Traditional and digital literacy

The literacy hypothesis, technologies of reading and writing, and the 'grammatized' body

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This article discusses, from a theoretical and philosophical perspective, the meaning and the importance of basic literacy training for education in an age in which digital technologies have become ubiquitous. I discuss some arguments which I draw from the so called literacy hypothesis approach (McLuhan, Goody, Havelock, Ong), in order to understand the significance of a 'traditional' initiation into literacy. I then use the work of Bernard Stiegler on bodily gestures and routines, related to different (traditional and digital) technologies, in order to elaborate and criticize the claims the literacy hypothesis makes. Bringing together insights from both the literacy hypothesis approach and Stiegler's work, I defend the view that there exists an essential difference between traditional and digital literacy, and I try to argue for the introduction of a spelling and grammar of the digital in the educational curriculum.

Key words : literacy training, literacy hypothesis, digitization, Bernard Stiegler, David Olson.

In this article I discuss, from a theoretical and philosophical perspective, the meaning and the importance of basic literacy training for education - an age-old pedagogical issue that nonetheless needs to be reconsidered in view of the increasing impact of digital technologies on teaching and learning. In a time and age when digital media have become ubiquitous, one simply cannot avoid posing the question why the acquisition of traditional literacy skills would be indispensable, and why it has to be regarded as the ground for the rest of one's education: why bother with teaching longhand writing and demanding children to read books if they have keyboards, screens, tablets and smartphones at their disposal?[1]

In trying to come and understand the value of basic literacy training, I revisit in the second part of this article the so called literacy hypothesis, as defended by scholars such as McLuhan (1962), Goody & Watt (1968), Havelock (1982) and Ong (1982), which stresses the invaluable impact of learning how to read and write on the kind of persons we are. This view allows for redefining literacy in terms of a space of experience (rather than as a mere technical skill) and for making a case for the kind of literacy initiation one traditionally encounters in schools. At the same time I raise some criticisms vis-à-vis this position, by turning to the work of a contemporary French philosopher of technology, Bernard Stiegler. In the third and fourth part I discuss his ideas on the importance of bodily gestures and routines that go together with various writing and reading technologies, and on the way in which these may literally 'form' and 'deform' its users.

Bringing together insights from both the literacy hypothesis approach and Stiegler's work, in the last part of this article I defend the view that there exists an essential difference between traditional and digital literacy, and I argue for the introduction of a *spelling and grammar of the digital* in the educational curriculum. This is a task of a major ethical importance. I show that the elder generation is being faced with an enormous responsibility, as the very possibility for the new generation to lead a fulfilling life is dependent upon dealing with the advent of digital technologies in an appropriate way. Before doing so, however, I first need to explain in greater detail, in

[1] One may appeal here to Sugata Mitra's 'Hole in the wall' experiment and the minimally evasive education movement that sprang from it (Mitra 2012), which professes that one can perfectly achieve digital competence, but also become proficient in another language (spoken and written) and even develop a high level of criticality solely by incidentally learning while using a computer connected to the internet.

the following part, what I mean by terms such as basic literacy and traditional literacy, but also why basic and traditional literacy training are more often than not being regarded as an obsolete and, to some, even as a dangerous practice.

Literacy and literacies: a mere technical skill or a part of social practices?

Literacy might be defined, very basically, as the ability to read and write, and therefore to come and understand the relation between spoken and written language. For English and other European languages this means that one gets to master the correspondences between script (written or printed signs) and sounds, i.e. between the twenty-six or so letters of the alphabet and the basic units or *phonemes* into which each spoken word can be decomposed. The English language, for instance, consists of forty-four phonemes (Gee & Hayes 2011, 17), and so there is no perfect, one-to-one match between letters and the units of spoken language. Therefore, there is more to learning to read than *just* acquiring a capability for matching signs and sounds. Nonetheless, compared with notation systems that are based on ideograms rather than letters (which is for instance partly the case in Chinese), alphabetic literacy allows one to *immediately* start reading words one has never seen before (even if pronounced incorrectly). In order to 'read' ideograms, on the contrary, one *first* has to interpret signs that refer to meanings, rather than to sounds, and *then* transpose these meanings into an oral language which has nothing in common with written language (Flusser 2011)[2]. As such an introduction to basic alphabetic literacy normally takes one or two years, whilst learning the ropes of written Chinese takes the whole of primary and secondary education (Christin 2002). Drilling young children on alphabet letters seems thus a fast, efficient and unavoidable way to introduce them into basic literacy.

This widespread account is for many authors a simplistic view that leads to a false understanding of what literacy is all about, and moreover one that may have disastrous educational and societal implications. For instance, in a recent criticism of the prevailing ('fundamentalist') view on literacy training in English schools, Andrew Davis (2013) argues that learning to combine letters and sounds, and to blend these into speech is different from *really* grasping the meaning of words. More specifically he criticizes the

[2] This is, of course, an oversimplification as many characters in the Chinese script haven't a purely ideogrammatical function, but qualify the meaning of other signs and sometimes play a phonogrammatical role too.

'synthetic phonics method', which is so to speak a pedagogical concretization of the view I just expounded: it regards a form of literacy-training without content, or even with the explicit aim to banish meaning from learning to read and write. A most telling illustration is the 'phonics check', a test in which children five years old have to prove that they can read 'pseudowords', i.e. non-existent words like 'nop' or 'feep', in order to predict reading proficiency at a later age. However, for Davis this doesn't regard *reading*, but mere decoding. He says: 'Here, the 'reader' must refrain from ascending to the level of meaning, and, instead, merely produce a composite sound from its constituent elements. She is not being allowed, so to speak, to deal with words as such.' (Ibid., 27) Becoming literate has to do with understanding the meaning of words, and therefore a suitable literacy training should do more than just train to see correspondences between signs and sounds, and then to blend these into words. Rather, students should come and understand the point of 'look[ing]at the meaning of what they are reading before working out how to *say* it, and sometimes [of] scrutinis[ing] the context in order to identify which word is linked to the sound resulting from their blending' (Ibid., 26). Literacy is thus a complex interplay of decoding and comprehending. Therefore, educational practices that are rooted in naive and simplistic views won't enhance literacy. If children learn to become readers with the aid of synthetic phonics, it is not thanks to this method, which is a in itself a pure waste of time, according to Davis. It is only indirectly, because of the interaction with teachers and the confrontation with words in meaningful contexts, that one may acquire literacy.

