

READING (R)EVOLUTIONS:

*A PERSONAL/PROFESSIONAL JOURNEY OF DISCOVERY THROUGH SOME
EMERGING TRENDS IN THE SOCIOLOGY, TECHNOLOGY & NEUROSCIENCE OF READING*

WITH RECOMMENDATIONS FOR UNB LIBRARIES

BARRY CULL, INFORMATION SERVICES LIBRARIAN

UNIVERSITY OF NEW BRUNSWICK (UNB), FREDERICTON, CANADA

APRIL 2010

This informal personal essay was written as a result of research undertaken during a six-month sabbatical granted by UNB in the Fall of 2009. A formal report was also submitted to UNB.

A portion of the essay was subsequently published as a peer-reviewed article in the journal *First Monday* in June 2011 at <http://firstmonday.org>

CONTENTS

INTRODUCTION: READING (R)EVOLUTIONS?	5
<i>A Personal Epiphany</i>	5
<i>Learning to Read—Without Genes</i>	6
<i>A World of Words</i>	7
<i>Information Literacy</i>	8
RESEARCH QUESTIONS	10
<i>Specific Questions about Academic Information Literacy and Reading</i>	10
<i>Other Questions about Academic Libraries and Reading</i>	12
RESEARCH METHODS	14
<i>Literature Review</i>	14
<i>Expert Interviews</i>	15
<i>E-READ Student Survey</i>	15
A VERY BRIEF HISTORY OF LITERACY AND BOOKS	17
CURRENT READING TRENDS: THE TECHNOLOGY	21
<i>Online Digital Texts: The Story of Academic Libraries and E-journals</i>	21
<i>E-books and Their Readers on the Horizon</i>	22
<i>iPad Fans: A Reader “For Readers Who Don’t Read Anymore”</i>	23
<i>Enter Google Books & Google Editions</i>	25
CURRENT READING TRENDS: SOCIETAL	30
<i>Literacy Rates</i>	30
<i>Leisure Reading: The United States, Canada, and Beyond</i>	33
<i>The Social Benefits of Leisure Reading</i>	35
<i>A New Brunswick Reading Culture?</i>	36
<i>Newfoundland’s Reading Culture: A Comparison with Our Neighbour</i>	38

CURRENT READING TRENDS: THE SOCI-TECHNOLOGICAL	41
<i>Public Internet Access and Use</i>	<i>41</i>
<i>The Relationship Between Internet Use and Reading</i>	<i>43</i>
<i>University Students' Information Research Behaviour</i>	<i>44</i>
<i>University Students' Critical Reading Skills</i>	<i>46</i>
THE NEUROSCIENCE OF READING: SCREEN VS. PAPER	48
<i>Speed & Comprehension</i>	<i>49</i>
<i>Distracted: The Myth of Multitasking</i>	<i>50</i>
<i>Brain Activation</i>	<i>51</i>
<i>The Context is the Message</i>	<i>53</i>
“EASIER ON THE EYES”, “I DON’T GET DISTRACTED”: STUDENT PREFERENCES FOR PAPER VS. SCREEN	54
IN WITH THE NEW, KEEP WITH THE OLD—FOR ALL OF US	56
A MORNING BACK IN KINDERGARTEN	60
“TIME TO THINK BEYOND”	62
CONCLUSIONS	66
<i>Personal Plans</i>	<i>67</i>
<i>Ongoing Research Plans</i>	<i>69</i>
<i>Some Recommendations for UNB Libraries</i>	<i>70</i>
Information Literacy Teaching	70
Print Collections, Printing, & e-Readers	71
Physical Spaces	72
<i>Summary of Findings</i>	<i>73</i>
A SHORT NOTE OF THANKS	75
REFERENCES	76

INTRODUCTION: READING (R)EVOLUTIONS?

A Personal Epiphany

Major changes in a person's life path often happen at a single memorable moment in time. The same can perhaps sometimes be said of one's career path or, on a smaller scale, the direction of one's professional interests. A major change in the direction of my own professional interest took place at a specific point nearly two years ago—a moment I will not soon forget. To be precise, it was on the morning of Sunday July 20, 2008. My recent sabbatical project had its genesis on that very specific July morning.

On the specific day in question, I heard the cognitive neuroscientist Maryanne Wolf in an interview on CBC Radio about her new book on reading and the brain called *Proust and the Squid*. Wolf pointed out the plasticity of the human brain, which forms new neural circuits for new activities, such as reading. She went on to talk about the differences between the reading behaviours of the current generation of children who tend to skim their online screens and earlier generations of print readers.

Putting those two things together, Wolf questions what this new type of reading is doing to the human brain. If we accept the assumption that the skimming style of reading tends not to be deep and contemplative, then are we raising a generation of children who, to use Wolf's words, are “more superficial and less analytical?” Even more profoundly, from an evolutionary perspective, Wolf wondered aloud if we are actually reducing the capacity of the human brain for critical thought.

At about the same time that I heard Wolf on the radio, I also read Nicholas Carr's now-famous “Is Google Making Us Stupid?” article in *The Atlantic* (Carr, 2008). Carr argues that there is little room in Google's world of distraction for concentration and contemplation. Many of us know exactly what he is talking about. Thinking online often seems to be an oxymoron.

On the other hand, Carr suggests, “the kind of deep reading that a sequence of printed pages promotes is valuable not just for the knowledge we acquire from the author's words but for the intellectual vibrations those words set off within our minds” (Carr, 2008). As I considered Carr's words, I was reminded of the fact that he is a technology writer and critic, a self-described technophile who says he has owned a Mac since the eighties—not a Luddite by a long stretch.

Could it be that the poet and cultural critic Robert Bly was *literally* right when, in relation to the changes wrought by computers, he suggested that “the neocortex is finally eating itself?” (Bly, 1997)

Now sometimes coincidences are just coincidences. But in my life, some coincidences have been important. The Wolf-Carr coincidence felt like one of those times. Profound ideas always make my brain run wild, and these two authors’ coinciding ideas made my head spin out of control. Sometimes I just think too much. But yet, how was it that I—the guy walking around with the word “librarian” written in bold on his business card and conference badge—had never really thought about this before? For me, this was a moment of epiphany, or at least a moment which brought a series of profound epiphanic questions.

I am not naïve. I realize that authors have books to sell, and speeches to make. Passionate, controversial, personal, timely—these are the sorts of words that sell, and can make people rich. Just ask Barack Obama. And as I subsequently discovered, there is an entire industry of popular books published just within the last few years—and largely sold to the fearful parents of the Millennial generation, I would guess—about the demise of books, of reading, of critical thinking, of intellectual life, and of western literate societies in general. And this is nothing new. Ironically, books about the demise of the book have been around a very long time, perhaps as long as books themselves have been around (Uzanne, 1894). But sometimes, perhaps often, words attract attention because they contain some important truth.

But looking beyond what may at first appear as hyperbole intended to boost book sales, perhaps, I began to think, these two writers do have something very important to say to world—both inside and outside academe. And certainly they have something to say to us young(ish) academic librarians, who are typically more interested in technology or teaching, than in the old-fashioned books loved by the stereotypical librarians of the past. In recent years, academic libraries have—out of some combination of necessity and convenience—been dealing as much with the electronic word as with the printed word. Have we truly stopped to consider the ramifications, and the bigger picture of what is happening to the world of reading?

Learning to Read—Without Genes

The other reason Wolf and Carr’s coinciding comments stuck in my mind is more personal. I am a father of two young children. Simultaneously, while these two writers’ thoughts have been fresh in my mind, I have been in the midst of watching my second daughter learn to read.

Before my kids were born, I thought about the basic skill of reading about as much as I thought about fresh air—it is always there, an important part of life for sure, something that I assume the students in my classes, even the first-year undergraduates, have mastered at some level. But it was an important part of life that I completely and utterly took for granted.

Yet for my own two young daughters, for the months and years that they have been learning to do it, the basic skill of reading has certainly not been taken for granted. They have learned to read relatively quickly, but it still has taken hours and hours of hard work, day after day, month after month. Here, I began to realize, is something totally unlike their first attempts at crawling or walking (both things just happened seemingly overnight with little effort), or their first spoken words (they just came blurting out naturally all on their own), or their first drawings (which made clear an inherited artistic streak from their mother since the first day they could hold onto a crayon).

But reading is totally different. *There are no reading genes*, as I would later hear Wolf put it during a conference presentation (Public Information Resources, 2009).

A World of Words

My girls, especially the eldest, absolutely love books, and my wife and I have been blessed with the means to fill their childhood with fantastic tales. Sure, our personal lives are also filled with magazines, computers, video screens, digital games, theatres, music, photos and art—not to mention the less-imaginary worlds of cycling, hiking, gardening, dance, travel, friendships, and most-recently *real* horses. Yet the books—their words and their illustrations, but mostly their words—purposely hold an almost sacred place among those others means of cultural expression and involvement, and have caught our kids’ attention like nothing else.

Now these kids’ father is an academic librarian. So perhaps a focus on books at our house is not all that surprising. However, like many of the newer generations of academic librarians, I did not become a librarian out of a love of books, at least not consciously. I have never been much of a bookworm. But yet I have always been a “reader”, and I have long admired the power and beauty of the written word. That is why I choose to study English literature as an undergraduate. And that is why filling my life, and the lives of those around me, with those words has been a given.

I am well aware that not every parent is able to so fill their kids' lives with the world of words, and not every parent fully appreciates the benefit. Wolf talks about “word poverty” and points to a study which suggests that by the age of five a child from an “impoverished-language environment” will have heard 32 million less words than a typical middle-class kid (Wolf, 2008, p.102). Reading and socioeconomics are clearly related.

While the ramifications of early word poverty are not always fully appreciated, the implications are enormous. That word gap translates into a vocabulary and reading comprehension lag that is likely to remain well into the school years, cumulating over the entirety of a young life, in some cases leading to reduced potential in adulthood—eventually coming to haunt us in universities, especially public universities like we have in Canada, where we see the lagging effects of poor literacy skills every day in some of our students (Willms, 1999; Carr-Hill, 2008).

