

Distributed reading: Literary reading in diverse environments

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Abstract

Reading has always been a contentious and political practice, but this is heightened in the contemporary moment both because of the way the environments in which we read are changing so radically. For Katherine Hayles reading is “a powerful technology for reconfiguring activity patterns in the brain” [Hayles 2010, 193], a view representative of attempts to connect the new neuroscience of reading with age old practices of literary endeavour. For Sven Birkerts, however, “the Internet and the novel are opposites” [Birkerts 2010], a view that suggests that a hierarchy of reading that locks digital readers out of higher order thinking and literary experience. Meanwhile, Anne Mangen finds that electronic reading environments “negatively affect emotional aspects of reading” [Mangen 2016]. But these approaches tend to understand reading as something static that occurs in one space or another. However, in practice our reading is increasingly distributed. Reading can occur in multiple formats, across multiple platforms for the one text or reading experience. A novel begun in print can be read online in a born-digital format and concluded in a scanned digital format, for example. These journeys across platform require deeper investigation.

If we think of the printed book as an interface between two orders of thinking, we need to consider how the experience of reading a digitized version of a formerly printed and bound book alters literary reception and student experience. How does the experience of reading across different technological platforms change the reader’s relationship to the content? As more and more electronic reading platforms take on the physical attributes of material reading experiences either by retaining material traces or by emulating them, we might question what experience. How do the material traces left on digitised works impact the reading process for reading in literary studies? The lively discourse surrounding Google Books and the human breaches of the material into the immaterial, as the work crosses the borders of formats and interfaces, raises valuable questions about the future of the book, reading in the twenty-first century, and the long and formidable shadow that centuries of material text production casts over Google Books’ electronic utopia. This paper uses both book history and new media interface theory to consider the multitude of diverse experiences that is literary reading across different platforms in and out of the classroom and to consider whether distracted reading can be better understood as distributed reading. It considers critical infrastructure studies as a useful framework through which to think about reading in the digital age.

Introduction

Reading has always been a diverse practice, encompassing many different approaches, activities, perspectives and styles, but we do not currently have a nuanced language for those different kinds of reading practices. Reading is frequently seen as something that is learned in early childhood, reducing it to a binary: one can or cannot read [Douglas et al 2016]. There is little granularity in our approach to this fundamental but under theorised foundational skill and experience. Within the field of the digital humanities (DH), however we might define it, the attention to reading has had a different focus. Here, the emphasis on the tension between close and distant reading, or their similarities and differences, has served to highlight reading, both in general terms as well as in its specificities, as a foundational and significant methodology for the humanities. This has been beneficial to the broader humanities sector. Understanding the tension between close and distant reading and the assumptions that underlie it, can assist in developing a more nuanced understanding of what we mean by reading, which will benefit diverse domains of pedagogy, personal reading,

and literary analysis, amongst others. The frames in which we read are diversifying due to constantly evolving online spaces and the affordances they invent and proliferate. This article considers the role of reading in the modern humanities landscape and proposes the notion of distributed reading as a useful concept for understanding changing reading practices in the digital era. Using scholarship from both book history and new media studies, this paper uses the concept of interface, following Johanna Drucker, to consider the multitude of diverse experiences that is literary reading across different platforms in and out of the classroom. The paper argues that the notion of critical infrastructure studies can help us better understand the broader material, structural and container issues of literary production, circulation and immersion that is reading in the contemporary moment. I ask whether distracted reading – which has a pejorative connotation, of poor reading, shallow reading – can be better understood as distributed reading, a reading across frames, surfaces, platforms, modes and materials. I pursue this question by looking at two related case studies: mass digitization project texts and the characteristics of online reading platforms found in those archives. Through these case studies, I consider the experience of distributed reading in practice. Reading is changing in large part because the frames within which reading occurs are changing; they are becoming more complex. This requires new ways of understanding reading in the digital age. The notion of distributed reading acknowledges that reading and the immersive experiences that go with reading occur across spectrums of attention, frames, technologies, purposes as well as time and space. The concept of distributed reading seeks to account for reading as an evolving practice. The frames across which our reading is distributed co-construct our relation to the text and the meaning we derive from it in ways as yet under theorised. Reading is not a static event but is parcelled out across different kinds of spaces. Reading can occur in multiple formats, across multiple platforms for the one text. For example, a novel begun in print can be read online in a born-digital format and concluded in a scanned digital format. These journeys across platform, frame and format require deeper investigation and further complicating what it is we mean by reading in the age of the digital.

Reading in/and the Digital Humanities

The field of digital humanities has had much input from literary studies and other text-based humanities disciplines and scholarship. The place of reading in this has yet to be fully considered. In part, this is because of the debate between close reading and distant reading that occupies so much space in our field. There are, too, tensions caused by the likes of Sven Birkerts for whom the material book is almost a moral imperative and Naomi Baron whose concept of “words onscreen” is one of almost, if not quite, diminishment. By looking at the way reading appears in and out of digital humanities scholarship we can build a better understanding of the usefulness of the notion of distributed-ness to contemporary reading practices. I specifically use the awkward construction of distributed-ness here, instead of the word distribution which might be more grammatically correct, to separate distributed as a word that casts reading practices across platforms from the notion of the distribution of books which refers to the physical movement of books (and other media and non-media content) in shipments around the world.

