

DIGITAL READING IN THE CONTEXT OF MEDIA-CRITICAL DISCOURSES

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KEYWORDS

Digital reading, deep reading, immersion, media criticism, distraction, embodied cognition

PUBLICATION DATE

Issue 16, May 31, 2024

HOW TO CITE

Susanne Düwell. "Digital Reading in the Context of Media-Critical Discourses."
On Culture: The Open Journal for the Study of Culture 16 (2024).
<<https://doi.org/10.22029/oc.2024.1412>>.

DOI: <<https://doi.org/10.22029/oc.2024.1412>>



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Abstract

With the transformation of media in the context of digitization, reading is once again becoming a highly debated topic. Not only are fears being expressed that the end of the ‘Gutenberg Galaxy’ will set back the spread of reading as a cultural technique, but more recent debates discuss the consequences of ‘digital reading’ from pedagogical and neurophysiological perspectives. The aim of this paper is to analyze the media and cultural debates about the consequences of digital reading. The different varieties and reference discourses of the discussion will be distinguished and related to the history of discourses critical of reading. The pedagogical critique of ‘digital reading’ is based on the thesis that it can lead to a diminution of cognitive abilities. The materiality of reading media and the physicality of the reading process are attributed with far-reaching mental and psychological effects. Furthermore, from a culturally pessimistic perspective, the spread of digital reading is seen as a cultural caesura that threatens the ability to think critically and empathize. The central reference discourse for the plausibility of the alleged dangers of digital reading is neuroscientific studies.

The course of digitalization has reshaped how we read, write, and access information. With the change of media, reading has become a highly debated topic. Not only are fears being voiced that the end of the “Gutenberg galaxy”¹ will push back the spread of the cultural technique of reading, but since the beginning of the millennium the consequences of ‘digital reading’ have been problematized by empirical reading research (e.g. Anne Mangen) as well as by pedagogical, neurophysiological and cultural-critical perspectives (e.g. Maryanne Wolf). The argumentation patterns of media- and culture-critical debates on the consequences of digital reading will be discussed below and related to the history of discourses critical of reading.

The assumption that reading and writing are fundamentally changed by digitalization is not necessarily linked to a media-critical perspective (as N. Katherine Hayles’ approach shows). The educational-theory critique of digital reading is based on the thesis that the development of cognitive and mental skills is hindered in children who predominantly read digitally. In this context, various research and educational initiatives recently have sought to address the consequences of using digital reading devices for literacy development in children and adolescents (e.g., Stavanger Declaration, 2018; OECD Reading Literacy Study 2021). Further debates about digital reading are critical of culture and attribute fundamental social effects to the practice of reading on screens, central to which are a focus on physical and

material aspects of reading, embodiment approaches, and recourse to cognitive science hypotheses that are often assumed to have self-explanatory evidence.

Discourse on digital reading assumes that reading on digital devices is categorically distinct from reading on paper, and ascribes to the reading material far-reaching effects concerning altered behaviors (swiping, clicking, etc.), sensorimotor and haptic functions, and specific cognitive/neural and psychological changes. It asserts qualitative difference between concentrated paper reading ('deep reading') and superficial, scattered screen reading ('surface or hyper reading'), suggesting that mediality (paper or screen) and a specific attitude to reception (deep or distracted) are involuntarily linked. This simplistic comparison between paper and screen, however, does not account for the wide variety of interfaces, layouts, and typographies that exist, nor for the digital methods used to produce paper texts. Digital technology influences almost all currently produced texts, thus challenging the assumed dichotomy of paper and screen.

Debates about the far-reaching consequences of digital reading have a broad impact, as they are often conducted in a popular-scientific manner. This essay aims to identify central media-critical argumentation patterns, how the feared pathological consequences are plausibilized, and to determine which (popular) scientific reference systems and theses might be authoritative. Discourses on digital reading not only describe the consequences of changed reading practices, but also attribute to digital reading many consequences of the digitization of society. In this context, the empirical results of neuroscience are intended to make plausible the assumed psychological and cognitive changes caused by digitization.