Information Literacy

This brings me back again to my chosen profession in academic libraries. Although I have not paid much attention to basic literacy prior to now, I do know about *information literacy*, the ability to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information”, as defined by the Association of College and Research Libraries (ACRL, 2000). As academic librarians well know, we do more than hover over stacks of millions of books and digital hoards of even more electronic articles and documents. We also directly facilitate a meaningful connection between academic readers and texts. We have a certain amount of influence over if, when, where, how and why reading (and by extension, learning) takes place.

Therefore, librarians need to understand the prior research habits and the newly evolving reading brains of the “digital natives” born since 1980. These young individuals have grown up with the completely comfortable information technologies of digital text, the internet, and personal computers.

Perhaps more important for us in 2010, we need to understand the most recent “Google Generation” born since 1993 who have no memory of life before the web (Rowlands, Nicholas, Williams, Huntington, & Fieldhouse, 2008), since the web, although created in 1991, only started to become popular in 1993 with the release of the first web browser, Mosaic (Robert H'obbes' Zakon, 2010). The Google Generation that will start entering our university gates en masse in the next year or two will have considerable familiarity with smart cellphones and tablet computers—gadgets which come with Google’s ubiquitous world of information always ready at their fingertips. The

trends affecting these newly emerging generations of young adults are my main concern, and the primary focus of my research.

Academic librarians need to know how to best engage all of our incoming students. With the high percentage of our populations who now attend post-secondary institutions, academic librarians, in cooperation with classroom instructors and professors, can have a profound impact on how emerging adult generations think. To use Maryanne Wolf's language, librarians are helping to shape the evolving digital brain of our species. Who knew our job was that important?

Yet ironically, as Harvard library director Robert Darnton puts it, "there is nothing like being a librarian for *not* reading" (Darnton, 2009e). The same can perhaps be said for reading about reading, or even thinking about reading. I have been an academic librarian for nearly fifteen years now. Over those years, as a young professional, I have been excited by the technological changes that have radically transformed my field over the course of the last two decades, and the information literacy teaching opportunities therein. But I had never really stepped back to think about the wider history, culture or cognitive processes of reading up until that July morning as I listened to Maryanne Wolf on the radio.

RESEARCH QUESTIONS

As I began to reflect on my Wolf-Carr epiphany and think beyond the tendency towards overstatement that is endemic to everything in the popular press, I began to wonder if we are truly in the midst of a major societal *reading revolution*. Or perhaps we are experiencing a slower *reading evolution*? Or maybe even a whole group of *(r)evolutions* as reading habits appear to be changing across academe, as it is changing across society in general? Or had I just been taken in by the popular press hype?

I would like to suggest that we are indeed living in the midst of a revolutionary period, one which (like all revolutions) we collectively have the power to see proceed in a way that leads to the long-term benefit of our society—but only if we step back and consider where we are headed.

We are, I think, in the midst of a nexus of reading revolutions—both societal and technological—that are affecting nearly everyone on the planet, but which is especially affecting our vulnerable children, and the future generations of adults they will become.

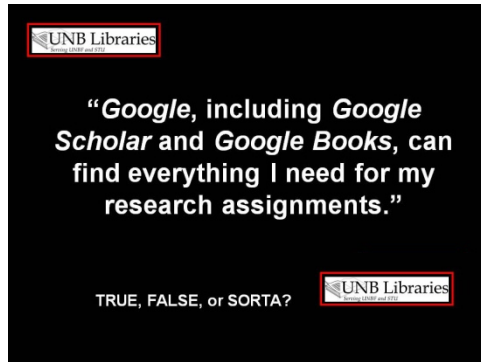
Specific Questions about Academic Information Literacy and Reading

My own work as a librarian is often one or two steps away from the reading process itself—as I mentioned before, information literacy has been my a large part of my realm of activity. My work over the past decade and a half has also involved collecting the best print and electronic resources for the library, most recently in sociology and related subject areas in the social sciences. Part of this work has involved helping to build and provide access to the newly emerging and evolving “digital library”. Since my time in graduate school in the mid-1990’s, I have been impressed by the dramatic changes and efficiencies that access to electronic information has brought to the world of academic research. The sense of being at the front edge of a profession that is undergoing a radical transformation has been truly exciting.

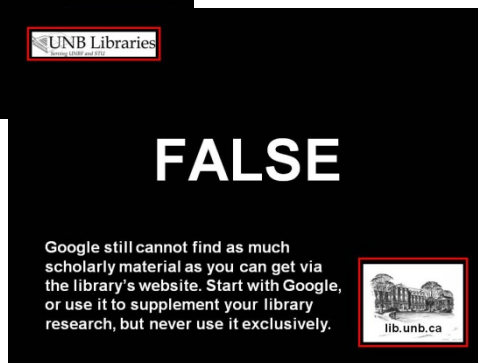
As an academic teacher, my work has revolved around helping students and faculty to make the best use of the new digital library. This involves helping students to effectively and efficiently use the best online research databases, and encouraging them to understand the relevance and authority of different types of information sources, even before reading the sources—a research process which I once heard a librarian call “pre-evaluation”. Then, at the opposite end of the research process, I help

students to appropriately integrate references to the information sources they have select during their research into their academic assignments.

As part of my teaching, I routinely try to get my classes to think about some of the false messages that the internet implicitly tells us—*Google lets you find all the world's information; research is easy; popular is*



best; reading does not need to take much time. Sometimes an in-class activity or homework assignment lets them discover some of that for themselves. At other times, I give them a quick in-class “pop quiz”, including slides of questions and answers like those pictured here.



The pre-evaluation and referencing processes involve a lot of cursory use of textual information—seeking out and selecting peer reviewed and other academic literature, considering the author and publisher/provider of an information source, avoiding

plagiarism by documenting sources, etc. But what about all the deep reading that we assume takes place amongst those research processes? Are most of our students actually reading much at all? And if so, what is the depth of their critical reading skills?

When I do have the opportunity to teach two or three undergraduate research classes within a single course in a row, I typically get students to do some critical reading between classes, and we have an in-class discussion about the reliability of the information: the author's and publisher/provider's authority, the intended audience, peer review, editorial process, point of view or bias, etc. Occasionally we get to questions of the reading's accuracy, validity of arguments and/or scientific proof, but mostly I leave those types of questions up to the course instructor or professor to discuss. So I do get some sense of students' critical information evaluation skills, and I do have the opportunity to encourage their critical reading skills, although I do not normally get a direct and full sense of the level of those critical reading skills.

Like my new-found interest in reading trends, the passion I have felt for information literacy over the years has also been personal as much as it has been professional. I have many times seen the clear impact that information literacy, or sometimes the lack thereof, has on the people around me.

One such personal story is that of my brother, who has two legs today because of the world of libraries and information literacy. When he was a young undergraduate university student, my brother experienced the return of an extremely rare cancer in his leg. Not content with his doctors' decision for sudden radical surgery, which would include the amputation of his leg, my brother went on a mission to find out what he could at the campus medical library. He discovered some promising-looking new research by the world's leading expert in this rare cancer at a research hospital in another province.

To make a long story short, my brother got the experimental treatment, and kept his leg. If it was not for his own level of information literacy—knowing where to go for reliable current research information, and knowing how to interpret those scientific articles—my brother's fate would have inevitably been much different. And while I have never told this story to my research classes, it is often there in the back of my mind as I try to encourage students to dig deeper.

Other Questions about Academic Libraries and Reading

My thoughts on reading over recent months have also led me to ask other questions related to the active and passive role of academic libraries with respect to reading: What are the messages, both explicit and implicit, that libraries and librarians pass on to students about reading—through the type and format of the resources we choose? Through our classroom teaching and individual student instruction in our offices, at reference desks, and online? And what about the messages we send by the layout and design of the physical buildings in which we work?

So those are some of the wide-ranging questions and issues I began pondering during my sabbatical project, a project which took me on travels throughout the Northeastern Seaboard, including some very special thinking and reading time which I savoured at my own private piece of rugged paradise—overlooking the ocean in my native province, Newfoundland.

Like my homeland itself, my focus on this project continues to be vast and broad. I am a generalist professional, not an academic specialist, and so I feel that my lack of focus on this project is appropriate. I have looked at what Wendy Griswold calls Reading with a capital “R”—that is, sitting down with a book, or any kind of reading for pleasure or information in one's leisure time—as well as issues around literacy requirements for merely “getting on with one's life in a text-saturated world” (Griswold, 2008, p.52).

In a conversation I had with him for this study, the renowned book scholar Robert Darnton reminded me that it is a mistake to isolate reading and study it as if it were autonomous. The general environment in which reading occurs is important.

For now my focus remains broadly on that general social environment, as well as on the general technology environment with which it is intertwined.

RESEARCH METHODS

My project on reading has three distinct sections:

- I. an extensive **literature review** (the “reading about reading” which I alluded to earlier),
- II. **interviews** with leading experts in various academic fields related to reading, and
- III. an initial phase of a **survey** of our own students’ reading habits and preferences.

Literature Review

As part of my extensive literature review, I have concentrated on four broad areas of research, professional, and popular writing:

1. current **statistical trends** in adult reading, as well as youth literacy, with a concentration mostly on Canada and the United States,
2. the **history of literacy** generally, as well as the **social history of reading**,
3. the **cognitive neuroscience** of reading, and
4. the emerging science surrounding **reading on screen**, including the use of e-book readers.

During my sabbatical I read nearly twenty books on the subject of reading, as well as dozens of academic articles, plus innumerable newspaper and magazine stories, blog entries and other websites. And my reading on the topic is ongoing, as I continue to keep abreast of the academic literature via several current awareness alerting services, as well as what is being reported in several newspaper websites and other professional and popular websites that I read on a daily basis. References for most of what I have read have been entered into a RefWorks database, currently containing 274 entries. Results and reflections on much of that literature are spread throughout this essay.

I think I may have perhaps gone a little overboard on the “reading about reading” front. My brain, not to mention my personal Amazon account, has been overwhelmed at times—hence the length of this essay, my attempt at some type of intellectual catharsis. If nothing else, my thoughts here will hopefully prove to be a cure for my own insomnia.

As part of my literature review, and specifically with respect to the third subject area mentioned above—reading and the brain—I also attended the 24th *Learning and the Brain Conference* in Cambridge and had the opportunity to hear presentations from such noted writers as the psychiatrist Gary W. Small, author of *iBrain* and other books in the popular press, as well as Maryanne Wolf, whom I interviewed while attending the conference, and who will be introduced more fully below.