Reading has always been a contentious and political practice, from the moral panic of the rise of the novel in the eighteenth and nineteenth centuries to the apparent high culture, low culture divide [Furedi 2015] but this has heightened in recent times because of the way the environments in which we read are changing so radically (albeit within a continuum of change in inscription practices dating back millennia) and because of the political environment in which communication occurs. Naomi Baron asks whether “our growing dependence on reading on screen contribute[s] to a redefinition of what it means to read?” [Baron 2013, 193]. The stakes are perceived as high. Sven Birkerts is frequently trotted out for his conservative and alarmist views on the future of reading. For Birkerts, digital reading signifies the loss not only of the special format of the book, which has important historic resonances, but of the significant mental capacities that, for him, are built around and dependent upon that material object [Birkerts 2006]. In fact, he goes as far as to identify immersive, long form literary reading with the very notion of the human [Birkerts 2010] so that the materiality of the traditional text is almost a moral imperative. Others see this approach as clouded nostalgia for a form for which evolution is part of a natural order bringing both affordances and costs [Hayles and Pressman 2013]. While still attentive to evidence from the cognitive sciences pointing to the changing brain in the age of digital immersion – a line evoked by Wolf, Baron, Carr and Bauerlein though to different ends – Hayles, among others, is seeking a more nuanced understanding of reading in the digital age and the sector is calling for deeper understanding of the new affordances of reading online.

Anne Mangen signals concern for particular types of reading in the distributed digital age. For Mangen, “the dispersion of literary reading to an increasing number of portable digital reading devices may prompt, or indeed necessitate, increased interdisciplinary empirical research on literary reading” [Mangen 2016, 242] but that it will require approaches beyond the traditional disciplines to do so. Mangen finds that electronic reading environments, and in particular the iPad, may have a negative effect on the generation of empathy in narrative settings [Mangen 2016, 249]. She argues that “the future of literary reading in a time of increasing digitization is too multifaceted, complex, multilayered to be studied entirely within disciplinary boundaries, and the consequences of continuing to do so should not be underestimated” [Mangen 2016, 258]. But others find cognitive science might not be the best approach to understanding the workings of literary reading [for example: [Elfenbein 2006]]. And, all the while, new reports about the health of the printed book and the industries around it gain headline after headline because we are, as a culture, really taken with the notion of reading, regardless of how and how much we personally practice it [Mitchell 2016]. So, while reading is all around us as a technical, commercial, consumer, or pedagogical issue, it is, at the same time, invisible, assumed, under the radar. “We do not see reading,” as Robert Scholes reminds us in his much-quoted statement about what happens in the literary studies classroom [Scholes 2002, 166]. Reading is an act that occurs in an inner landscape that cannot be observed directly. We can only see some of the things that go on around it. Into this debate comes the contribution from the digital humanities of the methodology (and value) of “distant reading” [Moretti 2005] or “macroanalysis” [Jockers 2013]. Further alarming the likes of Birkerts, this practice is perceived to be a form of abstract reading, to efface the individual text in a corpus, and to outsource the act of reading to a machine or algorithm.

Digitalisation of textuality has also altered the way we understand the act of reading. Reading of all kinds are now distributed acts across platforms, frames, media, devices, but, as always, also across purposes and contexts. Some new platforms for reading are more intimate; the mobile phone screen frequently goes everywhere with its owner. Some are more social in the way they position the reader’s body or behaviour or both [Barnett 2015]. Some platforms are both more social and more intimate simultaneously. But in addition to the impact of emerging physical devices for reading, the interfaces that support textual immersion in the digital age require more consideration.

Perhaps the biggest debate in text-based DH at the moment is that between close and distant reading. Certainly, the tension between close and distant reading is at the centre of debates about the humanities and digital humanities, their functions, histories and futures. The digital humanities, as a field, has inherited problems about the articulation of the notion of reading from the humanities, problems that are old and enduring. DH adds to the complexity by contributing notions such as “machine reading” that further complicate our understanding of what reading is, ascribing to the computer, application or algorithm a skill or task we cannot see entirely and yet we revere across different modes or practices. Digital Humanists offer a range of views of reading in their works. For Katherine Hayles, online reading is “a powerful technology for reconfiguring activity patterns in the brain” [Hayles 2007, 193], a view representative of attempts to connect the new neuroscience of reading with age-old practices of literary endeavour. Franco Moretti’s distant reading comes to us in a wave of rethinking reading in light of both theory and pedagogy, of the death and future of the book. While for Lesjak theory and reading are oppositional (“theory is on its way out; reading is (back) in” [Lesjak 2013, 233]), Alan Liu’s call to bring cultural critique to the digital humanities is an opportunity to find a useful balance between the two approaches and refuse to see them as separate [Liu 2012]. New methods or approaches to reading, such as distant reading [Moretti 2005], reparative reading [Sedgwick 1997], and surface reading [Best and Marcus 2009], remind us that we need to work to make reading more visible, to understand reading as in a more modulated or granulated way, and alert us to the fact that there is still more work to do. Reading occupies a special place in the humanities’ imaginary. Close reading is seen as the signature skill of the Humanities, the “sacred icon of literary studies” [Hayles 2010, 63] and the “primary methodology” of the Humanities [Jockers 2013, 6]. Attempts to promote data intensive approaches to humanities research are not necessarily oppositional to traditional forms of reading in the humanities. In fact, for Stephen Ramsay “algorithmic criticism is fully compatible with the goals of criticism ... critical reading practices already contain elements of the algorithmic” [Ramsay 2011, 16]. In his article “From Reading to Social Computing” Alan Liu comes to the conclusion that:

Ultimately, it may be that experiencing and communicating literature through social-computing technologies will do more than supplement older reading, interpreting, and performing practices.

