From Codex to Kindle: Exploring the Technological Mediation of Words in the Digital Era

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ABSTRACT

This thesis argues that like the emergence of the technology of writing in antiquity, digital literacy is also a technology with tremendous cultural, economic, political and cognitive repercussions, and that these technologies partially inform the ways by which contemporary Western society is ordered.

The thesis begins by offering a broad definition of ‘literacy’ that takes into account literacy’s potential as a technology to help shape individual understanding of the external world. The first chapter is concerned with exploring the implications of this definition of literacy by investigating how print literacy alters human cognitive function, which in turn affects society more broadly, with particular reference to the work of Ong and Dehaene. It suggests literacy’s influence on the human cognitive system affects the structure of narratives, and that literacy privileges certain modes of cultural consumption over others by reifying cultural artefacts as private property.

The thesis goes on to investigate whether emerging digital technologies affect human cognition to the same degree as print literacy, and how this affect may be moderated by cultural forces in the form of digital literature conventions, as well as how digital literacy is taught. An interview was conducted with two University of Melbourne Library staff, who spoke about emerging digital pedagogic practices, as well as the difficulties faced by staff and students in successfully navigating digital systems. It emerged that digital literacy is not yet formally taught, and I suggest that this is one of the largest reasons for the negative conceptions of digital literature as a force of cultural degredation that this chapter explores.

Finally, the thesis suggests that – with certain caveats – digital literature is capable of deepening the conceptual abstraction of thought enabled by print literature. It goes on to analyse the implications of this on narrative modes, as well as the economic and political ramifications of digital literature’s lack of physicality.
DECLARATION

This is to certify that,

(i) the thesis comprises only my original work towards the degree of Master of Arts (Media and Communications) except where indicated in the Preface,

(ii) due acknowledgement has been made in the text to all other material used,

(iii) the thesis is fewer than 50,000 words in length (or fewer than 22,000 words for a Masters by Research (Advanced Seminar & Shorter Thesis)), exclusive of words in tables, maps, bibliographies and appendices

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INTRODUCTION

Although individuals are considered ‘literate’ or ‘illiterate’, there is no consensus definition of the skills that literacy demands and confers, nor universally accepted metrics by which literacy might be objectively measured. A person may be said to be ‘fully literate’ or ‘partially literate’, ‘digitally literate’ or ‘numerically literate’. Often the term is used interchangeably with the more general ‘competent’, which is a signifier of literacy’s broad utility, though being ‘literate’ is a far more specific attainment than mere competency.

Attempts to define literacy have grown in complexity at the same rate as our understanding of literacy’s implications for human thought and culture. In 1958, the United Nations Educational, Scientific and Cultural Organization (UNESCO) defined a literate person as someone who “can, with understanding, both read and write a simple statement on his everyday life”. Contemporary scholars would recognise this functional definition as vague and incomplete: what constitutes a ‘simple’ statement? How deep does this ‘understanding’ need to be? Such a definition also fails to include the transformative qualities of literacy, instead positioning it as a simple tool to facilitate conversation at a geographical and temporal distance.

More recent definitions emphasise the nature of words as abstract symbols that need to be interpreted by individuals within a given context before they can be assigned meaning (Keller-Cohen, 1994); that is, texts do not carry an inherent meaning exterior to the person who reads them, but are rather informed by the technological and cultural milieu of the reader (Leu, 2000). This means that literacy is not a static concept (Sutherland-Smith, 2002), but rather a dynamic term that must change its meaning over time. Ong prefigures this more recent conception when he writes that “Technologies are not mere exterior aids but also interior transformations of consciousness, and never more than when they affect the word” (1982, p.81). The emergence of digital technology as a new system of absorbing information exterior to ourselves necessitates that we redefine the term ‘literacy’ again, to incorporate the changing ways we interiorise information. If digital technology affects knowledge formation, this raises the question of what
ramifications flow on from this transformation – not only to individual interpretation of digital literature, but also in terms of broader social, cultural and economic issues.

The evolution of literacy’s definition underscores the increasing sophistication with which scholars understand the mechanisms that give rise to the ability to read and write, and the numerous strategies that literate individuals employ in order to understand different types of text. Contemporary definitions of literacy emphasise “the interactive nature of reading and the constructive, generative nature of comprehension” (Chen et al, p. 1706), highlighting the fact that “literacy is not merely the ability to write or to read. How you write and read matters” (Small, p. 240). The scholarly focus on the reader’s participation is important, because it implies a heterogeneity of textual interpretation and analysis, rather than a single monolithic practice termed ‘literacy.’ As this thesis will trace the emergence of print literacy and then the beginnings of digital literacy that we are currently experiencing, it covers a wide time period, from antiquity to today. It will focus closely on the two transitions mentioned: the first, from an oral to a print culture, and the second, from a print to a digital culture.

For the purpose of my thesis, I will deploy key terms in ways that vary slightly from their accepted dictionary definitions. I will use the generic term ‘literacy’ to mean the ability to successfully interiorise information from a recording medium of some sort. By interiorise, I mean, approximately, ‘understand’. Using this definition, someone who is ‘print literate’ is able to parse a text, elucidate its key points, and make sense of the printed medium’s paratextual information: chapters, headings, page numbers, paragraphs, indices. Similarly, I will take ‘digital literacy’ to mean the ability to interiorise textual information that is stored digitally. This requires the ability to navigate between digital networks and devices competently, as well as successfully interpreting digital symbols, layouts and metaphors that contribute meaning to the overall text. Digital literature therefore refers to any text that is stored and displayed digitally; the term does not refer to ‘hypertext fiction’ specifically, but that genre would sit comfortably within the much broader corpus digital literature includes (i.e., all words stored digitally). Because digital texts come in a vaster array of formats and styles than printed material does, I will refer to the spectrum of such texts as ‘digital literature’ generically, and go into greater detail where necessary.
In my first chapter, I will argue that the advent of print literacy in human culture alters not only the way we produce and consume the stories we tell one another, but also our conceptions of narrative value or literary worth. Literacy privileges certain patterns of thought and modes of expression over others, thereby instituting discrete aesthetic and creative hierarchies, in turn driving the development of a print culture and establishing a political economy of literature.

In chapter two, I will take up the interrogative framework developed in my first chapter regarding the transition from orality to literacy, and apply this to the ongoing navigation between print and digital literacy. I will argue that like print literature, digital literature has repercussions for the way we compose our thoughts, and will discuss to what degree digital environments might shape the neurological predilections of contemporary digitally literate readers. I will go on to explore the conventions that are in the process of being developed in response to digital literacy, and what these conventions say about the cultural uses to which we assign the ability to rapidly interiorise information. Finally, I will discuss pedagogical approaches to digital literacy: how students respond to digital literature, the skills they need to be taught in order to navigate data-rich environments, and whether they are in fact being taught these skills, with reference to interviews I conducted at an academic borrowing library. I suggest that digital literacy skills are not currently being taught to students, and highlight the importance of teaching both print and digital literacy as discerete modes of textual interrogation.

Finally, my third chapter will analyse the implications of these claims on print culture and society more broadly. I will argue that digital literature alters the status quo in Western societies, in which ubiquitous print literacy has partly come to define the ways we think about narrative structure, creativity and even property ownership. After establishing an interrogative framework in chapter one around the ways print literacy informs societal expectations – cognitively, creatively and culturally – I will then use this framework to analyse how digital literature may challenge and redefine these expectations.

First, however, I will establish the interrogative framework that stands as the foundation to this enquiry. It will explore literacy’s impact by investigating the transition from orality to print
literacy, and the effects this transition has had on human cognition and therefore our cultural and technological systems. Ong suggests that an examination of what he terms ‘primary oral’ cultures – cultures in which literacy does not exist – “enables us better to understand… what functionally literate human beings really are: beings whose thought processes do not grow out of simply natural powers but out of these powers as structured, directly or indirectly, by the technology of writing” (1982, p. 77). I use the work of Dehaene, a cognitive scientist, to show that cultural practices such as literacy result in changes of the structure of the brain, in turn producing certain cognitive effects in literate subjects. I then analyse how these effects, positioned within a broader cultural context, primed individuals to respond to particular narrative forms, and will follow this by looking at changing conceptions of literary value. Next, I will analyse how print literature’s cultural value and political economy have evolved, and the implications of these changes. Having developed a framework dealing with some of the effects of print literacy on human thought and culture, I will in subsequent chapters use this to explore the effects digital literacy may have.
CHAPTER ONE

The effects of print literacy on the human cognitive system

Print literacy is not simply a tool used to extend human agency across geographic or temporal distance; becoming literate creates profound changes in the human brain, in turn affecting how we process information. Cultural and technological forces, including print literacy, have altered aspects of the human cognitive system so that contemporary literate readers order their thoughts differently to how pre-literate peoples put ideas together. Although numerous scholars – both ancient and modern – suppose that print literacy acts as a crutch for memory and other cognitive functions, in actuality this is complicated by the memory-enhancing practices that arose in response to literacy.

While many scholars agree that print literacy affects the human cognitive system, a few theorists disagree. One objection emphasises the primacy of the narratives transmitted over the medium of their transmission (Callil, 2011) – the message is the medium – and in doing so implicitly elides the possibility that humans would respond to and appreciate differently the same narrative transmitted through different channels. This is unconvincing; an audience responds very differently to a play being performed than readers might to the same text, and this response is predicated at least in part by how they think and feel about it, integral aspects of our cognitive function. It seems plausible that a particular response, repeated often enough, would have long-term ramifications on our cognitive function.

A different class of objection argues “Literacy will not affect the way individuals think unless they use literacy in order to think” (Vincent, 1989, p. 18). The premise upon which this argument is based is fundamentally flawed: speaking as someone who can surely have only a hazy recollection of his own pre-literacy, Vincent has limited firsthand knowledge of print literacy’s impact on his cognitive development. Moreover, the fact that Vincent has written a book concerned with the spread of literacy and presumably carefully planned its chapters, arguments and references, suggests that he, at least, is an individual whose thoughts have been thoroughly affected by print literacy.
Against these two points, most scholars argue that print literacy does inform the thoughts of literate subjects, and that all of us use literacy in order to think regardless of whether we realise it or not (Chaytor, 1945; Ong, 1982; Dehaene, 2009). They make several related points in support of this thesis, but one unwritten commonality is that print literacy is an inherently abstract system of knowledge, divorced from nature by the fact that it is entirely moderated by human convention, with no pre-existing genetic basis (unlike spoken language, for example). By internalising this propensity for abstraction in the form of literacy, we prime ourselves to think in more abstract, less literal terms.

H. J. Chaytor summarises this point:

> All thought, including that in primary oral cultures, is to some degree analytic... But abstractly sequential, classificatory, explanatory examination of phenomena or of stated truths is impossible without writing and reading. Human beings in primary oral cultures, those untouched by writing in any form, learn a great deal and possess and practice great wisdom, but they do not ‘study’ (1945, p. 8-9).

Print literature also influences our cognitive capacities by externalising some of the uses to which we put our brains, and in doing so releasing the time and energy we would have spent to use in other, more analytical, pursuits. According to Ong, text reduces the load on human memory by acting as an external storage space that can be consulted whenever necessary, thereby freeing the mind “of conservative tasks” (1982, p. 41) and allowing it to “turn itself to new speculation” (1982, p. 41). Ong contrasts this literate speculative mode against oral societies, which he terms ‘homeostatic’ in that they “live very much in a present which keeps itself in equilibrium or homeostasis by sloughing off memories which no longer have present relevance” (1982, p. 46). Ong’s argument here, that print literacy allowed human societies to develop complex cognitive strategies, clearly repudiates Vincent’s assertion, and underlines the cultural effects literacy achieves by altering the amount of information we are able to recall with ease and fidelity.
Both these arguments hinge on the fact that there is a fundamental difference between receiving language visually as opposed to aurally (Chaytor, 1945). This is problematic, for a reason already stated: unlike spoken language, there is no genetic predisposition towards print literacy. It is, in all cases, a skill that must be deliberately learned, unlike the unintentional and inevitable learning of a language through speech that accompanies normal human development. Dehaene, a cognitive scientist, expresses this problem paradoxically: “Nothing in our evolution could have prepared us to absorb language through vision. Yet brain imaging demonstrates that the adult brain contains circuitry exquisitely attuned to reading” (2009, p. 4). From this paradox he puts forward the ‘neuronal recycling’ hypothesis, in which pre-existing neuronal circuits are repurposed by human culture and individual experience to take up new roles. Dehaene makes a convincing case for macroscopic, physical changes in the brain due to literacy, noting that when comparing the fMRI scans of literate and illiterate subjects, “The rear part of the corpus callosum, which links the parietal regions of both hemispheres, had thickened in the literate subjects” (2009, p. 209). Cultural practices – in this case, literacy – physically affect the structure of the brain, and must therefore have an effect on human cognition.

Part of the strength of Dehaene’s argument is that he bounds it, suggesting there are absolute limits to the changes culture is able to inspire in reconfiguring the human brain. He cautions that “a broad range of universal, neurologically constrained features underlies the apparent diversity of writing” (2009, p. 304), and that “neuronal restrictions… define the scope of human cultural invention” (2009, p. 304), and so protects his argument from charges of absolute cultural relativism. This also raises an intriguing possibility: considering what Dehaene describes as the limits to human neural plasticity, it may be that the evolution of print literacy – as a human cultural invention – is bounded by certain walls we have difficulty perceiving, because they are literally ‘unthinkable.’ By considering the most popular forms of print literacy, we can see this principle at work. For example, while writing was invented many times by different cultures, the alphabet, a system of relatively few signs, each representing a single sound, needed to be invented only once before spreading rapidly. Similarly, while systems like the Chinese logosyllabary may be more efficient in purely technical terms for expressing information within a given space, its cognitive demands on human memory are far greater than those of the alphabet, with the result that even the most accomplished Chinese communicator knows a few thousand
ideograms at most (Wolf, 2007, p. 48-49), and must spend years learning them. The idea that people alter systems of communication to suit their needs even while these same systems alter human consciousness is a nuanced one, and it has implications for how quickly-evolving systems of digital literacy might develop. I will return to this proposal in chapter two.