Expert Interviews

The academic experts that I choose to interview for this initial phase of my project include prominent individuals from some of the subject areas mentioned above:

1. **Robert Darnton**, Harvard University Library Director & Social Historian / History of the Book Scholar,
1. **Wendy Griswold**, Bergen Evans Professor of Humanities & Professor of Sociology and Comparative Literary Studies, Northwestern University
2. **Maryanne Wolf**, Tufts Center for Reading and Language Research Director & Cognitive Neuroscientist.

All three individuals are senior scholars who have devoted much of their careers to date to different aspects of the study of reading, and who have some very important things to say at this juncture in their lives. I was able to conduct all of these interviews in person, as all three individuals live or work within about a day's drive of Fredericton, and they were all surprisingly willing to take time to meet with an unknown academic librarian from Canada.

The interviews with Darnton, Griswold and Wolf were all fairly in-depth, lasting 85 minutes, 67 minutes, and 24 minutes respectively. All three interviews have been transcribed, and many of the three scholar's comments will be sprinkled throughout this essay. I intend to continue meeting and interviewing additional scholars and other leaders whose work relates to some aspect of reading, as opportunities arise in the future.

E-READ Student Survey

The third part of this project consists of an ongoing survey of student reading habits and preferences entitled E-READ (Emerging Reading Environment and Academic Discourse). I began the survey in February 2009, and it has taken place in various library instruction classes that I have been teaching at UNB. It has been approved by the University's Research Ethics Board.

To date, 78 surveys have been completed by a mix of graduate and undergraduate students, mostly undergraduates in their second, third, or fourth years of university study. The survey asks respondents 12 to 16 questions about the amount of time spent on personal reading for academic, recreational, and employment purposes. It asks respondents to differentiate between reading on paper, on a computer screen, and a mobile device screen. It also asks several open-ended questions about preferences for reading on screen or paper, and how personal reading habits have changed

over the previous five years. I will discuss some of the preliminary findings of the survey later in this essay.

A VERY BRIEF HISTORY OF LITERACY AND BOOKS

The history of reading is both technological and social. In the introduction to his new book, *The Case for Books*, Robert Darnton, although a social historian, points to some of the intertwining technological trends, suggesting that readers today “feel the ground shifting beneath their feet, tipping toward a new area that will be determined by innovations in technology” (Darnton, 2009a, p.xiii). He is, of course, talking about those of us who are “digital immigrants”, which includes Generation X folks like myself, not the younger digital natives who are right now forming the newest generation of adult readers.

On the social side, it has been said that leisure reading is on the rise again in the United States following a significant decline in the 1990s (National Endowment for the Arts, 2009). However, Wendy Griswold suggests that it will never return to the golden age of the past two centuries. Meanwhile, Canadian youth, like those throughout the developed world, are now spending far more time with computer technology than reading print for pleasure (Bibby, Russell, & Rolheiser, 2009). And within universities, students are displaying a skimming behaviour online, in which they ironically appear to go online to actually avoid reading (Rowlands et al., 2008).

But before I say more about recent technology and social trends, it will be useful to take a short step back in time to get a better perspective on our current situation. Although it will be a quick step back in time, it will encompass 6,000 years of human history. And since I am no expert in this area, I will rely heavily on the scholarship of others—solid shoulders which can easily bear my weight.

In the standard history of reading entitled *Orality and Literacy*, Walter Ong points out that despite the extensive history of our species, our earliest script dates from only about 6,000 years ago (Ong, 2008). However, the first full alphabet did not have its beginning until the Greeks invented theirs at about 750 BC. Maryanne Wolf, whose scholarship as a cognitive neuroscientist has centred mainly around dyslexia, poetically points out that “despite the fact that it took our ancestors about 2,000 years to develop an alphabetic code, children are regularly expected to crack this code in about 2,000 days” (Wolf, 2008, p.222).

The next stage of the book’s history is taken up by Robert Darnton, who points out that up until the third or fourth century AD, “one had to unroll a book to read it” (Darnton, 1990, p.185). Scrolls then evolved into folded pages, which eventually became gathered pages—or the *codex*—the book that we recognize today. At least, almost the book that we recognize today, as these early books were

all handwritten. Gutenberg had not yet added his enormous contribution to the history of the book. More about that in a moment.

Meanwhile, the popular writer Alberto Manguel picks up the tale of the book's progress and points out that "early Christians adopted the codex because they found it highly practical for carrying around, hidden away in their clothes, texts that were forbidden by the Roman authorities" (Manguel, 1998, p.48). These early Christians were the forefathers of the men who later read and transcribed their religious texts in monasteries.

Interestingly, these early scribes first did their work by reading out loud to themselves. Not until the ninth century did monastic regulations begin requiring silent reading (Manguel, 1998, p.50). Can you imagine sitting in a library reading room or coffee shop today, trying to make sense of a book as you read it aloud, and simultaneously trying not to get distracted by the deafening hum of all the other readers around you? Us ADHD types would never get anything read.

Thankfully we do not have to worry about that, as by the thirteenth century the practice of men (and they were typically *men*, as women had not yet entered into the fold of the literate) reading silently and alone became commonplace. This shift to silent reading was a profound change, one that Darton suggests "involved a greater mental adjustment than the shift to printed text" (Darton, 1990, p.185).

Speaking of print, the next turn in the tale of the book finally brings us to Johann Gutenberg, perhaps the one name from the story of the book's history that is universally recognizable. In the middle of the fifteenth century, this enterprising German produced his first bibles using his fantastic invention of movable type—the printing press had been born. (And, as an aside, handwriting began its long descent into the sorry state it currently occupies in our lives.) Yet, for all the popular notion of the printing press as a revolutionary event, Darton points out that the revolution did not happen overnight:

For the first half century of its existence, the printed book continued to be an imitation of the manuscript book. No doubt it was read by the same public in the same way. But after 1500 the printed book, pamphlet, broadside, map, and poster reached new kinds of readers and stimulated new kinds of reading. Increasingly standardized in its design, cheaper in its price, and widespread in its distribution, the new book transformed the world. It did not simply supply more information. It provided a mode of understanding, a basic metaphor of making sense of life (Darton, 1990, p.186).

Before we get to our present place in the long sweep of book history, we have to make two last stops, the first being in eighteenth century Europe. Another turning point happens here, as men largely began to switch from reading “intensively” to “extensively” (Darnton, 1990, p.165-7). Darnton admits that this is perhaps an oversimplification, but it does make some sense, given the emergence of cheaply produced texts which could be made available to a wider public.

And interestingly, with the democratization of the printed text, there was a return to reading aloud. Reading was a solitary silent process only for the educated elite who could afford to buy books. For the rest of the population, as Darnton points out, reading was a social activity:

For the common people in early modern Europe, reading was a social activity. It took place in workshops, barns, and taverns....While children played, women sewed, and men repaired tools, one of the company who could decipher a text would regale them with the adventures of [a] favorite from the standard repertory of the cheap, popular chapbooks. Some of these primitive paperbacks indicated that they were meant to be taken in through the ears by beginning with phrases such as, ‘What you are about to hear...’ (Darnton, 1990, p. 168-9).

In the eighteenth century Gutenberg’s invention became commercialized and industrialized. The sociologist Wendy Griswold picks up this last leg of our journey: she points out that during the height of the Industrial Revolution reading finally became a widespread leisure activity in Europe and North America. And as the post-industrial information society developed over the past two centuries, reading became necessary for many occupations in the skilled labour force.

Griswold also considers the past two centuries to have been the golden age for leisure reading. She puts this voluntary reading for pleasure and information into a sociological, as well as a historical, context:

Readers in most societies have almost always been a minority. Only in a small portion of the world (northwest Europe, North America, and—somewhat later—Japan) and only for a brief period of time (mid-nineteenth to mid-twentieth century) was reading the standard pastime for the middle-class majority. The more typical situation is the one that is increasingly the case today: readers are an elite group that holds disproportionate political, economic, and cultural power. To recognize this as a fact is neither to decry the elitism nor to celebrate the avidity of committed readers, but it is to gain a clearer sense of where the practice of reading stands now and in the foreseeable future (Griswold, 2008, p.2).

And so, after all the twists and turns of the preceding history of reading, which I have no doubt grossly over-simplified, one truth emerges: *reading has profoundly changed alongside us, and that change has steadily accelerated over the millennia.*

But what is more, *reading has also changed us*. And perhaps that change is accelerating too, maybe too fast for us to appreciate what is happening to us. That is something that will be discussed throughout this essay. For now, I will leave this section on reading and book history with Walter Ong, with whom I began the section, as he nicely sums up the profundity of the change brought about by literacy:

Many of the features we have taken for granted in thought and expression in literature, philosophy and science, and even in the oral discourse among literates, are not directly native to human existence as such but have come into being because of the resources which the technology of writing makes available to human consciousness (Ong, 2008, p.1).

CURRENT READING TRENDS: THE TECHNOLOGY

And thus the apparent acceleration of world history has brought us at last to our current point in time, and the latest technologies to have a major impact upon reading: the widespread use of personal computers, the internet, and digital text. The profound changes brought to the history of reading by this technology triumvirate has not happened over millennia, nor over centuries, but only over the past two decades—a period of time that is too small to even register on the Wallchart of World History, let alone the timeline of human evolution.

The prominent Canadian academic librarian Michael Ridley has described the internet as the “largest, most comprehensive information resource ever assembled.” “It represents,” he suggests, “the triumph of literacy, not its demise” (Ridley, p.211). Robert Darnton believes that digital text is bringing out a change as big as Gutenberg. “The explosion of modes of communication,” he asserts, “is as revolutionary as the invention of printing with movable type” (Darnton, 2009a, p.xiv). That’s a rather profound statement, coming as it does from a leading scholar who has pioneered the study of the history of the book. While I will not myself attempt to make a comparison with Guterberg’s fifteenth century revolution, I agree that we are indeed in the midst of another very profound and widespread technology-induced reading revolution.

I will illustrate the impact of internet-accessible digital text on reading by focusing on the perspective of modern research libraries. Our situation in Canadian academic libraries will perhaps serve as a useful illustration to back up my assertion that we are in the midst of a profound reading revolution.

Online Digital Texts: The Story of Academic Libraries and E-journals

It has been just within the last few years that Canadian academic libraries, in a situation similar to our counterparts throughout the developed world, have reached an interesting tipping point—we now spend the majority of our collections budgets on electronic instead of printed texts (Byrne et al., 2010, p.11; Canadian Association of Research Libraries, 2008).