1_Digital Reading in the Educational Process

Educational, psychiatric, and cognitive science concerns abound about children and adolescents' excessive use of digital media (often generalized as 'screen time' or 'media time'), but there also exists a concrete debate about the possible consequences of digital reading in general, and for adolescents in particular. Fundamental to this pedagogical discussion is a qualitative differentiation between analog and digital reading and writing. On the content level, it is assumed that digital reading requires different strategies and thus media-didactic instruction. In addition, the process of reading itself is categorically differentiated into reading texts in paper form and

reading on the screen; it is assumed that ‘deep reading’ is dependent on paper form, while ‘digital reading’ is superficial, fleeting, and discontinuous. Crucial to this discourse is the widespread assumption that these are not only two different material practices, but that they also correspond to different cognitive and mental processes. Empirical reading research and cognitive science studies on the changes in reading on digital devices develop after the turn of the millennium. Public debates, partly motivated by media criticism, pursue different angles but warn of far-reaching harmful consequences of digital reading.

A dichotomy of attention and distraction,² which over two centuries had already characterized debates about the addictiveness of reading,³ remains a guiding distinction of the ‘new’ reading debate.⁴ In the last third of the 18th century, a debate arose in the context of empirical psychology and philanthropic pedagogy about the dangers of uncontrolled reading, especially for young people and women. Warnings were issued about the psychological and physical consequences of excessive reading, with reading of novels in particular suspected to cause pathological effects. Indiscriminate, excessive, and distracting reading of contemporary fiction is contrasted with concentrated and moderate reading of selected, morally valuable texts. Now, on the other hand, books that stimulate the imagination rather than simply providing information are recommended; it is precisely the reading of fiction in book form that is considered valuable. If one follows the common argument, however, today’s temptation to distraction instead has been potentiated by the use of a single mobile device for diverse forms of play, entertainment, communication, learning, and reading. Digital reading holds additional potential for distraction through hypertextual structures and multimodal arrangements.

The pedagogical discussion about the harmful consequences of digital reading can be interpreted as a late variant of the reading addiction debate, in that the (Enlightenment) idea that reading must be guided and controlled if it is not to cause harm is repeated in the discussion about the pedagogical use of digital reading. According to the 2018 European Stavanger Declaration,⁵ to accomplish this without serious loss of comprehension, memory, and attention, requires instruction in appropriate reading methods, particularly via the reading of longer texts in paper form. The Stavanger Declaration concludes:

Students should be taught strategies they can use to master deep reading and higher-level reading processes on digital devices. In addition, it remains important that schools and school libraries continue to motivate students to read paper books, and to set time apart for it in the curriculum. Teachers and other educators must be made aware that rapid and indiscriminate swaps of print, paper, and pencils for digital technologies in primary education are not neutral. Unless accompanied by carefully developed digital learning tools and strategies, they may cause a setback in the development of children's reading comprehension and emerging critical thinking skills.⁶

The initiative, which originates from the Danish University of Stavanger, compares the effects of reading on digital devices with reading printed material on the basis of empirical reading research. It is based on the thesis that the specific materiality of the devices and media of reading is constitutive for the reading and thinking process; in this respect, it can also be understood as an expression of the practical and material turn in educational science.⁷

An OECD study published in May 2021 on the reading competence of students—which, notably, presupposed a relationship between reading literacy and reading media—arrived at an even stronger endorsement of reading on paper. Citing a survey that revealed a significant decrease between 2009 and 2018 in the pleasure that students derive from reading, alongside a survey on increasing Internet use,⁸ the study concluded that “in 35 countries, there is a negative correlation between student performance in reading literacy and the use of digital devices for school purposes, especially in Germany,” and that increased duration of digital device use led to significant deterioration in reading literacy scores.⁹ Students who read predominantly print media had better scores than those who read both print and digital books. Students who read mostly digital books had literacy scores no better than students who rarely or never read books.¹⁰ The question of why students digitally reading do not perform better than those who do not read at all has yet to be answered. The results of the study have been polemically and media-critically truncated into the headline that digital media could become “a danger for reading skills.”¹¹

The reading debate corresponds to a controversial debate about writing, considering whether no longer learning cursive (that is, writing only in print or with electronic devices) could lead to developmental disorders in children, which posits that cognitive development is linked to physical processes such as fine motor skills, which are a prerequisite for and are trained by handwriting.¹² While focused on children, writing by hand is described as having positive effects on all ages.¹³ These

debates about reading and writing are not limited to questions of educational policy and pedagogy; the end of the ‘Gutenberg galaxy’ and the dominance of digital reading is also interpreted as a fundamental cultural caesura.

