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Abstract

The aim of the paper is to outline the basic theoretical reasons for applying the concept of extended mind to literacy theory. In order to explicate theoretical difficulties faced by literacy theory, one needs to take into account the debate regarding technological determinism. Using this debate as an example, one can observe two basic strategies applied to defining the concept of a medium. On the one hand, there exists a strategy to formulate a narrow definition of a medium in terms of material artifacts. On the other hand, one can observe a strategy which relies on creating a wide definition of a medium. According to this definition, a medium is understood as a social institution which denotes a particular way of behaving and thinking. The paper aims at justifying the hypothesis that both interpretational strategies employed in defining a medium and the related concept of technology are inaccurate in certain important respects. If the argumentation presented here proves correct, literacy theory will be faced with a serious dilemma: a choice between two equally unsuitable definitions of technology/media. However, the theoretical dilemma pertaining to the question of media can be elucidated by appealing to the conceptual framework of the extended mind hypothesis.

Keywords: Literacy Theory; Toronto School of Communication; Definition of Media; Extended Mind Thesis; Technological Determinism.

Introduction

The standard list of seminal authors working within the tradition referred to as "literacy theory" or the "Toronto School of communication" includes names such as Marshall McLuhan, Harold Innis , Eric Havelock, Walter Ong and David Olson. Research conducted within this framework is focused on formulating a detailed description of cognitive and socio-cultural consequences of media (Jahandarie 1999). Therefore, it is not surprising that one can approach the basic theoretical objective of this orientation from several different methodological background. It is commonly acknowledged that literacy theory offers a multidisciplinary approach to culture and media. In the field of anthropology it has been developed by Jack Goody, in psychology by D. Olson, in sociology by Joshua Meyrowitz, in history by Elizabeth Eisenstein, in linguistics by E. Havelock, etc. However, its most celebrated representative, M. McLuhan, is recognized as a media scholar and communication researcher. Thus, in the present paper I propose to treat literacy theory as one particular framework within the larger field of media studies and communication theory. Interpreting literacy theory against the background of media studies seems promising, because on this construal we can more clearly discern the basic reasons behind the severe critique against the Toronto School. Researchers working within the framework of English cultural studies accused McLuhan and his followers of technological determinism and an ethnocentric bias. Those accusations led to the marginalization of the Toronto School within media studies (Williams 2003; Lister, Dovey, and Giddings 2003).

However, in the present paper I argue that there is a more deeply rooted reason for criticizing literacy theory in mediology. The marginalization of literacy theory in the field of communication research results from a fundamental ambiguity in the concepts of *media* and *technology* as they are traditionally employed by the Toronto School. Contrary to common interpretation, I will argue that neither the problem of technological determinism, nor accusations of ethnocentrism themselves constitute the most pressing challenge for literacy theory. Indeed, the most serious threat for literacy theory is generated internally, stemming from the fact that there is no consensus as to how media are to be understood broadly. We can broadly distinguish two readings of media. According to a narrow interpretation, media are understood as material vehicles for the purpose of expression and transfer of thoughts and meanings between people. A broader interpretation, on the other hand, defines media in terms of socially standardized ways of behaving or thinking. Both interpretations can be seen in the work of literacy theorists; however, both are to a certain extent invalid and generate serious interpretational difficulties. On the one hand, applying the narrow definition of communication technologies seems to invariably lead to accusations of technological determinism. On the other hand, the common tendency to avoid such accusations by extending the meaning of technology is even more dangerous. Focusing exclu-

sively on the social dimension of communication technologies entails two interconnected threats. Firstly, there is an inherent risk of significantly decreasing the explanatory power of literacy theory, secondly, there is the concomitant danger of blurring its theoretical identity. Therefore, the problem of technological determinism is rather a superficial manifestation of a more deeply rooted conceptual dilemma as to how communication technologies should be defined.

In what follows, I shall approach the dilemma of literacy theory in four steps. I start by presenting literacy theory against the background of media studies. This will facilitate the definition of the theoretical identity of the Toronto School and therefore contribute to defining the basic meaning of communication technology. Secondly, following the footsteps of seminal authors in literacy theory, I will present reasons for extending the narrow definition of media. Thirdly, I show how the inclusive interpretation of media leads to fundamental dilemma of literacy theory. Finally, I make an attempt to explain how literacy theory can help to circumvent the aforementioned dilemma. In order to do so, I use the conceptual framework of the "extended mind" hypothesis.

