and Taipale, 2013).

Thus, the daily practices of new media use may remain rather straightforward, although the new digital devices provide more and more technical means to perform complicated and multimodal communication. Such inertia in the use of technology is explained with a propensity to retain the existing ways of doing things (Orlikowski, 2000). Statistics indicate that well-equipped devices, such as large-screen smart phones and tablet computers with built-in cameras, high-resolution (touch) screens and full keyboards (either digital or conventional ones) as well as e-book readers, are truly hitting the markets in Europe (e.g., comScore, 2010). From a technical standpoint, their design makes them look as more genuine alternatives to the paper. It is still completely unclear, however, which of the technical features of these devices that are supplied to the users are really perceived useful and employed. Based on these considerations, the following research question that was also presented by Fortunati and Vincent, is considered for the study:

> RQ3. Have electronic reading and writing become richer experiences than paper reading and writing?

Fortunati and Vincent (2014) conclude that there is no evidence that reading and writing digitally would convey in practice a richer communication in Italy. Quite the contrary, they

argue that paper and a pen still enable sensorial and emotionally more intense experiences, which Italian students could not draw from a keyboard and screen.

2. Methodology

The research design of this study is replicated from the study presented by Fortunati and Vincent (2014). Exactly the same four questions were used in Finland. The questions were:

(1) Describe the differences you find when using a pen and using the computer. Furthermore describe what you like and dislike about both these modalities.

(2) Describe which differences you find in reading paper and reading on a screen. Furthermore, describe what you like and dislike about both these modalities.

(3) Think now of the gestures and postures you assume in reading and writing using paper and on a screen. Reflect and describe them.

(4) Think now to your use of the computer/Internet. This tool allows multimodal communication (images/videos, texts and sounds, music and so on). How do you use it? Reflect on your personal experience and then describe it.

Like Fortunati and Vincent, only the first two questions were systematically analysed in this study. In other respects, the design includes some deviations from the Italian study. Regarding a target group, Fortunati and Vincent analysed research material collected from 24 graduate Masters students of the course in "Multimedia Communication and Technologies of Information" at the University of Udine, Italy. In Finland, 25 students, who were not participants of any particular course, answered the essay questions. They were approached through the student e-mail lists of the Department of Communication, University of Jyväskylä, Finland. The lists covered students ranging from undergraduates to doctoral candidates (542 enrolled students on February 21, 2012) and representing different fields of communication studies (Intercultural Communication; Journalism; Organizational Communication and PR; and Speech Communication). These differences in the sampling method and frame stem from a practical constraint. Unlike Fortunati and Vincent in Italy, the author had no direct access to communication students and could not carry out the study as part of any particular course in Finland.

Web links to the Finnish and English versions of the questionnaire were posted through the email lists on January 17, 2013. Students were asked to respond by February 8, 2013. To increase the answering rate, lecturers and professors, who were teaching at the Department of Communication, were contacted and asked to promote this study in their classes by showing a PowerPoint advert slide. Of 25 answers, 24 were provided in Finnish and they were translated into English by the author. One student responded in English. Background information that was collected shows that 3 of the respondents were men and 23 women. The average age of respondents was 27. Thirteen were undergraduate Bachelor, eight graduate Masters, and six Doctoral students.

Communication students are a specific research target group as regards to investigating reading and writing practices (Fortunati and Vincent, 2014). In their academic studies, communication students are expected to read and write, and thus they are familiar with the

difficulty of both practices. The modes of study are rapidly digitalising, too. For instance, the studied university students are increasingly taking their exams digitally in an eExam room, which is equipped with electronic access control and camera surveillance. The university students are also used to reading scientific books and articles, which as literary categories are different to those they and other people encounter outside the academe. Students are also taught academic writing, which differ from writing in prose in several respects. In summary, in this study communication students are readers with a lower case R and writers with a lower case W as they are investigated as members of the academe.

Student essays are analysed by following the guidelines of theory-directed content analysis (Krippendorff, 2004; Neuendorf, 2002). The chosen method is useful to empirically challenge and further develop the previous theoretical and conceptual frameworks (Hsieh and Shannon, 2005). Keeping the theoretical starting points in mind, the frequency of affordances discussed by the respondents were calculated, and the most recurrent were identified. The categories found by Fortunati and Vincent were used as a starting point for the coding of Finnish essays. Of the more uncommon categories and the categories that were not detected in the Italian study, those that were theoretically intriguing or enriched the main findings were also preserved. The author analysed all essays by himself to ensure the consistency of coding process. The meanings and nuances of the categories were constantly discovered and compared, both with other categories and with the categories that emerged in the Italian study. In this way, the study should be systematic, but not rigid in its analysis (Altheide and Schneider, 2013).

3. Results

Results are organised in four sub-sections following the order of presentation in the Fortunati and Vincent study (2014). The positive affordances are presented before reporting negative ones in each section. Pseudonyms are used to ensure the anonymity of the respondents, whose age and gender are also supplied.