From a rather different angle, the so called New Literacy Studies (e.g. Barton 1994, Gee 1999, Kress 2003, Street 2003) cast a similar critical eye on this too simple account and the consequences its implementation in education might have. Literacy, according to this school of thought, is part of 'a social and cultural practice in the lived lives of people' (Purcell-Gates 2006, 164). Situating it thus in a broader social context this school of thought shows literacy to be much more than the ability for reading and writing *per se,* i.e. just mastering (the basics of) written language in the 'technical' sense of being able to recognize the correspondences between signs and sounds (Ibid., 166; Cf. Gee 2006, 155). Rather, being literate is the result of having become familiar with particular social practices, which renders the *merely technical* activity of reading and writing into *something meaningful*: as Paulo Freire points out, reading the world should precede

reading the word (1985). Literacy is never something that is in and of itself meaningful. Rather it always has to draw its meaning from concrete ways of interacting with others and the world, i.e. from experiencing what one actually may achieve with this ability: 'learning to read is learning what people *do* with written language' (Gee & Hayes 2011, 61; italics in original).

An important consequence of this view is that it is utterly incorrect stating that there exists only one and unitary form of literacy. Rather, there are as many 'literacies' as there are different linguistic practices (Gee 1996). So, even if due to the pervasiveness of synthetic phonics in the western school system literacy is commonly held to be the ability to link sounds and letters, this actually regards just one of a rich variety of literacy practices (Cf. Gee & Hayes 2011, 61). The 'old school' form of literacy training is *only one* out of many possibilities, and moreover a practice that *exclusively* makes sense within the very particular context of formal education as we have known it for the last two hundred years or so[3]. However, according to the New Literacy Studies, this unwarranted reduction of literacy to a merely technical skill may have most noxious consequences.

First, there are well-documented devastating societal repercussions (e.g. Purcell-Gates & Dahl 1991): traditional literacy initiation affects disenfranchised groups of people who lack in their own social environment (i.e. outside of the school) opportunities to come and understand the significance of reading and writing (because, for instance, at home they don't read newspapers, write letters (or emails), talk about literature, etc.; Cf. Gee & Hayes 2011, 58-62). For children born into these surroundings literacy training at school is far from a vehicle for emancipation. Rather, it is a waste of effort. Even worse, as Freire already argued in the 1970's, acquiring literacy in a traditional way might - in spite of the best of intentions teachers might have - solidify social inequality (Freire 1985). This is because it results in a bifurcation between groups of people who actually

[3] The 'old school' pedagogies I refer to are actually not that old. For a long time literacy training consisted mainly of learning to read (or better: to recite) texts one already knew by heart (e.g. prayers) and, later on, learning to read by cramming syllables (on the basis of syllabaries). It is only from the 19th Century on that literacy training became a matter of linking sounds to the separate letters of the alphabet. This change is related to very particular technological inventions, viz. cheap cellulose paper and resistant metallic quills that became available to the masses, but also particular schoolbooks (with 'cursive' print, i.e. rounded and flowing letters that resemble longhand writing). These inventions allowed students for the first time in western history to get acquainted with individual letters *and* to learn reading and writing *at the same time* (before that era literacy training consisted mainly in getting the hang of reading; writing was even a far more seldom privilege) (Chartier 2008).

come to experience reading and writing as a way to get control over their lives, and groups of people for whom reading and writing becomes an utterly pointless activity. Or, if it does has a point for them, literacy is only seen as a skill one must learn to master in order to get good grades (and to forget all about it after passing one's final tests). Gee & Hayes (2011), who call this phenomenon *test literacy*, remark the following: 'we get students who can pass tests, but not solve problems' (67). These students actually have no sense of what literacy is for: they don't see that reading the *word* is also connected to reading the *world*, and that it might enable people to act upon their world. The traditional way of acquiring literacy is as absurd as intensively studying the manual of a complex machine, without ever using it.

Second, when taking 'old school' literacy as the sole form of literacy, we might disregard other literacies that are most likely of great importance for the quality of our communal future. And so, it might well be high time to discredit and expose the idea that the school exclusively owns literacy, and to highlight the affordances of *new* forms of literacy that are made possible due to technological (and especially digital) evolutions. Gee's (2007) analysis of the effects of playing video-games forms a case in point. Over and against pernicious prejudices regarding gaming as merely superficial, passive and consumerist entertainment, or as a training ground for materialist and violent attitudes, Gee argues that complex and interactive games actually offer strong learning environments. Therefore, he makes the overtly simplified claim that there is a lot of truth in the idea that 'you can't screw up a Dostoevsky book, but you can screw up a game'[4]. With this provocative statement he wants to say that while playing video-games one may acquire a far greater sense that one's actions have real consequences. Moreover, these games demand active collaboration with others (even if only virtually present) and the ongoing development of new skills, but also study, creativity, and a sense of community and solidarity. Dealing with a problem one encounters in *World of Warcraft* for instance, one will have to learn how previous solutions other players invented did and didn't work, to come up with and try out new ideas, which one can share with other members of the on-line gaming community, etc. As such, games offer possibilities for promoting valuable

[4] The opposition between gaming and reading is simplistic in that in most cases the purposes of reading a novel are interpretation and sense-making, rather than changing something in the world. Seen from this perspective, one obviously can 'screw up' reading a novel, e.g. when one reads it only superficially, without knowledge of the appropriate context or starting from the wrong assumptions (e.g. reading *Crime and Punishment* as a detective story).

skills, insights and character-traits. This leads Gee to making the even more provocative statement that in contradistinction to traditional schools, where most students never get to see the point of the subject-matters they have to engage with, game-playing generates 'passionate affinity spaces', where interest-driven groups allow people to come and learn together on the basis of intrinsic motivation.