Viewing literacy theory against the backdrop of media studies

The essential question that needs to be asked in order to understand the conceptual source of the debate over technological determinism is: How is the Toronto School recognized among media scholars? As a way of answering this question, let me introduce a classification proposed by Denis McQuail (2002). McQuail distinguishes four basic theoretical approaches within media studies and communication theory: *culture-centered* orientation, *materialistic* orientation, *socio-centered* orientation and *media-centered* orientation. Combining the four perspectives creates a schema within which most theories in media studies can be ordered.

Table1: Basic theoretical orientations in media studies and communication theories

	Culture-centered orientation	**Materialistic orientation**
Socio-centered orientation	Frankfurt School, Functionalism	Political economy
Media-centered orientation	Agenda-setting theory, Cultivation theory, Uses and gratifications theory	Toronto School, Literacy theory

The distinction between socio-centered and media-centered orientation is based on different answers that both orientations deliver for the question of what is the main factor organizing the use of media. When adopting a socio-centered orientation, media can be perceived as institutions driven either by social forces such as cultural values (the culture-centered orientation) or by economic and political factors (the materialistic orientation). Meanwhile, the media-centered orientation emphasizes the importance of the vehicle for meaning as a relatively independent factor organizing the act of communication. According to McQuail's classification, the Toronto School falls into the category of a media-centered, materialistic orientation. Media are perceived here as driving factors of social change activated by material transformations within communication technologies (McQuail 2002: 5–6). It is this very characteristic that establishes the unique character of the Toronto School compared to other orientations in communication studies (Meyrowitz 1994: 50–52). Therefore, the theoretical identity of literacy theory, when understood as a theoretical approach within media studies, depends on adopting a media-centered and materialistic stance concerning the nature of communication technologies. Communication technologies understood in this way constitute an important, although not the sole factor of socio-cognitive change. However, this common view of the identity of the Toronto School, and its use of the notion of communication technologies, is often called into question by representatives of the school itself.

Moving from "exclusive" to "inclusive" conceptions of media

The term "media" remains one of the most ambiguous concepts not only within literacy theory, but within media studies in general. Thomas Mock (2006) summarizes his attempts to order the different uses of the term "media" in mediology as follows:

> *Besides 'communication', 'medium' is a basic concept of media and communication studies. Nevertheless, or rather for that reason, this term is extremely imprecise and ambiguous* (Mock 2006: 183).

Therefore, in the absence of satisfying definitions of the term "medium," there is a strong tendency to replace it with other categories. The most influential conceptual strategy is perhaps to replace the category of media by technological metaphors. Rather than media, various expressions are frequently being used, such as "technology of the intellect," "communication technologies," "information technologies," or "technological environments." However, as argued below, the attempt to substitute "media" with "technology" yields unexpected results.

Many different meanings ascribed to media explain why contradictory attitudes towards this concept have emerged even among literacy scholars themselves. On the one hand, there is no doubt that media are the central subject for researchers of the Toronto School. For instance J. Meyrowitz, following the already mentioned D. McQuail, claims that the distinctive feature of this approach consists of a particular focus on the medium itself, and its impact on culture and society (Meyrowitz 1985). Similarly, D. Olson (2007) asserts that "*media themselves put an indelible stamp on the structure of knowledge and on the mentality of their users*" (355). It seems that the meaning of expressions such as "medium itself" or "media themselves" more or less coincides with the narrow understanding of communication technologies. On the other hand, however, there are those who insist that the notion of 'medium' is of little theoretical value or methodological import. Walter Ong (1986) explicitly denies the usefulness of this category: "The concept of 'medium' or 'media' applied to human communication uses an analogy which is useful but nevertheless so gross [...], that it regularly falsifies what human communication is. I myself try to avoid the term now" (Ong 1986: 38). Elsewhere, he explains his critical attitude when he claims that using the term media/medium

> *can give a false impression of the nature of verbal communication, and of other human communication as well. Thinking of a 'medium' of communication or of 'media' of communication suggests that communication is a pipeline transfer of units of material called 'information' from one place to another. My mind is a box. I take a unit of 'information' out of it, encode the unit (...) and put it into one end of the pipe (...). From the one end of the pipe the 'information' proceeds to the other end, where someone decodes it (...) and puts it in his or her own box-like container called a mind* (Ong 2002: 171–172).