This shift to digital “holdings” has brought tremendous benefits to all our researchers—students, faculty members, and members of the public, to varying degrees and in various ways. The shift has taken place largely as a result of our enormous collections of newly-acquired electronic journal holdings. The e-journal article, with its relatively short page length and content focus on newly emerging research, is ideally suited to the digital format. It is easy to print something that is less than

30 pages long, and time-sensitive current research can be delivered to researchers' electronic desktops much quicker than it could be printed on paper and physically shipped to their physical desktops.

Academic libraries first started to take e-journals seriously back in the 1990's, and especially underfunded library systems like UNB's were among the first institutions to cut print journal subscriptions in favour of the less-expensive electronic alternatives. Per title, e-journals have been far cheaper than print journals.

Since the 1990's several information technology changes have coalesced: e-journals have increased in quality; increasing internet bandwidth has helped to make access speeds faster; high-quality colour laser printers have become less expensive; and high-quality LCD screens became standard, effectively doing away with the eyestrain-inducing flickering that was the norm for CRTs. All those factors, coupled with two rounds of national site-licensing programs in Canada that made it financially feasible for many universities to gain access to enormous high-quality academic e-journal collections, and of course the obvious convenience and immediacy of 24/7 access from anywhere, have contributed to the satisfaction our students and faculty have expressed over our e-journal holdings.

And e-journals are only part of the story. Over the last decade and a half, various other substantial electronic document, data, and image collections have been added to our collections. The acquisition of these digital "learning objects" (Beck, 2008), when included along with our e-journals, have led to our current situation in which these digital resources consume the majority of our collections budgets. And at the current time, one particular type of digital object—the e-book—seems poised to finally take hold and perhaps gain the widespread acceptance enjoyed by its big sister, the e-journal.

E-books and Their Readers on the Horizon

Academic libraries have had collections of electronic books for several years now. However, poor publisher e-book interfaces, along with various access restrictions, have helped to make e-books unpopular with both librarians and library users.

Yet in recent months we have been witnessing the second wave of considerable hype in the popular press and the online world over e-books and e-book readers, the portable electronic devices which display digital books. Many people within libraries, as well as publishers, authors, editors, book

designers, and of course, tech writers, think that the e-book's time has finally arrived. Again. (13 of the Brightest Tech Minds, 2010; Tonkin, 2010; *The Institute for the Future of the Book*).

Casper Grathwohl, Vice President of Oxford University Press, thinks that the current recession may be responsible for creating the dramatic increase in sales that the e-book industry is experiencing (International Digital Publishing Forum,). Many publishers have jumped into electronic publishing as they see profits in the traditional print side of their industry stagnating, while the incredible growth of long-tail print-on-demand titles is dominated by a handful of speciality companies (Bowker LLC, 2010). "Nothing stimulates the creative juices like fear," Grathwohl commented in a recent interview (Roncevic, 2009).

At the same time we are finally seeing the commercial success of e-book readers which make use of the very readable e-ink technology in their screens—Amazon's Kindle, Sony's Reader, and now the Barnes & Noble NOOK and the Indigo/Chapters/Borders Kobo—to name just four of the most popular. E-ink screens do not have a backlit display, which makes sustained reading much more pleasant than on regular backlit screens, even outside on sunny days or in brightly lit airport terminals.

And now of course there is Apple's new tablet computer, the iPad. Apple CEO Steve Jobs sees his tablet as the next generation of e-book readers, even though it does not use e-ink. While the iPad screen may not be perfectly suited to the sustained reading of a novel or other narrative text, I suspect it is poised to become the standard e-reader. Within the personal computing industry, it is predicted that the tablet will undergo enormous growth over the next few years (Paczkowski, 2010).

iPad Fans: A Reader "For Readers Who Don't Read Anymore"

Apple's iPad has emerged right in middle of two well-proven technologies—the cellphone and the laptop. It is neither, yet it is capable of being both. And it is also an e-book reader. From the hype surrounding it, I am sure there must be an app that can mow the lawn, walk the dog, take out the trash, make dinner, do the laundry, and clean up the kids' rooms too.

It is quite possible that the kids entering university over the next few years, whose middle-class parents cannot really afford both a cellphone and a laptop, may opt for an inexpensive tablet that allows text messaging instead. That may especially come true if the next generation iPad, and the other competing tablets, come with a virtual touch-screen keyboard so that it will also allow students

to write their research papers on it as well as it now allows them to surf the internet and access online library resources (Graham-Rowe, 2010). But can we expect them to do much *reading* with them?

Apple is likely banking on the fact that the *possibility* of using the tablet to read books will help ensure sales. “But Mom, I will be able to do my research and read my textbooks and library books on it too!”—a refrain no doubt already being heard in the homes of college-bound students the world over.

Certainly Apple’s beautifully designed devices already have their religiously-devoted fans. US President Barack Obama recently sent legions of those fans all around the world into a considerable Twitter when he appeared to diss the latest digital object of their affection. Obama’s words appeared in the context of a speech to graduates at the historically black Hampton University about the value of a hard-won education:

You’re coming of age in a 24/7 media environment that bombards us with all kinds of content and exposes us to all kinds of arguments, some of which don’t rank all that high on the truth meter. With iPods and iPads, Xboxes, and PlayStations—information becomes a distraction, a diversion, a form of entertainment, rather than a tool of empowerment. All of this is not only putting new pressures on you. It is putting new pressures on our country and on our democracy (Kafka, 2010).

Academic librarians will note the information literacy allusion in Obama’s speech. Information as a distraction, information as entertainment, information lacking truth—those are the very things we have been trying to get our students to understand for years.

The Apple fanboys out there would do well to remember that even Apple CEO Steve Jobs does not think that reading is the iPad’s primary purpose. When Apple was rumoured to be working on an e-book reader a couple years ago, Saint Jobs expressed his lack of interest:

“It doesn’t matter how good or bad the product is, the fact is that people don’t read anymore,” he said. “Forty percent of the people in the U.S. read one book or less last year. The whole conception is flawed at the top because people don’t read anymore” (Markoff, 2008).

And early reviews of the iPad from people who do actually read are far less positive than the pre-release hype that reached a fever pitch this winter (Mod, 2010; Scowen, 2010). This should not be surprising, considering that it has taken two thousand years to perfect the technology of the book—a technology that has evolved for people who do actually want to read, instead of people who want

to surf, text, Tweet, watch, and listen, while trying to fit in a little reading somewhere in the background.

In my conversation with her, Wendy Griswold suggested that “many of the people who are intrigued by e-book readers are not the readers of books anyway.”

I travel a great deal for my work because I do a lot of comparative work. I always walk up and down on the aisles of airplanes seeing what people are reading. The people who are flying on international flights are the advantaged people of the world, typically affluent, and therefore would be potential members of the reading class. Roughly half the people are reading something at some point. What you don't see is many Kindles. And if there is ever a time that a Kindle makes sense it is on long a long flight. But the idea that it is a big advantage to be able to have all of Stephen King's novels at your fingertips is false, because we only read one or two at a time (Griswold, 2009).

Nicholas Carr put it succinctly in his blog: “Jobs is no dummy. As a text delivery system, the iPad is perfectly suited to readers who don't read anymore” (Carr, 2010).

Enter Google Books & Google Editions

Now that portable e-book readers and tablets seem set to truly take hold in the popular arena, popular e-book stores are poised and ready to deliver content to those devices. While Amazon, Apple, Indigo/Chapters, Barnes & Noble, Borders and others are already selling their device-specific e-book content, Google is poised to soon become the biggest player by far, and it will soon begin selling its content without any proprietary hardware restrictions.

Google has been scanning the books of academic and other libraries in the US and around the world since 2004, and has also signed contracts with publishers across the globe to include new “born digital” books. The mission of Google Books, as stated on the front page of downloaded PDFs of its public domain books, is nothing less than to “make the world's books discoverable online” (Weinberg, 2006). In Google co-founder Sergey Brin's *New York Times* Op-Ed piece last October, he pointed out that the number of books in this worldwide “library to last forever” stands at “over 10 million and counting” (Brin, 2009). Six months later, estimates now stand at around 12 million.

Google Books is quickly becoming the largest “library” the world has ever known. Google plans to eventually sell the contents of its database back to academic and public libraries, as well as to individual members of the public, perhaps through its newly announced Google Editions site, due to become publically available later this year.

At the present time, the entire digital content of many of the books in the Google Books database is searchable. This is already proving to be a boon to readers and various types of researchers from many disciplines. Consider the power of being able to search the full contents of the world's books in one place. Cannot remember where you read that phrase a few months back? Was it in a book in your office? At the library? The bookstore? Maybe a conference you attended? No worries, Google Books will quickly find it. It is like going through the back-of-the-book indexes of twelve million books in less than a second. Certainly I have made use of it many times while writing this essay.

While the entire digital contents of some books are freely available, the amount of material available depends upon the country and institution from which it is accessed. Books fall into three categories: digitized books available online in their entirety, books which provide a limited preview of several pages (often 20 percent), and books for which only basic information about their contents is provided, sometimes along with a snippet of text. In addition, there are digitized archives of many popular magazines. Clicking "Find in a library" will conduct a search for the book at your local library, perhaps through the WorldCat catalogue, as is the case for UNB.

Given the obvious copyright infringements surrounding the scanning of in-copyright works, the project has been the subject of considerable outrage, from authors, publishers, librarians, concerned citizens, Marxists, whole countries, and professors—including my own professional association, the Canadian Association of University Teachers, whose recent objections over the pending amended settlement with American authors and publishers appeared on the front page of the association newspaper, the *CAUT Bulletin*, this February (CAUT, 2010). The pending settlement centres around "orphan books"—books which are in-copyright but out of print, and whose copyright is unclaimed.

But the hoopla and legal wrangling over the settlement is, in part, a red herring. In the long run, the orphan books, which are the main focus of the current furor, may matter less than both the access to out-of-copyright digitized books, and all the "born digital" new e-books. Publishers of new books already allow Google Books to provide a preview of their titles—typically 20 percent—for free. Given the ongoing growth in the number of book titles published each year worldwide, how big will that portion of the Google "library" be within five or ten years? How about 50 or 100 years? And given the benefit to publishers who use book previews as a means of promoting sales of whole books, this enormous world "library" of partial books may remain free to users, no matter what future private or public organizations eventually takes over Google Books.