3.1 Writing on paper

The topmost affordances of writing on paper for Finnish students are immediacy, personality, and portability in communication practices. For example, Virpi (25, female) writes *"I think pen writing is more personal than computer writing"* and Eveliina (22, female) that *"I write letters always by hand, as it is more personal and more beautiful."* The same affordances were also mentioned as key findings in the Italian study.

In Finland, the possibility to leave a personal imprint is considered as a source of intense emotions, just like in Italy (Fortunati and Vincent, 2013, p. 45). This emotional bond gives a reason for some students to keep on writing by hand in preference to digital communication, as the following excerpt shows:

> *Handwriting is slower and impractical, but at the same time more personal and enjoyable. -- Writing with a pen also relates to the joy of chirography. My chirography is unique and it often catches other people's attention. I feel that it says something about my persona and perhaps because of this I want to cherish handwriting.* (Miira, female, 24)

Writing on paper is deemed as a more flexible practice than writing digitally. The same observation was made by Fortunati and Vincent (2014, p. 45) in Italy. In fact, the affordances of drafting, drawing and writing sideways is one of the most recurrent categories in the research material collected for this study.

> *On the other hand, a great thing in pen writing is a possibility to write on different parts of a paper sheet, in different directions and with different coloured pens, use text of different size, and insert this and that here and there. Making a mind map with a computer is, in principle, much more difficult, and requires efforts to a different extent.* (Kaisu, 21, female)

> *What I like most about a pen, is that it is quick to add notes, comments, and all kind of drawings in the text and on the side. For example, for me drawing arrows is easiest by hand.* (Kata, 23, female)

Compared with Italian students, as reported by Fortunati and Vincent (2014), Finnish students are more sceptical towards the usefulness of chirography. Selja, a 23 year-old female student, writes that "*The only thing when the pen and the paper are useful is when executing and re-shaping various charts and graphs.*" Like in Italy, writing on paper is considered as an ideal mode of taking notes, drawing mind maps and alike, but otherwise the need for handwriting is seen a diminishing in Finland.

> *When writing by hand, I only take notes and do mind maps, otherwise there is seldom any need to write by hand. In case I do, I write visually different patterns, by combining lines, by drawing, and even on the top of another text.* (Joni, male, 30)

The above excerpt indicates that Finnish students have slowly become estranged from chirography. It is seldom used for purposes other than drawing and taking short notes. Students write in their essays as if chirography should justify its own existence and purpose each and every time.

Research material includes even more distinct evidence supporting this proposition. For example, Ville, a 24 year-old male student, writes that "*For me handwriting is already so rare [practice] that writing a longer text quickly induce pain and even hand cramps, which further complicates and slows down writing.*" Even students who appreciate the art of chirography are inclined to think that handwriting is becoming a rare practice. The following excerpt illustrates this:

> *Since I write with a pen less than before, while writing I evaluate how handwriting has changed. I appreciate a beautiful and personal handwriting. In fact, I believe that practicing handwriting is also about practicing personality! I would like to continue to write the important things with a pen.* (Laura, female, 35)

While chirography is losing its popularity, people seem to become more self-reflective towards it. Writing on paper makes people think about themselves: how they have changed as persons and how their chirography has changed since they used a pen more regularly. Joni, 30 year-old male, writes about this and recognises that his handwriting is not so neat any longer: "*My handwriting has considerably worsened; it is frustrating to fill in, say, paper questionnaire, when you have to scratch here and there.*"

In Italy, Fortunati and Vincent (2014) found that writing on paper gives more room for creativity, aesthetics, and artistic practices. This observation applies to Finland as well, yet Finns seem to appreciate more the practical side of visual affordances. For example, Armi (34, female) writes that what she likes about *"writing with a pen on paper is that it makes me write more creative texts and it is nice to see visually my own handwriting."* The visual aspect is also important for Kaisu (21, female). She appreciates writing on paper because she can see what she has *"rejected by crossing out."*

Another similarity between the two countries is that writing on paper is considered as a process that favours a complete formulation of sentences because it is a slower practice than typing. For example, Miira (24, female) writes, *"Handwriting is slower, but at the same time it provides time to ponder the contents of the text that I produce. When writing with a pen, I use more creative and richer language."* Tiina (28, female) writes, *"When handwriting I think more carefully in advance what I want to say, while typing I can continuously edit the text"*. Actually, it is a well-known fact that handwriting as a slow activity provides time for cognitive processing (Ong, 1982). For this same reason, many respondents mention that chirography enables better memorization. Pihla (21, female) explicitly addresses this issue by writing that "*Things remain better stored in my memory if I write them down with a pen - perhaps because writing with a pen is slower than typing."* Saara (22, female) notices the same affordance: *"writing by a pen things are a little more memorable as you have to write each and every letter by yourself."*