2_Reading as a Physical Act

The European Stavanger Declaration on digital reading can be traced to prominent empirical reading researcher Anne Mangen, whose various comparative studies on digital and analog reading center on the different materialities and affordances of books and digital devices. In her much-cited essay “Hypertext Fiction Reading: Haptics and Immersion,” Mangen examines how reading ‘hypertext fiction’ and digital texts differ from reading fiction books in paper form.¹⁴ Linking this distinction to reflections on the concept of immersion, especially central to computer game debates, Mangen considers the phenomenology of bodily experience. With respect to literary concepts and reading practices, Mangen’s initial question is highly presuppositional. Assuming that fiction texts demand an immersed and focused reading, Mangen argues that this focus is disrupted by the haptic affordance of digital devices: the constant stimulus to make new things appear on the screen through clicks and the like pushes the materiality of the medium into the foreground, splitting attention so that it is no longer fully available for reading or visualizing what has been read.

To qualitatively differentiate the experience of traditional reading of fictional texts and hypertext fiction, Mangen distinguishes two types of immersion: phenomenological vs. technological. What Mangen describes as phenomenological immersion is a classical intensive reading experience corresponding to the 18th-century concept of illusion, wherein the reading medium becomes transparent with respect to what is read, or the idea that the reading triggers, such that the medium itself is no longer perceived. This immersion is a product of the human mind: “This is the kind of immersion we experience when reading a page-turner novel. In this kind of immersion, the physical and technical features of the material support—the book—are ideally transparent in order to facilitate, and not disturb, phenomenological immersion.”¹⁵ Technological immersion, on the other hand, is a product of technology, e.g., a virtual environment in computer games, or hypertext fiction.

Digital technology, Mangen argues, is designed to produce technological immersion, but is less capable of producing phenomenological immersion.

Mangen's argument is paradoxical. On one hand, the transparency of the medium is considered a feature of phenomenological immersion, as well as of the aesthetic illusion, allowing mental processes alone to come to the fore. On the other hand, the problematization of digital reading strengthens the materiality—the opacity—of the printed book. The book's temporal and spatial permanence of the book is emphasized above all: it is a stable, tangible, individual object; it has a specific weight; its paper has a particular feel; its spatiality and physicality facilitate orientation, annotation, and jumping around from page to page, section to section.¹⁶ Digital devices offer some of these same functions, but in less vivid and intuitive forms, given their single-screen surfaces. From this Mangen infers that text, unlike paper, is immaterial, ephemeral, and dynamic:

Because of this ontological intangibility of the digital text, our phenomenological experience—reading—of the digital text will differ profoundly from that of a print text. The print text is tangible—it is physically, tactilely, graspable, in ways that digital texts are not (until they are printed out and hence no longer digital).¹⁷

According to Mangen, studies show that the 'intangibility' of digital text leads to cursory reading. Furthermore, digital text offers distraction potential, which Mangen compares with that of television: like television, reading on the screen offers moving images and the possibility of switching or channel-surfing, enabling a decisive stimulus of calling up new impressions by moving one's hand. For every bout of boredom or strain, there is the possibility to stimulate attention again by new external stimuli,¹⁸ unlike with a paper book: "When reading a book, the text in the book as a static and fixed perceptual phenomenon simply does not provide us with options for attentional switching and for autostimulating our attentional response."¹⁹

This emphatic understanding of bodily process and materiality in reading counters the widespread tendency in the second half of the 20th century to define the human brain primarily in terms of its information-processing performance, by analogy with the computer.²⁰ In contrast, embodiment and embodied cognition focus on the effects of movement, haptics, and perception on cognition and behavior. Even if the invisible processes in reading are still largely unknown, there is a tendency to confer to digital media far-reaching physical effects attributed to deficient characteristics. Even if it is

admitted that the invisible processes involved in reading are still largely unknown, there is a tendency to attribute very far-reaching and generally deficient characteristics to the physical effects of digital media.