Thanks to Google Books/Editions and other noteworthy major digital library initiatives such as HathiTrust and the Internet Archive, as well the coming widespread popular acceptance of e-book readers, I predict that within the next few years students entering university will as be as comfortable with the notion of e-books as they are with print books. Perhaps more so. Ask them the first thing they think of when you say the word “book”, and they may be as likely to describe something on their iPad or iPhone screen as they will ink on paper.

Furthermore, in lower socioeconomic sections of society where access to the more expensive printed book will continue to be limited (like New Brunswick, for example²), university students may be far *more* familiar with e-books (or whatever e-book previews and tiny snippets of books that Google continues to provide for free) than they may be with whole books on paper.

Robert Darnton is perhaps the leading established social thinker who has been critical of Google Books (The Google Books Settlement, 2010; Blount et al., 2010; Darnton, 2008; Darnton, 2009a; Darnton, 2009b; R. Darnton, 2009c). In my interview with him I asked what he thought of my prediction that many undergraduates will be starting their book searches at Google instead of the library. Keep in mind that he is talking about *Harvard* students, many of whom have grown up in homes and attended private schools where there was no question of not being able to afford paper books:

Yes, I think that most undergraduates, ten years from now, or five years from now will perhaps go to Google Books first. You locate something by looking it up in Google. That will be a first impulse on the part of students. Here at Harvard the Google link goes right into our catalogue. So the student can begin with Google, but wind up in the catalogue—sometimes even in the library (Darnton, 2009e).

If that is likely to be the case for Harvard, how much more so for state colleges or public Canadian universities like UNB? Indeed, as every academic librarian from most any post-secondary institution knows very well, many students typically start their research at Google already. Perhaps the most noteworthy research on the issue comes from a “virtual longitudinal study” conducted recently at the University College London (UCL) by the Centre for Information Behaviour and the Evaluation of Research (CIBER), and which was commissioned by the British Library and The Joint Information Systems Committee (JISC) (CIBER & University College London, 2008; Rowlands et al., 2008) CIBER points to a study by OCLC in the US which suggests that 89 percent of college students use search engines to begin an information search while only two percent start from a library website (De Rosa, Cantrell, Hawk, & Wilson, 2006).

At UNB, our LibQUAL survey results show that respondents—undergraduates, graduate students, and faculty—made daily use of “non-library gateways” such as Google for information more than twice as often as library resources (Association of Research Libraries, 2004; 2007). Compared to undergraduates, our faculty and graduate students are more likely to use the library’s website than our library buildings, but they still go to Google much more often than either. The preliminary results from our latest 2010 survey suggests an ever starker contrast—overall our respondents are now 2.6 times as likely to use Google over the physical library on a daily basis, compared to 2.3 in both 2004 and 2007.

However, getting students to go beyond Google and eventually come to the library is not librarians’ only concern over Google Books. There are more global and profound issues at stake. Robert Darnton, for example, is troubled by the fact that the coming worldwide Google “library” will not be provided to the public and institutional subscribers by governments, but by a single for-profit corporation with a “powerful commercial monopoly” (Blount et al., 2010). Darnton elaborated on this during my conversation with him:

Google is creating this digital database that is just staggering and simply wonderful. It has enormous implications for not just the world of libraries, but the world of readers as well. I think that resolution of the settlement with the authors and publishers is likely to have enormous consequences for the way the world of books takes shape in the digital era that is now upon us.

I think Google believes in their slogan, “do no evil”, but they could produce evil, in the sense that they could have a really airtight monopoly on access to this kind of information. They could end up misconstruing this world of the digital book in a way that will not take adequate account of the public good.

For small colleges that cannot afford to have a great research library, Google’s digital library is a wonderful thing. Google has said that it will have a graduated system of pricing and that small colleges will pay less. What worries me is what I call ‘cocaine’ pricing in which the price is lower at the outset and then when the constituents are hooked on it, it is ratcheted up. You cannot unsubscribe because it is such a crucial service to the people at your college or library that they would raise absolute hell. So I am worried about the abuse of this terrific power (Darnton, 2009e).

Darnton’s concerns also extend to the quality and equality issues that are typical librarian fare, citing the “missing pages, botched images, faulty editions, omitted artwork, censoring, and misconceived cataloguing” of titles already in the Google database (Darnton, 2009c). As an alternative to Google Books, Darnton envisions the creation of a “national digital library” free of those problems, or at the very least a “open-access repository” for out-of-print books, which would be separate from the rest of the books in Google’s database (Blount et al., 2010).

Google may be quickly becoming the largest player in the e-books field, but it is certainly not the only player. Libraries, universities, museums, national governments, and various non-profit organizations around the world have been busy creating digital collections for the past decade and a half, long before Google became involved in the book digitization business. Yet Google's enormous financial and technical power has made the goal of digitizing the world's global heritage of books plausible on a scale and with a speed that the public sector could never hoped to achieve on its own. As a result, Google's academic library partners largely continue to stand by their Google book scanning partnerships (Anderson, 2010), even as they create their own complementary or competing access points and digital collections.

There are two such alternate digital book projects, which I alluded to before, of particular note: HathiTrust and the Internet Archive. HathiTrust is billed as a "shared digital repository" between twenty-five research libraries, including The University of Michigan, Indiana University, the University of Virginia, and the University of California system, as a way to preserve digital books which they had contributed to the Google Books database (HathiTrust, 2010). "Hathi" is the Hindi word for elephant, an animal considered to have a very powerful memory. HathiTrust currently has nearly six million volumes preserved in its digital library.

The non-profit Internet Archive has been around since 1996, and has partnered with over 150 libraries and universities around the world. It aims to provide free "universal access to all knowledge", including archived websites, video, audio, and over two million texts (Internet Archive, 2010). Of particular interest to researchers in Canada is the fact that the Internet Archive has had a longstanding partnership with the University of Toronto's Robarts Library. The Robarts is now half-way through its goal of digitizing a half a million of its books for inclusion in the Internet Archive (CANARIE, 2010).

CURRENT READING TRENDS: SOCIETAL

Earlier I proposed that current trends around reading are social as much as they are technological. Of course, the sociological and the technological are intertwined. Yet there are significant distinctly social trends emerging within wider society in general. University students' reading-related behaviours need to be understood within this larger societal context. The context of the general trends in leisure reading, literacy rates, and internet access and use amongst the public are all important to consider, as are the facts of the particular research behaviours and reading habits and skills of students within the university setting.

Literacy Rates

As is common knowledge, worldwide literacy rates have been increasing for some time. The adult literacy rate for the entire globe, including the developing world, currently stands at 84 percent, and is expected to reach 87 percent by 2015 (Watkins, Al-Samarrai, & Bella, 2010, p.17). There have been major increases in literacy rates over the past two decades in China and India, yet those two countries, when combined with Bangladesh and Pakistan, still account for over half of the illiterate adults on the planet. Meanwhile, in South and West Asia and Sub-Saharan Africa, over one-third of the adult population is illiterate, while the rate is not much better in the Arab world.

However those rates only refer to basic literacy. Literacy researchers describe a wide spectrum of literacy proficiencies, which have been quantified using various international surveys, including the 2003 International Adult Literacy and Skills Survey (IALSS), the more recent 2004-2005 International Study of Reading Skills (ISRS) survey which looked more closely at low-skilled adults in the US and Canada, and the 2000 Programme for International Student Assessment (PISA) which looked at 15-year old youth throughout OECD countries.

In the US, the National Endowment for the Arts (NEA) reported a drastic decline in reading ability of the public between the early 1980s and the mid 2000s in their much-discussed *Reading at Risk* report (National Endowment for the Arts, 2004). It was reported that teenagers were reading less well while adult reading proficiency rates were stagnant or declining (National Endowment for the Arts, 2007).(12, 14) Meanwhile, employers were reported to be concerned about their employees' reading comprehension and writing skills. Americans with the highest levels of reading proficiency, the NEA points out, get the best jobs (National Endowment for the Arts, 2007, p.16-7).

Canada's basic literacy rate, meanwhile, is widely reported in public reference tools to be nearly 100 percent (CIA). Yet, it has been reported that literacy levels in Canada are not where they should be in order for Canadians to succeed in the knowledge economy. A Statistics Canada report on IALSS concludes that "nationally, 48 percent of the adult population—12 million Canadians aged 16 and over—perform below...the 'desired level' of competence for coping with the increasing skill demands of the emerging knowledge and information society" (*Building on our Competencies*, 2005, p.9).

And having a university degree does not guarantee anything. In fact, between 1994 and 2003 there was a significant decline in Canadian university graduates' level of "prose literacy"—the ability to read, understand, and use continuous written texts such as newspaper stories (as opposed to "document" literacy which is the ability to read non-continuous texts such as bus route map, and "quantitative literacy", numeracy or math skills) (*Building on our Competencies*, 2005).

Nearly one quarter of a million Canadians have a university degree, but have not achieved anything higher than the very lowest level of literacy as identified by ISRS (Grenier et al., 2008, p.28-9).¹ Many of those are immigrants whose mother tongue is not English or French. But for 76,000 of those under-served individuals whose degrees are apparently worth little more than the paper on which they are printed, their mother tongue *is* either English or French. Perhaps that is not a statistically significant number, but it is still noteworthy: There are 76,000 English or French Canadians walking around with university degrees, but whose literacy levels are barely what a layman would expect an elementary school student to have achieved. One hopes they did not get their degrees from Canadian universities, although that is not specified in the report. In any event, they clearly are not members of Griswold's "reading class" by a long shot.

When we look at literacy over the lifecourse, researchers have pointed out that literacy is not a static skill maintained throughout life:

Skill loss in Canada appears to be a gradual process, which begins at about age 25, peaks at around age 40, and tapers off during late middle age.... Taking into account that skill loss appears to be less for young and late middle age adults, we estimate that on average most Canadian adults experience a skill loss over their lifetime of about one grade level.... Engagement in technical literacy practices at work increased over the study period [1994-2003], but this does not seem to have as strong an impact on people's literacy skills. In contrast, the amount and range of what people choose to read at home, away from the job, seems to have a strong influence on skill development. In fact, the increase in skill observed for individuals with higher levels of reading at home is about the same as the skill loss observed on average

¹ In order to achieve Level 1 on the prose literacy scale an individual merely needs to be able to "read relatively short text to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. If plausible but incorrect information is present in the text, it tends not to be located near the correct information"(Grenier et al., 2008, p.22).

over the ten-year period when skill loss is greatest. Clearly, lifestyle and individual choice matter (Willms & Murray, 2007, p.21-2).