Next, the attention is turned to the negative affordances of writing on paper. In Italy, Fortunati and Vincent (2014) notes getting fingers dirty as the first defect. In Finland, none of respondents were concerned how a pen or ink would affect their body. The second point brought up by them, that writing on paper is a slower process than on a keyboard, receives remarkably attention also in Finland. Selja (23, female), for instance, describes that *"Writing with a pen is in every way a more cumbersome and wearing business than typing."* Armi (34, female) adds *"What I don't like about writing with a pen is that in long texts it is time-consuming."* Also Meri (20, female) expects that writing with a pen should be faster: *"Hand is not fast enough to write at the speed of thought."*

In Finland, the slowness of chirography is first and foremost related to the expectation that handwriting should be faster in order to be a true alternative for typing. This indicates that they already take this affordance of digital writing as a point of reference when evaluating the affordances of chirography. Finnish students also ponder how much writing on paper affects thinking. In this connection too, it appears that typing is really grounded in their technological frame of reference. The next excerpt from the students' essays illustrates this:

> *I like writing on a computer because you can almost always easily correct the text, which in turn makes writing quick and intuitive - the text can be produced almost as fast as you can think. While [as opposed to typing] writing on paper every sentence must be planned carefully before the tip of a pen even touches the paper, which makes thinking fragmentary and tangled.* (Ville, 24, male)

As their technologic frame is so aligned with the logic of digital writing, students also express certain feelings of nostalgia towards writing on paper. This finding did not strongly emerge in the Italian study, which hints that the technological frame of Finnish students may guide their interpretations and expectations of writing more powerfully towards the digital. Kata's (23, female) comment, *"I may feel old-fashioned if I take notes with a pen on a cross-ruled*

paper", reveals how paper and pen are associated with the past. The following comment adds to this interpretation:

> *I also like the feeling of writing with a pen on paper, it is a sort of a good-old-time feeling. And the fact that you can concretely see what you write and what you know, that it cannot disappear just like that, unlike when you write on a keyboard and the machine may overheat or so.* (Kaisu, 21, female)

Finnish respondents like their Italian colleagues bring up that their handwriting has worsened over the years and that this is sometimes embarrassing (Paula, 30, female). Difficulties in sharing handwritten texts are also mentioned in the Finnish responses (e.g., Martti, 23, male; Kaisu, 21, female). Lastly, the research material exhibits that differences in the structure of languages influence responses. Fortunati and Vincent (2014) bring up the use of aids, such as a dictionary or a thesaurus, that complicates and breaks the rhythm of handwriting. Writing in Finnish rarely necessitates such aids, and hence this issue does not emerge from the Finnish research material.

3.2 Writing on a keyboard

Clearly a majority of respondents appreciate more writing on a keyboard than writing with a pen on paper because of its speed and higher textual productivity. The following excerpts are examples among the many that indicate the superiority of a keyboard over a pen: *"It is definitely faster to write on a computer than with a pen"* (Melissa, 24, female); *"When writing on a keyboard, writing is of course faster"* (Saara, 22, female); and *"On a computer I write longer texts"* (Antti, 44, male).

Another affordance, that is more characteristics of Finnish than Italian students, relates to the possibility to immediately document one's thoughts. This can be understood as another dimension of textual productivity and efficiency that is strongly appreciated by Finns. Aino (22, female) writes that *"I love writing on a keyboard as I can write quickly before I lost my point"* and notes that *"When writing on a keyboard, I put on paper ready thoughts sentence by sentence. Thinking is straightforward and succinct."* These two excerpts reveal how much they really value the possibility to minimise the time between coming up with an idea and writing it down.

The possibility to modify text is also recurrently mentioned in the essays (e.g., Saara, 22 female; Kaisu, 21, female; Aino, 22, female; Kata, 23, female). In general, this finding is perfectly in line with the findings of Fortunati and Vincent (2014). But on a more detailed level, Finnish students value more the affordances of quickly editing and finishing the text without delays. Armi (34, female), for example, writes about this by comparing writing digitally with chirography:

> *On a computer, I edit the text immediately and I'll try to write the text as complete and accurate as possible right when I have concluded the sentence for the first time. When writing on paper with a pen I don't think so thoroughly, but I explain and specify in the next sentence if further explanations are needed.* (Armi, 34, female)

Selja (23, female) reflects on quick editing, too. She does not even recognise the affordance of paper that allows writing several drafts before a fair copy. It all should be ready at once, without several rounds of editing.