With regard to the arrangement of factors (type of text, purpose of reading, reading device, reading environment, social context) that determine reading, Mangen argues that the fundamental role of the body has so far been misjudged and that reading is “multisensory and embodied,”²¹ even if, with regard to factors that determine reading (type of text, purpose of reading, reading device, reading environment, social context), the fundamental role of the body has so far been misunderstood. Alongside references to the work of Maryanne Wolf and Nicholas Carr, Mangen’s starting point is her own empirical research showing that text comprehension is worse when reading texts on a screen than when reading on paper. While Mangen admits that no firm causal evidence exists, she emphasizes the relevance of hand movements, touch, haptics, and the differences in “sensorimotor contingencies” or “kinesthetic feedback” between reading on screen or on paper: “recent research,” she says, “indicates that the missing sensorimotor—kinesthetic—feedback of screens may in fact negatively affect certain cognitive aspects of reading.”²²

N. Katherine Hayles, on the other hand, shows that the emphasis on embodiment in reading need not be associated with a devaluation of digital reading or culturally pessimistic perspectives. While Hayles also assumes a serious change brought about by digital reading, she contextualizes this in her concept of posthumanism.²³ Asserting that human intelligence adapts to the affordances of the computer and that a coevolution of man and machine emerges, Hayles refers to the connection and interaction between humans and machines that determines how we interact with digital devices as assemblages:

I also want to emphasize that interpretations and meaning-making practices circulate through transindividual collectivities created by fluctuating and dynamic interconnections between humans and computational media, interconnections that I call cognitive assemblages.²⁴

Unlike Anne Mangen or Maryanne Wolf, Hayles argues that different forms of reading should not be considered antagonistically, and rather emphasizes the potential given by the combination of close,²⁵ hyper and machine reading. Though Hayles also notes a change in reading skills among students, she does not accept the dichotomy of reading on paper and reading on screen or of deep reading and surface/hyper reading,

nor the devaluation of digital reading that this usually invokes. Hayles includes machine reading as a third form of reading, and in contrast to positions that limit the concept of reading to human activity, Hayle postulates a permeability here as well. Her approach emphasizes the specific achievements of all three forms of reading and, above all, the synergies that allow them to connect and interact.

4_ ‘Deep Reading,’ ‘Deep Thinking’ and the Evolution of the Reading Brain

Neuroscientist Maryanne Wolf is prominent in warning of the loss of deep-reading ability to due to advancing digitization, and her trenchant theses on the fundamental importance of deep reading have been widely received.²⁶ Her starting point is that the loss of ‘deep reading’ or ‘deep literacy’²⁷ is associated not only with cultural changes, but also with changes in brain physiology and sociopolitics. Wolf defines deep reading (also called meditative, contemplative, concentrated, slow, or immersive reading) as the self-forgetting reading of long fictional or belletristic texts. According to Wolf, the loss of deep reading threatens not only the ability to read with perseverance and the literary canon of education, but concepts such as the autonomous subject, individuality, the ability to reflect, and morality itself. Reading and thinking are short-circuited in this argument: to Wolf, ‘deep reading’ and ‘deep thinking’ are inseparable; without deep reading, contemplation, imagination, analytical and critical thinking, and the ability to empathize are also in danger. Wolf further correlates pure knowledge acquisition and imagination with the differences between digital versus analog reading. To not lose reading’s old forms and the cognitive abilities attached to them, Wolf prescribes conscious training in contemplative reading skills alongside digital reading acquisition.²⁸ Wolf’s argument gathers force through its anthropological and cognitive-scientific underpinning, which she employs to assert the equivalence of reading and thinking. Reading—according to Wolf—is a late evolutionary ability,²⁹ unprogrammed genetically and therefore easily lost; it is about nothing less than the evolution of the “reading brain.”³⁰ Learning to read is connected with the development of specific neuronal ‘circuits,’ irreplaceable via any other activity, which also directly affect the development of thinking; today’s digital environments thereby involuntarily and unconsciously affect humans’ perception and attention economies.³¹

In opposition to Hayles' posthumanist approach, Wolf aims at the preservation of educated bourgeois humanism. Digitization is described as an upheaval comparable in scope to the transition from orality to writing, and far-reaching interpretations and prognoses of diverse futures, from utopian to anti-utopian to dystopian, are attached to this 'transitional period.' Although the discourse on 'digital reading' is disciplinarily differentiated,³² theses such as Wolf's have been widely accepted despite (or precisely because of) their popular scientific pointing. This is true for her postulation of the connection of 'deep reading' and 'deep thinking;' the differences between natural and technical, internal and external, which are connected with analog and digital reading; and also for her recourse to the 18th century emergence through reading of bourgeois subjectivity and the public sphere, which seem to be endangered with the decline of the ability for analog 'deep' reading.