Dehaene may overstep himself when he suggests that the working verbal memory of illiterate people is “vastly inferior to ours” (2009, p. 210). As he only had access to illiterate subjects who were raised in contemporary, normatively literate societies, his subjects would not have had access to the same techniques valued by ancient and medieval societies to aid recall, and would essentially have had the worst of both worlds: not only illiterate, but illiterate in societies that no longer practiced memory enhancement and recollection techniques, as they had no need for them. By implicitly suggesting all forms of illiteracy are the same, Dehaene has made an error equivalent to suggesting that all forms of literacy are alike.

It is implausible that the macroscopic physical changes that Dehaene describes could take place in our most complex organ without a corresponding alteration in cognitive function. Although comprehensively determining what these exact changes are may be impossible, scholars have theorised partial answers based on cultural assumptions. For example, Ong proposes complex thoughts would be difficult to sustain in an oral culture:

Suppose a person in an oral culture would undertake to think through a particular complex problem... How does he or she retain for later recall the verbalization so painstakingly elaborated? In the total absence of any writing, there is nothing outside the thinker, no text, to enable him or her to produce the same line of thought again or even to verify whether he or she has done so or not... How, in fact, could a lengthy, analytic solution ever be assembled in the first place? … Sustained thought in an oral culture is tied to communication (1982, p. 34).

The argument that complex trains of thought are difficult to maintain without some external force – be it interpersonal communication or writing – is convincing, and is taken up by Wolf who similarly suggests that “the very process of writing one’s thoughts leads individuals to
refine those thoughts and to discover new ways of thinking. In this sense the process of writing can re-enact within a single person the [Socratic] dialectic” (2007, p. 73). These critiques position Socratic dialogue, in which discussion between two or more parties is used as a learning tool to arrive at a logical conclusion, as a useful pedagogic tool. It also highlights some of the possibilities of digital literature; complex problems encoded in digital text are more readily disseminated than their print equivalents, and multiple readers can contribute understanding to a single document simultaneously, essentially recalling and updating the Socratic method of dialectical learning. This possibility and its consequences will be more fully explored in chapter three.

Although some scholars believe that print literacy’s ability to store information external to the human mind is a straightforward crutch to memory (Ong, 1982, p. 41), the reality of the interplay between access to and ease of information is more complex. This is because ‘memory’ and ‘stored information’ are not synonymous; in antiquity memory was recognised as “more than a passive receptacle: it was intimately connected to thinking” (Small, 1997, p. 238). This conception aligns more closely with Dehaene’s neuronal recycling hypothesis, in that print literacy affects the entire cognitive system, rather than merely the ability to recall information. Remembered information has already been interiorised by the individual who remembers it, and may have had an emotional or cognitive effect; information read in a book is open to interiorisation, but may also be forgotten or disregarded. This became a vital point of distinction to ancient scholars, who argued that writing, as an analogue for memory, was worse than useless: “With written words... they seem to talk to you as though they were intelligent, but if you ask them anything about what they say, from a desire to be instructed, they go on telling you just the same thing forever” (Plato, Phaedrus, l. 274e-275d). Similarly, Quintilian emphasised memory’s importance to oratory:

It is memory which has brought oratory to its present position of glory. For it provides the orator not merely with the order of his thoughts, but even of his words, nor is its power limited to stringing merely a few words together; its capacity for endurance is inexhaustible, and even in the longest pleadings the patience of the audience flags long before the memory of the speaker (Quintilian 11.2.7-8. Translation from the LCL).
To aid the interiorisation of read information, Small suggests several techniques, which she terms ‘mnemotechnics’ (1997, p. 81) were developed in antiquity, to assist in moving knowledge from print to personal permanence.

While print literacy did have an effect on human memory, it was not the one anticipated by ancient scholars. The timing of the development of mnemotechnics after the adoption of print literacy “is crucial, because it has often been maintained by classical scholars that increasing literacy meant less rather than more reliance on memory. If that were the case, training in mnemonics would have disappeared from the curriculum rather than being given a greater role in education” (Small, 1997, p. 83). Therefore although it’s likely that “literacy and orality are an exchange that uses the currency of memory” (Small, 1997 p. XIV), this is probably because print literacy enabled new types of rhetoric (“Actors had to memorise lines. A government official would need to be able to remember contracts, correspondence, laws, treaties, etc” (1997, p. 84)), and necessitated mnemotechnic techniques be developed to accommodate an expanded repertoire of rhetorical devices (more on this later in this chapter). The emphasis here is on the mutual influence of literacy on narrative form, with any conception of literacy causing the wholesale deterioration of natural memory being too simplistic.

If individuals trained in mnemotechnic techniques in a primary oral society were predominantly those who routinely put such skills to use – bureaucrats, actors, scholars and rhetoricians, for example – this indicates there were many for whom such techniques were inessential in day-to-day life. For these people, unable to read a play at leisure or contemplate an edict at length, certain narrative conventions arose. Chaytor suggests that to get “an idea into the heads of the average audience, it must be repeated three times at least and the rhetoricians provided recipes for performing the operation artistically” (1945, p. 60). While orators were no doubt able to skillfully weave such repetitions into their performances, repetitions – and other similarly necessary rhetorical devices – nevertheless, to quote Wolf, “came with a cost. Sometimes subtly, sometimes blatantly, dependence on rhythm, memory, formulas and strategy constrained what could be said, remembered and created” (2007, p. 65). The next section will analyse how
particular patterns of thought contribute to shaping the narratives we are able to competently produce and consume.
Narratives are partly shaped by our cultural and cognitive limitations and abilities

Given that early print literature was produced for public recitation to a largely illiterate audience, such narratives were still shaped according to the proclivities of the oral cultures within which they would be propagated. Poets could not deviate too far from a rhetorical mode that forcefully emphasised the main points of a narrative. As Chaytor explains,

To savour the finer points of literary style... to appreciate the exact choice of words, the cadence of phrases and even the logical sequence of ideas, we require to read and re-read the matter presented to us. But it was not to a reading public that the medieval writer appealed. An unlettered audience cannot be treated tenderly; points must be vigorously emphasised; statements must be repeated, variety of diction must be something of an actor as well as a narrator (1945, p. 55).

Such narratives were therefore “rhetorical rather than literary in character, and rules of rhetoric governed [their] composition” (Chaytor, 1945, p. 10). The ‘rules’ Chaytor refers to here include “heavily rhythmic, balanced patterns, in repetitions or antithesis, in alliterations and assonances, in epithetic and other formulary expressions, in standard thematic settings... in proverbs which are constantly heard by everyone so that they come to mind readily and which themselves are patterned for retention and ready recall, or in other mnemonic form” (Ong, 1982, p. 34). Chaytor reaffirms that in addition to assisting the audience follow the plot, these expressions were designed to be “an aid to the memory of the performer, by helping to fix in his mind the succession of incidents” (1945, p. 66). The boundaries of the pre-literate human cognitive system in this sense also delimited what was culturally allowable for works of literature to achieve.

Examples of these stylistic necessities are common in early literature. Ong notes that “the Homeric epithets used for wine are all metrically different and that the use of a given epithet was determined not by its precise meaning so much as by the metrical needs of the passage in which it turned up” (1982, p. 21). Mnemotechnic techniques therefore assisted oral storytellers to remember lists and sequences, but left many of the details open, to be informed by the idiosyncrasies of each performer’s rendition. This emphasised the generative and unique nature
of each performance, privileging spontaneity and clarity of delivery over the action of the story. As Small says, “For oral cultures it is not the words but the story or the gist that counts” (1997, p. 7).

As literature and literacy became more commonplace, and particularly following the invention of the printing press, there arose a “new breed of poets [who] no longer relied on stock phrases to complete lines. With greater variation within a poem came a greater need for remembering what those words were” (Small, 1997, p. 83).

The transition between oral and literate narrative modes was therefore a gradual navigation, informed by the cultural proclivities of both performers and audiences as well as technological artefacts – the development of the codex, for example, and later mass printing. Print literacy spread through populations at a rate dependent on factors outside of and in addition to its own transformative qualities, so that changing narrative styles are perhaps only recognisable in hindsight; “Authors of 1150 wrote works intended primarily for recitation; those of 1550 wrote for a public that could read as well as listen” (Chaytor, 1945, p. 80). The stylistic differences between Homer’s *The Iliad*, Chaucer’s *The Canterbury Tales* and Coleridge’s *Rime of the Ancient Mariner* are obvious, but their disparate productions reflect conceptions of narrative value that evolved over the course of centuries, rather than years.

The next section will examine how an evolving narrative style affects ideas around literary worth.
Changing conceptions of narrative value

As literature changed over time, dependent on the cultural and technological norms of the societies in which it was embedded, so too did a society’s conception of what made good literature, how it should affect individuals, and the sorts of ideas it should propagate. As Ong suggests, “Over the centuries, the shift from orality through writing and print to electronic processing of the word has profoundly affected… successive modes of characterization and of plot” (1982, p. 155). In chapter three I will explore how digital literature may affect contemporary ideas surrounding the ideal narrative shape and characterisation, but for the moment it is worth discussing how print literature’s content is dependent on the dominant prose style and cultural expectations of what literature should convey.

Conventions in literature increase or decline in popularity depending on their utility to the predominant mode of narrative, so that the heavy-handed repetitions familiar and popular with illiterate audiences would come to feel out of place and even irritating for literate audiences that could pore over narratives at leisure, and had a slowly broadening cultural canon to draw from. Contemporary writers deplore cliché as lazy, but

Homeric Greeks valued clichés because not only the poets but the entire oral neotic world or thought world relied upon the formulaic constitution of thought. In an oral culture, knowledge, once acquired, had to be constantly repeated or it would be lost: fixed, formulaic patterns were essential for wisdom and effective administration (Ong, 1982, p. 23).

In this quote the interplay between cognitive capacity, mnemotechnic techniques and cultural expectations surrounding narratives becomes explicit. My contention is that there is no single reason for any particular narrative mode to become the default, but rather a number of broad cultural, technological and economic reasons that are often mutually reinforcing. While becoming literate may have been theoretically possible for large swathes of the ancient population, a lack of written material in addition to the lack of a good reason prevented this from taking place in actuality for many centuries. Even when the printing press finally allowed the mass distribution of written materials, the opportunity cost of spending time learning literacy
meant it still took hundreds of years before most of Europe was normatively literate (according to Vincent, three in five English men could sign their marriage licences by the 1750s – the rate for women was somewhat lower (1989, p. 53)).

Despite this apparent intertia against mass literacy, technological and cultural forces can act in strongly deterministic ways once general literacy is achieved. Small recounts that “some reporters who used the Radio Shack portable with its scant four-line display found themselves writing very short sentences in very short paragraphs” (1997, p. 143), while Norman relates that students write “markedly longer pieces when using a small-type, single-spaced format than a large-type, double-spaced format” (1988, p. 211). This technological determinism of narrative value finds its match in McLuhan’s suggestion that typographic convention (the placement of blank spaces to separate words – a cultural invention) similarly affects, or is affected by, conceptions of ‘ideal’ forms of literature:

> Readers continued to read aloud after the beginning of word separation in the later Middle Ages, and even after the coming or print in the Renaissance. But all these developments fostered speed and visual stress. Today, scholars using manuscripts read them silently for the most part (1962, p. 95-96).

In an ancient culture where there were few written texts available, large amounts of time could be given to each one, so there was no requirement for speed or ease of legibility. It was only as written material became more common that familiar typographic conventions slowly took form – “The paragraph, as a regular unit of layout on a page, does not appear until print in the sixteenth century, according to the OED” (Small, 1997, p. 15). Other paratextual aids like contents or index pages and page numbers gradually evolved in order to organise a formerly chaotic mass of writing into discretely efficient textual elements, privileging ease of reference and accessibility.

If the form of literature has evolved in a certain direction because of the cultural values to which we assign texts, it is no less true that we have repurposed pre-existing cognitive traits to similarly help us sort and understand the information presented in print literature. For example, there is evidence suggesting that humans build ‘cognitive maps’ of physical texts in front of them,
allowing us to “unconsciously note the physical location of information within a text and its spatial relationship to our location in the text as a whole” (Thayer et al, 2011, p. 2923). These maps are based on “headings, illustrations and other features that act as landmarks” (Waller, 1986, p. 40). This echoes Dehaene’s work on neural plasticity: our cultural products become more sophisticated as we invent textual features that lend themselves toward our own innate capacities. Paratextual features do not emerge for their own sakes, but are developed piecemeal, dependant on cultural and cognitive proclivities. The evolution of paratextual and typographical convention finds its print apex in the book, or codex, a technology that has had the benefit of thousands of years of experimentation and mutation to arrive at the satisfying finished-seeming product in use today. Conversely, digital text is a recent phenomenon, and by analogy, it is as if we are living through the first years after the invention of the papyrus scroll; conventions are still competing to change digital literature into a form with broad, deep utility, and digital texts may find their own solutions to the ‘cognitive mapping’ issue, which is a point I will return to in chapter two.

As the narrative style and physical shape of print literature evolved ever more toward contemporary taste, so too did its content. Ong suggests that “in a primary oral culture, knowledge cannot be managed in elaborate, more or less scientifically abstract categories… [such cultures use] stories of human action to store, organise, and communicate much of what they know” (1982, p. 137). We would expect emphasis to be placed then on fast-moving, episodic plots that do not require deep introspection, on the parts of either the audience or a narrative’s protagonists, and this is what we find in much of the epic poetry or oral cultures, from The Odyssey to Beowulf. In these early narratives, there is little room left for audience interpretation; stories are unambiguous, if not necessarily didactic.

A certain level of abstraction is necessary before more complex rhetorical devices can be employed. This abstraction opens a space between the narrator or character and the world through which they move, a space into which the writer can insert layers of introspection, complex allegory and even metacognition on the parts of the characters involved. Ong agrees with this when he suggests that “By separating the knower from the known, writing makes possible increasingly articulate introspectivity, opening the psyche as never before not only to
the external objective world quite distinct from itself but also to the interior self against whom
the objective world is set” (1982, p. 104). In such a way, narrative theories that are familiar to us
today (a three-act structure, for example) begin to make sense. In a world where literacy is the
norm, “carefully itemized introspection and elaborately worked out analyses of inner states of
soul” (1982, p. 149) beget characters who speak and behave much as real people do. The more
granularly we are able to model our literary inventions, the more they begin to look like
ourselves – motivated, distinctive agents moving through a world of cause and effect.