> *The text is easier to edit on a computer afterwards, so it is more likely that all ideas will come out, while when writing on paper you sort of have to manage with what comes to your mind at that particular moment, and thus the outcome is easily unclear and inconsistent.* (Selja, 23, female)

Writing on a keyboard is described as an economic mode of writing. It is not only that more text can be produced in a shorter period of time. Typing is also cost-effective in the sense that you can produce excess sentences with little trouble, and later delete these useless sentences easily without feeling a great loss, like Meri explains:

> *On a computer [I produce more] stream of consciousness writing. In other words, I do not think so much what I write but I form my text by writing down also dumb sentences. When writing on paper, I'm just too lazy to produce excess sentences, but I'm rather turning over the text in my mind. In general, the editing and processing of text is much more productive on a computer.* (Meri, 20, female)

Fortunati and Vincent (2014) found many references to 'augmented writing'; writing that is enhanced by automatised editing tools, such as automatic corrections of orthographic, grammar and syntax mistakes. There are only very few references to such aids in Finnish responses. This might, as noted above, results from the differences in linguistic structures, but Finns are also rather critical towards such technical aids. For example, Meri (20, female) writes that *"You make more mistakes with inflected forms as you blindly trust in automatic corrections. The word may be correctly spelled, but in that specific context the inflected form, for instance, is wrong."*

Other positive affordance of electronic writing is that it hides the process of writing. Tiina (28, female) writes, *"I like typing as it doesn't reveal my ugly handwriting"* (also Paula, 30, female). Others, like Armi (24, female), do not directly comment on their own style of writing but they like typing as *"you can make corrections to the text also afterwards and it still looks neat."*

Lastly, writing on a keyboard is described as a better choice when there is a need to write and simultaneously look to another place. It is startling that Finnish students do not notice that it is similarly possible to write with a pen without looking back at paper at the same time: they present as if this is only possible with a computer. Eveliina (22, female) puts it very succinctly: *"When writing with a pen I look at the paper more, but when typing I can write without looking at a keyboard or even a screen."* Oona (22, female) is more verbose in her answer:

> *When typing I can better focus on the surroundings, and I don't need to look back at the keyboard all the time. While handwriting I have to look at the paper continuously. For instance, on a lecture I can follow the notes from a big screen, but when writing with a pen I have raise my eyes up and down, again and again.* (Oona, 20, female)

Regarding negative affordances, students for example perceive a computer as a source of distraction. For example, Eveliina (22, female) writes that *"I don't bother myself dragging a*

computer to the lecture room, I'm afraid it would interfere with my concentration, also staring at a screen is tiresome." Similar findings were reported from Italy, where computer mediation was described as a vehicle of distraction. It was also reported to fragmentise the thinking process (Fortunati and Vincent, 2014). Lastly, what is peculiar to Finland is that students do not reflect much on how writing on a keyboard affects the body. In this respect, Italian students were quite specific in their answers (e.g., they brought out the issue of writing tendonitis) (e.g., Fortunati and Vincent, 2014, p. 47). In Finland, the bodily impacts were more associated with reading from on screen, the issue that will be discussed below.

3.3 Reading on paper

What is preferred in reading on paper or screen depends on the typology and length of the text. In this regard, findings from Finland are similar to those reported from Italy (Fortunati and Vincent, 2014) and in many other countries (Cull, 2011; Liu and Huang, 2008). Respondents prefer reading short texts, like academic articles, on a screen but opt for reading printed books. Like several other students, Miira (24, female) explains this as follows:

> *If, say in studies, it is possible to choose between reading the same book as a printed or as an electronic version, I choose always the paper version even if it is more difficult to carry along. -- If I have a chance to read both printed and online newspapers, I usually use the paper version - - Reading on a screen makes more sense, when the text is short (e.g. articles). The easy accessibility then outweighs the comfort of reading.*

The length of the texts differentiates reading habits even more powerfully than typology of texts. For instance, Aino (22, female) writes that she likes *"reading entertaining texts on a screen, that is, mainly short pieces of text. I also 'read' more pictures from a screen."* Saara (22, female) also argues that when reading *"FB [Facebook] or online magazines it does really feel different [to reading on paper],"* but she admits that the case if different *"when reading especially long texts."*

What Sellen and Harper (2002) concluded more than a decade ago is still timely: the possibility to underline and annotate simultaneously while reading is one of the key affordances of reading on paper. It is one of the most frequent affordance categories in the research material collected from Finland. For example, Joni (30, male) writes, *"While reading on paper I use a pen. I even modify and make marks on my book to remember where I stopped reading."* Eveliina (22, female) adds that: *"In an ideal situation, I can underline and annotate to the side of the text, which of course is not possible if it is a library book"* (also Niina, 23; Aura, 53; Marja, 40; Kata, 23; all females). Another oft-mentioned affordance is that reading on paper does not tire the eyes. For example, Martti (23, male) writes that reading on paper is *"natural, I can stare hours and hours at a stretch"* (e.g., also Ville, 24, male; Eveliina, 22, female; Armi, 34, female; Niina, 21, female). Unsurprisingly, these two affordances were also reported in the Italian study.

The fact that reading on paper is possible everywhere and you can vary postures while reading are other positive affordances associated with reading on paper. For instance, Tiina (28, female) describes that she can read a paper book in bed before sleeping: *"the laptop would be much more uncomfortable to take along to a bed,"* Ville (24, male) is more descriptive in his answer:

In addition, I really like the possibility of reading in natural light, for instance while sitting in front of a window, on a couch or when lying on a bed, even on the seat of a bus. Reading on a screen in a moving vehicle is almost impossible, while reading on paper is somehow doable.