There are some other very noteworthy co-relations within the literacy statistics. For example, it has been widely reported that there is a co-relation between high youth literacy rates and low crime rates, low unemployment and dependence on social welfare, and low costs of health care (Willms, 2003, p.247-8). It is also well known that high levels of adult literacy are associated with higher levels of employment and wages, lifelong learning activities, participation in society and level of health (Grenier et al., 2008, p.17). In the US, a strong correlation has been found between literacy levels and the likelihood of time spent in prison— 56 percent of adult prisoners read at or below a basic level (National Endowment for the Arts, 2007, p.20). And the notion of a brilliant Hannibal Lecter type of criminal is a rarity— only three percent of adult prisoners read at a proficient level (National Endowment for the Arts, 2007, p.67).

Bringing these literacy rates to the world of books, statistics Canada predictably reports a significant co-relation between the frequency of reading books and the level of literacy in Canada:

Reading is of importance as it is crucial to being an informed citizen and to succeed in one's career. Good readers are able to understand sentences and the organizational structure of a written text. They can also comprehend ideas, follow arguments, and detect implications. Literacy proficiency has a direct impact on the capacity to read and understand the information presented in texts. In reverse, reading helps to strengthen literacy proficiency by building a strong and precise vocabulary. Among Canadians with prose proficiency at Level 1 [the lowest level of literacy], 65 percent mentioned that they never or rarely read books compared to 49 percent at proficiency Level 2; and only 27 percent at Levels 3, 4 and 5 combined. Comparatively, 54 percent of the latter reported reading at least once a week against 35 percent of those at proficiency Level 2 and 24 percent of those at Level 1 (Grenier et al., 2008).

It has also been found that Canadian youth aged 16-25 who read or wrote letters in their leisure time at home score significantly better on literacy scores (Willms, 1999, p.30). Conversely, watching television negatively affects literacy skills, to the extent that each additional hour a kid watches television has the effect of putting him half a school year behind in his reading ability (Willms, 1999, p.30). The effect of the choice of leisure activities account for 15 percent of the variations between US states and Canadian provinces. Looking specifically at youth aged 15, the PISA study has sadly found that New Brunswick teens have the lowest reading performance in the country (Willms, 2004, p.20).

Leisure Reading: The United States, Canada, and Beyond

Reading scholars are quick to point out that there are many types of reading. There is the voluntary reading for leisure or pleasure (including fiction, but also the sustained reading of non-fiction for information), reading for work, and the necessary reading one must do to go about one's day-to-day activities, such as reading road signs, food labels, tax forms, etc.

In her critical essay in the *New York Times*, history of reading scholar Leah Price points out that there are many types of reading not discussed in the NEA studies (Price, 2007). For example, she suggests that both the study of the bible and web-surfing for pornography are common types of reading excluded from the NEA studies. The bible reference I understand, as does the outspoken feminist Camille Paglia, who mentioned the sense of history gained from bible reading, during a recent visit to Canada:

I've met fundamentalist Protestants who've just come out of high school and read the Bible. They have a longer view of history than most students who come out of Harvard (Wente & Paglia, 2010).

But pornography? Speaking as a male, I feel pretty confident in stating that porn has much more to do with image than text. Although perhaps Price is thinking of a wider definition of "text" than I.

Price goes on to point out that Benjamin Franklin, who was a successful eighteenth-century printer as well as a founding father of the US, printed many things we would not call "literature"—from bills of sale to medicine bottle labels. She goes on to ironically suggest that "the file, the list, the label, the memo" will keep reading alive. What she fails to point out is that Franklin also read books constantly and set up one of the first American lending libraries.

Five years after their study of the decline in reading ability in the US, the NEA published its 2009 report, *Reading on the Rise*, focusing on literary reading for leisure and the voluntary reading of books (as opposed to reading for school or work), which suggested that young Americans aged 18-24 have "undergone a particularly inspiring transformation from a 20 percent decline in 2002 to a 21 percent increase in 2008—a startling level of change." (National Endowment for the Arts, 2009, p.21). Nearly 52 percent of Americans 18-24 years of age, and just over 50 percent of all American adults, now read for pleasure (National Endowment for the Arts, 2009, p.5).

The NEA surveys consistently suggest that more women read than men: about 42 percent of men are voluntary readers of literature (defined as novels, short stories, poems, or plays in print or online), compared to 58 percent of women (National Endowment for the Arts, 2007, p.3,6). However, men are beginning to read more—the rate of literary reading amongst men is increasing at

more than twice the rate that it is for women (National Endowment for the Arts, 2007). (p 6)
Unfortunately the NEA studies do not include reading for work or school, which is perhaps responsible for much of the reading done by men. In 2009, the industry reported that men in the US only accounted for 29 percent of purchases made within the adult fiction market, compared to 40 percent of the UK market (Bowker LLC, 2009).

In Canada, the sociologist Reginald Bibby has found similar numbers among our youth, despite Canadian industry and government reports which suggest that adult Canadians' reading rate has constantly remained 30 percent higher than the US for the past two decades (*Reading and Book Buying Behaviour*; Bibby et al., 2009). In 2008, Bibby found that 47 percent of teenagers 15-19 years of age reported receiving a "great deal" or "quite a bit" of pleasure from reading (Bibby et al., 2009, p.27). Also like our neighbours to the south, young Canadian readers are more likely to be female than male: 56 percent of those reporting pleasure reading are female, while only 35 percent are male—seven percent less than the US figure, although the Canadian number is only for teenagers, and does not include the university-aged young men like the American numbers.

I suspect that many young guys begin to read more once they mature beyond their teen years. I know that was the case for myself. Although I loved books as a very young kid, I did not read a whole lot between my Dr. Seuss days and my university days. From what I can remember, teenage reading was limited mostly to comic books, cereal boxes, captions below magazine illustrations, and begrudgingly, school textbooks.

Yet there were two pockets of my adolescent life that did involve some sustained reading: required high school English lit classes, and the even more required church youth groups which encouraged an Ezekiel-like consumption of religious text. In retrospect, I am extremely thankful for those two aspects of my teen life. They helped lay an important foundation for the extensive and intensive practices of sustained reading that would become typical of my senior undergraduate university student days, when reading for study and reading for pleasure began to overlap one another in my life.

Wendy Griswold would say I belong to an emerging "reading class." Griswold has studied the culture of reading in regions as diverse as West Africa, Norway, Italy, and the United States, and has come to some interesting general conclusions about worldwide reading culture. She suggests that, despite a recent increase in leisure reading in the US, for example, not everyone is going to do much leisure reading:

An elite segment of the general population, one that is highly educated, affluent, metropolitan, and young, has produced both heavy readers and early adopters of the Internet. Exhibiting the concentration effect, they read more than the average readers of the past. Right now these people—the avid readers, the communications elite, the cultural omnivores, much of “the creative class”—along with older, less technologically advanced, long-committed readers, make up the reading class (Griswold, 2008, p.65-6).

This reading class, Griswold suggests, is a minority throughout many developed countries:

Numerical predictions are hazardous, but I will venture a couple. In the West and Japan, the reading class will stabilize at something between one-quarter and one-third of the population. It will vary—Norway’s will remain larger than Italy’s—but overall that will be the picture: a minority, but a good-sized minority, of adults will read in their spare time. In developing countries the reading class will be a smaller minority, perhaps around fifteen percent. The reading class will remain strong, but the day of reading culture is over (Griswold, 2008, p.167).

The Social Benefits of Leisure Reading

Interestingly, the NEA has found that the 50 percent of Americans who are readers have far higher levels of cultural and civic engagement than non-readers (National Endowment for the Arts, 2007, p.16-7). They visit more museums, see more plays, and attend more concerts. They also play more sports, exercise more, and generally do far more outdoor activities than non-readers. They read online as well as print. And they are also much more likely to volunteer and vote. To put it in sociological terms, there is a relationship between cultural capital and social capital. So much for the bookworm stereotype—readers tend to be more like social butterflies. They like to socialize. What they do not do much of is watching television.

A significant co-relation has also been found between social capital and library users. People who frequent libraries have higher levels of trust, are more likely to be involved in their community, and show a high level of civic engagement (Johnson, 2010).

On the other hand, the effect of internet use and screen time on social capital is an ongoing matter of dispute. Robert Putman, political scientist and author of *Bowling Alone: The Collapse and Revival of American Community*, first blamed the internet for the decline of US social capital in the US, but then a few years later suggested that the involvement in online communities could lead to greater social engagement (Putnam, 2000; Putnam, Cohen, & Feldstein, 2004). While the research of health scientists continues to show a negative relationship between the internet and social capital, social scientists suggest a positive one (Richards, McGee, Williams, Welch, & Hancox, 2010; Shah, McLeod, & Yoon, 2001; Wellman, Haase, Witte, & Hampton, 2001).

A New Brunswick Reading Culture?

All this should give anybody who supports reading, including teachers and public librarians, reason to stand tall. But why should *academic* libraries care about what is happening in the wider culture of voluntary reading? Simply put, a general reading culture nurtures an individual's reading habits. And university students need to have developed the habit of independent critical reading. If the university students entering our campuses are coming from an environment in which sustained reading is not a widespread part of the culture around them, and not part of their own individual everyday lives, then motivating them to become advanced academic readers will be extremely difficult. Their habits, and their brains, will need to undergo a profound change. (I will say more about brains a little later.)

Wendy Griswold defines a reading culture as “a place (a city, a province, a country) where most people, over and above the demands of their job or schooling, routinely read printed materials for entertainment and information” (Griswold, 2008, p.164). In a reading culture, reading is “expected, valued, and common” (Griswold, 2008, p.37). It could be said then, that in a reading culture people will likely do things such as buy books from bookstores and borrow books from libraries.