While it is impossible to fully enumerate the mutual influence of culture and technology on
evolving conceptions of narrative value, it can be seen that this evolution moves progressively
toward a more abstract noetic mode, capable of conveying a greater range of human inner life.
One question is whether digital literature represents the removal or addition of a layer of
abstraction from a narrative. While conceivably providing space for multiple interpretations of a
narrative to be given equal weight (readers might add notes that can be seen by others reading
the same passage simultaneously but in a different location, for example), the trend towards
multimedia content in digital literature tends to collapse narrative ambiguity by providing
additional, perhaps unnecessary, contextual information. This point will be taken up in chapter
three.

As print literature increasingly came to represent a version of the world that exists in actuality, so
too did its utility to culture grow from relatively simplistic stories of dramatic action, deep
emotion and morality tales, to encompass more complex and abstract issues. These included
class, gender and nuanced representations of philosophical problems without easy solutions – the
difference between Ulysses in Homer’s *Odyssey* and Leopold Bloom in Joyce’s *Ulysses*. The
next section will examine how the cultural uses of literature have changed, as well as how its
growing abilities and ubiquity, have affected its cultural value.
Changing conceptions of literature’s cultural value

The development of new methods of manufacturing in the publishing industry meant the rate of literature’s production increased dramatically following the invention of the printing press, a trend that continues today. Despite this, our ability to consume literature – the pace at which we read – has increased only slightly over centuries, thanks to aforementioned paratextual and typographic improvements. We have the same number of hours each day to read ever-increasing numbers of books and articles. The superfluity of text has affected the ways we conceive of and respond to literature, in that we must consider the opportunity cost of reading a lengthy text instead of several shorter ones, or parsing a complex argument instead of reading a summary. The ever-enlarging, ever-updating cultural canon also means that issues of access remain paramount, even as information becomes cheaper than ever to copy and transmit. Finding relevant high-quality information has required the development of new tools as the production of information has increased by orders of magnitude since the invention of the press. Additionally, with the advent of digital literature, the ‘digital divide’ between those who can afford to access digital technologies and those who cannot has become a pressing issue for a culture in which lack of access to digital information can have enormous negative consequences. This is a point I will explore further in chapter three.

Advances in computer-based technologies like desktop publishing, word processors and ebooks are largely responsible for the vast increase in the rate of production of literature – the number of books published in the United States increased from roughly 80,000 per year in the 1980s to 328,259 in 2010 (Nash, online, 2013). While such technologies enable the greater democratisation of literature production, they entail their own problems, with one of the most obvious being organisational capacity. Despite paratextual advances like index and contents pages, ISBN codes and the Dewey decimal system, Small suggests that “each tool or technology makes it possible to deal more efficiently with the current accumulation of words, but by virtue of its success propagates yet more works that need yet more techniques to control them” (1997, p. 141).

That the conventions and technologies we invent to regulate flows of information often boost the rate at which information can be accumulated is problematic, because this accumulation in turn
has consequences. Although much more information is being produced today than in the 1980s – and many orders of magnitude more than in antiquity – our individual ability to internalise information has remained constant, which leads to cultural predilections and coping mechanisms. Small suggests that “speed in reading was not considered an ideal to achieve in antiquity the way it is today” (1997 p. 22), and it is likely that our preference for ease of accessibility has resulted in particular modes of prose and syntax gaining popularity. Writing in the 90s, Small has had only a taste of the way that the burgeoning production of information has led to emphasis being placed on speed of knowledge interiorisation. Two decades later, the widespread adoption of the internet and other digital systems has intensified this process further still, to the point where search engines are an integral part of any information-location strategy, and software ‘apps’ that promise dramatically increased reading speed are advertised as conceptual breakthroughs (Spritzinc, online, 2014).

The glut of written material affects not only how we read, but also how we choose to write. Berkenkotter and Huckin found that from 1944-1984, “experimental results [were] increasingly being foregrounded in titles, abstracts, introduction, and section headings but methods and procedures sections increasingly being relegated to secondary status” (1993, quoted in Liu, p. 706). In this sense, the emphasis on an easily accessible summary of results comes potentially at the cost of a full understanding of an experiment’s methodology, which is especially problematic given the scientific method’s required concern for replicability of results, as well as academia’s more general emphasis on producing robust research. Similarly, Liu suggests that the growing number of scientific journals means that even experts cannot keep pace with the literature and “are forced to skim journal articles the way that many readers skim newspapers” (2006, p. 706). While there may be cultural advantages to understanding in broad terms the many disparate topics contained within a newspaper, it is difficult to argue that an equivalent advantage exists for the researcher struggling to keep up with her field. Given insufficient time for contemplative analysis, the advantage modern readers possess over primary oral audiences is elided.

As the pace of cultural production increases, conceptions of cultural ownership also change. The development of the printing press meant that value was no longer only – or even primarily – in the reading or recitation of a work, but rather reified into a physical object, and could be
accessed at no loss of fidelity whenever the owner chose. This change in the system of cultural knowledge had immediate economic impact; since a reader cannot be charged for each reading, they must instead be charged a heftier sum at the initial point of sale.

Further, since texts could be laid side-by-side for comparison, literary novelty became an important point of difference between cultural products. The production of a valuably distinct version of a text necessitates the emergence of copyright law, and indeed the first such appeared in 1710 with the Statute of Anne in England, which initially prescribed a copyright term of 14 years. McLuhan emphasises the changes in narrative mode that follow from an expansion of literacy and its attendant economic connotations:

To copy and duplicate another man’s books might be regarded as a meritorious action in the age of manuscript; in the age of print, such action results in law suits and damages. Writers who wish to derive profit by amusing a public now write for the most part in prose; until the middle of the thirteenth century, only verse could obtain a hearing (1962, p. 99).

The production of distinct literary works had another, more lasting implication. As Nash argues, “to provide a cultural as well as economic rationale for copyright, we had to invent the Author” (online, 2013). Whereas oral performers were expected to perform adaptations of familiar works, copyright laws meant that for authors and publishers to profit, the literature they produced needed to be almost wholly original, or at least ‘original’ in the eyes of the law.

The advantages of perfect transmissibility in printed texts over oral narratives also has implications on cultural expectations of record-keeping and ideas around permanence, as well as artistic performance and novelty. Whereas once it was natural that performers would never give quite the same performance, but would get the gist of the story right, the appearance of scripts with lines to memorise meant there was no longer any reason for a given performance to be different from any other. Similarly, the ability to encode laws semi-permanently in paper or papyrus would have allowed the blossoming of ever-greater numbers of laws, which could be looked up and consulted – if government officials recalled they were there in the first place.
Even manuscripts, “however useful as a reference guide, could not be preserved for long without undergoing corruption by copyists” (Eisenstein, 1983, p. 78). The printing press allowed cheap, identical copies of documents to be produced en masse, meaning that for the first time in human history, important documents could be made public rather than kept sequestered (Eisenstein, 1983, p. 80).

Finally, literacy may have been key to accessing and participating in an increasingly textual and commercialised cache of popular culture, which required specialised technical knowledge – print literacy – in order to access. Eighteenth-century farmer James Fretwell advocated print literacy to maintain generational integrity: “By this means our predecessors have transmitted to us their various exploits and transactions, and we hand them down, together with our own to future generations” (quoted in Laqueur, 1976, p. 261). Aspects of folk culture like ballads and tales were also primed for new forms of distribution; oral tales were repackaged, “very early recorded in print and sold back to the people; the oral tradition came to be transmitted through the written word” (1976, p. 267). The work of the Grimm brothers is one example of this.

Any change in the way popular culture is distributed comes with a cost, however. Once a tale is set in print, it becomes external from the person telling it; there is no longer any requirement for anyone to remember particular details from the story, as a different skill, literacy, is used to retrieve the information. Two factors are then required to access popular culture: literacy, and the money to buy whatever object the information is stored within. In the same sense, an oral culture is open to regulation by the community it takes place within, but textual objects are exterior to the community, as they are held in private ownership and may be produced distantly. As Vincent suggests, “There are complex structures of authority within the oral tradition, with those who remembered the most claiming precedence over those with the most to learn, but these are informal and are policed by the community” (1989, p. 19). Part of the rise of mass literacy may have been a desire by working-class people to restore their authority over their own recycled oral narratives by learning to parse them as text.
Summary

I have argued that the technology of print literacy profoundly alters the human cognitive system, producing a style of abstracted, rational thought that stands apart from the habits of mind employed by non-literate humans. I went on to consider the implications of this change on how we express ourselves culturally, through the narratives that are developed. I argue such narratives are informed not only by the style of thought that produces them, but also by the extant technology that allows them to be manufactured, and the cultural uses to which technology is put – from scribe to author, and from painstakingly copied manuscript to mass-produced novel.

I argue that the technological, cognitive and cultural settings within which we produce literature come in large part to define literary value, which in turn has broad implications for our legal, political and economic systems. The increasing ubiquity of printed words has changed our relationship to them, highlighting literacy as necessary in accessing a shared cultural cache, and perhaps disenfranchising those unable to expend the money, time or intellectual energy to remain invested in print culture.

The basis for this development is Dehaene’s neuronal recycling hypothesis, in which pre-existing neural circuitry can be redeployed through cultural practices to allow radically new modes of expression. In the second chapter, I will explore the implications of this hypothesis with regard to digital literacy, by arguing it represents a neuronal repurposing of equivalent magnitude to that of print literacy. I will go on to explore how this repurposing can be moderated by conventions established as part of the communication medium, and will finally investigate how the formal and informal learning of digital literacy skills contributes to digital reading practices.
CHAPTER TWO

Introduction

In the previous chapter I argued that the transition from orality to literacy deeply affected the physical structure of the human brain, resulting in new patterns of expression, cognitive abilities and cultural predilections. Therefore, in order to argue that digital literacy affects our natures to a similarly broad extent, I must show that digital literacy also fosters real change in the brain. The first part of this chapter will explore the evidence for digital literature’s effects on cognition, and the degree to which it may be responsible for altering our habits of thought.

I will go on to analyse the interplay between technological invention, Western culture and human adaptability, in order to investigate how the conventions of digital literacy may affect – and be affected by – our inherent neurological limitations, in the same way that these limitations have ensured print literacy conventions evolved in a particular direction over time. I will go on to suggest some possible scenarios for how the conventions of digital literacy might evolve in the future, based on how print literacy conventions arose, and on our cognitive underpinnings.

Finally, this chapter will interrogate the benefits and potential pitfalls of teaching digital literacy skills, especially in relation to (and sometimes, in competition with) teaching print literacy skills. I conducted interviews with University of Melbourne library staff in order to understand emerging digital pedagogical practices. Contemporary university libraries are data-rich environments in which students must navigate digital systems in order to locate both print and digital literature; librarians regularly answer student queries, teach research skills, and are themselves skilled in locating library resources. For these reasons, I concluded library staff might have keen insights on the state of contemporary digital pedagogies. I spoke with Monica Raszewski, a subject librarian with several decades of experience, and Janetta Mascilongo, who leads the university’s Library Learning program.

In comparing print and digital literacy, this section will explicitly analyse the different uses that varying styles of reading are put to, using the assumption that not all styles of reading are equally
engaging, and that print and digital literacy emphasise different styles. It will suggest that as computing devices aren’t disappearing soon, that holistic, scaffolded pedagogic approaches that unambiguously delineate between reading strategies are likely to be the most effective way of teaching digital literacy without simultaneously suppressing print literacy skills.
Digital literature’s effect on human cognition

Scholars have widely come to accept that the act of communicating through differing artificial mediums alters the nature of human thought – the medium affects the message being carried, and how the message is received (Gleick, 2011, p. 12; Greenfield, 2009, p. 108-109; Ong, 1982, p. 77). This broad consensus underscores the fact that although humans are genetically predisposed to learn spoken language (Dehaene, 2009), all more abstract forms of communication are learned. This is perfectly prefigured by McLuhan, who argues a message’s content is simply “the juicy piece of meat carried by the burglar to distract the watchdog of the mind” (1964); the way we interiorize knowledge changes us, even if we cannot feel ourselves changing. Any sort of learning affects the neuronal structure of the brain, constituting an “unnatural… deliberate shaping” (Carr, 2010, p. 51). There is therefore little doubt that digital literature plays some role in shaping human consciousness, but the full extent and broader ramifications of this change are matters of some contention.

Psychiatrists G. Small and Vorgan assert that digital technology specifically is “changing the way we live and communicate” (2008, p. 120), changes they attribute to the strengthening of new neural pathways in our brains. More empirically, G. W. Small et al conducted an fMRI study (2009) that concludes that short periods of internet use can profoundly alter brain structure, reconfiguring the patterns of cerebral activity that take place following the learning of even rudimentary digital literacy. Carr uses these and similar studies to push forward a relatively strong version of an argument in favour of technological determinism: that the use of digital technologies alters human thought quickly and thoroughly – leading, in his view, to negative cultural and neurological outcomes.

Carr’s interpretation of the studies he cites is challenged in more recent work by Hayles (2012), who argues the data Carr quotes are insufficiently strong to come to such a broad conclusion. She asserts fMRI machines are noisy, chaotic environments, which might influence the responses of participants, meaning that the nuanced conclusions study designers draw from their participants might be overly simplistic (p. 66). Similarly, Hayles invokes a ‘correlation does not equal causation’ argument to suggest digital literacy might be one of half a dozen intertwined...
reasons for changed brain activity, and perhaps not even the most important or direct one (p. 67). Although these arguments are not convincing enough to entirely repudiate Carr’s narrative of cerebral change, they do serve to complicate it, particularly some of his more negative criticisms of digital literature – especially when even he admits readers have always ‘scanned’ print media like newspapers to locate specific items of interest (2010, p. 138), a reading behavior he largely attributes to digital literature. The literature on the relationship between changes in the brain and digital literacy is not yet as convincing as that concerning the relationship between print literacy and the macroscopic brain alterations it causes, though perhaps this will change as studies are able to use more powerful technologies to directly measure the inner workings of the human brain.