The payoff will be an evolution in our understanding of the nature of reading, interpreting, and performing [Liu 2013, para 46]

This view, that access to the immersive literary experience through digital frames may work to support development of our understanding of what reading means, is desperately required. At the same time, the debate or tension between close and distant reading is diffusing to some extent with the increasingly articulated view that close reading and distant reading are not mutually exclusive [Liu 2012] [Bode 2017]. Indeed, the new methodologies do not supplant or even supplement reading but rather unpack the elements involved in the methodology of reading in both primary and secondary contexts (which is true for both literary objects and their criticism). Katherine Bode argues that “close reading and distant reading are not opposites” [Bode 2017, 79]. For Bode, the perceived clash between distant and close reading is the result of a particular kind of distant reading suggested by Moretti and Jockers who neglect the important field of textual scholarship [Bode 2017], and, I would add, book history. Marjorie Perloff suggests something similar when she calls for “differential reading”: modes of reading that incorporate not only close and distant reading but also the practice of reading subjectively and objectively [Perloff 2004]. Tanya Clement picks up on Perloff’s calls for reading methodologies or approaches that incorporate “differential reading ... practices” [Clement 2013, para 1], arguing that by incorporating these different but complementary approaches we can make greater advances in literary interpretation because of their dissimilarity and their complementarity. The apparent tension between close and distant reading is ameliorated through a practice that privileges a differential approach. However, in addition to these important interventions into kinds of reading that may or may not be afforded by digitalisation – the move to digital surrogate artefacts – we need to pay attention to the impact of the infrastructures of reading. The concept of distribution needs to be accounted for, not in the old sense of the infrastructure between publisher and reader throughout bookshops or other modes of bookselling, but distribution in the sense of acts of reading that occur across devices, platforms or material modes. We do not yet have the language or theoretical frameworks to account for these changes.

The notion of distribution as an effect of particular relevance in the digital age does not have as much purchase or controversy as the debate over close versus distant reading. Laura Mandell uses, or perhaps coins, the term “distributed reading” in her 2012 work *Breaking the Book* [Mandell 2015, 103] but the term appears in that format only in a chapter title. Mandell’s book focuses on the time of the rise of “mass print” in order to understand how print functions differently in the digital age [Mandell 2015, 58]. For Mandell’s purposes, distributed reading refers both to mass distribution of print at an historical moment and to a player in distributing thinking which she understands as embodied, as distributed across tools and interfaces. Mandell asks:

What happens to the discipline of English when both the texts that we investigate and the filters we use allow us to range widely over what is really, this time, the whole field of literature, including ephemera and the allegedly non-literary? We are looking forward to an era of reading that is evenly distributed. [Mandell 2015, 145]

For Mandell, then, the distribution relates to the filters, definitions and field-building occurring in literary studies as well as to access. There is an optimism here, that a focus on distributed reading means that we account more for meaning generated out of engagements with other components of the literary, and even with non-literary entanglements. Meaning is recognised as emanating from more than the words on the page. This is not a controversial suggestion but has implications for the digitization of literature when we consider, for example, the difference between a Project Gutenberg copy of an out-of-copyright novel (typed into the archive by volunteers) and a Google Books/Hathi Trust version of the same novel, scanned in by Google or library staff. More on this below. Taking a different tack but still focussing on the many entanglements of the material/digital divide, Johanna Drucker uses the term “distributed materiality” to think through the locatedness of the text [Drucker 2013].

Distributed materiality focuses on the complex of interdependencies on which any digital artifact depends for its basic existence. In a distributed approach, any digital “entity” is dependent on servers, networks, software, hosting environments and the relations among them just as surely as a biological entity depends upon atmospheric and climatic conditions. [Drucker 2013, para 21]

This, as I argue below, can be read as a call for an infrastructure studies approach to the study of reading and literary experiences. For Drucker, it is more useful to think not about the reception of a text so much as the performance of it. The text not as object but as event [Drucker 2013, 10]. This is a useful aid to thinking about the many breaches of the overtly material into the overtly digital, which will be considered in the case studies below. Certainly, the consideration of digital literary artefacts has had significant pay-off for our thinking around the material object.