The skills, insights and character-traits that come along with videogames (and with many more passionate affinity spaces outside the school, like special interest groups on the internet) are more suitable when it comes to deal with the great societal challenges that we will have to face in the near future. These challenges, like climate change or the threat of international terrorism, involve literally the whole planet and are so complex that no one can reasonably claim to be a specialist. Therefore what we need, so Gee (Ibid.) argues, is no longer specialist knowledge and a training of people in academic disciplines created in the 19th Century, but the development of *collective intelligence* exercised by *amateur experts*. We can no longer expect old school intellectuals to come up with creative solutions. These solutions will have to result from the collaboration of people from different age groups, ethical origins, geographical backgrounds and walks of life, gathered in interest-driven on-line communities. Here each member's (limited) knowledge and experience is brought together and gets exchanged, so that one can learn from one other, that one is willing to explore new paths and to take risks, and that one may come up with ideas that might help to solve otherwise insoluble problems. Much more than the existing schooling apparatus ever could, gaming practices stand for a genuine *public pedagogy* (Gee & Hayes 2010)[5]: while gaming (young) people develop the skills that are necessary for guaranteeing a flourishing life for all in the (near) future.

Literacy as a formal and a formative skill: the literacy hypothesis and the role of schooling

Even if Gee's eulogy on on-line game-communities might have led us far away from the issue of (basic) literacy, his ideas have serious bearings on this issue. This is, first, because Gee demands us to come and see literacy as a complex phenomenon that is

[5] As such, Gee is part of a larger public-pedagogy movement which is rooted in adult education and which stresses the importance of learning that is taking place outside of formal educational institutions (through informal contexts, popular culture, etc.) (See Sandlin, Schultz & Burdick 2010).

itself part of social practices, and to appreciate that there are many literacies next to the mere technical ability to read and write. Game literacy is, so to speak a literacy in its own right[6]. Second, putting a too great stress on literacy in a traditional (i.e. technical) sense makes us disregard literacies that might constitute important vehicles of social equality and societal progress (and that are being increasingly picked up outside of established educational institutions).

Although this line of thought may sound very convincing and although it has gained much popularity in educational theory (Cf. two recent books on the future of education in digital times: Kahn 2012, Waks 2013), a counter-argument could be made *in favour* of a rather traditional, 'school' form of literacy training. At least that is what certain authors who are to a greater or a lesser extent adhering to the *literacy hypothesis* do (McLuhan 1962, Goody & Watt 1968, Havelock 1982, Ong 1982). David Olson, for instance, objects to the New Literacy Studies that the so called merely technical skill of mastering basic literacy provokes in the literate person a *unique* relationship towards the language she uses: she comes to an 'understanding of the phonological, syllabic, morphemic, and syntactic properties of speech that are represented by a script' (Olson 2006, 176). This is due, and *only* due to a mode of training that focuses on *formal* dimensions of language. This is, of course, not to deny that literacy is a complex phenomenon the meaning of which can be quite divergent and dependent upon particular contexts and social practices in which written language is used. But, so Olson argues, the New literacy Studies hastily overturn the priority of form over use (ibid., 175): they neglect that in order for script to have these many meanings and functions, one first needs to come and understand what written language is all about, i.e. that it is possible in the first place to 'lay down' (ibid., 176) what we think and say in material inscriptions according to a set of conventions (of which the alphabetical system is the best known, but obviously not the only possible set of conventions).

Now, as I said, this view is closely connected to the literacy hypothesis approach, which claims that the technology of reading and writing is not something a very clever and rationally structured mind invented in order to expand on the abilities it already possessed in the pre-literal, i.e. oral culture. Rather, it is the technology of reading and

[6] In this article I only focus on a particular author. Gees's work is representative for a a larger body of scholarship that has discussed the notion of 'game literacy' (Cf. Buckingham & Burn 2009).

writing that first turned us into the kind of human beings we are today: our ability for logically stringent thought is dependent upon the possibility to express oral utterances in written accounts (Cf. Olson 1977). As such gaining mastery over written language literally *forms* us: it decides on who we are, on what we can do, say and think. More precisely it is the linear and consecutive order of written sentences that underpins the clarity and order of what we see today as a sound argument.

Also, the habit of trusting down our ideas to writing presupposes that we place ourselves in the position of a non-present reader who has neither access to the context in which the author's uttered her words, nor to the intonations and other verbal and non-verbal (facial and gestural) clues that might reveal the true meaning of these words – as is the case when we are using oral language. This gave rise to the desire to develop a kind of language use that is maximally precise, transparent and objective (even if one never fully succeeds in this). This comes down to creating a kind of text that (at least ideally) speaks for itself – and thus to bringing into practice Luther's famous apothegm 'sola scriptura', i.e. the idea that that the meaning of the Holy Text is *in the text itself* (Ibid., 5). Making an allusion to the Sapir-Worf hypothesis, Olson claims in this connection (Olson 2006, 167) that it is not so much language that determines reality, as it is *script that determines language*. As the result of starting to write down things and trying to come to a transparent and maximally objective language use, language transmogrified drastically: it became a *'schooled* language' (Olson 1977, 4; emphasis by author). Thus, as users of literate language we came to realize possibilities that remained hidden when language was only used in an oral way. And so, formal schooling is of the utmost importance: 'when children are taught to read [at school], they are learning both to read and to treat language as text' (ibid., 24).