There is more extensive scholarship when it comes to measuring the affect of digital literature on the human cognitive system less directly, chiefly through exploring theories of attentionality and memory, as well as by measuring actual reading performance. The explosion of digital material over the last several decades emulates – over a far shorter timescale – the burgeoning of print literature that followed the printing press, and this sudden superfluity of digital literature has predisposed people to consume it in particular ways, a trend that has been noticed and commented upon by scholars. These patterns of consumption come to affect our patterns of thought – “When information is cheap, attention becomes expensive” (Gleick, 2011, p. 410).

It is not only the ‘cheapness’ or ubiquity of digital information that alters how we think about its content, but also the format that content is delivered in. Levy recalls an early Xerox demonstration of a graphical operating system in the 1970s, in which users used the visual metaphor of ‘windows’ to switch seamlessly between tasks – to code a program while also responding to a message, for example (2001, p. 101-102). Though most attendees were enthused by the heretofore unimagined technology, believing it would make them more productive, one attending academic objected that having to ‘multi-task’ would make the user worse at both tasks, by dividing his or her attention between them. This objection is taken up more recently by Carr, who suggests “the multimedia Net further fragments our concentration” (2010, p. 91), and contrasts this against the more contemplative mode in which he characterizes print literature:
To read a long book silently required an ability to concentrate intently over a long period of time, to “lose oneself” in the pages of a book, as we now say. Developing such mental discipline was not easy. The natural state of the human brain, like that of the brains of most of our relatives in the animal kingdom, is one of distractedness… To read a book was to practice an unnatural process of thought, one that demanded sustained, unbroken attention to a single, static object (2010, p. 63-64).

The point, he argues, is that the internet “indulges” us with mental stimulation (2010, p. 118), with the result that our brains have now been trained to be entertained by “a swiftly moving stream of particles” (2010, p. 7). Carr characterises this mental stimulation as a form of distractedness, one that redirects “our mental resources, from reading words to making judgments” (2010, p. 122) on what to click next, or where to move our eyes. Indeed, even Hayles allows that “the small distractions involved with hypertext and web reading” (2010, p. 68) might impair our ability to read deeply.

This conception of the internet as a broadly damaging force that elides the cognitive ‘improvements’ imbued by print literacy has a flipside, though Carr does not place much weight on it. According to Dehaene’s neuronal recycling hypothesis (explored in chapter one), a slackening of some neural circuits in the brain should cause them to be repurposed to accomplish other functions, in line with the new demands being made upon the brain. If digital reading fragments our attention and interferes with our ability to concentrate for long periods because our brains are being stimulated by visual cues and the need to make choices on where to focus our attention next, Dehaene’s hypothesis would suggest neuronal resources are shuffled, for example enhancing our ability to interpret non-textual visual stimuli.

An expansion of certain cognitive traits has indeed been indicated by some studies. Bauerlein, in a book otherwise devoted to relentlessly dismissing digital literacy as overwhelmingly negative, writes that a correlation between people who spend the longest online and above-average visual-spatial reasoning ability has caused some researchers to attribute the “escalating demands of an increasingly visual environment” to increases in some cognitive functions (2008, p. 91). This is especially important as visual-spatial reasoning is a component of standard IQ tests, and may
help explain the apparent trend towards an increasing average intelligence among the population (the Flynn effect). This is the same increase in visual-spatial reasoning that Wolf describes when explaining how systems of writing like the Chinese logosyllabary, in which symbols represent concepts rather than sounds (as in a Western alphabet) effect the human cognitive system (2007, p. 48). The question of how digital literature might affect a brain already predisposed toward visual-spatial reasoning by virtue of its having learned a logosyllabary is fascinating, but outside the remit of this thesis.

Other studies similarly suggest a correlation between an above-average working memory and deep online engagement (Klingberg, 2008, p. 115). Working memory is a temporary ‘scratchpad’, where small amounts of information can be kept for a short time before being either forgotten or cemented in longer-term memory. Examples include phone numbers or lines of poetry. This is again relevant, considering the frequency of claims that the internet generally has a negative effect on memory (Carr, 2010). Echoing Ong’s claim, discussed in chapter one, that literacy is a straightforward crutch to memory, Carr argues “the Web provides a convenient and compelling supplement to personal memory, but when we start using the Web as a substitute for personal memory, bypassing the inner processes of consolidation, we risk emptying our minds of their riches” (2010, p. 192). Like print literature, however, digital literature is not a mere storage receptacle, but rather an interface between a reader’s active memory, a writer’s rhetoric, and the established conventions that make these mutually comprehensible. This is made clear in a study conducted by Eden et al, in which the authors had a student cohort edit written documents either in printed text or digitally, then analysed the timeliness and accuracy of their edits. Contrary to much of the literature on digital versus print reading performance – and their own expectations – researchers found students were just as accurate editing digitally as in print, and were substantially faster. The authors conclude:

To date, most studies on print versus digital reading were conducted under passive conditions, in which participants were tested for text comprehension without the need to act on the text by editing it. The present study was conducted under “active reading” conditions in which participants were tested for their ability to demonstrate comprehension by revising and editing a given text. We therefore suggest that our
findings, which are contradictory to the common findings in recent print versus digital studies, may result from the difference in research methodologies (passive vs. active) that were utilized (2012, p. 8).

The emphasis on the active nature of this task contrasts with the way some of the above critics have portrayed digital literature as a passive mode of consumption, and raises the possibility that even if readers of digital literature do not perform as well on tests of close reading or attentionality as print readers do, there are other legitimate metrics by which overall ‘literacy’ in either of these modes of reading might be measured.

Many of Carr’s claims, if substantiated, have dire repercussions for both individuals and, on a grander scale, aspects of society more broadly. However, the gloomy picture he paints is complicated by both methodological limitations of some of the studies he quotes, and also by other studies that indicate digital environments strengthen those parts of the brain concerned with working memory and visual-spatial reasoning. Moreover, Carr’s portrayal of digital literature and the internet generally as a technology that appeals to our cognitive lowest common denominator misses that point that technology and culture proceed in lockstep, with mutually reinforcing conventions governing the deployment and use of new modes of communication; while the modern book may well be the apogee of print culture, it is also the product of millennia of user-testing and slowly worked-upon convention. Digital literature is by contrast a few decades old, and convention is still catching up. The next section will explore the interplay between cultural convention, technological limitation, and human cognitive predilection, and will serve to unpack some of Carr’s assumptions.
Memes v. Genes: the interplay of technological convention and human adaptation

Unlike the typographic conventions of print literature, which were developed over thousands of years, the conventions governing reader interaction with digital literature are still new and radically disparate. Everything about digital literature, from its optimal manifestation on a diverse array of screens, to the software code that underpins how it is rendered to the reader, to whether or not it should support hyperlinks and mixed media, is still up for debate. Although this suggests a certain degree of mental flexibility is required for digitally literate readers to parse different formats of text, it also leaves the door open for a more democratic consensus to be built regarding what shape digital literature moves towards than was often the case for print literature. While many of the technologies used to render text on a screen are still being developed, the concept and practice of reading digitally has found increasing mainstream acceptance, leading Hayles to posit that “we are now in a new phase of the dance between epigenetic changes in brain function and the evolution of new reading and writing modalities on the web” (2012, p. 66). Readers therefore have an opportunity, before the conventions of digital literature are as rigorously codified as those of print, to take existing and emerging research into account when designing conventions for digital literature that efficiently promote the rapid internalisation of knowledge.

The conventions of print literature developed over time, based in part on the cultural and commercial expectations we had for writing. Breaks between words and paragraphs, page numbers and contents pages all allowed readers to browse more quickly and efficiently, hinting toward a print culture moving toward the privileging of accessibility over serendipity when locating information. Similarly, even paper format became a point of contention when “in France, in 1527, Francois I decreed standard paper sizes throughout his kingdom; anyone breaking this rule was thrown into prison” (Manguel, 1996, p. 127) – a move that had less to do with the optimum page size for reading than creating revenue through a monopoly on the production of books. Somewhat weaker modern instantiations of this practice include the dust jackets that most hardcover books are packaged in, which perform a marketing role for the plainer book wrapped inside (Genette, 1997, p. 27).
Culture played a leading role in developing print conventions in response to an information surfeit, by inventing “mechanisms of selection and sorting: alphabetical indexes, book reviews, library shelving schemes and card catalogues, encyclopedias, anthologies and digests, books of quotation and concordances and gazettes” (Gleick, 2011, p. 411). This ‘surfeit’ would not be possible without technology enabling the industrial-scale production of literature enabled by the printing press and its attendant technologies, such as moveable type and oil-based printing ink. Technological, cultural and commercial factors were therefore mutually deterministic in the establishment of print literature conventions; it seems plausible to assume they will have an equivalent impact on the conventions governing digital literature as well.

It is important to note that over a long period of time, the conventions of print literature have been redefined on numerous occasions based on format and content. Initially made from papyrus, then parchment and finally paper, information was first rolled into scrolls and then bound loosely in sheafs before finally becoming the finished-seeming product we recognise today. This is not often recalled when critics point to the seeming balkanization of formats, sizes and software that digital literature comes parcelled in, especially when the continuous development and refinement of digital technology ensures the predominant modes of digital literacy consumption that open a decade will almost certainly not endure to its close.

Intriguingly, the conventions underpinning print and digital literacy also exert an influence on one another. Carr suggests early websites took design cues from print publications, whereas contemporary magazines have layouts that recall “the look and feel of Web sites. They’ve shortened their articles, introduced capsule summaries, and crowded their pages with easy-to-browse blurbs and captions” (2010, p. 94). Regardless, it is useful to note that print and digital conventions are not wholly separate, but are rather in conversation with one another, moderated by the bounds of their cultural utility.

By analysing the trends that helped define print literature convention, it is possible to look forward and anticipate some of the forces that will determine the look, feel and shape of digital literature. Because digital text is both more transmissible and fungible than printed text – more
readily reshaped to fit the device it is displayed on – it seems likely that publishers and distributors will need to again modify their business models, just as the purveyors of popular culture did with the advent of mass print literacy. The most popular way of retaining profitability in online environments at present is digital advertising. Devices like Amazon’s ‘Kindle’ ebook readers and tablets offer customers the option of paying a one-off fee for the removal of advertising, or waiving the fee and being advertised at (Martin, online, 2012) – the advertising is only seen when the device is switched off, coating its ‘cover’, so as not to interfere with reading. Other trends include bundling print literature with a digital copy of the same text, selling digital versions of texts at a considerably lower price than print literature versions (the rationale being the lower overhead costs associated with production, distribution and physical storage), and paying subscription fees for content like digital newspapers and magazines. However, each of these options has drawbacks, and it seems impossible to reliably predict the future of digital literature commercialisation, in the same sense a medieval scholar could not have conceptualised a modern book store: without solid data on how widespread digital literature might become and the legal framework within which it will be produced and consumed, it is impossible to divine how distributors will go about charging readers.

Other trends are easier to extrapolate. As the conventions of print literature are informed by the culture from which that literature emerges, so too should we expect our culture’s expectations to help shape digital literature. Current digital culture is broadly defined by two related trends: *remix*, in which disparate artistic elements are recombined to produce surprisingly new (if not wholly ‘original’ in the historical sense) works, and *sharing*, in which consumers are able to effortlessly transmit to others some facet of their own digital experience, such as emotional states or engaging content. Digital technology enables these behaviors in a way that the physical transmission of print literature cannot, and it seems likely that social and legal conventions will arise to govern the appropriateness of these new practices. Turkle relates the practice of teenagers texting one another their emotional states as they occur, in order to receive an immediate response from their friends, which she characterises as “cultivating a collaborative self” (2011, p. 176); it is the sort of cultural performance predicated on shared conventions of acceptability. Regarding works of pastiche art more broadly, Australia’s Copyright Act 1968 allows a ‘fair use’ exemption when copyrighted material is used for critical (section 41) or
satirical purposes (section 41A); these provisions may need to be expanded or re-written if a new conception of creativity for the digital era becomes mainstream, and remix artists begin to have trouble creating works under current laws. Issues with copyright laws extend even to non-artists. Mascilongo, one of the University of Melbourne librarians I interviewed, mentioned that for students, who might be researching a particular subject and downloading numerous journal articles related to it, eventually they will enter a legal ‘grey area’. She said while students today didn’t have a good conception of copyright law, the onus of effecting copyright reform should be on “publishers and the distributors” who “all want their piece of the pie and they haven’t quite caught up to this share-everything world” (Mascilongo, J. and Raszewski, M, Interview, 2014).

The practice of sharing digital content presents another challenge to digital literacy, as current formats are so wildly disparate as to be incompatible with one another. If a reader consuming digital literature in the .EPUB format wants to share an especially insightful or interesting passage with another friend reading on an Amazon Kindle, she will be unable to, as this class of popular device does not support the .EPUB software format. This is a common issue, and although one resolution involves the use of third-party software to change the encoding of a piece of digital literature from one format to another, this can result in display errors and impairs the ‘frictionless’, or relative ease of the sharing. Similarly, not all formats or devices are able to display the full range of media some digital literature entails, including high-resolution images, videos, or internet access.

Part of the reason digital literature is so poorly codified is that it serves a multitude of purposes, from websites and online encyclopedia entries to scholarly articles, personal ‘blogs’ and novels. This diversity of purpose is naturally mirrored by a diversity of display formats. The limitations of some of these formats, as well as our own neurological predispositions, may however soon begin pushing digital literature formats toward a convergence for form-factor. As noted in chapter one, this is because as humans read, we form mental images that link where a particular piece of information is located to its relation in the text as a whole (Thayer et al, 2011), a process generally termed ‘cognitive mapping’ (Waller, 1986, p. 72). Headings, illustrations and other paratextual cues act as ‘landmarks’, whereby readers can quickly recall their approximate place in a piece of print literature, even between chapters. Similarly, readers can place their fingers
between the pages of a text as temporary bookmarks, and are often able to recall whether a piece of information they seek was on the left or right page of an open book, near the top or bottom of the page, and near the beginning or end (Thayer et al, 2011, p. 2918). The human nervous system is also primed for hand-eye coordination, such that “it is much easier to read something that is held in the hand than something that just lies on a table” (Strassman, 1985, cited in Liu, 2005, p. 709).