Fairly similar reservations regarding the concept of a medium are shared by Olson, who claims that when "media of communication were seen simply as channels of information rather than as forms of representation (...) their intellectual and social implications were largely overlooked" (Olson 1988: 27). According to some literacy scholars, then, these are reasons enough to dismiss the idea of a medium as a physical artifact embedding meaning. Olson and Ong point out two problematic consequences of relying on a narrow definition of a medium. Firstly, understanding media as material channels for convening thoughts is to assume an oversimplified mechanistic model of human communication. Secondly, understanding writing solely in terms of physical artifacts tends to remain fixated on analyzing its purely quantitative consequences such as an extension of human memory, or the increased production of knowledge and distribution of access to information. From this point of view, however, media cannot significantly change the content and forms of communication, and consequently the mind's cognitive architecture. To sum up, there are important theoretical and methodological considerations in fa-

vour of extending the meaning of medium, and of relinquishing its narrow interpretation. On this example, we can see why technological metaphors are so tempting. The ambiguity concerning the meaning of media and the theoretical ambivalence of this concept are what encouraged Ong and his followers to explain it in general terms of "technologies" of the intellect. However, the suggested substitution obscures the underlying subject matter even further.

The term "technology" is just as imprecise as the term "medium". On closer examination, technology and media alike can stand for simple material artifacts, complex devices and machines, human motor abilities, organizational structures, applied science, rational methods and different means to achieve ends, social values and social practices etc. (Mitcham 1994: 153; Chesebro and Bertelsen 1998: 184–187). For that reason, criticisms of the concept of technology are as plentiful as those that have been levelled against the concept of a medium. However, the debate over technological determinism seems to be of special importance here, since it reveals the second reason for extending the notion of media and technology. Accusations of technological determinism that have been directed against literacy theory are particularly concerned with two categories: the concept of causality and the concept of technology (Lister, Dovey, and Giddings 2003). Since a consideration of causality lies beyond the scope of this paper, I shall focus here solely on criticisms pertaining to the concept of technology. Standard reservations about appeals to technology as an explanatory construct are aptly expressed by Ruth Finnegan (1988) when she claims that the basic defect of literacy theory is the attempt to depict technology and society as two separate phenomena. She claims that in literacy theory

> *technology is viewed as autonomous, that is as itself self-standing and independent of social shaping and as more or less inescapably determining social forms* (Finnegan 1988: 10).

Finnegan goes on to argue that the primary task of literacy theory cannot be properly accomplished due to this fundamental conceptual confusion. The central question asked by literacy scholars is about the implications of media "as such." Such a question assumes, however, that it is possible in principle to neatly separate technological phenomena from the social and cultural practices in which they are embedded. Since technology is originally created in a social context, and its use is always governed by cultural values, the autonomy assumption must be called into question. Moreover, the attempt to account for the implications of media "as such" seems to be methodologically questionable. If it is impossible, conceptually speaking, to separate technology from society, then it is hardly a meaningful scientific enterprise to try to study the impact of media as causally independent drivers of social and cognitive change. In short, we simply cannot isolate technology as a factor that is somehow ontologically prior to, and causally independent from, culture and society

(McQuail 2002: 14–15). Therefore, any research into the consequences of technology as a causally separable factor of change must remain inconclusive, because it is unclear whether the described consequences are produced by technology per se or simply by the social practices of using it.

The consequences of adopting an "inclusive" interpretation of media

The main point of criticism, then, is that literacy theorists operate with a flawed concept of technology that is too narrow and overly simplistic. Defining technology in terms of material tools or artifacts is based on the tacit assumption that technology is independent of social circumstances, but that assumption ought to be rejected. The very attempt to characterize the implications of media "as such," or so it has been argued, is destined to preclude a consideration of the social factors which organize and structure our engagement with media. According to Finnegan, medium theory commits a "pars pro toto" fallacy. It defines a complex and multidimensional construct such as technology as if it were a simple material and one-dimensional phenomenon (Finnegan 1988:2).