The encounter of texts and digital media has reinforced theoretical realizations that printed materials are not static, self-identical artifacts and that the act of reading and interpretation is a performative intervention in a textual field that is charged with potentiality. [Drucker 2009, 9]

This idea that no texts are static, material or digital, and that reading is a performance is true of all reading; but these are notions especially complicated by digitization which presents a case that is neither exactly electronic nor print but is, rather, a hybrid object. Elsewhere, Drucker signals her growing interest in the impact of interfaces on interpretation arguing that we often “take interface for a thing, static, stable, and fixed. Or we take it as a representation of computational processes, a convenient translation of what is ‘really going on’ inside” [Drucker 2013, 213]. We look through interfaces – they are often invisible or at least self-effacing. Following Drucker, then, we can see interfaces and processes, like readings and interpretations, as performances. They are contingent spaces where elements come together in diverse ways to create interpretive environments that support readings.

In this view, the “mediating structures of interface signify by their graphical organization (they do not just display information ‘transferred’ to us by reading)” [Drucker 2013, 213]. In which case, according to Drucker, it becomes essential to take on the task of understanding how interfaces “organize our relation to complex systems (rather than how they represent them) and, maybe more important but less tangible, to understand how an interface works as a boundary space (though it masquerades as a reified image or menu of options)” [Drucker 2013, 213]. Interface has a distributed component to it that needs unpacking. Drucker emphasises that “a *book is conceived as a distributed object, not a thing, but a set of intersection events, material conditions and activities*” (Drucker 2014, 12, original emphasis). For Drucker, then, distribution emerges as a key quality for the representation of knowledge in digital environments. These approaches to understanding how reading is changing in the increasingly digital textual environment demonstrates how these shifts have the capacity to teach us something new about reading itself. That is, the shift to the digital teaches us something about all kinds of reading: digital, material, online, offline, handwritten, typed. This set of conditions provides an important opportunity to pursue and develop that more nuanced notion of reading that the scholarly community is calling for [Deegan 2017] [Manarin 2012]. The common component amongst these perspectives is infrastructure, if we take a broader understanding of what infrastructure for text, literature and the humanities might be.

Two case studies of distributed reading as a quality of infrastructure will illuminate these shifts in reading and enable us to think about how distributed-ness plays into the new conditions for reading. First, the mass digitization archive (Google Books, Hathi Trust, Internet Archive) presents a challenge for thinking about acts of reading through an interface. Second, I will look at the various frames that inhabit those archives and consider their implications for reading.

Reading in the mass digitization archive

Reading in, though, with or against archives (personal, institutional, corporate, private, public etc) has a long history. Libraries, archives and other collections have markers, policies and gatekeepers in both their material and digital contexts. The rhetoric that Google uses in promoting its digitization work infuses the project with utopian tones, as being primarily about access to the vast archive of human knowledge, to preserve and disseminate that knowledge, or as much as is digitizable, and provide open access to that record beyond the material library with their stubbornly persistent geographical locations. In contrast to this, critics argue that the mass digitization project demotes the role of authors in the provision of literary culture and knowledge and so prevents them from gaining a living by their work [Hoffmann 2016]. It is argued, too, that this underwrites the decline of the book as a physical material object, and that it imposes a significant cost upon libraries in accommodating the project and upon the books themselves in the process of being digitized. And to what purpose or benefit, critics argue, given the high rates of error and incomprehensibility in the

archive and given the changing (deteriorating) relationship between the partner libraries and Google throughout the project [Hoffmann 2016]. The discourse is thick with contradictions: knowledge is free and common but also retained and commercialised, books are preserved (saved?) through their disassembly (dismemberment?).

The digital archive, frequently built through the rhetoric of accessibility, brings with it a whole new set of gatekeeping strategies to negotiate. The Google Books project has received a great deal of media attention mostly centred on the legal struggles to establish an understanding of fair use and copyright in a changing textual environment [Barnett 2016]. Projects such as “The Art of Google Books” have registered and circulated the oddities found in mass digitization archives [Wilson nd]. Meanwhile, Andrew Norman Wilson has drawn attention to the labour issues in mass digitization projects [Wilson 2016] [Barnett 2016]. Increasingly, scholars are turning to the history of digitization practices to develop an understanding of what digitization means for the human record and the way we interact with and draw meaning from it ([Sartori 2016]; [Gooding et al 2013]; [Bode 2017]; [Barnett 2016]). Conway’s analysis of errors in the Hathi Trust archive is a useful intervention, concluding that “to preserve the products of large-scale digitization is a decision to preserve imperfection” [Conway 2013, 27]. This provides us with information about the usability of the archive but what we really need are qualitative accounts so that we can consider what not only these imperfections within the archive might mean but also the larger questions about the systems, interfaces and frames within which digitization and mass digitization projects operate and what they mean for readers of all kinds. The archives of mass digitization projects like Google Books, the Hathi Trust, the Internet Archive and so on highlight important questions about what is lost and what is gained when we commit to digital that which was (is still somewhere) material. They highlight the significance of the material as the object becomes (imperfect) digitization. By providing the digital image of scans alongside the text of their content, mass digitization projects re-emphasise the material components of the text.