This is to say that, once a text is written down, it starts to have its own separate existence. So for instance, when an author revises a text, he or she isn't merely clarifying her intentions, i.e. what he or she meant the text to say. Rather, the writer is confronted with 'a visible object, on paper, from which he or she may infer a meaning that may or may not correspond to his or her original intention. What remains invariant is not the intention but the linguistic form preserved in writing' (ibid.). This is a phenomenon that is very well known by what Chandler calls 'discoverers', i.e. writers who 'experience writing primarily as a way of "discovering" what they want to say' - as opposed to

'planners' who form their ideas independently from the writing process (Chandler 1992, 65).

There exists thus, according to this view, an *inherent potential* to language - and we only develop a sense for this potential thanks to a particular initiation into written language. To illustrate this further, Olson and Oatley refer to what Carl-Gustav Jung, much to his own surprise, discovered when starting to work with word-association tests: 'differences between the sane and the insane were minor compared to those between the educated and the uneducated. Whereas more educated subjects gave a single word in response to a stimulus word, the uneducated told stories, offered explanations, provided paraphrases, and the like' (Olson & Oatley 2013, 17). In order to perform this kind of test adequately one needs to be able to relate to words *as words* - and this is not something that is spontaneously given with being a competent speaker of language. Rather, it demands that one maintains a schooled relationship towards language[7].

The literacy hypothesis approach has thus particular implications regarding the meaning of *school* education, which are however often misunderstood. In a recent article, Olson and Oatley (Ibid.) argue against the widespread misinterpretation which comes down to saying that literate cultures are superior to illiterate ones and that people who are less exposed to reading are less rational. This Eurocentric idea has been invalidated by comparative anthropological and linguistic research. However, the fundamental insight behind the literacy hypothesis is not in the least that literacy training should guarantee an appropriate level of rationality in a schooled society. What it *does* imply, as I said, is that literacy training goes together with *coming to take a particular relation towards language.* This is to claim that the 'unique significance' of learning to read and write (Olson & Oatley 2013, 8) has more to do with raising an awareness of what one is able to do as a user of language than with concerns over success and efficiency. As such, literacy training is related to the possibility of experiencing language, and our faculties for language production, in a way we never would if we didn't attend school: here language is taken 'off-line' (Ibid.) and appears as a source of potential meaning that has an existence in and of itself (i.e. independent of the meaning the user intends to give to her utterances – which is typically the case in

[7] This idea comes close to the defence of *school* practices in the work of Jan Masschelein and Maarten Simons (2013)

merely spoken language; Ibid., 10). This is also to say, like Gee and other supporters of New Literacies do, that literacy is *more* than just the technical ability to link signs and sounds. But, this 'more' relates, in contradistinction to the New Literacy Studies, rather to formal characteristics than to the many uses of language: literacy refers, most essentially, to the possibility *to experience language in a unique way*.

In sum, literacy, taken in this *formal* definition, has important *formative* respects: it decides on the kind of subjects that we are. An initiation into language that goes together with a *sense* of the things script renders possible makes all the difference. And therefore, school forms of literacy training are of the greatest *educational* importance. This view implies, at the same time, that serious doubts can be raised regarding the implementation of digital media at the detriment of traditional reading and writing practices. As Olson and Oatley (2014, 8) state: 'If writing were merely a storage device for information and an optional substitute for speech, newer technologies such as television and Facebook would seem to offer credible alternatives.' However, according to them, script isn't merely some support for (spoken) language: script elevates language so to speak, and brings most articulately under attention its innermost potential.

Stiegler's techno-centric perspective on subject-constitution

In the remaining parts of this article I elaborate on these ideas and develop a somewhat more nuanced account which also relates back to the views defended by Gee, especially in relation to the affordances that come along with digitization. Therefore I turn to the work of the French philosopher Bernard Stiegler, who throughout his work (and political activism) underscores a fundamental reciprocity between the uses of technology and human subject-constitution, and who is also much concerned with the positive *and* negative impact the large-scale introduction of digital media might have for the future of education[8].

Stiegler (1998) argues that we are but who we are thanks to the invention and implementation of certain technological tools and the practices related to these

[8]My presentation of Stiegler's work is partial, as I won't go deeper into his discussion regarding the school as an institute that promotes deep forms of attention as opposed to industrial forces ('psychopower') that infatuate our minds and take advantage of dispersed forms attention. Neither will I discuss the specialized notions of primary, secondary and tertiary retention.

instruments. To be clear on this point, the term technology refers to *every* kind of artifact we use, as well as to the embodied *routines* related to them. Thus, using a fountain pen to scribble down letters is as much a technology as using a cell phone to text a message. For Stiegler these tools aren't mere extensions of our bodies (prostheses) or externalizations of powers we already possess. Rather, it is the possession of certain technologies that decides on what we are able to do and what not. Stiegler suggests as much as to say that humankind is an extension of technology (Cf. Lemmens 2009). To give a simple yet radical example: as a rule we are inclined to consider memory as a fundamental human capacity (it defines who we are) and as a private possession (an intangible mental space to which nobody else has access). Technologies such as writing down appointments or keeping a diary are then regarded as mere aids or supports for memory. Stiegler, however, suggests seeing things precisely the other way around: human beings only have a memory *because* there first exist memorization tools, which are in a sense external to us (Cf. Barker 2009). And so, 'our' memory is only the effect of an internalization of certain operations that are dependent upon technological inventions such as a system of notation, which originated in the records of commercial activities in the Sumerian society in the 4th Millenium BC (Herrenschmidt 2007)[9].