Students still value more the portability of books and paper, although electronic reading tools, such as laptops, tablets, and e-book readers are also made to be portable (e.g., Armi, 34, female). When reading on paper you are not reliant on electricity, wall sockets and Internet connections (e.g., Niina, 21, female). Laura (35, female) summarises this as follows: *"Paper follows me wherever I go. I carry books and magazines under my arm, and I pack them in my already-full bag."*

Reading on paper is described as a focused and sustained practice compared with reading on screen. *"For me it is easier to focus on reading on paper,"* writes Armi (34, female) who shares her view with many others (e.g., Kata, 23, female; Oona, 20, female). What is valued greatly is that external factors do not disturb reading on paper as much as they do when reading on screen. Eveliina (22, female), for instance, writes that *"patience and ability to concentrate are much better than on paper compared with reading on screen, and the temptation to do something else is lower."* Virpi (25, female) notices another aspect: *"When I read on paper, I can count on the fact that there are no banner ads popping out that would irritate me when I am reading something that I am really interested in."*

The only negative aspect in reading on paper reported in Italy was that the search of words in the text is dependent on memory. While this aspect is not vividly discussed in Finland, students note another negative affordance. Certain text types are not available as printed at all. Tiina (28, female), for instance, considers it as a disadvantage of reading on paper that she cannot read blogs in a printed form. This can also be considered as a proof of embeddedness in the world of digital texts.

3.4 Reading on screen

Fortunati and Vincent (2014, p. 10) point out that reading on screen provokes fewer positive comments than reading on paper. They even state that reading from screen may be the Achilles' heel of the digitalization of the writing process at large. Research material from Finland provides support for these findings. In Finland, one of the few positive affordances, like in Italy, is that words and phrases can be easily searched by using technical aids. Armi (34, female) states that *"As regards reading on screen I like that with help of a search function, it is easy to find the point of text you are looking for."* Martti (23, male) refers to the same virtue, but emphasises more the economy of such reading practice *"'find words' facilitates reading, you don't need to read everything."*

Regarding the negative affordances of reading on screen, remarks found from the research material are a little more numerous. As a logical opposite to the pros of reading on paper, it was mentioned that reading longer texts on screen tires the eyes. Ville (24, male), for instance, stresses that: *"I need to squint a lot when reading long texts, and at times I have to look elsewhere before I can continue"* (also, Tiina, 28; Eveliina, 22; Pihla, 22; Meri, 20; Mari, 20; all females). The postures you need to take for reading from a screen do not satisfy respondents either. Armi (23, female) also raises the issue that *"A tablet screen doesn't feel in hand as nice and doesn't please me as a book or a magazine."*

Other negative affordances of reading on a screen relate to the limited size and dimensions of the screen that are issues also discovered in Italy (Fortunati and Vincent, 2014). *"I'm annoyed that I have to click and click, and download to get text in sight,"* complains Laura (35, female). Kaisu (21, female) feels uncomfortable when there is a need to get text to fit into the screen adequately. She writes: *"On the other hand, if I read a PDF file, each sheet contains two pages. To read it you must zoom in, move up and down when you make progress in reading, and then you need to move horizontally too, I get annoyed."*

To conclude, the research material indicates that Finnish students are amidst a transition from reading on paper towards reading from a screen. Some respondents describe how they have recently been successfully moving to reading electronic materials, as they have found that it is supported by functionalities, such as annotating and highlighting that they also like about reading on paper.

> *Until last year I was mostly a paper reader but I slightly evolved so that now I think I'm equally competent as a paper and online reader. I used to print articles if they were longer than 10 pages but nowadays I manage to do that online. I got used to it but I also got this application to write notes on a PDF file so that I can act on online documents as much as I would do on paper.* (Melissa, 24, female)

Also, Raisa (22, female) expects that she would be ready to utilise electronic texts more. She writes that *"I feel that it is only a question of getting used to it, and that I could manage reading on a screen, too."* She just needs to have a bit more experience in using a computer for reading. These findings give a reason to believe that the screen is becoming a more serious alternative to paper in Finland.

4. Discussion

With the first research question (RQ1), the study aimed to investigate how college students perceive the affordances of electronic reading/writing when compared to reading/writing on paper in Finland. The results support previous findings that argue for the persistence of positive affordances of paper (Sellen and Harper, 2002) and those that speak for the significance of even small changes in daily reading and writing practices (Cull, 2011; Warde, 1995; Reckwitz, 2002).

First, the study clearly confirms the finding of Fortunati and Vincent (2014) that positive affordances of writing on paper outnumber the negative ones. These positive affordances are mainly the same as those reported from Italy: immediacy, personality, portability, flexibility in style, and direction of writing. Fortunati and Vincent (2014) presented doubt whether this should be understood as "a kind of nostalgic link with old technologies or as the fact that writing on paper will continue to have a secure future" (p. 48). Regarding Finland, the results indicate that there is at least a good hint of both involved.