In remarks on the cultural and political relevance of the cultural technique of reading, Michael Hagner cites Wolf's theses as a material basis for his own political argument:

The findings of cognitive research confirm and deepen what is known through life experience, historical overview and socio-psychological insights: literacy—once acquired and then cultivated throughout life—[...] forms a foundation of our civilizational and cultural human condition.³³

Hagner fails to explain why the cognitive-scientific proof that changes in practices and media applications are also associated with changes in neuronal processes should be confirmation of life experiences or historical and psychological insights.³⁴

Though recourse to the physicality and materiality of media use has been integral in media-critical arguments since the end of the 18th century, current theories differ from earlier theses regarding physical and psychological consequences of excessive reading, which was understood as moral misconduct and/or illness, not least because the alleged cognitive changes occur unconsciously, involuntarily, and in a close interconnection between the human body or brain and technology. In addition, technology is ascribed its own agency. Even more profound changes are attributed to digital reading: digitization is interpreted as an anthropological caesura, encompassing all areas of life and the cognitive abilities of all who are confronted with digital media.

Whereas the excessive reading of fiction books in the reading addiction debate of the late Enlightenment was taken to be the cause of distraction and immersion—

which in the present are discussed more as effects of smartphones and computer games—book reading in the discourse on digital reading is instead portrayed as a guarantor of reflective ability, imagination, and empathy. Insofar as these qualities, which can also be addressed as the basis of aesthetic experience, appear endangered, the cultural-critical discourse on digital reading also conjures up the end of all forms of active and reflected reception of art and media as a danger, in that digital media threaten to undermine the subject and its power of imagination itself.

Overall, media-critical discourses on digital reading are characterized by dichotomies and presuppositional, generalizing hypotheses. Although it is conceded that cognitive processes of reading and the interaction between physical and mental/emotional activity have hardly been researched, sociopolitical and anthropological interpretations are derived from empirical results of reading research and neuroscientific measurement results. In addition, general criticism of the political and cultural effects of digitalization is sometimes projected onto the concept of digital reading. The concrete differences between various media, formats, and reading practices are usually ignored. Standard arguments of technology criticism are often promoted;³⁵ these are not specific to digital reading, but accompany the history of moral and media panics and are assumed to be scientific evidence by recourse to neuroscientific data.

On the one hand, the materiality of technology and media is ascribed very far-reaching, yet hardly verifiable effects, which are claimed to occur more or less automatically. On the other hand, traditional reading (especially of canonized fiction) in paper form is attributed an immense effect as a remedy against the dangers of digitalization, implicating not only individual education, but the state of society as a whole. Such a culturally conservative approach, alongside arguments from the repertoire of media criticism, replace the discussion of concrete political issues (such as the democratic control of digital media or the social prerequisites of education) in both educational and political-cultural contexts.

Endnotes

¹ The concept of the ‘Gutenberg Galaxy’ is associated with the idea that media history is characterized by media breaks. The decisive caesuras would be the transition from oral to written form, the invention of letterpress printing by Gutenberg and digitization. This latest caesura is said to have had similarly serious effects as the introduction of the printing press. See Marshall