If this *techno-centric* account of humankind is correct, it is also implied that a lot of that which characterizes us as human beings is not given with our genetic code and therefore with the way in which the brain is programmed at our birth, but that it is the result of learning to use certain technologies. Technologies give shape to who we are (or if one likes: they give shape to the neurological circuits in our brains). For this almost neo-Lamarckian view on the genesis of humankind Stiegler finds support in the work of the anthropologist Leroi-Gourhan (1993), who claims that the most decisive step in human evolution is not so much the increase in brain size (i.e. in the amount of cortical neurons), but the upright posture and the emancipation of the hand that resulted from this, which allowed for using ('hand-ling') all kind of simpler and more complex tools. The kinesthetic possibilities that the setting free of our hands allows for are actually

[9] This would mean that the literacy hypothesis should be adjusted at least on the following point: historically spoken script did not originate *out of* speech. Written language was not invented as a better or more accurate version of oral language. Rather it was in essence part of a commercial practice. Only later on it began to be used for facilitating oral language and therefore it was only as an already existing medium with its own characteristics that it helped to determine the shape language still has today.

shaping our brains – rather than vice versa (Cf. Gallager 2005). Recent neurological research (Dehaene 2010) confirms this point of view.

Now, this techno-centric perspective may complement the literacy hypothesis approach in a most innovative way. Stiegler fully agrees with the formative role learning to read and write has for the kind of human beings we are, but at the same time he would object to the literacy hypothesis approach that it leaves the most important questions out of consideration. More precisely such an account doesn't explain accurately enough *how* it is that literacy can force particular dispositions of thinking and acting upon us. This is for Stiegler, as he says in a commentary on the work of Wolfgang Iser (Stiegler 2010b), because we tend to omit taking into account that reading and writing are also *materially* supported and highly *embodied* practices. It concerns activities which are dependent upon particular implements and supports, as well as upon bodily movements, routines and gestures – and it is this dependency which accounts for the effect of literacy practice on who we are. It is against this background that Stiegler (2006) supports basic literacy training, in the sense of the tedious and strenuous exercise of getting to write the letters of the alphabet just right.

Drawing from neurological research Stiegler argues that the practice of writing, over and over again, the same letters, and later on just scribbling down lines of text (for instance during a dictation exercise) are responsible for a 'grammatization' of our brains. Stiegler uses the expression grammar here in another sense than linguists usually do (i.e. the structures and rules that order both written and spoken language). Bearing in mind that the Greek expression 'gramma', stems from the verb 'grammein', which actually means tracking lines, this expression should be taken literally: 'grammatization' means that we come to incorporate a certain code (e.g. an alphabetic or an ideographic code which links signs to sounds and ideas respectively) which regulates the *tracking* of lines on a material support (be it on wax, papyrus or paper)[10] and which, in turn, results in *tracking* particular patterns in the neurological architecture of our brains. The discovery that the zones in our brain responsible for

[10] There is no place to go deeper into this here, but taking Stiegler's account seriously, differences between writing with a pen on paper and engraving a wax tablet with a stylus must in fact have vast consequences, as they require entirely different bodily routines (Cf. Baron 2009). Stiegler doesn't seem to take this into account. Recall also that the kind of alphabetization practice Stiegler refers to is actually a relatively recent invention (see footnote 3).

reading are differently organized in Western and Chinese readers (Dehaene 2010) forms a telling illustration of this point.

This illustrates that the frequent use of particular technologies (rather than other ones) decides on who we are[11]. According to Stiegler's (1998) own terminology, technologies 'program' and (with a term taken from Simondon) 'individuate' us (i.e. they turn us into a specific kind of subjects and regulate the possibilities and limitations of what we as human beings are capable of being and doing). 'Individuation' is thus a matter of historical contingency. If this may sound overall deterministic at first, this view is in fact *profoundly educational*. This is because it suggests that we are 'educable' creatures: there is no necessity in the way in which we are 'formed'. Nonetheless, this educability comes with a cost. As the title of one of Stiegler's most important books (2010a) goes, the existing generations carry the weight of the shared responsibility 'of taking care of youth and the (coming) generations'. Developing this idea, Stiegler offers a rather unique account of the history of humankind on the basis of which he shows that humanity always had to come to terms with the technologies it invented, and more precisely with its inherent possibilities and threats. Relying on a Platonic vocabulary, Stiegler claims that every technology on which we depend for our subject-constitution should be regarded as a 'pharmakon': it is *simultaneously* a cure and a poison.

Another way of putting this is that because of their formative power technologies might as much *form* us as they might *deform* us. Stiegler's perspective is thus *techno-centric* rather than *techno-determinist*: technologies are never in and out of themselves beneficial or harmful. As such the coming into being of every new generation poses a particular task to the older one: it has to initiate the new generation into an existing world which is structured by dominant technologies, but in such a way that it also gets the opportunity to be actually a *new* generation that can take critical distance from the

[11] I have only discussed here the impact of reading/writing technologies, but the same applies to *all* technologies humankind uses. A good example would be the domestication of plants and animals (around 10.000 BCE) and the technology of farming that went along. Farming is not so much the result of humanity entering a new phase of development. Rather, the technology of farming *itself* has brought about a new kind of human being. From this moment on humankind had to stay permanently at one and the same place, to live together with many other people on a small surface, to spend all available time and energy for solving agricultural problems, etc. These changes brought about new ways to relate to ourselves, viz. we became members of a community in which we had to behave in a civilized way, as well as individuals who had to be concerned not only with the present, but who were first and foremost concerned with the outcomes of our actions in a distant future. As such, it is more adequate to claim that plants and animals domesticated humankind (than vice versa).

existing society and rejuvenate it (Cf. Arendt 1958). Stiegler (2010a) refers to this by coining the term 'transindividuation': in each and every act of individuation (i.e. subject-constitution) there is a dimension that *transcends* the purely individual level. This is, on the one hand, because in order to become a subject one has to rely on something that precedes subject-constitution and that is preserved by the elder generation, and on the other hand, because there is principally an openness towards a future that can be different from the present. At least, this happens when technologies are used in a beneficial way. The harmful side of the pharmakon consists in a use of technology that renders transindividuation impossible, i.e. a way of dealing with the predominant technologies that disturbs intergenerational interaction and that puts a stop to the possibility of criticality and of societal change. Stiegler's view on subject-constitution is thus also *profoundly educational* for a second reason: the quality of our common world and the possibility of a truly humane future depends much upon the responsibility the existing generation takes (or refuses to take).