Second, many of the positive affordances of reading on paper were similar to those found in Italy. When compared with reading on screen, reading on paper allows easier annotation and underlining, and varying postures. Reading on paper was also perceived as a more focused and sustained practice, a result that is aligned with previous findings from China (Liu and Huang, 2008) and the US (Purcell et al., 2013). Third, reading from screen attracts fewer

positive affordances, yet it is also evident that shorter and professional texts are increasingly read on screen.

Fourth, regarding reading and writing digitally, this study confirms that computer technologies have had a more substantial effect on the production of writing than on reading from screen. Computer technologies have clearly produced a birth of student writers with a lower case W (Baron, 2008), and increased their textual output. At the same time, in Finland writing on a keyboard has reinforced the identity of students as kind of neoliberal mass producers, who perceive the importance to write a lot, quickly and instantly without losing time.

The same attitude towards ICTs as the "means of production" has been found from the opinions of school principals. In 2006, 47 per cent of school principals in Finland considered it "Very important" that the use of ICT in schools prepares students for working life. In Italy, the share of school principals who agreed with the same statement was only 27 per cent. However, Italian school principals considered more often than Finnish principals that it is important that the use of ICTs improves students' performance in schools (15 % vs. 5 %), improves their skills (34 % vs. 21 %), and meets the expectations of their parents (24 % vs. 17 %) (Kankaanranta and Puhakka, 2008). These findings add to the picture that Finnish educational culture, like national culture in general (e.g., Tuohinen, 1991; Heiskala and Luhtakallio, 2006), resonates more with the ethos of work and competition than the Italian schooling system, which associates the role of ICTs more pronouncedly with educational attainments. Nevertheless, it is not quite sure to what extent these results dealing with Finland originate from the affordances that are headlong utilised and to what extent from the political and economic zeitgeist. Both are likely to be guilty and both affect the shaping of the technological frame that guides students' interpretation of digital writing technologies.

The second research question (RQ2) of the study was: in what respects, if any, are the perceived affordances in Finland different from those found by Fortunati and Vincent in Italy? First, by comparing the results of two studies, it turned out that in Finland writing with a keyboard was a point of reference for all comparisons in students' responses, while in Italy it was more typically a combination of paper and pen. It entails from this that at least in this respect the technological frames of reference are profoundly different in these two countries. Although it is difficult to assess up to what age students write by hand at schools, as it differs remarkably within Finland (e.g. between municipalities and schools), the National Curriculum of Finland requires that during the first and second year of primary school (between ages 7 and 8), students should start learning both how to "hold a pencil correctly" and how to "write with a computer" (Board of Education, 2004). Hence, the educational system considers it important that the physical experience of handwriting and typing are simultaneously developed in schools from very early on. Second, another difference pertains to textual productivity: Finnish students welcome more output efficiency, which is in line with the Finnish ethos of work and competitiveness, and fewer less technical aids, such as automatic corrections, than Italians. These technological aids are not considered to be working sufficiently to support the textual productivity. Lastly, Finnish students are clearly less aware of the impact of calligraphic writing and digital writing on their body than Italian students.

The third research question (RQ3) was the same as the second question in the Fortunati and Vincent study: Have electronic reading and writing become richer experiences than paper reading and writing? Fortunati and Vincent's (2014) answer put it quite plainly: "digital

media do not automatically convey richer communications in term of sensorial and emotionally intense experience" (p. 49). This conclusion might partly stem from the long-established cultural expectations about the physical affordances of printed media (MacFadyen, 2001). This study indicates that Finnish students, who have adopted computers in school some years earlier, show signs of more versatile and richer use of digital reading and writing technologies than their Italian counterparts. A form of "augmented reading" practices arises as students are beginning to learn how to annotate and underline electronic texts. Apart from this finding, the study does not provide any support for the idea that digital media would be able to challenge paper and pen in terms of the richness of communication.

5. Conclusions

This study departed from a theoretical premise that by investigating daily practices of reading and writing on paper and digitally, it can be determined what affordances people associate with paper/pen and keyboard/screen. The technological frames approach was applied to understand whether or not the frames that guide students' perception and sense making of these writing techniques differ between Finland and Italy. Insofar, studies have discussed how entire devices, such as the mobile phone (Ling, 2012), become taken for granted in societies, but this study disclosed the existence of *taken for granted affordances*.

More specifically, the study showed that while some of the affordances of digital writing on a keyboard are clearly already taken for granted in Finland, others are still in the process of legitimising their usefulness (e.g., technical aids). For example, it was presented that writing notes without looking at the keyboard was a widely-spread practice in Finland, while writing with a pen without looking at the paper was considered as if it were impossible. The study also proved that writing as a process, including editing, reorganization of text and finishing up the text, was almost categorically associated with digital writing only: to do the same task with paper and a pen was considered too arduous. There is a correspondence between this observation and what Baron (2014) calls "one-off reading" referring to the assumption that the text is only read once. Similarly, student responses in this study reflect the idea of "one-off writing": when the text is finished for the first time, then it is done.