Proponents of literacy theory have raised numerous counterarguments against these criticisms (Chandler 1995; Watson and Blondheim 2008). While there is no space here to discuss any of these argument in detail, suffice it to say that the common strategy in dealing with accusations of technological determinism involves extending the meaning of the term "technology." Much effort has been invested into show that the Toronto School actually employs an "inclusive" understanding of technology (Strate 2004; Logan 2010). At this point, there has been a strong trend towards defining technology as an inherently social phenomenon. According to this revised conception, technology is in fact a socially organized way of gathering, storing, and processing information. In other words, technology is already synonymous with using different strategies of processing information. Or, to put it even more succinctly, technology is a way of thinking.

There is much to be said in favour of this strategy. First of all, it shows that critics simply misunderstand the central theses of medium theory, and hence their criticisms are unjustified. Moreover, it is easy to find textual evidence in McLuhan, Goody or Ong that can be marshaled to undermine the claim that technology is really just a matter of material artifacts. McLuhan's *Extensions of Man* constitutes a paradigmatic case here. In his book, money, language, automation, logic, and rationality are all analyzed in terms of an inclusive understanding of technology (McLuhan 1994). For McLuhan, every technology is either a kind of social institution as is the case with money, language and automation; or a way of thinking, as it is demonstrated in the case of logic or

rationality. On closer inspection, however, this response strategy is not quite as reasonable as it may initially appear.

As I have argued elsewhere (Trybulec 2013), advocating an inclusive definition of technology poses a serious threat to the theoretical identity of literacy theory. Here, I would like to discuss yet another undesirable consequence of the aforementioned response strategy employed by literacy theorists, namely that it significantly diminishes its explanatory power. In order to demonstrate this claim, it will be useful to focus on one representative example: the title of W. Ong's (1986) seminal essay "*Writing is a technology that restructures thought*". It is hardly an exaggeration to say that Ong's title aptly expresses the basic thesis which literacy theory seeks to advance. Thus formulated, the fundamental aim of literacy theory is very intriguing, since it broaches the intricate question of how mind, external tools, and reality are intertwined in complex, and mutually constraining ways. However, justifying the claim that technology restructures thought is challenging only relative to the narrow understanding of technology. The attempt to characterize the relation between media (as material artifacts such as paper, pen, or graphical inscriptions) and cognition raises a host of issues that has frequently been neglected in philosophy and classical cognitive science (Theiner 2011). But once we shift from an exclusive to an inclusive conception of technology, the "shock value" of the suggested counter-perspective is significantly diminished. What happens when a wide reading of technology is employed to interpret the title of Ong's paper? According to an inclusive interpretation, technology is in fact a way of thinking or some kind of social institution. Going with the former interpretation, according to which technology is conceived as a way of thinking, yields a particularly instructive result. If, however in the phrase "*… technology restructures thought*" we substitute the term "technology" with "a way of thinking", then the revised version of Ong's title reads: "*Writing is a way of thinking that restructures thought*." The claim that "a way of thinking (…) restructures thought" in most cases is undoubtedly true. What is missing though is the informational load of the statement. Therefore, due to overextending the meaning of technology, the main thesis of the Toronto School becomes uninformative. Such a strategy leads to a significant decrease in its explanatory power.

Summing up, the desire to avert accusations of technological determinism has become one of the key considerations shaping the reformulation of inclusive definitions of media and technology. However, this interpretational strategy may threaten not only the theoretical identity of the Toronto School but also to delude its explanatory potential. Thus, literacy theory seems to be confronted with the following dilemma: to face accusations of technological determinism, or risk having its explanatory power and identity undermined. Both options seem equally unsatisfactory.

In the following section I will try to justify the thesis that it is possible to find a way out of this dilemma by appealing to the narrow understanding of media and technology, and facing the accusations of technological determinism once again. Only this time, I shall confront the accusations of technological determinism from an angle that is different from the one which literacy theorists have traditionally adopted. Accusations of technological determinism are usually understood as raising empirical or methodological questions. In contrast, I argue that we ought to treat accusations of technological determinism as an epistemological issue.