The literacy hypothesis revisited: literacy as a pharmakon, and as an intricate and embodied sense of text-production

Apart from the fact that Stiegler's account on subject-constitution complements the literacy hypothesis approach by drawing more attention to the concrete, technological and embodied dimensions of literacy practices, his view may also be used to develop some additional comments - and to take the literacy hypothesis approach a step further. First, Stiegler's 'pharmacological' perspective offers a less one-sided take on the effects of being able to read and write: the practice of literacy is, like every other technology, a pharmakon, and can always be misused and wind up in the opposite direction. One may consider here Kant's remarks on reading as an example (Stiegler 2010a, 20-22)[12]. Kant was very well aware of the fact that Enlightenment was dependent upon the capacity of the larger public to engage in reading, but he was equally sensible to the danger related to the spread of printed texts among the masses: people might get carried away or just start to parrot whatever they read in books, without any readiness for critical reflection.

[12] The other example Stiegler relies on throughout his genealogical analyses is that of the historical disagreement between Platonic philosophy and the Sophist movement. Both are a response to the invention and spread of alphabetic notation systems. Plato's criticism vis-à-vis the sophists is that they exploit the harmful powers of this technology, by substituting real critical thought and solidly formed insight by 'prêt-à-penser' thoughts and one-liners, which beguile the mind rather than properly form it (Stiegler 2010a, 21)

Obviously, canonical religious texts and especially the widely used catechism were the things a critical mind had to be wary of[13]. But, in a sense this mistrust was equally shared by the autocratic Clerical authorities Kant criticizes. Being well aware of the power that books may have, Pope Gregory XIII ordained in 1572 a bull entitled *Ut Pestiferarum*, comparing printed words to germs spreading pestilence (Vandendorpe 2011, 50-51). The lesson to take is that both Kant's opposition against *certain books* and the Church's measures against *other books* testify to the infectious power the printed word possesses – and therefore they testify to its pharmakon-character. The written word is not per se a vehicle of emancipation, as the literacy hypothesis tends to suggest. Perhaps this has to do with the fact that when reading, as opposed to listening, one has to surrender fully to the meaning of the words and the stringent logic of the book one has before one's eyes (Bell 2005, 30-31). In the act of listening one can more easily dissociate oneself from what one's interlocutor claims, whereas in order to really understand what is written in a book, even a book one is hostile to, a reader has no choice but to surrender and to go along – even if only temporarily – with the author's intentions. And thus, the risk of infection is always present.

Second, whereas the literacy hypothesis seems to deal with reading and writing in one and the same breath, Stiegler (2010a) asks for a more careful analysis which reveals both a close interconnection *but also* a fundamental distinction between these activities which can be easily missed out. He emphasizes that the process of writing consists in the transformation of a continuous flow of speech or thought into something discontinuous (clearly distinguished letters, words, sentences, etc. written or printed on a two dimensional surface): a phenomenon which is essentially temporal gets 'spatialized'. And, as I explained, this transformation of time into space takes place according to a code (grammar) that is inscribed ('grammatized') in our bodies during formal schooling. Reading consists in a reciprocal, mirror-image operation: applying the same code the reader converts an essentially spatial phenomenon into a temporal flux of speech or thought. Space becomes time again. This implies that one can only write if one is able to read, but also the less trivial idea *that one can only read if one is a writer*

[13] In a recent article, Norm Friesen (2013) offers a genealogical analysis of textbooks and related didactical practices which shows that the Catechism played an important role in the genesis of common pedagogical practices (which he shows to be a form of 'catechism with oneself'). This underscores, I believe, that the Catechism itself is also a pharmakon: one and the same text/technology can have at the same time effects that hinder and promote education.

(Cf. Iser 1976). This is to say that one can only be said to be properly *reading* a text if one potentially could have been oneself the *writer* of this text. This means that on many occasions we don't actually 'read', but merely consume a text: 'true' reading relies on a profound and embodied sense of what it means to be able to generate text oneself (Stiegler & Rogoff 2010). Thus, literacy refers to more than to the mere ability to read (consume) and write (produce); it presupposes *an intricate banding together of production and consumption* of text.

This is of the greatest importance, so Stiegler argues, for understanding the impact of digital media on literacy. The grammar which regulates the spatialization of speech and thought into digital supports and the retemporalization of strings of binary code (1's and 0's) back into thought and speech can never be internalized into our central nervous system (even though in a sense computers are structurally akin to the electronic circuits in our brains, cf. Herrenschmidt 2007). The code is inside the digital device and remains hidden there, whereas the code that facilitates traditional writing and reading is firmly and intimately embodied in the literate person herself. Apart from trained informaticians, most users of digital media have no inkling about what is going on in the machines they use - just like most people without specialized knowledge of neurophysiology have no idea about how the brain functions. Moreover, even if they would, there is still an enormous difference between knowing about the brain's working and experiencing what it is to be a thinking brain (Cf. Nagel 1974), and the same applies to the trained informatician vis-à-vis her knowledge of how computers work[14]. Therefore, whereas we have a deeply intimate and bodily ingrained sense of what we do when we produce and consume (hand)written texts, we haven't the faintest idea about what happens when we type a text on our keyboards and see words appear on our screens[15], being automatically detected as wrongly spelled (and being replaced by one

[14] Moreover, even if one fully understands how binary coding works, it is very unlikely that one ever will be able to immediately understand 011000110110000101111000 as equivalent to 'cat' without the aid of a computer translation program.