In fact, it is almost an irremovable part of the technological frames approach that some affordances of a technology become "taken for granted." As recurrent use of a technology is indispensable for the emergence of new technology-in-practice, habitual use eventually leads to the "congealment of practices" (Camilleri, 2012, p. 165). The empirical evidence of this study points out that some affordances, such as taking notes digitally and writing as a process that is only feasible with a computer, have congealed in the technological frames of Finnish students more firmly when compared with Italian students.

Another theoretical conclusion relates to the research design, which includes the comparison of the older technologies of reading and writing with newer ones. According to the theory of technological frames, people are inclined to approach the new in terms of their pre-existing technological frames (Orlikowski and Gash, 1994, p. 191). Finnish students clearly took digital writing as their frame of reference when they were asked to evaluate the difference between writing on paper and digitally. It was their pre-existing and prevalent frame, unlike in Italy where students mainly approach digital writing in terms of chirography, that here represent the older technique of writing. However, the same country difference does not

apply to reading practices. Both in Italy and Finland, reading on paper was clearly a basis of comparison when the virtues and defects of reading on screen were evaluated.

To conclude, the study brought out that cultural dissimilarities and the timing of digitalization are both relevant factors for understanding the country differences found in this research. Regarding the former, research material from Finland included a significant handful of neo-liberal productivity talk and considerable less discussion of the bodily impacts of reading and writing than the Italian study. Regarding the latter, the study indicated that Finnish students are little by little moving towards the world of digitally augmented reading, that is an issue not found and discussed in the Italian study. Certainly, both lines of argumentation have explanatory power for understanding country differences, yet more focused analyses on both are required.

Bibliography

Altheide, D. L., Schneider, C. J., 2013. Qualitative Media Analysis. 2nd ed. SAGE, Los Angeles.

Anandarajan, M., Zaman, M., Dai, Q., Arinze, B., 2010. Generation y adoption of instant messaging: an examination of the impact of social usefulness and media richness on use richness. IEEE Transactions on Professional Communicatio, 53, 132-143.

Arminen, I., 2002. Design-oriented sociology. Acta Sociologiaca 45, 315-321.

Barlett, F. C., 1932. Remembering: A study in experimental and social psychology. Cambridge University Press, Cambridge.

Barnard, J., 1991. The information environments of new managers. Journal of Business Communication 28, 312-324.

Baron, N., 2008. Always On: Language in an Online and Mobile World. Oxford University Press, New York.

Baron, N., 2014. Does Mobile Matter?: The Case of One-Off Reading. In Goggin, G., Larissa, H., (Eds.), The Routledge Companion to Mobile Media. Routledge, London.

Berger, P. L. , Luckmann, T., 1967. The Social Construction of Reality: A Treatise in the Sociology of Knowledge. Anchor, New York.

Board of Education, 2004, Perusopetuksen Opetussuunnitelman Perusteet 2004 [Core Curriculum for 2004] Board of Education, Helsinki. Available at: http://www.oph.fi/download/139848_pops_web.pdf [Accessed 19 November 2012].

Camilleri, P., 2012. Teachers' interpretations of the internet. An applied case study for the evaluation of technological frames of reference. Informatics in Education 11, 151-167.

comScore, 2010. 2010 Europe Digital Year in Review. [Online] Available at: http://www.comscore.com/Press_Events/Presentations_Whitepapers/2011/2010_Europe_Digital_Year_in_Review [Accessed 25 January 2012].

Cruz-Jesus, F., Oliveira, T., Bacao, F., 2012. Digital divide across the European Union. Information & Management 49, 278-291.

Cull, B. W., 2011. Reading revolutions: online digital texts and implications for reading in academe. First Monday 16.

Daft, R. L., Lengel, R. H., 1986. Organizational information requirements, media richness and structural design. Management Science 32, 554-571.

Davidson, E., 2006. A technological frames perspective on information technology and organizational change. The Journal of Applied Behavioral Science 42, 23-39.

Dennis, A. R., Kinney, S. T., 1998. Testing media richness theory in the new media: the effects of cues, feedback, and task equivocality. Information Systems Research 9, 256-274.

Dourish, P., 2004. Where the Action Is: The Foundations of Embodied Interaction. MIT Press, Cambridge.

Fann, G. L., Smeltzer, L. R., 1989. Communication attributes used by small business owner/managers for operational decision making. Journal of Business Communication 26, 305-321.

Fortunati, L., Taipale, S., 2013, accepted. The advanced use of mobile phones in five European countries. British Journal of Sociology.