Conversely, the primary style of navigation used in most digital systems, scrolling down a ‘page’, weakens the sense by which readers can get a feel for the location of a piece of information in the context of the wider body of text (Olsen, 1994); it is neither on the left or right-hand page of a codex, neither toward the top or bottom, but rather some indeterminate place partway through. In a study in which students were given access to their class readings as digital texts, many of them not only cited the dynamic content location as an issue with the Kindle DX, but also told us their physical experience with the text changed dramatically because they missed the physical, or kinesthetic, interactions of other reading technologies. People use their spatial and kinesthetic knowledge to assist them with a variety of interfaces; it is also clear that kinesthetic cues aid spatial memory (Thayer et al, 2011, p. 2923).

Reading behavior is another issue with using scrolling as a navigation interface; flipping through a print document while browsing for keywords or subheadings gives readers a literal ‘feel’ for the text, and allows some sense of the text in its entirety (Liu, 2005, p. 703). This was raised in an interview I conducted with Monica Raszewski, a subject librarian at the University of Melbourne. She informed me that during library teaching sessions, some academics direct her to show students physical copies of scholarly journals; they wanted students to appreciate the journals as finished works, with many articles on the same topic resting next to one another, rather than using electronic databases to read individual articles, without the context afforded by the work as a whole. According to Manguel, the digital ‘scrolling’ readers do recalls quite precisely the problem with the physical scrolls from antiquity: by revealing only a portion of the text at a time, we fail to grasp the portion’s relation to the body of text as a whole (1996). If the
text forms part of an extended argument, as in most critical and academic works, this has implications for how well we are able to interiorise, qualify and appraise logical clauses. Perhaps this is why almost 78 per cent of the university students in a study conducted by Ramirez preferred to read a digital piece of text in print in order to understand it with clarity (2003, p. 8). Liu concludes that another reason for this preference, apart from the cognitive mapping issue, is that digital displays had lower resolution, which was especially an issue when browsing image-heavy documents (2005, p. 702).

This last complaint, at least, has lost its currency, as the increasing quality of screen resolution has ameliorated the visual resolution difference between browsing in print versus digitally. Similarly, the e-ink technology utilized by Amazon (among others) removes the harsh glare that can lead to irritation and eyestrain when reading from the screens of digital devices for long periods. More problematic is the cognitive mapping issue. Although digital reading devices do offer some paratextual clues to readers regarding their place in the text, such as ‘percentage complete’ indicators or page numbers, these lack the physicality of an open book, in which readers can judge by weight alone approximately how far through they are. Anecdotally, however, consumers of digital literature are showing strong preferences for digital reading devices that mirror at least some aspects of the print literature experience; Thompson speaks to an office worker, who uses a tablet computing device to remove herself from her ‘distracting’ smartphone and desktop computer:

I need to put myself in a situation where I can really focus,” she says. So when she gets to a long article, she uses a browser shortcut to send it to her iPad. All day long, she’ll switch back and forth from one screen to another, shifting between reading and communicating (2014, online).

By segregating digital tasks onto separate devices – one of which is custom-built for long-form digital reading – the distractedness that characterises digital reading from computer screens is reduced, while many of the paratextual conventions familiar from print literacy, including holding a physical object and left-right pages, are maintained. Modern tablets are also more capable than many early iterations of digital reading devices, meaning they can display pictures
and video with no loss of fidelity, and their screen size frequently emulates the surface area of an open book.

Even so, significant usability issues for digital literature remain unaddressed, chief among them a ubiquitous, intuitive interface to mark-up, share and remix digital text and images. In time, solid design principles, perhaps based on some of the research quoted here, will reduce the cognitive mapping issue (in the same way modern screen technology has reduced the resolution and eyestrain complaints), but the lack of physical pages may remain a sticking point. Moreover, we seem to expect more from our digital devices than we do from print technology. Print literature comes in a variety of sizes, styles and formats depending on the demands of its content – newspaper broadsheets, scholarly journals, image-heavy glossy magazines – yet the idea of owning multiple digital reading devices to suit different digital formats is absurd (fairly enough: the cost would be extravagant).

If we are to surmise that diverse digital publications should exist and be displayed primarily in the same way on digital reading devices, then the conventions developed for digital literacy are only one way in which readers might navigate the transition between print and digital formats. Another important factor in the uptake and usefulness of digital literature is how readers and writers are taught to use digital technology – or even whether they are taught – in the same way that even the youngest students are taught to read print literature. The next section in this chapter will examine the pedagogical practices currently used for teaching digital literacy, as well as how alternatives might address the issues with digital literacy explored in this and the previous section.
Teaching digital literacy: searching, reading, writing

In both scholarly literature and speaking with interview subjects, I was surprised to find little evidence of teaching digital literacy, either during formal schooling or afterward. The assumption seems to be that ‘digital natives’, those who have grown up using digital technology, will naturally teach themselves fluency in its use, while older people will “close the gap” (Eden et al, 2012, p. 8) as they use digital systems more frequently. This is a strange supposition, because digital literature represents a challenge to readers familiar with traditional print literature – not only because of its altered form, conventions and capabilities, but also because of its sheer abundance. This has ramifications for the reliability of information we interiorise digitally: because of the relative ease by which digital literature is published, it is far less likely to be vetted than the more resource-intensive print literature, with the result that it is correspondingly less reliable. The ability to distinguish between reliable and unreliable sources of information therefore becomes paramount (Sutherland-Smith, 2002, p. 663), and is a skill that must be learned and exercised constantly. Indeed, locating good information in the first place is of overriding importance: constructing the ideal search string and knowing what databases to use to get the best results are skills that can be learned through individual practice and experience, but should also be taught. In this section I will explore the differences between teaching print and digital literature, and suggest some ways in which we might improve digital pedagogic practices.

While both print and digital literature can be displayed as long, unbroken chunks of text, as found in chapters or sections of books, digital literature by its nature lends itself toward a different form of interrogation (Carr, 2010, p. 106). Readers can use commands to leap directly to specific words or phrases, or search databases for articles in which they appear; they can copy-paste whole paragraphs that they appreciate, without copying these out by hand; they can use in-text hyperlinks to skip past sections of content they suppose to be irrelevant, jumping directly to those parts of the document they think most important, not needing to skim the surrounding paragraphs for contextual information. Conversely, print literature, by its nature, lends itself toward a longer, more involved reading experience. Readers have only chapter titles and occasionally indices and appendices to go by; by being less fluidly navigable, print literature forces the reader to slow her pace, to read more thoroughly for keywords and quotes, and
eventually to get a ‘feel’ for the structure of the author’s arguments. Wolf and Barzillai suggest this kind of attentive reading is “formed over years of learning” (2011, p. 173) and only becomes automatic for expert readers. Building on this theory of attentionality in reading, Thayer et al posit five levels of reading engagement, presented here from least to most intensive:

*Scanning* involves locating specific information when students know what word or phrase to look for. This technique does not involve making meaning from the text, but simply locating the desired information. *Search* reading occurs when students seek topical information without knowing exactly what text to look for. *Skimming* occurs when students need to follow how the authors structured their ideas and information in their texts, and when they assess whether to engage in a different reading technique. Skimming is also useful when the structure of a text is difficult to follow and the ideas must be organized into a meaningful framework. *Receptive* reading involves reading a text from beginning to end without critically appraising the ideas, taking notes, or interrupting one’s train of thought. Finally, *responsive* reading is the process of developing new knowledge or modifying existing knowledge by engaging with the ideas presented in a text. Students often engage in responsive reading, as when they annotate parts of a text. Responsive reading is essentially synonymous with… close reading (2011, p. 2918).

Print and digital literature can both be read in all five of these modes, but each mode of literature predisposes itself toward a different style of consumption, or interiorisation. While students continue to be taught close reading skills in literary studies classes, they are only rarely given explicit instructions to read digitally in a scholarly environment that might “encourage the transfer of print reading abilities to digital and vice versa” (Hayles, 2012, p. 57). This is especially concerning given that students intuitively treat digital and print literature differently; Sutherland-Smith reports that in a study she conducted, students had misapprehensions about the authority of web text, but “accepted books as an embodiment of authority” (2002, p. 664).

If the demarcation and transfer of skills between print and digital literacy goes unmediated, students take it upon themselves to navigate the differences between the two modes of
information consumption. Without being taught the appropriate sets of skills best employed by each sort of literature, students end up haphazardly muddling their reading practices, a possibility that leads Hayles to emphasise “the need for pedagogical strategies that recognise the strengths and limitations of each cognitive mode” in order to “build bridges between them” (2012, p. 12). Bauerlein goes so far as to question whether young people can even be properly considered digitally literate (2008, p. 113-114), given that they are largely unable to apply digital tools to digital problems. Bauerlein’s definition of digital literacy seems to differ from mine, and there is evidence to suggest that even without guided assistance, regular immersion in a digital environment makes people more proficient in understanding the conventions which govern that environment, and better able to find the information they require; studies have shown the speed and accuracy of the assessment of probable value of websites increases proportionately to familiarity with the internet (Sillence et al, 2007, p. 1861). The question therefore becomes not whether students can independently navigate digital spaces to discover and learn new information (digital literacy), but whether they understand the circumstances in which it might be more effective to put down the screen and move instead to print browsing.

If we accept that print and digital literacy require differing (if interrelated) skill-sets, it is important to define what digital skills ought to be taught, and what we can leave to students to ‘pick up’ as self-evident, in the same way that some self-evident paratextual elements of print literature are learned independently rather than taught – page numbers, for example, or headings. Further, who should teach these skills, and at what point should such knowledge be assumed?

Mascilongo told me that students arrive at university with a developed set of digital literacy skills, “because obviously we are in an online, digital environment.” She qualified this statement by suggesting that these skills need to be further developed in order to help students locate and use appropriate scholarly information: “They’re not necessarily going to bring that ability to critically analyse and evaluate what they’re finding, and the sources they need... They can’t remix, they can’t copy and paste without thinking.” Raszewski emphasised the importance of what she termed a “holistic approach” to learning digital literature, in which constant formal and informal training continues over “a lifetime and career.” She mentioned this specifically in relation to the intricacies and fluidity of copyright law, but it is applicable to digital learning
more generally; the operating systems and databases the University uses today will almost certainly not be part of the institution a decade from now (just as they differ hugely from the systems in place a decade ago), but some of the academic staff likely will be, and if they are to remain proficient researchers they will need continuous training on how to best access and use the digital literature available to the institute.

Formal training is especially important in light of the number and diversity of digital environments maintained by the University of Melbourne library system alone. Both Raszewski and Mascilongo spoke of students being unaware of the resources the library offered, and Raszewski mentioned several features of the library’s digital environment I was unaware of and impressed with, including a free search database tied directly to Google Scholar. Again, though, there was little emphasis on how new students – or graduate researchers – were supposed to come by this information in the first place. Raszewski mentioned that although some lecturers sent classes to the library for a session on learning proficiency in its digital systems, many do not. Moreover, Mascilongo admits that the formal teaching of digital literacy is “a little bit ad-hoc,” and largely depends on what academic staff directly ask librarians to teach. Similarly, when asked where and when students ought to be learning basic digital literacy skills, Raszewski admitted librarians assume students are already proficient. The University of Melbourne’s 2014-2015 Scholarly Literacy Strategy document appears to take note of this gap, and suggested “Taking a ‘whole of course’, curriculum-based approach to scholarly literacy would be the optimal way to develop students’ knowledge and skills… [this would] allow higher level skills to be acquired incrementally across the duration of the course” (2014, p. 2).

It would be difficult to teach digital literacy skills outside of a digital environment, which raises the question of how educators might go about fostering expertise without succumbing to the complaints outlined in the first two sections – that digital systems distract from, rather than enhance, learning. One option is holistic or ‘scaffolded’ digital learning, in which students are assigned problems and goals, then given tools and tasked with finding their own ways to solutions, which has been shown to be effective in augmenting print-based learning (Chen et al, 2011, p. 1706). Such digital pedagogic practices posit the reader at the centre of an active, involved process of meaning-making, which is a critical component of my conception of digital
literature. Chen et al suggest bringing the idea of “embedded virtuality” – whereby digital systems and material are brought into the physical world and become an integral part of it – to reading. This would involve integrating digital resources into learning materials without disrupting the learning process, instead adding to it, “so that learners can be aware of the peripheral functionality of the connection and the availability of the associated digital resources” (2011, p. 1707).

However, there remain theoretical questions to seeing this style of learning implemented. Wolf questions whether the addition of hyperlinks to pedagogical resources might add to the breadth of children’s thinking, even as it elides the “more time-demanding, probative analytics, and creative aspects of comprehension” (2007, p. 16). The concern with the distracting nature of hyperlinks is widely shared by critics, with the general consensus being that their presence removes more from the reading experience than the potential additional information they represent adds (Carr, 2010, p. 126; Eden et al, 2012, p. 3; Hayles, 2010, p. 67). Less distracting digital additions might involve supplementary interactive quizzes or similar, to be completed after a period of initial close reading, but better yet would be a direct, unambiguous comparison between reading modes, one that straightforwardly addresses the strengths and weaknesses of each, while keeping them discretely separate.

This sort of pedagogical approach is advocated by Halyes, who calls for the field of ‘Comparative Media Studies’ to be established (2012, p. 6-9). This field already exists, she says, in “comparisons of manuscript and print cultures, oral versus literate cultures, papyri versus vellum, immobile type versus moveable type, letterpress versus offset printing etc”, but could be expanded to include modern media and its uses. She suggests that:

Without abandoning print literacy, Comparative Media Studies enriches it through judicious comparison with other media, so that print is no longer the default mode into which one falls without much thought about alternatives but rather an informed choice made with full awareness of its possibilities and limitations. (2012, p. 9)
In academia, the branch of scholarship that ties together traditional humanities research and digital technology is usually termed ‘the Digital Humanities’, and at first glance Hayles’ suggestion seems largely at home within that field. However, she is not pushing for a new methodological approach, which is what the Digital Humanities by definition involve, but rather a more straightforward shift in pedagogical emphasis from ignoring the relationship between print and digital media to thoroughly researching and teaching it. This is her point when she speaks of the challenge for educators “to ensure that deep attention and close reading continue to be vibrant components of our reading cultures and interact synergistically with the kind of web and hyper reading in which our young people are increasingly immersed” (2012, p. 69). This type of pedagogical approach is promising in that it would not require new training or equipment on the part of education providers; on the other hand, it would require much earlier interventions, given children are constantly exposed to digital environments from a young age. Indeed, the best time to begin explaining how print differs from screens might be while children are still learning to read.
Summary

This chapter has explored how digital literacy affects our cognitive systems, the ways that convention might affect how we come to understand and think about digital literature, and the role teaching plays in fostering digital literacy skills. One of digital literature’s current defining characteristics is its unpredictable evolution, so that its affect on humans – individually and socially – is only obvious after we have been changed. In this sense McLuhan’s ‘distract the watchdog of the mind’ analogy might as aptly describe collective scholarly efforts to investigate the affects of digital literacy as it does our individual responses to it.