- McLuhan, *The Gutenberg Galaxy* (Toronto: University of Toronto Press, 1962); Horst Wenzel, *Mediengeschichte vor und nach Gutenberg: Wissen. Bildung. Gemeinschaft* (Darmstadt: WBG, 2007).
- ² See Petra Löffler, *Verteilte Aufmerksamkeit: Eine Mediengeschichte der Zerstreuung* (Zürich: Diaphanes, 2014).
- ³ See Hans-Jörg Künast, “Lesen macht krank und kann tödlich sein: Lesesucht und Selbstmord um 1800,” in *Sinn und Unsinn des Lesens: Gegenstände, Darstellungen und Argumente aus Geschichte und Gegenwart*, eds. Axel Kuhn and Sandra Rühr (Göttingen: Vandenhoeck & Ruprecht, 2013), 121–141; Susanne Düwell, “Von der Lesesucht über das Lesen als Selbstbildung zum digitalen Lesen,” in *Medienkritik und Wirkungsästhetik*, eds. Susanne Düwell and Nicolas Pethes (Berlin: Kadmos, 2023), 107–131.
- ⁴ Lauer interprets the cultural-critical devaluations of digital reading as a new edition of the opposition of superficial, distracted ‘newspaper reading’ versus concentrated ‘book reading’ that characterized press-critical discourse at the beginning of the 20th century. Cf. Gerhard Lauer, *Lesen im digitalen Zeitalter* (Darmstadt: WBG, 2020).
- ⁵ The ‘COST E-READ Stavanger Declaration’ on the future of reading is based on a European research initiative involving 200 scientists. The focus is, among other things, on the question of what differences emerge, especially among children and young people, in terms of text comprehension and memorability, depending on whether they read digital or printed material (COST=European Cooperation in Science and Technology; E-READ=Evolution of Reading in the Age of Digitisation).
- ⁶ COST E-READ Stavanger Declaration Concerning the Future of Reading
<<https://futureofreading.eu/wpcontent/uploads/2019/01/StavangerDeclaration-1.pdf>>.
- ⁷ See Arnd-Michael Nohl and Christoph Wulf, “Die Materialität pädagogischer Prozesse zwischen Mensch und Ding,” *Zeitschrift für Erziehungswissenschaft*, no. 16 (2013): 1–13.
- ⁸ “Den PISA-Erhebungen zufolge hat sich die Internetnutzung der 15-Jährigen im OECD-Raum zwischen 2012 und 2018 von 21 auf 35 Stunden wöchentlich erhöht.” Christine Sälzer, “Lesen im 21. Jahrhundert: Lesekompetenzen in einer digitalen Welt. Deutschlandspezifische Ergebnisse des PISA-Berichts ‘21st-century readers,’” May, 2021,
<https://www.oecd.org/pisa/PISA2018_Lesen_DEUTSCHLAND.pdf>, 4.
- ⁹ (“In 35 Ländern besteht zwischen den Schülerleistungen im Bereich Lesekompetenz und der Nutzungsdauer digitaler Geräte für schulische Zwecke ein negativer Zusammenhang, insbesondere in Deutschland”) Sälzer, “Lesen im 21. Jahrhundert,” 2. Overall, education policy studies conclude that socioeconomic factors have a particularly strong effect in Germany.
- ¹⁰ See Sälzer, “Lesen im 21. Jahrhundert,” 13.
- ¹¹ (“eine Gefahr für die Lesekompetenz”) Kristin Haug, “Pisa-Sonderauswertung Schülerinnen und Schüler haben keine Lust mehr zu lesen: Immer mehr Jugendliche lesen nur noch, wenn sie müssen, das zeigt eine Pisa-Sonderauswertung. Und: Digitale Medien können zur Gefahr für die Lesekompetenz werden,” in *Spiegel*, May 4, 2021,
<<https://www.spiegel.de/panorama/bildung/pisa-sonderauswertung-schuelerinnen-und-schueler-habe-keine-lust-mehr-zu-lesen-a-7a8f6bb3-c221-4b61-be9b-a279814c9cc7>>, [english translation S.D.].
- ¹² Sabine Czerny further argues that learning handwriting is significant to learning psychology precisely because of the difficulty involved; in addition to fine motor skills, her plea for handwriting also focuses on “Anstrengungsbereitschaft” [willingness to achieve] and “Aufmerksamkeit” [attention]. The coupling of physical activity and learning goes back to the