From literacy theory to distributed cognition

What I would like to suggest is that both the creators and the critics of the Toronto School tacitly subscribe to certain epistemological assumptions which systematically hinder a proper understanding of the relationship between mind and media. Those assumptions which are claimed to be responsible for many conceptual confusions surrounding technological determinism and literacy theory are revealed in the way literacy scholars tend to articulate their statements about the cognitive importance of technology. Frequently used phrases such as "the impact of the media on the human being" or "awareness transforming technologies" or "writing affects a way of thinking" or "media change the world we live in" are problematic, because they suggest that some external factors necessarily and immediately transform a merely "passive" and "reactive" human mind. Using terms such as "affecting", "changing", "transforming" etc. suggests overly simplistic mechanistic model of the relation between mind and media. Therefore, part of the problem faced by the Toronto School results from relying on such simplifying expressions and the tacit assumptions that underlie them. From here, it is only a small step to be accused of technological determinism. Critics of literacy theory create a straw man by pushing particular phrases to the extreme and depicting the relation between mind and media in terms of an unmediated causal influence of external physical artifacts. Some researchers prefer to speak of "biases of communication" (Innis) or the "logic of writing" (Goody) or "consequences of literacy" (Goody) rather than speaking about "transformations" and "influences". But these are still fairly vague metaphors that call for further interpretations and pose new problems. Therefore, creating new metaphors or exploiting old ones cannot resolve the problem of technological determinism. The ongoing discussion about technological determinism proves that, when explaining the cognitive functions of media, it is extremely difficult to avoid the aforementioned expressions and troublesome ways of conceptualizing the relation between technology and mind.

These simplistic ways of expressing the consequences of literacy reveal at least two invalid assumptions regarding the nature of media and their relation to the human mind. First, the use of expressions such as "*the impact of the media on the human being*" suggests that media are external to man and constitute an autonomous realm that exists outside of concrete, historically situated human practices, and exerting their power immediately and independently of social circumstances. The second assumption is that media as the extensions of man directly amplify his or her cognitive potentials. Both assumptions are deeply rooted in prevailing ways of thinking and speaking about cognition and technology. Therefore, it is not easy to think outside this conceptual schema, and traditional philosophical frameworks seem of little help for overcoming this perspective. Particular importance in this respect can be attributed to the hypothesis of extended mind and the paradigm of situated cognition. I shall argue that the framework of situated cognition allows us to change the misleading way of making statements about the relations between media and cognition, for it helps to venture beyond the invalid assumptions concerning technology that I have identified above.

I will start by discussing the latter assumption. The concept of a "cognitive artifact" (Norman 1991), which has been fruitfully developed within theories of distributed cognition, can be gainfully applied in order to confront the second presupposition that media are extensions that and amplify pre-existing cognitive abilities. This assumption leads to an oversimplified picture of the relation between media and cognition. When taking as one's point of departure the metaphor of amplification and extension, one is then compelled to depict the consequences of media in terms of merely quantitative changes (Cole & Griffin 1980). For example, the implications of writing conceived as an "amplifier" are confined to the quantitative extension of the original and pre-existing cognitive capabilities. According to this perspective, writing increases memory abilities, improves communication, intensifies creativity, facilitates argumentation and makes it easier to transmit knowledge over time and space. However, none of these consequences refers to the generation of new, and distinctively literate cognitive capacities. Those are still the same cognitive faculties that were already pre-possessed by the human cognizer, albeit made more efficient. The metaphor of extension masks the important fact that the use of new communication technologies can bring about genuine qualitative changes to our cognitive faculties.

In contrast, the approach of situated cognition can help to overcome the commonly used metaphor of amplification and extension through the concept of a "cognitive artifact." According to socio-culturalists such as Cole and Griffin (1980), it is not exactly that writing considered as cognitive technology directly amplifies human faculties. (At least that is not the most important function it serves.) It is, rather, that properly designed cognitive artifacts

transform certain cognitive task so as to make them easier to accomplish (Norman 1991). Andy Clark (2001) puts this point nicely when he argues that:

> *external operations and tools (...) serve to reduce various complex, sequential problems to an ordered set of simpler pattern-completing operations of the kind our brains are most comfortable with* (133).