Even so, the numerous studies published, in combination with convincing scholarly theories, paint a picture of digital literacy as a powerful force affecting human cognition, convention and classrooms. The next chapter will use the framework of enquiry established in the first chapter to explore digital literacy’s ramifications on our culture more broadly. It will investigate its impact on our conceptions of narrative, questions of the digital political economy, and whether or not digital literacy’s multimedia capabilities represent a force of abstraction, freeing us to more readily conceptualise a greater range of ideas.
CHAPTER THREE

Introduction

In the first chapter of this thesis, I suggested that print literacy modifies humans cognitively, and in chapter two I went on to extend this argument to digital literacy. I noted that this modification does not happen in a vacuum, but is rather informed and mediated by convergent forces that include the technological and cultural uses to which we put print literature. In this chapter, I will explore the wider implications of the assertions I have made – that is, how the medium of digital literature might come to affect our culture more broadly.

Like the changes inspired by print literacy, alterations in our cognition due to digital literacy flow on to affect how we think about things. Our thoughts grow more or less abstracted, which, combined with digital technology, in turn affects the narratives we tend to produce and consume. As narratives change in style and content, the methods of producing them changes as well, which opens up questions around who controls and distributes them, and whether the types of power structures inherent to print literature are maintained or elided by this new order. Finally, the emergence of digital environments in which new forms of literature is created necessitates we re-evaluate the cultural uses to which we put print literature, and this raises questions of obsolescence and whether the positive aspects of what we today consider ‘print culture’ will be maintained in the digital future.
Does digital literature enable or inhibit deeper forms of abstract thought?

In the first chapter, I argued that print literacy is an inherently abstract system of interiorising knowledge, mediated by cultural rather than genetic expression (unlike spoken language). I suggested that internalizing this system of abstraction positions literate subjects to think more abstractly in other ways as well; by divorcing the interior self from the “external objective world” (Ong, 1982, p. 104), we are primed for acts of introspection and metacognition, which in turn affect the sorts of narratives we produce. I characterized this internalised propensity for abstraction as deepening over time, so that in Western culture narratives seem to move toward a more abstract noetic mode, capable of conveying an ever more nuanced range of human inner life. Given the rising primacy of digital literature as a supplementary mode of knowledge interiorisation to print literacy, one question must be whether digital literacy constitutes a further extension in the trend of noetic abstraction, or its regression. This section will explore that question, while the one following will deal with its consequences on the sorts of narratives we produce.

McLuhan believes that what he termed ‘the electronic age’ stands in opposition to print literature in the effect it has on the human mind:

The print phase, however, has encountered today the new organic and biological modes of the electronic world... And it is this reversal of character which makes our age “connatural,” as it were, with non-literate cultures (McLuhan, 1964).

Writing prior to the advent of widespread digital technology, McLuhan’s ‘electronic age’ largely refers to the technologies of radio and television rather than anything we would recognise as digital literature. By contrasting the ‘organic’ immediacy and orality of these mediums against the artificial, slower visual basis native to print, McLuhan’s suggestion implies our ability for highly abstract thought collapses back to near the levels of our pre-literate ancestors. Although it is tempting to argue digital literature is wholly unlike the other electronic technologies McLuhan refers to, this is not the case. Taken most broadly, digital literature encompasses digital formats, like websites, that enable and often require some form of multimedia component; some
publishers even produce “e-novels that have videos embedded in their virtual pages” (Carr, 2010, p. 105). The addition of multimedia to digital texts stems from the supposition that “text-only narrative is ripe for disruption” (Nash, 2013, online) – that is, the interiorisation of knowledge can be aided rather than detracted from by supplying more information in the form of different media formats. Studies have indeed indicated that students are more highly motivated to engage with learning materials when these include multimedia aspects (Burke and Roswell, 2009, p. 110). Although often supplementary to the main body of text, multimedia additions (such as visual and audio clips) to digital literature can be considered problematic in that:

Interactive multimedia leaves very little to the imagination. Like a Hollywood film, multimedia narrative includes such specific representations that less and less is left to the mind’s eye. By contrast, the written word sparks images and evokes metaphors that get much of their meaning from the reader’s imagination and experiences. When you read a novel, much of the colour, sound, and motion come from you (Negroponte, 1995, p. 8).

Moreover, ‘updating’ a text that had previously only appeared in print by adding images, audio or video is often superfluous to the text’s inherent message; “The desk I’m sitting at doesn’t tweet either. The “job to be done” is to deliver a very large set of words” (Nash, 2013, online). The issue is less that multimedia distracts from the essence of a text – though critics consider this a problem as well (Carr, 2010, p. 102) – than the fact that by supplying ready-made visual metaphors and visualisations, multimedia serves to ‘hand-hold’ readers through the more difficult and engrossing task of closely parsing a passage’s content. Rather than using a text to piece together related theories into a new conceptual model, readers are served ready-made interpretations, and in so doing fail to exercise their capacity for abstraction.

However, digital literature is capable of more than simply including irrelevant noise in previously perfectly acceptable texts: its inherent capacity to utilise networks allows the possibility of achieving deeper levels of abstraction than print literature permits. If print literature allows sufficient space for abstraction that a reader can rationalise the characters that he or she is reading about, and contrast their actions against his or her own (demanding, in turn, the development of introspection), digital literature allows for the open comparison of multiple
streams of introspection to occur between readers simultaneously, and to mutually influence one another. Many readers choose to ‘mark up’ the print literature they read with marginalia, writing notes and comments about passages in the text they find important. These notes might serve as rebuttals, suggestions for further reading, or ideas on how this passage fits within the context of the entire text: in short, they de-reify a printed page from a finished product to an abstract collection of overlapping, a-synchronous clauses that can be independently interrogated. As the technology for digital literature evolves, it first imitates, and then occasionally surpasses the capacities of print literature. This is true of marginalia, for example; on the website medium.com, essays are posted online, to be read, shared and discussed. Rather than the more typical ‘comment box’ at the bottom of the page, however, each paragraph of the essay has a small ‘plus’ symbol next to it, and when clicked, this telescopes open into a space where readers can write their own responses to the arguments they have read (example below.)

It *can truly change my life*, if I play it right. I kept 2
1 after month, with great results.

of what some of my passwords have been in the ea of how my life has changed, thanks to this

wife, who started it all.

*It worked.*

*worked.*

*or worked, still fat.*

*ked.*

*ked. I fell in love again.*

*it worked. It felt great!*

Fig 1. Retrieved from https://medium.com/@manicho/how-a-password-changed-my-life-7af5d5f28038 on 25 July 2014
Interestingly, the practice of carefully reading a text and adding contextual notes echoes ‘responsive reading’, which was vaunted as one of the highest skills of print literacy in chapter two. In this sense digital literature can be seen to support rather than supplant a skill more usually associated with print literacy. By utilising the capacity to extend, rebut and critique and author’s argument, readers of digital literature are able to enjoy alternative readings of such texts; the fact that these are not presented immediately, but must be clicked on by the reader to expand them, likewise ensures they do not distract from the reading experience until the reader is ready to engage with them. This expands upon Wolf’s conception of print literature as a type of Socratic dialogue, in which “the process of writing can re-enact within a single person the [Socratic] dialectic” (2007, p. 73): here the Socratic dialogue takes place between the author and all of his or her readers, who may be from geographically and ideologically disparate backgrounds.

Finally, although many critics suggest the addition of hyperlinks in digital documents is inherently distracting, there is no reason that this must be so in all cases. A well-designed, modern hyperlinked digital document can visually represent the network of ideas that make up its author’s argument. Sources can be cross-checked, and each strand of prose can be picked apart to check for truthfulness or examine its narrative value. This is part of what the practice of ‘Fisking’ involves. Named after journalist Robert Fisk, digital texts are pulled apart and deconstructed, often a paragraph at a time, with additional commentary or rebuttal provided between each clause. This allows a higher degree of nuance in response to objectionable material than would be possible in print, and it is a technique that has come to be used extensively in digital journalism, especially by political bloggers (example below).
When combined with a comment system like that of medium.com, Fisking would allow the robust and transparent dissection of argument and the airing of disparate opinions, providing fertile ground for abstracted concepts to be remixed between worldviews. That these trends in digital design are relatively recent underscores the fact, outlined in chapter two, that the conventions of digital literature are far from settled; however, given that conventions like these aid reader response rather than impinging on textual comprehension, there is reason to be cautiously optimistic about the direction that trends in digital design are moving towards.

Given that, in sum, digital literature may well represent a movement towards a more highly abstracted form of knowledge interiorisation, this movement will likely have repercussions on the types of narrative produced within that literature, in the same way that the themes of print narratives “are infinitely more varied and less obtrusive” than their oral counterparts (Ong, 1982, 53.)
The next section will explore the digital literature’s potential to shift our conception of what narratives should look like, and how we might best interiorize them.
Changing narrative forms

In chapter one, I discussed how the transition from orality to literacy influenced the rhetoric deployed by storytellers, in turn affecting “successive modes of characterization and of plot” (Ong, 1982, p. 155). Gleick, sharing McLuhan’s conception of the medium being the message, similarly argues the communications channel employed explicitly affects the sorts of communications allowable – “the new channel does more than extend the previous channel… It permits whole new architectures of information. Among them are history, law, business, mathematics, and logic” (2011, p. 32). This section will explore the implications of extending this ‘communicative determinism’ to digital literature, and will make some suggestions regarding what narratives shaped by the exigencies of digital literature might look like.

There is little critical contention that constructing a text digitally changes how authors are predisposed to write. Carr gives an obvious example in which Japanese mobile phone novelists write their narratives in a deliberately abrupt, truncated style, in line with the restrictive demands of the medium (2010, p. 104-105), and much has been said regarding the similarly abridged missives dictated by mobile SMS messaging. A more interesting question is whether the content of messages itself changes, dependent on the environment in which it is written. As the internet is usually accessible on digital devices, some critics argue the temptation to ‘look things up’, like facts or lists of synonyms, reduces the author’s capacity for creativity (Andrukonis, 2006, cited in Bauerlein, 2008, p. 66): “the imagination, which needs must be fanciful, [is] at a few keystrokes reduced to factualism” (Self, 2014, online). This contention allows a very narrow scope for what is meant by ‘imagination’; although digital thesauruses and encyclopedias may be quicker to access than their print counterparts, no computer program can construct an elaborately realized character, invent the perfect plot twist, or synthesise disparate pieces of information into a coherent, engaging narrative. Moreover, digital literature’s ability to deliver masses of information from geographically and socially distant settings, and to juxtapose these against one another, leads to anecdotes of enhanced creativity (Carr, 2010, p. 8) – even Carr, who otherwise dismisses the attention-draining propensities of digital literature as wasteful, allows that the internet “has made me smarter. More connections to documents, artifacts, and people means more external influences on my thinking and thus on my writing” (2010, p. 8).
As well as modifying how we write, digital literature also allows for new forms of reading. The rate at which people read is largely governed by eye movement, and indeed one hypothesis with regard to cognitive mapping is that readers prefer the codex format because when held, the reader’s hand-eye coordination system engages and means that eye movements become steadier and more assured (Strassman, 1985, cited in Ziming, 2005, p. 709). Presenting words one after another at the precise point where the reader’s gaze is focalized – a technique called rapid sequential visual presentation (Dehaene, 2009, p. 17) – up to three times as many words can be read in the same amount of time (compared to a baseline print media reading rate), while studies have shown that “identification and comprehension remain satisfactory” (Dehaene, 2009, p. 18). The academic research on this subject was recently put to use by a private company, Spritz Inc, which in 2014 launched a smartphone application whereby pages of digital text were modified to be displayed as rapid sequential visual presentation (Spritz, 2014, online). The application received significant positive press, especially on social media (The Wire, 2014, online), where it seemed to strike a nerve by promising efficiency, thereby “freeing up more time to do other things” (Spritz, online, 2014).

While laudable, the digital application’s usefulness somewhat ironically depends on readers consuming print literature-style texts, with relatively simple paratextual elements like headings, and no embedded multimedia cues complicating the text’s context. This is because in print, “the trajectory is linear… with digital texts, however, the reading path is ‘to-be-constructed’ by the reader” (Burke and Roswell, 2009, p. 107). Many narratives still employ linear storytelling, especially commercially successful novels and certainly scholarly works, so it would certainly be useful in such instances; however some experiments, primarily in journalism, indicate that digital paratextual elements can increase interest in and comprehension of complex stories. The New York Times in particular has championed a style of journalism in which video and audio recordings are embedded within more traditional long-form reporting, alongside hyperlinks and interactive ‘infographics’, whereby each reader will receive a slightly different experience of the text (New York Times, 2013, online). A powerful recent example of digital literature is the below infographic developed by the Washington Post, depicting the death toll in the most recent conflict in Gaza:
1396 were Palestinian civilians. Of those, 222 were women and 418 were children.


Each death is represented by the outline of a human figure; when the mouse is placed over any of the figures, text appears detailing the victim’s age and gender, as well as the date they were reported a casualty. This graphic was assembled during the conflict, and updated periodically with new figures and information as it became available. While it is conceivable that similar statistics might appear in a print newspaper, the visual, interactive and continually revised nature of this digital version contributes to a certain affect in the reader that a more textually stable piece of print literature would be unable to match.

Digital literature promotes intertextuality, in which digital texts are read against one another in order to generate a context-driven response from the reader. The scholarly close reading of different texts has always inherently promoted the idea that texts derive meaning from one another, which is the assumption that underlies the very concept of having a ‘course list’ of
novels to read, for example. Part of the modernist and postmodernist projects is to examine these influences directly, as Ong suggests:

Printed books did echo one another, willy-nilly. At the onset of the electronic age, Joyce faced up to the anxieties of influence squarely and in *Ulysses* and *Finnegans Wake* undertook to echo everybody on purpose (1982, p. 129).