- Enlightenment pedagogy. Sabine Czerny, “Handschrift ist mühsam und das ist gut so,” in Deutsches Schulportal, July 1, 2020, <<https://deutsches-schulportal.de/kolumnen/handschrift-ist-muehsam-und-das-ist-gut-so/>>.
- ¹³ Gwendolyn Bounds, “How Handwriting Trains the Brain: Forming Letters Is Key to Learning, Memory, Ideas,” in *Wall Street Journal*, October 5, 2010, <<https://www.wsj.com/articles/SB10001424052748704631504575531932754922518>>; Gernot Böhme, “Handschrift und leibliche Anwesenheit,” in *Kultur der Privatheit in der Netzgesellschaft*, eds. Gernot Böhme and Ute Gahlings (Bielefeld: Aisthesis, 2018).
- ¹⁴ Anne Mangen, “Hypertext Fiction Reading: Haptics and Immersion,” *Journal of Research in Reading* 31, no. 4 (2008): 404–419.
- ¹⁵ Mangen, “Hypertext,” 406.
- ¹⁶ Literary studies also emphasize the materiality of paper and printed books because central categories such as ‘historicity’ and ‘original’ are related to the individual object, which is also valorized by the argument that it forms a unity of content and materiality, unlike the digital text associated with dissociation, overstimulation, and fragmentation, see Lothar Müller, *Weißer Magie: Die Epoche des Papiers* (München: Hanser, 2012); Roland Reuß, *Die perfekte Lesemaschine: Zur Ergonomie des Buches* (Göttingen: Wallstein, 2014). Cf. also Reuß’s critique of digital and social media: Roland Reuß, *Ende der Hypnose: Vom Netz und zum Buch* (Frankfurt a. M./Basel: Stroemfeld, 2012).
- ¹⁷ Mangen, “Hypertext,” 408.
- ¹⁸ The mere knowledge of the possibility is distracting: “When afforded the possibility to click, however, our attentional allocation is already partly directed toward the haptic intending of clicking, rather than fully directed toward the contents of the text itself, and hence the potentially immersive impact of the narrative fiction.” Mangen, “Hypertext,” 413. Even functions that are useful in themselves, such as translation aids in the e-book, caused such a distraction of undivided attention.
- ¹⁹ Mangen, “Hypertext,” 410. Mangen cites the attraction of the new, to which one can immediately give in, is also used in the reading addiction debate of the 18th century to argue against excessive reading of new novels.
- ²⁰ “Rather than viewing the brain as the only factor responsible for adaptive behavior, this ‘embodied’ view of cognition regards the brain as part of a dynamic system in which brains, bodies, and environment all come together to generate intelligent action. That is, cognitive processes are grounded in action [...]” Louise Barrett, “Introduction: Face It or Replace It?: Why Computational Metaphors Fall Short and Why We Need a New Approach,” in *A Multidisciplinary Approach to Embodiment: Understanding Human Being*, ed. Nancy K. Dess (New York: Routledge, 2021), 1–5, here: 3.
- ²¹ Anne Mangen, “Digitization, Reading, and the Body: Handling Texts on Paper and Screens,” in *A Multidisciplinary Approach to Embodiment: Understanding Human Being*, ed. Nancy K. Dess (New York: Routledge, 2021), 51–55, here: 51.
- ²² Mangen, “Digitization,” 54. Paper’s material significance also underlies the concept of “haptic dissonance,” see Jin Gerlach and Peter Buxmann, “Investigating the Acceptance of Electronic Books: The Impact of Haptic Dissonance on Innovation Adoption,” *ECIS Proceedings* 141 (2011): n.p. The term is based on the concept of cognitive dissonance. Gerlach and Buxmann distinguish between various aspects of the haptics of a printed book and the reading process, which the respondents conversely miss in digital reading. They distinguish between the following elements: “the feel of the book’s (individual) weight,” “thickness,” “value,” “age and previous

usage,” “the natural and nontechnical feel of a book,” “durability,” and “binding.” Concerning the reading process, “the feel of the stimulation of one’s fingers while reading,” “often the page and the paper,” “turning a page,” “having a book in one’s hand,” “the progress one has made in a book,” “ability to put a finger into a book,” “feel of opening and closing” are distinguished. Gerlach and Buxmann, “Investigating the Acceptance of Electronic Books,” n.p. However, the study is not designed to be critical of the media; instead, it asks about the reasons for the preference for reading on paper.