[15] This is also related to the phenomenological difference which exists between typing an 'a' or 'b' on a keyboard (or for that matter on a touchscreen) and composing an 'a' or 'b' with a longhand writing implement. In the first case there is not really much difference, as typing whatever letter on the keyboard consists merely in *pointing* at a key and seeing the corresponding letter appear, whilst in the second case the writer has to *'produce* a graphic shape resembling as much as possible the standard shape of the specific letter' (Mangen & Velay 2010, 386; Italics by author). As such writing an 'a' on a sheet of paper is, experientially spoken, something altogether from jotting down the letter 'b'. Writing by hand one has a much more direct understanding of what it means to generate various letters.

mouse click), being saved on a hard drive (again by one mouse click), etc.. Using a Marxian terminology, Stiegler (2010a) analyzes this situation as a form of 'proletarianization': just like the blue collar class working in the 19th Century factories had no choice but selling its labor-force to the Bourgeoisie and to be utterly alienated from its own productive powers, users of digital devices might run the risk of becoming mere consumers of apparatuses. They have delegated their capacities for producing text (and thus also for non-consumptive reading) to an external device that remains something utterly alien.

Stiegler's approach might, again, complement the literacy hypothesis approach on this point. As I discussed at great length above, a formal introduction into literacy at school involves much more than the acquisition of a technical skill. It may predispose readers/writers to relate in a most particular way towards text and therefore open a unique experiential realm, viz. to relate to text *as text* (rather than as mere utterance), and this grants the possibility of experiencing written language as a peculiar, autonomous reality that (to a certain degree) conveys meaning out of itself. With Stiegler, this argument could be strengthened and refined: what the schooled language user is disposed to experience is first and foremost a deep-seated intertwinement between reading and writing - and thus an in-depth sense of what it means to *create* text. Otherwise stated, literacy as traditionally conceived is indeed related to *a unique space of experience*, in the way Olson claims, but what is at stake in this experience is a *sense of ability* which Olson's analyses fail to articulate. The truly literate person not only has a propensity to see text as text. She also possesses *a profound inside understanding of what producing text-as-text is all about*. There is thus not only an acknowledgment of the enormous potential written language possesses (in contradistinction to merely spoken language), but also a sense of the very potentiality to create this kind of language in the first place[16]. Moreover, this sense is - as Stiegler shows - *profoundly embodied*: it is 'grammatized' in the schooled person's body. So, literacy is not just a matter of theoretically understanding the unique power of the

[16] This is also to say that the repetition inherent to traditional alphabetization practice (writing again and again strings of 'aaaaaaaaa', 'bbbbbbbb', etc.) goes together with a heightened awareness of the potentiality to write (i.e. not the experience that one can use a's and b's to write a poem or to send a text-message, but just the experience that one actually *can* write a's and b's).

written, but a sharp, direct and literally 'firsthand' comprehension of the power to express meaning by means of generating ourselves traces of ink on a flat surface.

A plea for a spelling and grammar of the digital

Stiegler's analyses furthermore show that when we start to use digital devices as the sole or prevailing means to read and create text, we enter into *an altogether different* space of experience: we no longer relate to text as text, but – even more importantly – we become strangers to our own productive capabilities[17]. Or at least, under digital conditions there is no longer a direct and intimate relationship with the production of text. This, however, is no cause for despair and it certainly doesn't offer an argument *against* the use of digital media. After all, it would be rather inconsistent to cast a one-sided and totally disparaging judgment on digital technologies on the one hand, and to hold that *all* technologies are pharmaka (poison *and* cure) on the other hand. Digital technologies shouldn't form an exception to this last rule. And, Stiegler has stressed time and again that we should find right ways to deal with the advent and proliferation of digital technologies, rather than stick to the past and disregard the present situation (e.g. Stiegler 2010c).

It is an undeniable fact that we increasingly live in a digital age and that a new type of reading and writing technologies has become prevailing. The challenge then is how to respond to this situation in such a way that the possibility of transindividuation isn't ruled out. This would mean, more specifically, that we have to try and prevent the

[17] The assumption I make here is, of course, that in a digital age we still read and compose text. In view of the evolutions we witness today, this seems reasonable to claim: even if text has increasingly become hypertext (Vandendorpe 2012), we still use web-*pages* that contain script and that are structured like texts. Moreover, as Bertrand Gervais says in his work on 'hypertextuality', texts 'are no longer something rare (as in a manuscript culture) or usual (as in a book culture) , they are almost a menace. We are less concerned with finding texts, and more concerned with stopping the flood of texts coming in.' (2008, 13) But, it can't be excluded that in a distant future a new medium may become dominant, viz. a hitherto unknown mode of imagery that comprises both images and texts as we know them today, as Flusser (2011) suggests in his work on 'the technical image'. In other words, texts might become 'textual images' (Gervais 2008). If this is true, the case I make in the final part of this article should be read as a plea for a spelling and grammar of producing textual images.
Moreover, I should stress here that my claim regarding a certain loss of a sense of productivity related to the use of digital media, doesn't disregard the fact that the advent of these technologies has as a result that more people write more, that people have increasingly come to write in new genres and that they more and more feel to have control over the things they write (Cf. Baron 2009, 229). Digitization also involves a democratization of writing which has turned many consumers into active producers. However, my Stieglerian analysis only deals with the sense of producing text-*as-text* (rather than with text-as-blog entry, text-as-chat message, etc.).

generation of digital natives to degenerate into merely passive consumers, and to grant them opportunities for coming to entertain the unique, direct and embodied relationship towards text and text-production I have tried to flesh out on the basis of Stiegler's work. Such an approach may actually answer to a third shortcoming implied by the literacy hypothesis approach. After all, this school of thought tends to defend a societal standstill and to turn a blind eye on what is actually taking place right under our noses. A Stieglerian approach, on the contrary, comes close to Gee's plea for a public pedagogy, which I discussed in the first part of this article: the quality of our future common world will depend on responding in an appropriate way to the proliferation and ubiquity of digital technologies in everyday life, i.e. giving a response that will form rather than deform the new generation. And so in the remaining part of this article I will try to articulate how an adequate answer to the challenge which digitization poses to literacy might look like.