A salient example of the transformative powers of writing as a cognitive artifact is Ward and Jenkins' (1965) classical research on inferences about the co-occurrence of events. Ward and Jenkins asked college students to make judgments about correlations between two events: the procedure of cloud seeding and the appearance of rain. The alleged correlations were presented in two formats. Firstly, they introduced the data to subjects in a linear way by simply enumerating pairs of events in long series of trials (e.g. clouds were seeded – it rained, clouds were not seeded – it didn't rain, clouds were seeded – it didn't rain ... etc.). The provided data suggested that there was a significant correlation between seeding and the appearance of rain. Interestingly enough, more than eighty percent of respondents failed to notice the correlation. However, in the second round of the study subjects were more successful. When respondents were presented with the same data in a different format (i.e. the format of a table) nearly all of them made correct judgments regarding correlations between seeding and rain. The study provided a good background for Clark's claim that re-description of available information not so much provides human minds with new powers (nor does it amplify old ones) as much as it transforms the task so as people have to perform different kind of cognitive actions in order to complete certain task.

While Ward and Jenkins' study present a nice example of the task-transforming powers of visual representations, also poses a significant challenge when taken to the extreme. Consider the much-discussed criticism by Cole and Griffin who (1980) use this study to make a case against the model of amplification and internalization of activities that supposedly emerges from the interaction between man and his tools. Pointing to the results of Ward and Jenkins study, Cole and Griffin (1980) argue that literacy does not contribute to any general cognitive changes. Empirical research such as that carried out by Ward and Jenkins suggests that in the absence of cognitive tools the performance level of literate subjects is equally low as the performance of illiterate respondents. Therefore, the consequences of literacy are domain-specific, and restricted to tasks that are performed with the help of particular artifacts in specific contexts. Since obtaining a cognitive effect hinges on the bio-external availability of the tool, it is unwarranted to claim that literacy really creates any new cognitive skills (Cole & Griffin 1980).

We can see the flaw in Cole and Griffin's objection if we apply the notion of „distributed cognition" to recent cognitive-scientific studies of language and thought. Focusing on the case of mathematical reasoning, Georg Theiner

(Theiner 2011) demonstrated in detail how fruitful the extended mind approach can be in the context of theorizing about the cognitive consequences of writing and, perhaps even more impressively, the invention and use of symbolic representations in mathematics. It appears that the mental computations which underpin our mathematical performance are the outcome of intense interactions with external representational systems. Mathematically literate cognizers internalize mathematical tools to such an extent that they were able to perform complex mathematical tasks even though they did not use mathematical notation at the moment of performance (Theiner 2011). The case described by Theiner suggests that constant preoccupation with mathematical notation produces general changes in the modes of information processing that is carried out by mathematically literate individuals. Similar conclusion have been reached in a series of studies by D. Olson investigating the implications of literacy for metalinguistic awareness. For example, Olson (2013) suggests that illiterate adults and young children display similar levels of phonological awareness. Moreover, as shown by studies, the word awareness of early literate children (4 to 6 years old) depends on their attempt to develop connections between written and spoken language (Homer & Olson 1999). In general, a wide body of recent research concerning the contribution of literacy to meta-linguistic awareness (Homer and Olson 1999; Ungureanu 2013) suggests, contrary to the claims made by Cole and Griffin, that literacy does indeed bring about domain-general changes to our cognitive apparatus, and the significance of literacy is not limited solely to its task-transforming powers.

Let us now turn to more general considerations regarding the first assumption concerning the relationship between mind and technology. The assumption of conceiving technology as a reality that exists "outside" of human mind employs a clearly Cartesian perspective on mind and cognition, as aptly characterized by Norman:

> *All the action is inside the head, yielding a natural distinction between the stuff out there and processes taking place inside here. (…) Sure there is a lot action in the world at large and within sociocultural groups, but cognitive processing occurs within the heads of individuals. So, all we have to do is understand the internal mental processes, and the nature of input/output transformations of individuals, and we will have covered everything that matters* (Norman 1993: 3–4).