The architecture of digital environments inherently promotes the tracing of textual influence, however, in a way even the most scrupulous citations cannot match. In digital literature, it happens regardless of the author’s intention. For example, blocks of text can be lifted straight from the longer piece in which they are embedded and placed in a search bar, which can then scour the internet for other texts that contain the same words in the same order. Digital authors can assign credit to one another by using hyperlinks to direct readers to primary source documents, or ‘hat-tip’ an online text which itself quotes another source. In this way, chains of references can be produced that directly reveal the spread and influence of an idea. The allusions and call-backs Joyce placed intentionally in his works are more often accidentally inserted into digital texts, but digital networks allow readers to explore them more accessibly.

Moreover, digital literature extends intertextuality’s scope to include paratextual elements that are not features of print literature. For example, the digital code that generates the graphics in the Gaza infographic, above, might be derived from some other source or project, which then creates a link between the two otherwise disparate works. In this sense, digital literature “offers the opportunity to extend literacy skills – such as associative logic, visual rhetoric and interactivity” (Sutherland-Smith, 2002, p. 665).

Given the new options afforded to producers of digital literature, and the new reading habits and expectations of consumers of the same, it makes sense to question what narratives constructed digitally might begin to look like. One recent example is *Lost in the Long White Cloud*. In 2013 print media giant Fairfax constructed a website to accompany a long-form piece of journalism by Charles Anderson, relating the mysterious disappearance of two pilots in New Zealand 85 years ago. The site featured occasional audio cues, embedded videos, and frequent photos with
captions, but these elements combine to make the overall product an immersive narrative experience (Anderson, 2013, online). Although the paratextual and multimedia elements of the narrative imbued it with interactive components, the story itself scrolls downwards as a timeline of events, maintaining chronological order and narrative linearity. By paying attention to smart design principles while retaining multimedia elements, Anderson’s story highlights the potentialities of digital literature – not merely to convey information for swift interiorisation, but by its visual and auditory cues, to also convey affect: to more readily inspire in ‘readers’ an emotional response, based on what they are seeing and hearing.

Less optimistically, the networks that convey digital literature also allow some of the latent negative aspects of the production of literature to propagate. Carr suggests that because digital literature tends towards impermanence, writers may be less inclined to assiduously perfect their work, to write for “an eye and an ear toward eternity” (2010, p. 106). Similarly, the financial imperatives that drive the production of print literature may similarly come to affect digital texts:

Writers and publishers will begin to think about how individual pages or chapters might rank in Google’s results, crafting sections explicitly in the hopes that they will draw in that steady stream of search visitors… chapter titles will be tested to determine how well they rank (Johnson, 2009, quoted in Carr, 2010, p. 106).

That the artistic merit of literature might become ancillary to the responses of focus groups seems disturbing, though it is reminiscent of the practice of ‘advertorials’, in which advertisers pay for editorial content that paints some aspect of their business in a glowing light, usually in newspapers or magazines (a practice that works just as well in digital literature as in print). Part of the issue is that while the power structures inherent in print literature are well-explored, those of digital literature are comparatively poorly understood. The next section will explore some of the underlying political, institutional and financial forces that shape how digital media is produced, distributed and consumed.
The Political Economy of Digital Literature

In the first chapter, I explored how new modes of production and the advent of mass literacy altered the political economy of print literature. Like any medium, literature has rules that govern how it is deployed, and these are both explicit – in terms of laws like copyright or infrastructure maintenance, for example – and culturally defined, in terms of who can say what to whom, and when. Digital literature is no less governed by (often competing) power structures than print, despite the rhetoric of democratization that is often invoked during discussions of its cultural role.

As a medium, digital literature does offer several potentialities not open to print, and these are usually a result of its networked infrastructure and the digital environment within which it is propagated. Such environments differ to print and other broadcast mediums in that they are multi-directional; information does not move linearly from author (or broadcaster) to consumer, but rather moves readily back the other way, as well as directly between consumers. This has inspired the term ‘prosumer’, a neologism based on the concept that the old dichotomy between cultural ‘producer’ and ‘consumer’ has become blurred due to the ease by which digital environments and texts can be influenced by those using them. This blurring is usually characterized as a positive development “in both political and emotional terms” (Gauntlett, 2011, p. 162), and one that “promote[s] sharing, connectedness, decentralization, and cross-cultural sensitivity as a direct alternative to old-media economies of distance, objectivity, privacy, and rationality” (Garde-Hansen and Gorton, 2013, p. 79).

Similarly, just as Eisenstein suggests that mass production following the printing press allowed important documents to be made public rather than ‘kept safe’ behind closed doors (1983, p. 80), digital literature appears to allow and extend the public appetite for scrutiny of civic and corporate interests. At its most extreme, this takes the form of whistleblowing (Edward Snowden’s 2013 revelations regarding US spying, for example), but it can often be observed on a more mundane level – the public display of census information, calls for submissions on proposed law changes, and even relatively banal interactions with politicians via social media. Print literature facilitates all of these interactions to some degree, but digital literature enables
them to become far faster and more efficient; rather than needing to smuggle hundreds of thousands of documents from Iraq, for example, renowned whistleblower Chelsea Manning simply uploaded them to Wikileaks.

However, the networks that enable digital literature’s accessibility and convenience are themselves amenable to regulation by often-invisible networks of institutional power, which is especially concerning when users are not aware of this fact. Information accessed via digital networks can be readily traced by the owners of the infrastructure over which signals travel, and this information can be recorded for government and corporate use. While interviewing Mascilongo, for example, she explained that the University of Melbourne library system keeps track of user movement through its digital environments, ostensibly for user testing purposes and system improvements, though she admits “we haven’t done much with the data.” Library information searched for via digital systems is therefore qualitatively different than information located through material arrangements like the Dewey decimal system. Search via digital systems can be tracked, whereas Dewey searches are traceless; more importantly, information is searched for in digital systems using keywords and meta-data which search within each volume, whereas Dewey searches use a taxonomic hierarchy to produce a certain range that each volume itself sits within.

Hayles argues that machine search enables scholars to find more diverse resources than was previously the case, since formerly the easiest resources to find were those in anthologies or that were already considered important in some special way; with machine searching, the system returns whatever results are closest to the keywords entered (2012, p.27-28). However, this ignores the way search engines work in actuality. Raszewski mentioned one of the university’s library databases was developed and owned by a private company, meaning that searches conducted on that database were weighted towards bringing up results featuring that company’s intellectual property, highlighting the “preferencing that the systems do behind the scenes.” Similarly, Google Scholar, one of the largest digital repositories of scholarly work, does rank results by how closely they conform to the keywords entered, but then modifies this by altering result rankings based on where and when an article was published, as well as how often and how recently it was cited (Google, 2014). The exact algorithm it uses to determine its results is a
proprietary secret, meaning it is impossible to know to what extent keyword choice influences the results displayed, or even, as is the case in the University of Melbourne library system, if the results might be affected by corporate interests. A survey of scholarly articles published between 1945 and 2005 discovered that as more articles went online, scholars cited fewer articles than before, and cited more recent articles with increasing frequency, indicating that far from enabling a more diverse academic landscape as Hayles suggests, the underlying architecture of search engines bias us toward certain kinds of results over others (Evans, cited in Carr, 2010, p. 217). Unless the algorithms digital search engines use to rank results are both transparent and widely understood by system users, search rankings represent an implicitly anti-democratic yet integral part of digital literacy.

Less opaque instances of institutional power in digital systems often take users by surprise. This was the case in 2009, when Amazon discovered two George Orwell books were being sold out of copyright in its online digital literature store, and remotely deleted these from the devices of anyone who had purchased them (Fabio, 2009) (somewhat ironically, one of the books in question was *Big Brother*). That Amazon was technologically able to do this is less interesting than its legal significance, and the implications this has for issues of copyright and ‘ownership’, in both the intellectual and property senses.

Because digital texts are more readily copied and archived than printed texts, ownership of digital text is less well defined and understood. The mass production of printed literature reified information in a form external to human beings, which allowed private ownership of texts, but created a barrier – property rights – to the cultural information that had previously been transmitted orally. Digital literature liberates text from a state of physical embodiment, but – legally, at least – does not return it to community regulation. The digital text is therefore held within the community (the community being some group of people, such as scholars, with a shared interest in the text), but the authority to transmit or duplicate the text is regulated externally, in the form of laws governing the transmission of data and intellectual property ownership. This tension occasionally comes to a head; Mascilongo related an incident in which an academic had used lecture capture technology to record a presentation and later distributed it via social media for the benefit of students who could not attend. Australia’s Copyright Act...
allows the University to reproduce copyrighted material, so long as only enrolled students can view it (University of Melbourne, 2011), which the institute usually accomplishes by using a digital environment owned wholly by the University, accessible only to students. When the academic posted his lecture online, it was widely shared among non-students, and he was forced to remove it for copyright reasons, even though it was composed almost entirely of his own original work.

Issues of access to digital literature also present a problem to narratives of digital environments as virtual locations of “sharing and connectedness”, especially in a culture where lack of access to timely digital information can have negative socio-economic consequences. The gap between that demographic of the population who live with some structural inequality (wealth, education, geography, technological understanding, etc) preventing them from accessing digital networks and the demographic that does not is often termed the ‘digital divide’. People on the wrong side of the digital divide are doubly disadvantaged in societies where in order to overcome structural inequality, some access to digital information is first necessary; if a digital world is one in which “unwired humans will come across as singularly unintelligent, non-conversant and incomprehensible” (Andrejevic, cited in Crang and Graham 2007, p. 798), issues of digital illiteracy become as serious and immediate as those of print illiteracy. If, as I suggest in chapter one, working class people used literacy to help maintain access to their cultural canon, it is plausible contemporary humans take up digital literacy for the same reason – and, given that digital literacy is often not explicitly taught, and that digital devices are often expensive, it may be that the barriers to digital literacy are relatively higher for the working classes of the twenty-first century than they were for those of the nineteenth.

Another often-repeated claim is that digital environments allow those with comparatively less institutional power a platform from which their views can be expressed as conspicuously as established forces – that they “amplify the voice of ordinary citizens” (Hindman, 2009, p. 107). However, as with any communications medium, some people can produce and consume digital literature more efficiently than others, and the medium is biased towards those with training in how to use it, the wealth to afford it, and the time to utilise it – effectively, those who are already
socio-economically privileged. Hindman confirmed this was an accurate analysis during an extensive survey of political blogs in the US:

Though millions of Americans now maintain a blog, only a few dozen political bloggers get as many readers as a typical college newspaper. Yet the problem is not just the small number of voices that matter; it is that those voices are quite unrepresentative of the broader electorate… Ultimately, blogs have given a small group of educational, professional and technical elites new influence in U.S. politics… Running a successful political blog requires strong analytic training, an encyclopedic knowledge of politics, the technical skill necessary to set up and maintain a blog, and writing ability equal to that of a print journalist. It is not an accident there are no factory workers or janitors in the upper ranks of the blogosphere (Hindman, 2009, p. 103, p. 123).

The conception of an ‘elite’ dominating the discourse is decidedly ‘old media’, yet digital literature seems nearly as powerless to avoid entrenched power structures as does the older print literature. This is true even among the cultural – rather than political – elite. Humphreys uses a case study from Cuba to explore this point. A poet who was employed as chief censor during the 1970s appeared recently on Cuban television, which some local writers took exception to. One writer began an email thread expressing his displeasure, which was forwarded and added to by other local artists, and eventually leaked to the politically significant exile community in the US. Humphreys notes that:

By turning to email as medium for debate, writers, film workers, and other cultural producers and critics circumvented state censorship and renewed their aspirations to act as public intellectuals who ‘speak truth to power’. Yet as they anxiously scanned every new event and intervention for signs of state conspiracy or political opportunism, intellectuals inadvertently strengthened the political divides between islanders and emigrants they had hoped to overcome (p. 198).

This anecdote helps illustrate the potentialities and shortcomings of digital literature: it is distributed via a medium that is not yet thoroughly controlled by corporate interests, allowing
those who are sufficiently privileged to propagate their voices and provide an alternative to mainstream narratives. At the same time, digital channels, like all media, can be controlled and regulated by both vested interests as well as social convention, so that the most disadvantaged people in society, who have the most to gain by using such channels, are also the least able to do so in practice. The tensions of Cuban natives surrounding paranoia and conspiracy were used to regulate the tone and content of digital discourse rather than being surmounted by the virtual environment; digital literature merely extended the institutional power structures embedded in reality rather than subverting them.

Since the complex systems of power that mediate access to digital literature are relatively new and often opaque, simplistic conceptions of the transformative power of digital networks tend to predominate in popular discourse. The next section will discuss how the environments by which digital literature is propagated is leading to changing conceptions of literature’s cultural value, as well as the affect this has in turn on our understanding of contemporary print culture.
Cultural Economy of digital literature

In the first chapter, I argued that the cultural values we attach to print literature are modified by technological factors influencing how quickly texts can be produced. The rapidity of a text’s dissemination has implications for its cultural currency, as well as our interest and ability in comparing similar texts to one another. In an age of literary mass production, literature can become a cultural touchstone – to quote Bauerlein, “Kids read Harry Potter not because they like reading, but because other kids read it” (2008, p. 43). Words are not simply being added to the dictionary, they are being added more quickly than ever before, indicating that the lexis – a “measure of shared experience, which comes from interconnectedness” (Gleick, 2011, p. 76) – may be enhanced by a common connectedness, rather than fractured or balkanized by the intersection of divergent worldviews. Digital literature’s distribution via electronic networks means that it can be produced and circulated orders of magnitude more quickly than print literature, and this not only has implications for how we respond to digital texts, but also modifies our understanding of extant print culture.