Stiegler's work remains highly ambivalent on this point. As I said, he defends a school form of introduction into literacy, and believes this to be a most pressing issue in the digital time and age we live in. As such Stiegler severely opposes Gee's plea for encouraging learning in passionate affinity spaces on line (Stiegler 2006; Stiegler and Rogoff 2010). Even if the generation of digital natives will exclusively use keyboards, screens and touchscreens in their adult lives, today's youth should still be trained in longhand writing, painstakingly as it is and useless as it might seem, in order to have a sense of what reading and writing are all about, i.e. to be able to understand – viscerally – the power of generating written signs. Even if I don't completely disagree with this, I don't think that this is the only or the most compelling conclusion to draw from Stiegler's techno-centric perspective.

Thinking through both the literacy hypothesis approach and Stiegler's work I have argued that literacy should first and foremost be defined in terms of a space of experience, and more precisely of a thoroughly embodied sense for the potential inherent to particular technologies of reading and writing. Moreover, this requires a particular 'school' form of training, meaning that students concentrate on *formal* characteristics which *form* (and *grammatize*) them through the repetitive exercise of a bodily discipline. If this is convincing, this also means that next to traditional literacy, related to the practice of writing with pen and paper, there also exists a specifically

digital literacy, i.e. a literacy that is valuable in and of itself and that is related to the technology of reading and writing with digital devices. Rather than first introducing young people into traditional literacy before they are allowed to start and work with digital devices, as Stiegler himself suggests, it makes much more sense to me to introduce a new subject matter in today's formal education[18] which is a proper equivalent to what we traditionally have known as basic literacy training: a *grammar and spelling of the digital*.

To be clear, I am most pointedly not referring here to one of the two following pedagogical initiatives that often go under the name of 'digital literacy'. First, I am *not* proposing that we should put more time and effort in integrating the use of digital media in other courses that are standard part the curriculum (collaborative on-line projects as part of a biology class, using Youtube-videos to enliven classroom experience, substituting the assignment of making a powerpoint presentation for classical exams etc.). Although this is highly commendable, it has nothing to do with digital literacy as I understand it. This is because these initiatives still assume that students are *mere consumers* of digital technologies in the sense Stiegler criticized. Here digital media remain something we put at use, rather than becoming the immediate object of educational interest and practice. I am also *not* driving at interventions that aim at making youngsters aware of the dangers digital media entail, such as provoking sensitivity for the fact that Wikipedia doesn't necessarily convey impartial information, for the presence of pedophiles on social network sites, for the risks of compulsive internet use and internet addiction disorder (IAD), etc. Again, such measures – necessary and praiseworthy as they are – deal with digital technology as something *external*, i.e. as something to judge from an outside position in order to protect this non-digital position from being too strongly affected by the digital media we use (Cf. Dorrestijn 2012).

Over and against this, I propose to regard the digital in an entirely *positive* way – taking it to be the new cultural condition under which we have to educate the next generations. Hence I argue for an introduction into digital literacy that is seen as a literacy in its own right (in the way Gee suggests), but at the same time I propose to

[18] For the time being I leave it open whether this should take place within the school or within on-line learning environments – as this regards an altogether different (but not less important) discussion.

regard digital literacy education in a most *literal* way (disagreeing here with Gee): a training of digital writing and reading skills that begins at the most basic level. Analogously to what happens during spelling and grammar exercises in traditional literacy instruction – this training concentrates on the formal aspects that lie behind the things we produce, and aims at a deeply embodied, direct and firsthand sense for the possibilities inherent to the particular medium we use. All this is of course not to deny the many dangers that a wholeheartedly acceptance of the digital might entail. After all, every technology (traditional writing *and* digital writing) remains to be a pharmakon. Nonetheless, in order to be able to guard ourselves and the future generations against a use of a technology that deforms rather than forms us, the first step to take is to assist young people in gaining a deep and embodied sense of what they can (and cannot) do as digital literates. As such, this defense of a digital spelling and grammar also has a double ethical relevance. First, although I acknowledge the risk inherent to the digital pharmakon, I have also argued for a *change in attitude* towards digital technologies of reading and writing. Instead of sticking to the past and excoriating these technologies in view of a traditional ideal the realization of which is under threat today, I have proposed to affirm our present condition to the full. This demands an openness to and involvement with the present such as it is. However, taking such an attitude doesn't imply a mandate for doing nothing or for evading responsibility. And so, secondly, as I have said at different points in this article, faced with the ubiquity of digital media, the existing generation has *the duty to respond in an appropriate way to the present situation*. This is not to say that they have to decide for the members of the new generation how they should lead their lives. Instead, what is stake here is the very possibility that the new generation is actually capable of deciding itself on how to give shape to individual and collective existence. The use of digital technologies, like *all* technologies, may always imply misuses and malformations which turn us blind to our own productive and creative potential, and thus for our educability and capacity for change. Therefore, it is not an old and traditional ideal of the good life that is at peril, so much as the possibility of transindividuation taking place, to draw once more from a Stieglerian vocabulary. In sum, the quality of our common world and the possibility of a truly humane future depends much upon the responsibility the existing generation takes - or refuses to take.

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