Any approach that is fuelled by such isolationist and individualistic intuitions is prone to depict media and technology as a completely extraneous phenomenon since only transformations of brain-internal representations are relevant to cognition. Therefore, theorizing media with the help of classical information-processing models of cognition offers us basically just two options. The first is to deny that media have any constitutive effects on human cogni-

tion, since what really matters is solely the cogitations inside the head of the individual. This, however, is an extreme position. The other option would be to allow that external factors can causally influence cognitive processes, while still retaining a traditional individualistic perspective. In other words, the second option consistent with the Cartesian paradigm is to construct a theory of "ecological" or "technological influence". According to this view, the human mind operates within a societal and technological context, and cognition is influenced by the external environment. Such an "ecological" approach, however, assumes that in principle both the mind and its external context are neatly separable, autonomous entities that are only accidentally interconnected (Sawyer 2002). The majority of critical discussions concerning literacy theory and technological determinism works within such an "ecological" framework. That is why the debate over technological determinism is preoccupied with the question of autonomy. One of the main concerns is therefore the question of who or what shall be ascribed with agency and autonomy (i.e. with the power to act independently): the individual, society or technology and media?

According to the approach of situated cognition, which is the third, and decidedly non-Cartesian perspective that I would like to advocate, any attempt to answer this question derives from the flawed assumption that it is methodologically possible to make a clear distinction between the individual and technology. The situated perspective is aptly characterized by Norman (1993):

> *One cannot look at just the situation, or just the environment, or just the person. To do so is to destroy the very phenomenon of interest. After all it is mutual accommodation of people and the environment that matters, so to focus upon only aspects in isolation is to destroy the interaction, to eliminate the role of the situation upon cognition and action* (4).

I posit that the idea of external and autonomous technology steams from the artificial division of individuals, the societal context in which they are embedded, and the media which they use. In order to break down the pervasive influence which ecological and individualistic assumptions have on our thinking about the cognitive functions of media, one ought to adopt the general idea of extended mind. According to this proposition, media are not merely external factors that influence cognitive processes from the outside, as it were, but cognition is in fact deeply dependent on, and partly constituted by the intricate and dynamic interactions between media, the individual, and society. Cognition is not simply influenced by the media, as critics of literacy theory would suggest, but cognitive processes are in some important sense created by our use of external media. (Hutchins 1995; Menary 2010; Cackowski 1979). Appreciating this important fact about what makes us human requires that we view the mind from the perspective of situated cognition, by moving its limits beyond the boundaries of the individual organism.

Conclusions

In this paper, I have examined the theoretical difficulties faced by literacy theory (or the Toronto School) and argued that there are at least two reasons to co-opt the frameworks of extended mind and situated cognition for the purpose of resolving some central theoretical dilemmas of the Toronto School. In particular, I used the debate over technological determinism within the area of media studies and theories of communication as a backdrop for introducing two basic strategies for defining the concept of a medium or technology within literacy theory: an *exclusive* versus an *inclusive* interpretation. The narrow, exclusive conception defines a medium in terms of a material artifact. The wider, inclusive definition of a medium identifies it with a kind of social institution which attends to bring about particular ways of thinking and acting. I have argued that both interpretational strategies used for defining media and the related concept of technology are inaccurate. On the one hand, construing media or technology as material artifacts leads to extreme forms of technological determinism, as critics of literacy theory have pointed out. On the other hand, an inclusive reading of media blurs the theoretical integrity of literacy theory, and decreases its explanatory power. Therefore, literacy theory faces a serious dilemma, since it needs to choose between two equally unsuitable definitions of technology/media. As a more viable alternative, I have recommended the conceptual framework of extended mind and situated cognition as a way of resolving the dilemma. When we then interpreted literacy theory and its theoretical constructs through the lens of situated cognition, we were able to reveal some frequently overlooked ambiguities concerning the relationship between mind and media. First, describing the relation between media and mind in terms of "impact", "change," or "influence" suggests that media and technology are purely external, autonomous phenomena "floating" above the human ground, and influencing cognition only in relatively superficial manners, from the outside. Second, the prevailing metaphors of extension and amplification suggest that the consequences of media are restricted to mere quantitative changes in pre-existing human potentials. Distributed cognition and the extended mind hypothesis yield a promising alternative framework to commonsensical intuitions and the classical individualist worldview regarding mind and the external world (media included). More specifically, the significance of distributed cognition in the context of literacy theory lies in its potential to retain the narrow, exclusive understanding of media while, at the same time, warding off accusations of technological determinism.

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