- ²³ See N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999).
- ²⁴ N. Katherine Hayles, *Postprint: Books and Becoming Computational* (New York: Columbia University Press, 2021), 8.
- ²⁵ Hayles refers to close reading here because her point of departure is the observation that literary studies regarded the practice of close reading as its unique selling point and for this reason neglected to address the possibilities of digital reading. In this context, she also critically engages with the culturally pessimistic, cognitive science theses of authors such as Nicholas Carr, Mark Bauerlein, and Stanislas Dehaene.
- ²⁶ See Maryanne Wolf and Mirit Barzillai, “The Importance of Deep Reading,” *Educational Leadership* 66, no. 6 (2009): 32–37; Maryanne Wolf, *Reader, Come Home: The Reading Brain in a Digital World* (New York: Harper, 2018).
- ²⁷ See Adam Garfinkel, “The Erosion of Deep Literacy,” *National Affairs*, no. 47 (2020): 192–208.
- ²⁸ Wolf, *Reader*, 25.
- ²⁹ Reference for this popular thesis is, among others, the cognitive psychologist Stanislas Dehaene, *Reading in the Brain: The New Science of How We Read* (New York: Penguin, 2009).
- ³⁰ Wolf, *Reader*, 12.
- ³¹ Similarly, Schirmmacher has described a personal experience: “Wir werden das selbstständige Denken verlernen, weil wir nicht mehr wissen, was wichtig ist und was nicht. Und wir werden uns in fast allen Bereichen der autoritären Herrschaft der Maschinen unterwerfen. Denn das Denken wandert buchstäblich nach außen; es verlässt unser Inneres und spielt sich auf digitalen Plattformen ab.” Frank Schirmmacher, “Mein Kopf kommt nicht mehr mit,” in *Payback: Warum wir im Informationszeitalter gezwungen sind zu tun, was wir nicht tun wollen, und wie wir die Kontrolle über unser Denken zurückgewinnen*, ed. Frank Schirmmacher (München: Pantheon, 2009), 13–21, here: 20. Schirmmacher’s collection of essays offers personal, pointed introspection about digital media: “Ich bin noch nicht bereit, den Bankrott zu erklären. Aber ich bin unkonzentriert, vergesslich und mein Hirn gibt jeder Ablenkung nach.” Schirmmacher, “Mein Kopf kommt nicht mehr mit,” 15.
- ³² Hardly any role for the discourse is played by purely polemical statements, such as those by Manfred Spitzer. Spitzer’s rejection of digital media for children goes so far that he also rejects any methodically reflected use of e-books: “It is interesting how the media deal with this insight: Instead of clearly stating that e-books are no good for children, parents and teachers are urged to make better use of the ‘advantages’ of e-books and to cultivate and teach a better way of dealing with them.” Manfred Spitzer, *Cyberkrank! Wie das digitalisierte Leben unsere Gesundheit ruiniert* (München: Droemer, 2015), 218.
- ³³ “Die Erkenntnisse der Kognitionsforschung bestätigen und vertiefen, was durch Lebenserfahrung, historische Übersicht und sozialpsychologische Einsichten bekannt ist: Literalität—einmal erworbene und dann lebenslang weiter gepflegte—[...] bildet ein Fundament unserer zivilisatorischen und kulturellen conditio humana.” Michael Hagner, *Zur Sache des Buches*

(Göttingen: Wallstein, 2015), 221, [english translation S.D.]. Hagner clearly distances himself, however, from polemical positions such as those formulated by Carr or Spitzer, and meets the experimental setups of empirical reading research with skepticism, claiming a middle position between ‘medial a priori’ and instrumentalism.

³⁴ Klaus Benesch also distances himself from culturally pessimistic diagnoses, but at the same time presupposes cognitive-scientific findings as the basis of argumentation, then idealizes traditional reading as a guarantor of political order and culture. The tradition of reading since the 18th century must simultaneously be unmasked as a “myth” and preserved: “Denn Bücher leisten etwas, das tatsächlich nur sie können: Was gestern noch—nicht ganz zu unrecht—als bürgerliche Form ideologiegeleiteter Erkenntnis kritisiert wurde, erscheint im heutigen neoliberalen Umfeld, allein aufgrund des erforderlichen Zeitkontingents, als gegenkulturelle Praxis. Bücherlesen lässt uns für die Dauer der Lektüre aus dem Kreislauf der Waren und ihrer Vermarktung heraustreten, führt uns die Widersprüchlich- und Vieldeutigkeit sprachlich formulierter Wahrheitsbehauptungen vor Augen, und erlaubt uns—im besten Fall—im intensiven Dialog mit dem Text gleich doppelt zur Besinnung zu kommen: als gemeinsame Anstrengung aller Sinne und als sinnlich erfahrbare Erkenntnis.” Klaus Benesch, *Mythos Lesen: Buchkultur und Geisteswissenschaften im Informationszeitalter* (Bielefeld: transcript, 2021), 28.

³⁵ See Kathrin Passig, *Standardsituationen der Technologiekritik* (Berlin: Suhrkamp, 2013).