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This rising significance of the material in an era of digitization is felt elsewhere too. Andrew Stauffer’s “Book Traces” project at the University of Virginia, a project that collects and records unique items in library books (mostly marginalia but also bookmarks, notepaper, leaves, strands of hair and so on) underscores the significance of the individual copy of a text in a market of hundreds or thousands [Stauffer 2015]. As projects such as Stauffer’s and Wilson’s demonstrate, errors and idiosyncrasies in the digitization archive generate a cognitive dissonance that reveals something about the inner workings of the relationship between the human and the printed text. When we encounter breaches of the material inside the immaterial archive (such as marginalia, ephemera, institutional stamps, scan errors) in Google Books scans, the “thingness” of the object in front of us is undermined. Its hybrid nature is revealed. It melds the material and the digital together in one space.

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That materiality and how we can understand its changing nature in the digital age is of increasing concern in the literature. We have come a long way since Mark Poster declared in 1990 that word processing “removes all traces of individuality from writing” [Poster 1990, 113]. He argued that the material object’s inevitable individuality (regardless of mass production) was not available to the digital object. But Hayles’ work combining electronic literary studies with the field of new materialism and the media archaeology of Jussi Parikka and so on have debunked this limited view. Rather than the illusion of reading online as a dematerialised experience, human traces in the archive as they appear in the Google Books archive are profound reminders of the hybridity of the scan. They impact how we read and respond to the texts, as any material characteristic does. They also shape our interpretations, by providing companion readers or markings of authority or disagreement, complementing or in some cases rendering the printed text unreadable. In doing so they highlight both the supposed immateriality of the electronic document and its former materiality, signalling its own metamorphoses and causing a level of cognitive dissonance in the reading moment. These material traces are permanent, in so far as any digital object is permanent. They are anachronistic, causing the reader to do cognitive work to accommodate the slippage between material and immaterial, between then and now. They are disruptive to our relationship with the immaterial text. They reveal other readers inside the text with you as not just through markings on the page – a co-presence that is as true for the material book as for the digital scan – but also of the human infrastructure in the production.

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But where errors of materiality in the Google and Hathi Trust book archives are accidental and erroneous, the intentional inclusion of material imagery in digital reading experiences serves to help the reader navigate the text in familiar ways and forms the subject for my second case study here. The material trace on the text is of benefit to the

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reading process as more and more electronic reading platforms take on the physical attributes of material reading experiences [Barnett 2015]. The lively discourse surrounding Google Books and the human breaches of the material into the immaterial, as the work crosses the borders of formats, raises valuable questions about the future of the book, reading in the twenty-first century and the long and formidable shadow that centuries of material text production casts over Google Books' electronic utopia. This interface establishes itself as a hybrid of digital and material. In addition to scan errors, the markers of the material text (perhaps aged or stained paper, markings by readers, institutional or gifting stamps, and so on) is now preserved in a digital image. The work is made available through an interface, a set of features that frame the text within the archive space. This heightens the sense of dislocation created by the merging of two formats. This framing is the subject of the second case study I consider here in service of a better understanding of the concept of distributedness in reading.

Framing reading

Where early attempts at creating ebooks lifted the content from its original material conditions of the book, the page and its bindings and rendered it in a text window with no reference to the iconography of the original material context, it was not long before imagery of the material elements of the books returned to the zone of e-reading with skeuomorphs representing the visual and auditory cues of reading [Barnett 2015]. As more electronic reading platforms take on the physical attributes or affordances of material reading experiences, these quasi-materialities influence the reading experience, and they frame it, taking on the role of the interface. They serve as interfaces through which reading is filtered according to familiar iconography of the printed book experience.

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Drucker's notion of frames helps us to think about the influence of interface in the distributed experience of reading. Some of these elements or characteristics have analogue equivalents but others are unique to the digital realm. Regardless, these elements activate a higher level of awareness of the distribution. Drucker argues that the cognitive skills of human beings work to create sense and meaning by

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stitching fragments of what are graphically related elements together into a narrative ... But in the graphically complex multimedia environment of the web, no pre-existing narrative organizes our task of correlation. We are constantly in the frame jumping state that disorients the reader, trying to create relations across varied types of material – images, videos, maps, graphs, texts, and the many structuring elements of layout and format that organize the graphic environment. [Drucker 2011, 4]

For all the benefits of distributed reading, then, reading across frames and materialities, the experience of frame jumping also comes at the cognitive cost of load.

As an example of frames in the archive, consider the context-rich and thoughtfully laid out interface of the Hathi Trust. The "structuring elements of the layout" form an important agent in the distribution of the reading. See for example Figures 1 and 2, which demonstrate many of these elements in action. Here the book is marked with the institutional book plate of the University of Michigan, complete with the name of the donor whose gift made possible the purchase of the book. This imbues the work with different kinds of authority (institutional, academic, professional, librarianship). In the bottom right hand corner, we can see the residue of fingers of scanners caught on the page during the scanning process. Quality control processes have attempted to minimize the disruption to the text but cannot erase it completely and in this way the human being scanning the book becomes a permanent reader inside the text with the reader/user. The age of the book and its worn state is evident through rips and tears, bindings coming loose and displaying the inner workings of the material book. But these elements are flattened under the glass of the scanner (real or metaphorical) – the gesture is to the textured but at the same time flattening effect of the scanning renders it untouchable. We have to do a lot of cognitive work in frame jumping to process this.