Fortunati, L. & Vincent, J., 2014. Sociological insights on the comparison of writing/reading on paper with writing/reading digitally. Telematics and Informatics (online first), 0-13.

Gibson, J. J., 1986. The Ecological Approach to Visual Perception.: Lawrence Elbaum, Hillsday.

Griswold, W., 2008. Regionalism and the reading class. University of Chicago Press, Chicago.

Heiskala, R. & Luhtakallio, E., (Eds.) 2006. Uusi jako: miten Suomesta tuli kilpailukyky-yhteiskunta? [New Divide: How did Finland become a competition society?] Gaudeamus, Helsinki.

Hilbert, M. López, P., Vásquez, C., 2010. Information Societies or "ICT Equipment Societies?": Measuring the Digital Information-Processing Capacity of a Society in Bits and Bytes. The Information Society: An International Journal 26, 157-178.

Hillesund, T., 2010. Digital reading spaces: how expert readers handle books, the web and electronic paper. First Monday 16.

Hsieh, H.-F. , Shannon, S. E., 2005. Three approaches to qualitative content analysis. Qualitative Health Research 15, 1277-1288.

Hutchby, I., 2001. Conversation and Technology: From the Telephone to the Internet. Polity, Cambridge.

Kankaanranta, M., Puhakka, E., 2008. Kohti Innovatiivista Tietotekniikan Opetuskäyttöä [Towards Innovative Use of ICT in Teaching]. Finnish Institute for Educational Research, University of Jyväskylä, Jyväskylä. [Online] Available at: http://ktl.jyu.fi/img/portal/13823/d087.pdf [Accessed 18 November 2013].

Krippendorff, K., 2004. Content Analysis: An Introduction to its Methodology. 2nd ed. Sage, London.

Ling, R., 2012. Taken for Grantedness: The Embedding of Mobile Communication into Society. MIT Press, Cambridge.

Liu, Z., Huang, X., 2008. Gender differences in the online reading environment. Journal of Documentation 64, 616-626.

El-Shinnaway, M. L., 1997. The poverty of media richness theory: explaining people's choice of electronic mail vs. voice mail. International Journal of Human–Computer Studies 46, 443-467.

MacFadyen, H., 2001. The reader's devices: the affordances of ebook readers. Dalhousie Journal of Interdisciplinary Management, 7(1).

Massey, A., Elliott, G., Johnson, N., 2005. Variations in Aspects of Writing in 16+ English Examinations between 1980 and 2004: Vocabulary, Spelling, Punctuation, Sentence Structure, Non-Standard English Research Matters. University of Cambridge Local Examinations Syndicate, Cambridge.

Neisser, U., 1967. Cognitive Psychology. Appleton Century Crofts, New York.

Neuendorf, K. A., 2002. The Content Analysis Guidebook. Sage. London.

OECD, 2005. Are Students Ready for a Technology-Rich World? What PISA Studies Tell Us. OECD, Paris:

Ong, W. J., 1982. Orality & Literacy: The Technologizing of the Word. Routledge, London.

Orlikowski, W. J., 2000. Using technology and constituting structures: a practice lens for studying technology in organizations. Organization Science 11, 404-428.

Orlikowski, W. J., Gash, D. C., 1994. Technological frames: making sense of information technology in organizations. ACM Transactions on Information Systems 12, 174-207.

Purcell, K., Buchanan, J., Friedrich, L., 2013. The impact of digital tools on student writing and how writing is taught in schools. [Online] Available at: http://pewinternet.org/Reports/2013/Teachers-technology-and-writing[Accessed 6 September 2013].

Reckwitz, A., 2002. Toward a theory of social practices. a development in culturalist theorising. European Journal of Social Theory 5, 243-263.

Rice, R. E., 1992. Task analyzability, use of new media, and effectiveness: a multi-site exploration of media richness. Organization Science 3, 475-500.

Rosen, L. D, Chang, J., Erwin, L., Carrier, M. L., Cheever, N. A, 2010. The relationship between "textisms" and formal and informal writing among young adults. Communication Research 37, 420-440.

Schryer, C. F., 1993. Records as genre. Written Communication 10, 200-234.

Sellen, A. J., Harper, R., 2002. The Myth of the Paperless Office. MIT, Press Boston.

Thurlow, C., 2006. From statistical panic to moral panic: the metadiscursive construction and popular exaggeration of new media language in the print media. Journal of Computer-Mediated Communication 11, 667-701.

Tuohinen, R. 1991. 'Nuorten "työ" – protestanttisesta etiikasta kapitalismin henkeen?' [Young people's work – from protestant ethic toward capitalist ethos?) In: Hoikkala, T., (Ed.), Törmäävät Tulkinnat: Kirja Nuorista ja Nuoruudesta (Collapsing Interpretations: A Book on Young People and Youth), pp. 169–77. Helsinki, Gaudeamus.

Warde, A., 1995. Consumption and theories of practice. Journal of Consumer Culture 5, 131–153.