As far as book purchasing goes, New Brunswickers spend less per capita than people from most other provinces in Canada, with only three other provinces below it (*The Book Retail Sector in Canada*, 2007, p.18). Library statistics paint an even grimmer picture. It is widely known, at least within the library profession, that libraries are drastically underfunded in the province of New Brunswick. For example, there is not a single professional librarian working within the entire New Brunswick school system. Collections budgets in our public library system are not only below the national average—they are at the very bottom.

In 2007, the most recent year for which data is available, the Province's three main cities—Fredericton, Moncton, and Saint John—spent an average of one dollar per capita on public library materials, compared to an average of around four dollars amongst urban libraries across the country (Canadian Urban Libraries Council, 2009). New Brunswick's capital city, Fredericton, which has the main population base for the provincially-sponsored York Regional Library system, has consistently ranked well towards the bottom nationally for many years, if not at the very bottom of the heap. In 2007 it provided its citizens less than any other urban library in the entire country—an insultingly low total of fifty-eight cents—on books per year for each of its citizens.

Fifty-eight cents. Compared to a national average of nearly three dollars spent on books per capita. Fifty-eight cents will pay for about ten pages of one book, providing it is either a cheap paperback bought on a half-price sale from Amazon, or maybe something from a used book sale.

Last year, Fredericton, New Brunswick's capital city, was designated Cultural Capital of Canada for 2009 by the federal Department of Canadian Heritage. Fredericton—the city of nearly 90,000 inhabitants that has only *one* general indie bookstore, *one* public library (other than a tiny combined middle school and public library), and *one* academic library. Sure, we have a healthy visual and performing arts community, including amazing art galleries and exceptional fine crafts—thanks in part to the longstanding influence of the New Brunswick College of Craft and Design—but we do not have a book or reading culture. You cannot buy a book culture with fifty-eight cents.

UNB Libraries, which consist of the Harriet Irving, a law library, very small science and engineering branch libraries, and a relatively small library at UNB's campus in Saint John, currently spends approximately 3.5 million dollars on library materials annually. Yet the amount of money we are able to spend on materials per student is a considerable amount below both the national average and the regional average for Atlantic Canada (Canadian Association of Research Libraries, 2008, p.80). And we are a striking anomaly in that we are forced to serve the needs of *two* completely separate universities—UNB and St. Thomas University—simultaneously. Our Electronic Licensing Librarian regularly has to try to explain that to completely bewildered international electronic database providers who have never encountered such a thing before.

The sorry state of book culture in New Brunswick is such that when St. Thomas University moved from the northern part of the province in 1964, this undergraduate liberal arts institution was forced to share a campus with UNB in Fredericton, in part so that it would at least have access to UNB's already-stretched collection of books. *A liberal arts university without a library*—now surely that is the very definition of an oxymoron.

In 1997, St. Thomas built a large new “study hall”—a beautifully inspiring airy room, complete with leather-topped hardwood tables, brass reading lamps, and comfortable leather chairs. Sounds like the reading room of the New York Public Library, right? Wrong. When you look closer, you realize something is not quite right with the picture. *There are no books.* Lee Siegel has written about the “laptopization” of the coffeehouse (Siegel, 2008, p.17). Well, this is the über laptopization of the library. St. Thomas essentially built a library, but left out the books, erroneously thinking that students' laptops will supply everything they need.

And the Province seems ready to make a similar move again, as a branch of the community college system is currently being moved to UNB's campus. This college system typically offers two-year trades programs, but many of them will be articulated with the university system. It has been said that the new building, currently under construction, will not have a library. Much like the situation with St. Thomas nearly a decade ago, the students attending this new facility will also be expected to avail themselves of UNB Libraries, and the already-stretched libraries will be expected to serve them, likely without the addition of adequate financial resources.

Newfoundland's Reading Culture: A Comparison with Our Neighbour

Perhaps someone may argue that New Brunswick's relatively poor economic situation does not allow for the funding of a reading culture. I would argue the exact opposite: we cannot afford not to have one. Education, with the opportunity for independent and lifelong learning from libraries as a cornerstone, is the only hope we have of improving our economic standing in the long run.

For a comparison, it may be useful to take a look at New Brunswick's neighbour to the east, Newfoundland—another Atlantic Canadian province with a historically low economic standing. Newfoundland, in fact, was long considered Canada's most "have-not" of have-not provinces. What does its reading culture look like?

As a displaced Newfoundlander myself, while I love my New Brunswick–Newfoundland "dual citizenship", Newfoundland has an enormous place in my heart that I cannot fully explain. And in order to make an argument for Newfoundland's reading culture, I will first have to tell part of my personal story of my relationship with my island home. But be forewarned—we Newfoundlanders are prone to excessive speech. Consider Rick Mercer, Rex Murphy, Danny Williams, Joey Smallwood—men of few words just do not seem to grow on our island.

Growing up in Newfoundland, I used to think that my home province—with its historical legacy as a poor and isolated single-industry fishing outpost out in the cold North Atlantic Ocean—was a cultural backwater beyond backwaters. I grew up in a middle-class one-income family without much money for luxuries. But my parents loved camping, and they loved travel, which was possible since my father's job as a high-school teacher gave him two months of vacation time every July and August.

We encountered a lot on our various RV trips around North America, including a lot of books—in museum and gallery bookstores, mall bookstores, downtown indie bookstores, university bookstores and libraries, and downtown city public libraries. In amongst all the popular touristy kitsch stops and natural wonders of every kind, books were always lurking in the background as one of my dad’s special interests.

Through the perspective gained by those early days of travel, as well as my subsequent years of education and international travel as a young adult, I came to discover and truly appreciate the rich culture and thriving literature of Newfoundland. It was not a cultural backwater after all.

As part of this new-found appreciation, I came to realize that my Newfoundland hometown’s tiny but prominently-placed public library, like the small elementary and high-school libraries of my youth, as well as Memorial University of Newfoundland’s Queen Elizabeth II library where I studied as an undergraduate, were not quite so little after all. It was not long after I had moved to New Brunswick in 1990s, fresh out of graduate school in Halifax, that I discovered how undervalued and underfunded its libraries were—even compared to what I had experienced back in Newfoundland.

Meanwhile, to return to the present, back home in Newfoundland things have been looking up for awhile. Thanks to the relatively recent discovery of oil off Newfoundland’s coast, and its considerable hydro and mineral resources, Newfoundland has already lost its official economic “have not” status within Canada. And its future economic outlook is even brighter.

And thanks to longstanding public support for its rich cultural and literary history (which has included the study of Newfoundland history, culture, and literature in schools), a thriving contingent of internationally-renowned writers past and present, an absolutely magnificent and inspirational combined new setting for its provincial museum, art gallery, and archives called “The Rooms”—as well as exceptionally healthy public funding for its main academic library at Memorial University—the reading culture in Newfoundland’s future appears destined to become as healthy as its future economy.

Of all those factors which have helped to nurture a reading culture in Newfoundland, I think it is the latter—the support for its flagship academic library—that has had, and will continue to have, the greatest long-term impact.

Unlike the situation in the linguistically and geographically fractured province of New Brunswick, Newfoundland decided many decades ago to support one single university, and to build and support one primary academic library, making as its trademark a collection of provincial literature, the Centre for Newfoundland Studies. Memorial University has long provided a relatively healthy amount of financial support for its library, and it now spends more on materials per student than most academic libraries in the entire country—nearly five hundred dollars per student annually (Canadian Association of Research Libraries, 2008, p.80). This situation, I believe, has begun to produce social, cultural, intellectual, and economic dividends unlike anything New Brunswick has yet been able to generate.

Newfoundland is perhaps becoming more like that other oil-enriched North Atlantic outpost across the ocean, Norway, whose extremely healthy state-supported reading culture has been described by Wendy Griswold (Griswold, 2008). Griswold believes that such reading cultures are becoming rarer. Yet Newfoundland's reading culture seems destined to prevail and grow as the "old lost land of Newfoundland" (Johnston, 2009) is reborn and its libraries—at least its large flagship university library—thrive. But what will New Brunswick's future reading culture look like in the coming decades and beyond? In what state is our flagship library, and how healthy is the intellectual heritage it will pass on to future generations?

CURRENT READING TRENDS: THE SOCI-TECHNOLOGICAL

Having looked at some distinctly technological reading trends, and some distinctly social reading trends, I will now look at some trends which are a combination of the two. Specifically, I will look at public internet use, its relationship with reading, and the research behaviour and reading skills of university students. As I mentioned before, academic libraries have very recently, in part, gone digital—to the tune of over fifty percent of our collections budgets. This makes sense, since the internet is now where our readers reside, as do most members of the public.

Public Internet Access and Use

Today most readers in the developed world have access to the internet, and reading on-screen is becoming the new medium of choice for many readers. In the United States, nearly 80 percent of all English-speaking adults over the age of 18 now use the internet (and that only drops to 74 percent when you include *all* American adults, including Spanish-speaking adults) (Rainie, 2010).

Canadians have widespread access to the internet through home, work, schools, and libraries. According to the 2007 Canadian Internet Use Survey (CIUS), nearly three-quarters of Canadians aged 16 and older went online for personal reasons during the 12 months prior to the survey (*Canadian Internet Use Survey*, 2008). The vast majority of internet users aged 16 or older, 94 percent, reported personal internet use from home, while 41 percent said they used it from work, 20 percent from schools and 15 percent from libraries.

Indeed throughout the entire world, including developing countries, access to the internet reached 26 percent in 2009, while usage of cell phone usage reached 67 percent of the world's population (International Telecommunication Union, 2010). Given the newly emerging access to mobile high-speed internet access in many countries around the world, worldwide internet access may be about to skyrocket beyond the current 26 percent of the global population up to something similar to the current 67 percent for cell phone usage.

So cellphones with internet access are becoming the global norm, and tablets and exceptionally inexpensive laptops are becoming the ubiquitous new slightly larger personal computer. As those tools tie in with cloud computing and the coming widespread worldwide broadband access, the vast majority of the planet's citizens will have relatively easy access to millions of online texts, perhaps much of it available in their own language. Consider the XO from Nicholas Negroponte's One

Laptop per Child campaign—the one hundred dollar laptop for children in the developing world (*One Laptop per Child*, 2010). Ironically, illiterate and semi-illiterate citizens of even the world’s poorest countries—people who have rarely seen paper books in their lives—will soon hold the world’s legacy of books in their hands.