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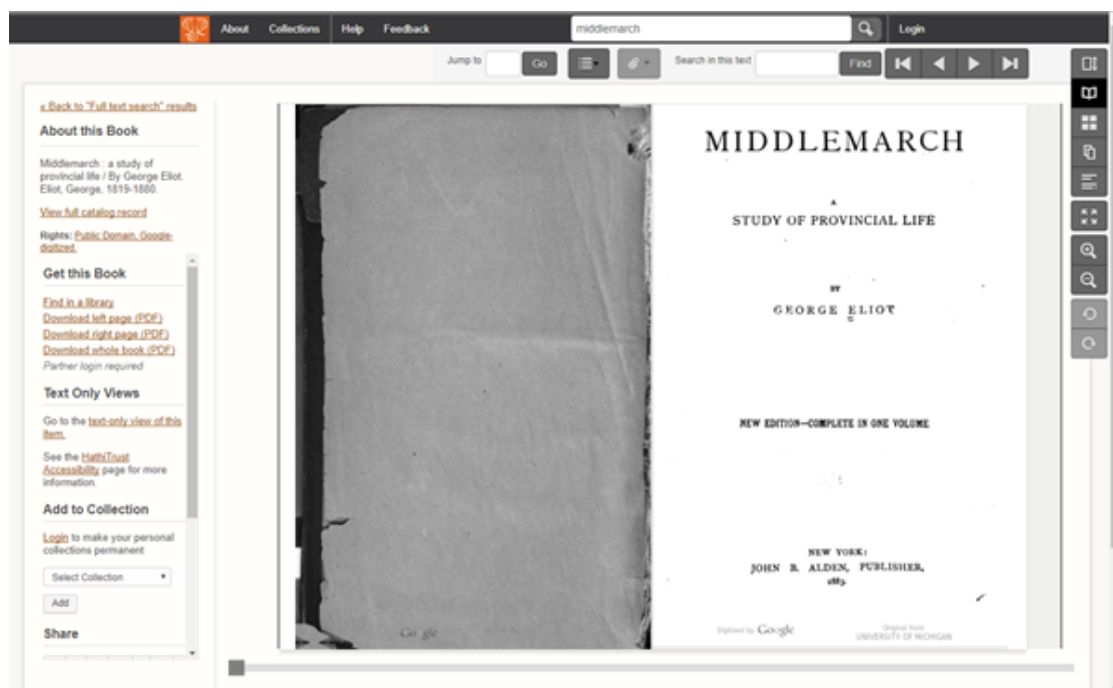


Figure 1. Middlemarch as housed in the Hathi Trust

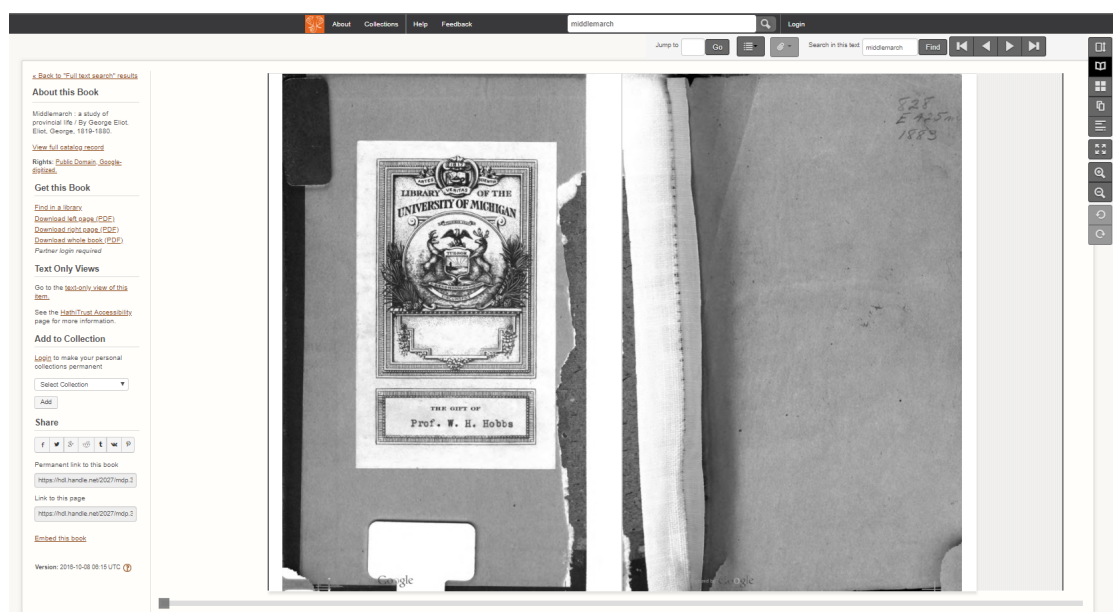


Figure 2. Middlemarch as housed in the Hathi Trust

In addition, there are multiple frames at work on the “page” [Mak 2011]. As well as the traditional frames of the print book – page, border, gutter and so on – the archive’s reading interface presents a range of tools that frame, at different levels, the reading space and the text. The reader has choices – one page at a time (where the logic of the scroll operates in moving from one page to the next) or the double page spread (where the skeuomorphic visual element of the turning of the page is introduced and other visual cues of material books such as gutters, margins, and so on can be rendered) [Hayles 1999]. Some of these frames are navigational – they help the reader to move throughout the text object and the archive that houses it. But “navigation is never natural; it is always the expression of a set of cultural assumptions and controls” [Drucker 2008, 137] There are contextual elements down the left-hand side, many offering literal (ie “click here”) or metaphorical (ie other components to consider such as the paratextual information) exits from the work of immersive literary reading. Instead of reading, one can curate, browse, share (in a wide range of formats),

play. Figure 2 shows additional interface elements. The authorizing marks seen here in the form of an institutional bookplate confer a level of authority on the text. In this case not only can we see which institutional repository or university library it comes from but we can also see which donation fund the book was purchased with.