As outlined in the above section, digital literature, often by dint of its ubiquity and ease of transmission, is regularly hailed as a panacea to many of the perceived ills afflicting society. The thinking seems to be that because so much information can be found using digital networks, users of such networks will become better-informed by a sort of info-osmosis. That there is little evidence for this happening disturbs some critics, who raise concerns typified by Bauerlein: “Digital habits have mushroomed, but reading scores for teens remain flat, and measures of scientific, cultural and civic knowledge linger at abysmal levels. Why?” (2008, p. 69). In fact, studies have indicated students tend to conflate the ephemeral nature of digital literature with a lack of authorial credibility; when serious attention needs to be paid to text, they either print digital materials or locate physical books (Eden et al, 2012, p. 2). Readers “indicate that they prefer the printed version of papers because of the sense of ownership provided by the printed text” (2012, p. 3), suggesting a research practice that emphasizes finding information through digital networks, but then learning that information in print. This recalls Ong’s point that in antiquity, “Witnesses were prima facie more credible than texts because they could be challenged and made to defend their statements, whereas texts could not” (1982, p. 95).
contemporary digital caveat seems to be that information is more credible in print: because it is set down and unchanging, it can be challenged, whereas digital texts change rapidly and unpredictably, so that a digital ‘fact’ might be different today than it was yesterday.

This point was confirmed by Raszewski, who informed me that until recently, University library administration prioritized the purchase of ebooks over print versions of the same text. They changed this practice when they realized that research students, especially those in the humanities, wanted to keep physical copies for extended periods of time, which they could then photocopy or mark-up as necessary. It seems that – for scholars, at least – print versions of text are considered authoritative in a way digital texts are not. Indeed, digital text’s ubiquity might work against its intellectual authority, as the proportion to bad information to good information available via digital networks worsens, even as the absolute quantity of good information increases. Printed materials, by dint of the extra effort required to reify the information inside them, act as something of a gatekeeper to poor-quality or incorrect ideas; this will likely remain the case unless and until the proliferation of bad information in digital networks is halted.

The mutual influence of digital literature on print culture, and vice versa, can be taken further within the library setting. Both of the University staff I interviewed suggested that numerous aspects of the library – including the architecture of its digital and physical environments – had been modified to take into account the new habits digital literature fostered in students. For example, Raszewski said the library administration was concerned with creating as much space for students to use their own digital research devices, including laptops and tablets, as possible. This meant that less space could be devoted to shelves filled with books; these were gradually being migrated to an off-site storage facility. Students could order books online, and within a day or two, these would be ready for pick-up from the library’s front desk. Not only physical books are in the process of being de-shelved: Mascilongo suggested that as digital networks became better able to transfer large amounts of information quickly, the library’s DVD collection would be retired, and a video streaming service could be used in their place.

Similarly, the library’s digital systems have been changed incrementally, so that students accessing most catalogue functions will now be presented with a generic ‘search bar’, similar to
the ones they may be presented with by commercial search engines – what Mascilongo refers to as part of a tendency towards “googlefying” scholarly databases. Raszewski explained the tension that operates “between making things really easy and just providing a search box that can be typed into, versus having to know what you’re searching, what you’re looking in, the limits of it.” Students’ familiarity with search engines means that when they type something into a search bar, they are used to receiving some sort of result, even if it needs to be refined further; the library’s digital architecture has been modified iteratively to take this into account. Raszewski labeled this problematic, in that students can be misled when they receive a result of “something – anything” into thinking they are on the right path to useful scholarly information, when in fact they have been given little of direct relevance to what they are trying to find. She suggested that the search bar feature implies the “notion of the catalogue, that idea of what the record constitutes, has somehow changed.” Works no longer stand on their own, individually divulging some piece of scholarship on a subject or topic, as put to print by an author or small group of authors. Rather, the catalogue is now a web of interrelated concepts and ideas, each of which is orbited by constellations of informational artefacts: each artefact is placed in its assigned position by a machine algorithm that scans keywords of abstracts and allocates a relevancy based on those, as well as the aforementioned biases of publication date, citations, and the commercial value to whichever corporation owns the algorithm itself.

Taken together, these changes indicate that the library’s internal space is in the process of transformation from a place in which the search for information ends with the discovery of a useful book or journal, to a jumping-off point, from which much more information is sought out. The role of librarian is evolving from that of organizer of information to mediator of information systems: students are less assisted to find the right book, but more coached in the information management strategy that will eventually help them locate the right information themselves.

In other ways, however, print culture stands to be only loosely affected by digital literacy. Nash makes the point that:

The business of literature is the business of making culture, not just the business of manufacturing bound books… [Print] culture is not print fetishism; it is the swirl and
gurgle of idea and style in the expression of stories and concepts—the conversation, polemic, narrative force that goes on within and between texts, within and between people as they write, revise, discover, and respond to those texts… Being yoked to the Industrial Revolution’s machines for analog reproduction, accompanied by an arbitrary process for selecting what should be reproduced, will prove to be an anomaly in the history of literature, useful as that phase was for the democratization of access to reading” (2013, online).

As discussed above, and in chapter two, the technology underpinning digital literature represents an extension of readers’ abilities to respond to texts and one another, and will likely lead to more complex intertextual modes becoming the norm. If this is part of what makes up print culture – a culture of criticism, social gathering and literary novelty – this is unlikely to change in substance, even if these aspects become mediated by digital networks rather than physical space.
Summary

The systems and processes that give rise to examples of digital literature are vastly different to those that support print. This chapter has been primarily concerned with exploring the structures of power – both cultural and political – that govern how digital literature is deployed, and by whom. Narratives of digital literature that position the technology as a more open and democratic alternative to the entrenched power structures of print literature are overly simplistic, and tend to rely on cherry-picked examples of digital networks enhancing the organizational capacities of groups that were already sufficiently privileged to utilize them.

As digital literature is a medium of communication so separate to print literature, it has a different utility, and I investigated the considerations that needed to be taken when thinking about the shape digital narratives may form. While digital literature is subject to structures of power, just like print literature, its nature allows it some narrative advantages over print; well-designed multimedia components, while potentially distracting, can also enhance story-telling and add an directly emotional aspect to narratives. Similarly, some of the structures of power inherent in all works of literature can be deconstructed more readily when read digitally, as the provenance of ideas and text are more readily checked.

Interestingly, the changes to the library system revealed in my interviews with Mascilongo and Raszewski suggest the influence of digital literature extends out of the virtual realm. With the architecture of digital systems affecting the structures of power literate subjects must navigate in order to locate the necessary information, the physical infrastructures within which information is kept – libraries, for example – are changing to accommodate this altered dynamic.

Although it is impossible to predict with much certainty the cultural impact digital literature will end up having on our society, I have attempted to trace its contours, and to provide a glimmering, at least, of where we may be headed.
CONCLUSION

This thesis has sought to investigate the cognitive, cultural, economic and social changes that are occurring as a result of the widespread uptake of digital literacy. This was accomplished by reference to academic works, contemporary examples of digital literature, and by interviews conducted with two of the people on the forefront of teaching digital literacy practices. The thesis was strongly influenced by Ong’s work in mapping the transition from orality to literacy in pre-print cultures, and the various ways in which that transition affected newly literate individuals and societies; I argue that the rise of digital technologies presents a paradigm shift of equivalent magnitude, and can be interrogated along similar lines.

It began by laying out what I mean by the term ‘digital literacy’, and then examining the cognitive, cultural, economic and social changes that needed to be navigated by primary-oral societies in the transition to print literature. By using this navigation as a framework from which to base my investigation of digital literature, I was able to analyse the many ways in which the transition to digital literacy affects our minds, culture and society.

I found that print literacy changes the human brain, though these changes are mediated by cultural and technological forces. Technological forces tend to determine the rate at which literacy and literature spread, while cultural forces tend to determine how literacy is deployed, and what sorts of literature is produced. Together, these form a complex web of mutually influential variables that govern what print literacy looks like at any particular point in time.

I asserted digital literacy was a communications medium distinct from print, and that it would therefore change human consciousness and society in a different yet broadly equivalent way; to this end, I used the interrogative framework from chapter one to analyse the broader ramifications of digital literature on other aspects of human noetic and cultural experience.

I found that although studies examining how digital literacy physically alters the brain were less well established than those investigating print literacy, there remained a significant amount of secondary evidence pointing towards alterations in human cognitive function. While some of
these are considered by many scholars to be negative – for example, a reduction in attention spans – there is also evidence of neuronal resource redistribution, such that working memory and visual-spatial reasoning abilities may be improved in people with strong digital literacy skills.

Some of the ‘negative’ cognitive implications of digital literacy, I argued, may be the result of insufficiently developed social and design conventions that regulate how digital literature is displayed and consumed. Digital literature is still an incredibly new technology, and does not benefit from millennia of refinement like print literature does. Although some aspects of print literacy are and may always remain superior to the capabilities of digital literature – the tactile nature of printed pages, for example – recent trends and anecdotal evidence suggest the ‘usability’ gap is closing, largely due to the improved capabilities of digital technologies to enable the cognitive mapping of texts, and this gap will continue to close as the designers of digital literature take criticisms of existing technologies into account and improve them iteratively.

Some aspects of digital literacy seem aligned to the expectations of a primary-oral society, moderated by the dynamics of print literacy. Digital culture’s emphasis on sharing and remix is similar to an oral poet’s generative performance, for example, in which the story is familiar yet the retelling is considered a separate and original piece of art. Because literacy allows us to draw on a broader cultural canon, however, the narratives explored through digital literature remain complex and use the highly abstract concepts familiar to print literature. Audience response to digital literature in some respects also emulates that of oral societies, in which physically present audience members could voice their approval or disdain of performances with some immediacy. This immediacy, if not physicality, has returned as a component of digital literature, in which physically, temporally and ideologically distant audience members can leave their thoughts and opinions on digital literature to be read by each other and the author. This serves to de-emphasise authorial privilege, and potentially broadens the demographic of the population able to actively participate in what has been known as ‘print culture’, but might be more aptly described as ‘literate culture’ or even simply ‘text culture’.

I characterised digital reading practices as being predisposed to certain types of enquiry, a
predisposition bourne largely of the limitations and capabilities of the digital medium. Readers can leap through a text via hyperlink or to ‘find’ individual keywords, a practice rightly considered the antithesis of traditional ‘close reading’, as it is taught in relation to print media. However, there are some circumstances where ‘skimming’ is a perfectly valid reading strategy, or where to read a new text in depth would be a waste of time; any conception of a fully digitally literate person should include an aptitude for quickly and accurately rating the usefulness of new information.

This has implications for the way we decide to teach digital literacy – or, in fact, whether we decide to teach it formally at all. My interviews with Mascilongo and Raszewski were useful in highlighting the fact that although students are expected to have reached a minimum digital literacy by the time they arrive at university, exactly when and where they should have picked up these skills remains blurry. Though there is some suggestion that the digital literacy skills required for scholarly research may be integrated directly into course subjects in the future (University of Melbourne Scholarly Literacy Strategy 2014-2015), this is not the case at present. Despite this, I found that pedagogic approaches to locating library information are changing. In teaching print literacy, the tendency was to teach students how to locate the specific information they wanted to find. In digital literacy, the tendency is to teach a range of different strategies for finding, sorting and rating information – skills that are part of my conception of what ‘digital literacy’ necessitates.

Just as institutions are coming to grapple with the difficulties and opportunities inherent to this new form of communication, so too is society more broadly being changed by the electronic networks through which digital literature is propagated. While the central argument of this thesis is that digital literature is indeed ‘transformative’ in many regards, the structures of power that shape its production and distribution remain tightly tethered to the institutional, corporate and social concerns that mediate print literature.

Large multinational corporations like Amazon regulate the flow of digital literature, freeing consumers from the necessity of visiting physical storefronts while simultaneously entrenching its own distribution and control paradigms. Although the networks over which digital literature is
distributed may be theoretically agnostic when it comes to the movement of information, real-
world monopolies and copyright laws that inform the movement of culture strongly mediate how
digital literature is consumed, and by whom. Existing legal structures play a role in this. I
showed that existing copyright law, for example, may not be well-positioned to support the
emerging artistic and pedagogical practices of a generation who are as familiar with digital
technology as they are with print. Scholarship could be impeded if students are unable to have
personal, timely access to a large database of journals, for example, and while copyright law was
originally intended to provide an incentive for authors to create original new material, the very
definition of ‘creativity’ is being challenged so that in some circumstances the law may act
against this purpose.

Despite these codifications of existing power structures in a new medium, digital literature
remains an emerging technology, and the conventions that shape its use and utility have not yet
been fully settled. Digital texts are also open to deconstruction and intertextuality in a way print
text cannot be, in that the digital medium allows for a greater (if still limited) range of
worldviews to be disseminated; expert knowledge can be interrogated more quickly and closely,
and digital networks are in the process of redefining authorial and journalistic practices.

By its very subject matter, this thesis will have a shelf life measured in years rather than decades.
Digital texts, and the conventions governing their production and consumption, are evolving with
remarkable rapidity, and that they will continue to do so is one of the very few near-certainties
scholars can have with regards to them. The last few years have seen digital giants like Google
and Amazon engage in legal battles with print giants like Hachette, Elsevier and Pearson, and
while the cultural ramifications of these battles are far from certain, it seems likely they will
leave a lasting impact on how digital literature is produced and consumed. Given more time and
space, I could also have devoted more research into the economics of digital publishing, from the
standpoints of authors, publishers and readers. This is an especially interesting facet of digital
literature, given that issues of economics cut to the heart of questions around the digital divide,
the tactics of marketing and publishing literature digitally, and the pervasive digital power
structures that influence the pricing and availability of digital texts.
Finally, further studies might interview students directly, or contact a broader range of teachers, including teachers practicing at earlier points in students’ academic lives. It is possible pedagogic practices have come to adapt to the rapid pace of technological change, and that academic literature has not yet caught up. Part of the advantage of speaking with relevant parties directly is that there is no need to wait for a journal article or book to be published, by which time the facts on the ground may have changed again. Conversely, part of the advantage of scholarly articles is their thorough, peer-reviewed nature. This is especially important when dealing with questions of changes in the human cognitive system, which can have implications on every part of a culture. As more sophisticated enquiries into the affect of digital literacy on the human cognitive system come to be published, it will be possible to speak more authoritatively on the neurological changes immanent in such cultural practices. Similarly, as scholars and critics become more familiar with digital technologies, and the political economy of digital networks is studied more exhaustively, teasing apart the structures of power inherent to their architecture may become easier.
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