Even at the level of the page much distraction occurs. Bonnie Mak uses the history of the textual interface to demonstrate the way human thinking and interpreting develops alongside the material components of what she calls “the signifying strategies of the page” [Mak 2011, 7] – a frame of reference that impacts every aspect of textuality (tablet, scroll and now printed and bound pages and even into the webpage). She argues

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From a young age we are trained to believe that the boundaries of the interface are always identical to the edges of the material platform of the page – namely, that the cognitive space and the physical dimension of the page are necessarily coterminous. But the page has not always been circumscribed in this way [Mak 2011, 3–4]

For Mak these signifying strategies follow, though in complicated ways, from the printed text to the electronic text. But again, the hybridity of the digitized page and the structures it exists within mean these examples require further unpacking. Mak goes on to argue that “the materiality of the page influences its own reception across technology, language, geography and time” [Mak 2011, 7]. The materiality of the page continues to inform literary and immersive reading.

And in addition to these visual elements in the co-production of the digitized text, the role of other elements in the chain from scan to book require unpacking. For example, an infrastructure approach to digital reading requires accounting for the role of such groups as the Distributed Proofreaders who volunteer their time to correct errors in the OCR record of items in the Internet Archive and other crowdsourced activities. These more formalized activities are complemented in every archive by labour with various levels of acknowledgement, sometimes crowdsourced such as the proofreaders who spend time correcting the Trove newspaper digitizations. Little is known about the Google Books archive's OCR correction processes. These are further distributions in the network that require accounting for.

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The emerging field of critical digital infrastructure studies or critical humanities infrastructure studies ([Liu et al 2016]; [Smithies 2017]; [Drucker and Svensson 2016]) provides a growing framework for thinking through questions about the foundations on which the knowledge production processes underpinning humanities and cultural research, knowledge and communication rest. Critical infrastructure studies may offer a way of thinking about how all the things we produce in the arts, humanities and culture can be understood as a system of communication. We can interrogate the functions and co-minglings of these elements at both macro and micro levels. The field provides a more structured way of thinking about a number of Humanities infrastructure objects such as the Google Books project, the Hathi Trust, the Internet Archive, Trove and so on as part of a bigger set of infrastructural conditions globally. The structures in which we hold, display, preserve and provide access to our cultural objects and information has an influence on that culture and its reception and interpretation. The frames we impose on them, the navigational devices that ensure usability and interoperability but which are nevertheless interpretive devices, require more understanding. The Galleries, Libraries, Archives and Museums sector contributes much to this knowledge [Marstine 2008]. However, with a few exceptions [Burrows and Verhoeven 2016], digital collections management processes tend not to emphasize this in the production of their tools and structures. Deb Verhoeven argues that “cultural infrastructure is not a passive conduit, it catalyzes for better or worse. It is a technology that holds a social promise, not just a technical one” [Verhoeven 2016]. Critical infrastructure studies afford a way of talking about these, often invisible, elements of digital design. Alan Liu reminds us that it is essential to consider the usually invisible support structures such as labour, administration, hardware and graphical user interfaces that underpin the provision of digital cultural material for access and research, because these structures thoroughly influence the means by which we access cultural objects and data internationally [Liu et al 2016]. Arguing that “thinking about ‘middleware’ as a concept and as concrete platforms can help us pay more attention to the ways tools structure our arguments or express thinking in protocols programmed into these platforms,” Drucker and Svensson highlight a new way of accounting for the software and hardware of virtual and digital objects [Drucker and Svensson 2016]. For James Smithies, in his book *Digital Modern: Humanities and New Media* [Smithies 2017], “Technical infrastructures – especially capacious ones like global humanities cyberinfrastructure – present an additional

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layer of interpretative complexity because of their combination of technical as well as socio-political (and perhaps aesthetic) complexity that leads to deep inscrutability” [Smithies 2017]. The “interpretive complexities” and epistemic extrusions that are posed by cultural infrastructure projects when we see them as media in their own right, as material components that shape to some extent the way we see the cultural objects assessed through them, deserve more attention that we currently give them.

A critical humanities infrastructure approach opens up to critique the systems, interactions and platforms of culture and knowledge production in ways that have not been possible before. It recognizes that “infrastructure is not neutral” [Verhoeven 2016] and seeks to understand the operational and cultural logics of humanities infrastructure projects. We are looking at a future in which cultural objects are preserved, accessed, shared and understood (interpreted) within the hardware and software frames that process them and make them available. To return to the work of Liu, there is an argument that “critique at the level of, and articulated through, infrastructure – where ‘infrastructure,’ the social-cum-technological milieu that at once enables the fulfillment of human experience and enforces constraints on that experience, today has much of the same scale, complexity, and general cultural impact as the idea of ‘culture’ itself” [Liu et al 2016].

The concept of critical infrastructure studies provides a useful way of thinking about mass digitization projects, such as Google Books, the Hathi Trust, the Internet Archive, the digitization strategies of individual libraries, as part of a bigger set of infrastructural conditions and as part of a history and future of reading, the conditions of which impact the experience of reading, interpretation, literary culture and, ultimately, the very institution of literature. This is crucial in order to understand the nature of reading in a digitised and distributed environment. But it is also crucial because the way we understand textuality in digitised spaces has a direct impact on the way we frame the study of literature for tertiary students and the practice of immersive literary experience across all educational and personal reading. A focus and more nuanced understanding of interfaces and infrastructures of reading enable students to understand the impact of their reading decisions on the way they relate to the texts they read for pleasure, study or work. Similarly, the results of the Academic Book of the Future project show that we do not yet know enough about reader behaviour in online environments to understand the full potential or the cost of enhanced ebooks for scholarly communication or digital environments for more traditional outputs [Deegan 2017]. The work we do as scholars and teachers, and inevitably, the way we provide learning environments for students will be fundamentally altered by changing reading behaviours and the infrastructures that support them.

Conclusion

How we frame the use of and relationship to electronic literature and digital reading environments will impact cultural work for decades, centuries and perhaps forever. In the Coda to *The Cambridge Companion to Textual Scholarship*, philologist Jerome McGann, instigator of the Rosetti Archive that bred a range of large scale literature-centric DH projects, argues that scholars are obligated “to surveille and monitor this process of digitization” [McGann 2013, 276] in order to understand the impact of the structure, infrastructure and interface, amongst other factors, upon the content, its use and its interpretation. Just as book history has provided a way of thinking (or a diversity of ways of thinking) about what the book is as a concept and event, joining together a multitude of individual objects known as books under the umbrella of book history, so too does a critical infrastructure studies approach pull together thinking, methods, frameworks from a variety of disciplines to think at the concept level about the impact of digitization and digital reading environments on the reception of the literary work.

Reframing distracted reading as distributed reading embeds the perspective that reading, and the thinking that goes along with it, occurs over devices, platforms, features, networks, contexts, and that these can usefully be understood as forming an infrastructure of reading. This emphasizes the crowding of our reading experience with unacknowledged inanimate others. If we think of the printed book as an interface between two orders of thinking, as I argue the work of Drucker and others implies, we need to consider how the experience of reading a digitized version of a formerly printed and bound book alters literary reception, student experience and the practices of scholarship. The lively discourse surrounding Google Books and the human breaches of the material into the immaterial, as the work crosses the borders of formats and interfaces, raises valuable questions about not only the future of the book as the container for literary

and textual output, but, more consequentially, for reading in the twenty-first century, and the long and formidable shadow that centuries of material text production casts over Google Books' electronic utopia.

Reading across platforms, then, complicates immersion even as it increases access. Since the material is so significant to reception, as we know it is, then surely different material experiences of the one literary engagement (text) affects the reading of the book. This has implications not only for reception and interpretation of texts but also at the more general level of information literacy. Anne Mangen's work, for example, seeks to point out what some of these effects may be [Mangen 2016]. A residual challenge may be to develop a typology of reading and reading-inflected cognition that accounts for the distributed nature of electronic reading environments. Reading is an under-theorised and under-attended component of interactions we have with text in online and off-line spaces, in material and digital forms. In addition to this general lack of understanding, the digital environments for reading offer unique challenges and affordances that we best account for in order to be able to mitigate or accentuate.

An important project ahead for the humanities, then, is to consider the impact of digitising on reading, not as a separate concern for librarians and collections professionals or technicians, not under the banner of accessibility or interoperability, but as a factor at the centre of what reading means, at the level of critique. While it is not at all radical to suggest that we account for the material conditions under which the literary texts we read, analyse, and teach were produced [Kirschenbaum 2012] it is perhaps the complicated making of the set of networks and conditions in which the digitized/digitalized novel exists that has led to its relative lack of attention. Reading studies has much to learn from DH and from comparative textual media studies and infrastructure studies approaches and, significantly, vice versa. Central to this has to be a better understanding of the story of digitization as it shapes up to be the most significant project for humanities scholarship into the future. Digitization needs to be understood as a cultural practice. In this article, I have attempted to make the case for this and to demonstrate the unique place of reading in this interdisciplinary mix. Digital Humanities needs to consider reading beyond close or distant. Distributed reading is a way of unpacking the complex relationship between the material and the digital and some half way space that injects the iconography of materiality into the digital literary experience. Despite all the attention reading has received in recent years, we still struggle to talk usefully and in a granulated way about what reading is and what it is in different modes, environments, or moments. The plethora of digital devices, platforms and interfaces only further complicates this, and raises the stakes for reading. But at the same time, it opens up new ways of thinking about reading and new avenues for interdisciplinary investigation. Ultimately, this renders many elements of reading, if not reading itself, more visible which can only benefit the field.

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