IT is easy, literacy is not. Providing access to online textual information is becoming far easier than teaching people to read that information. Basic information technology access is proving to be rather simple to provide, but basic literacy takes years to achieve in children, and advanced or proficient literacy—such as information literacy, or what literacy experts call prose literacy and “problem solving” literacy—has been barely achieved by a majority of citizens in developed countries such as Canada (*Building on our Competencies*, 2005, p.35).

When it comes to university-aged Canadians, last Fall Ipsos Reid found that 18-34 year olds are spending an average of 20 hours a week online (Kenney, 2010). Looking at a slightly lower cohort, in 2008 Bibby found that 98 percent of 15-19 year old Canadian high-school students are using computers one hour a day or more (Bibby et al., 2009). About one half those teenagers are using their computers at least two hours a day, while 20 percent are on their computers for three to four hours, and 20 percent use their computers five hours or more each day (Bibby et al., 2009, p.88). They list the internet as their third favourite source of enjoyment, just after their friends and listening to music (Bibby et al., 2009, p.27).

Canadian teens are also heavy mobile phone users. In 2007, 71 percent of households reported having a cellular phone for personal use (*Cellphone Services*, 2008, p.1). For 95 percent of those households 13-17 year-olds are the main household cellphone user (*Mobile commerce*, 2010, p.6).

Jenna Wortham, writing in *The New York Times*, recently put Americans’ willingness to spend money on their networked gadgets into a startling perspective:

It used to be that a basic \$25-a-month phone bill was your main telecommunications expense. But by 2004, the average American spent \$770.95 annually on services like cable television, Internet connectivity and video games, according to data from the Census Bureau. By 2008, that number rose to \$903, outstripping inflation. By the end of this year, it is expected to have grown to \$997.07. Add another \$1,000 or more for cellphone service and the average family is spending as much on entertainment over devices as they are on dining out or buying gasoline....For many people, the subscriptions and services for entertainment and communications, which are more often now one and the same, have become indispensable necessities of life, on par with electricity, water and groceries. And for every new device, there seems to be yet another fee. Buyers of the more advanced Apple iPad, to cite the latest example, can

buy unlimited data access for \$30 a month from AT&T even if they already have a data plan from the carrier (Wortham, 2010).

Those figures do not include one-off purchases for content on services such as iTunes. Meanwhile, Canadians' use of communications technology has followed a similar skyrocketing trend, while we continue to pay even higher cellphone service rates than users in many OECD countries (*Cellphone Services - Recent Consumer Trends* 2008; Office of Consumer Affairs, 2006). What's more, we tend to spend a comparatively long amount of time on our cellphones (Schmidt, 2009).

The Relationship Between Internet Use and Reading

So, the kids who are now entering Canadian universities typically have cellphones, not to mention laptops and/or tablets, and most of them are used to spending *a lot* of time online. That is not news to most of us working in the field. Furthermore, those coming from high-schools in New Brunswick in particular will be coming from what is arguably a non-reading culture. Again—nothing new there for those of us in the Province's higher education sector. But are those two things related? Do the fact that these new students spend an enormous amount of their time communicating with their friends and the wider internet on their mobile devices prevent them from doing any sustained reading?

Perhaps counter-intuitively, the answer that is emerging is “no”. People who are online also tend to be readers. This does make some sense, since despite the growing emphasis of audio and video online, the web is still predominantly a text-based world. Nearly a decade ago, Griswold and Wright found a positive co-relation between internet use and reading, which they specifically defined as sustained reading of printed material that people voluntarily do for pleasure or information in their leisure time (Griswold & Wright, 2004, p.203).

People who exhibit the more-more pattern, reading a lot and using the internet a lot, are doubly advantaged. They possess information, social connections, and cultural capital, and they know how to get more when they need them. They can adapt to circumstances—satisfying professors who require books, staying in touch with distant friends, chatting about the latest novels, filling pockets of time—with the flexibility of those comfortable with two powerful media. The world of the more-more is rich with possibilities. Because the logical alternative to more-more is less-less, on the other hand, the digital divide and the persistence of pockets of literacy disadvantage. The internet is not going to displace reading but it is going to give readers yet one more advantage (Griswold & Wright, 2004, p.215-6).

In 2008 the US NEA study concluded a similar thing, suggesting that 84 percent of American adults who read literature (defined as fiction, poetry, or drama) either directly online or downloaded from the internet, also read books (National Endowment for the Arts, 2009, p.8). Similarly, a Canadian

study using the Statscan 2005 General Social Survey found that both heavy and moderate internet users spend more time reading books than people who do not use the internet, while all three categories of people read similar numbers of magazines and newspapers. (Veenhof 15) Similar results have been found for university students, whose amount of time spent on the internet has not been found to interfere with the time they report spending on reading for their studies or for leisure (Mokhtari, 2009, p.618).

Unfortunately, all that time on the internet does not mean that people have the information literacy skills necessary to find and evaluate reliable information on the internet. My experience, like that of academic librarians everywhere, does not coincide with Griswold and Wright's assertion that kids who are wired know how to find information—at least not the best information, the most reliable material suited to academic research. Twittering and sending Facebook messages are like passing notes in class—it has absolutely nothing to do with knowing how to do good research online. Unless your idea of research in school is getting the kid who sits next to you to give you all the answers.

University Students' Information Research Behaviour

As I mentioned before, Nicholas Carr and Maryanne Wolf are certainly not the only current writers of popular books to assert that ironically, Google—despite its stated mission to “to organize the world's information and make it universally accessible and useful” (*Google Corporate Information*, 2010)—may in fact be facilitating the dumbing-down society (Bauerlein, 2008; Tenner, 2006). But academic research is also beginning to point to similar conclusions about the general public, or at least, it has been concluded that being online does not by itself lead to online research skills. For example, sociological research of the “digital divide” between the information technology “haves” and “have nots” has suggested online research skills are not well developed among people who are online (Hargittai, 2002).

Within academe, librarians and professors have been decrying the lack of research skills amongst students perhaps for as long as there have been students. But over the past decade and a half, ever since Mosaic began to make web browsing widespread in the mid-1990s, there has been a difference—the deception and myth of easy information research has taken hold. This myth of quick and easy research is widespread, and the concepts of speed and quality have become confused. Or at least, speed trumps quality. And academic teachers' anecdotal evidence is backed up by a wealth of research. Today's students, especially beginning undergraduates, continue to be happy to make do with simplistic “good enough” information search strategies, and ease of access to

information continues to be more important than the accuracy of that information (Currie, Devlin, Emde, & Graves, 2010; De Rosa et al., 2006; Nicholas, Huntington, Rowlands, Fieldhouse, & Jamali, 2009; Weiler, 2005). Interestingly, convenience and easy access to information are also more important than perceived accuracy or authority when students select library books. They want to be able to zero in on a specific piece of information right away, not read the whole book (Stieve & Schoen, 2006).

In Canada, while college and university enrolments have increased since the mid-1990s, at the same time there has been a quantified decline in the average literacy skills of high school graduates. This has led to some rather startling conclusions:

[One] interpretation of these findings is that Canada's education system is failing to impart durable skills, or at least the attitudes, values and behaviours that would allow their graduates to retain the literacy skills they learned. If this is true, then Canadian educators need to take a hard look at the content and delivery of instruction to see what might be improved (Willms & Murray, 2007, p.23).

Is the path-of-least-resistance research behaviour distinctive only of students? No. Most of us behave the very same way. Most of us do not like to “dig deeper” for information any more than we tend to take the “narrow path” or bypass the “shortcut” in other areas of our lives. Indeed, website designers know very well that people generally do not read much online, despite the fact that the online world is a world of text. Website users tend to browse pages rapidly, and read only about 20 percent of the text on an average page (Nielsen, 2008; Weinreich, Obendorf, Herder, & Mayer, 2008). And within academe, everyone—from first-year undergraduates, to practitioners, to professors—are exhibiting a similar tendency to search horizontally instead of vertically, to skim information, and to bounce quickly from place to place:

The average times that users spend on e-book and e-journal sites are very short: typically four and eight minutes respectively. It is clear that users are not reading online in the traditional sense, indeed there are signs that new forms of “reading” are emerging as users “power browse” horizontally through titles, contents pages and abstracts going for quick wins. *It almost seems that they go online to avoid reading in the traditional sense* (Rowlands et al., 2008, p.305). [emphasis added]

Academic librarians have a strong interest in teaching information literacy skills to students—we see it as a large part of our jobs (Cull, 2005). Yet, we have begun to understand that non-proficient students are unlikely to learn much from our teaching (Gross & Latham, 2007). If the students who arrive in our classrooms have already developed the notion that the library is “too damn confusing” (an actual library user’s comment—my favourite ever—from my library’s comment box), then changing their minds and research behaviours will be very difficult.

It appears the information literacy skills, just like so much of our students' other personal, social, and academic behaviours, became habits very early in life:

When the top and bottom quartiles of students—as defined by their information literacy skills—are compared, it emerges that the top quartile report a much higher incidence of exposure to basic library skills from their parents, in the school library, classroom or public library in their earlier years. It seems that a new divide is opening up in the USA, with the better-equipped students taking the prizes of better grades. At the lower end of the information skills spectrum, the research finds that intervention at university age is too late: these students have already developed an ingrained coping behaviour: they have learned to “get by” with Google. The problem here is that they simply do not recognize that they have a problem: there is a big gap between their actual performance in information literacy tests and self-estimates of their information skill and library anxiety.

These skills need to be inculcated during the formative years of childhood: by university or college it is too late to reverse engineer deeply ingrained habits, notably an uncritical trust in branded search engines to deliver quick fixes. This will require concerted action between libraries, schools and parents (Rowlands et al., 2008, p.303-8).

University Students' Critical Reading Skills

But does a low level of research skills translate into poor grades? Yes—at least there is a strong correlation. The library literature backs up the assertion that entering students have a wide range of information literacy skills, and that low-performing students typically have low information literacy skills (Gross & Latham, 2007, p.335).

Over the past few years I have been conducting my own informal survey of faculty opinion on the matter. I have had many conversations with professors and other academic instructors from within Atlantic Canada, and I have also had similar conversations with faculty at the international conferences which I attend. Specifically, I have been interested in their perceived assessment of long-term changes in the information research, critical reading, and critical thinking skills in their students. Are their students today any better or worse than they were years ago? Do they agree with the “dumbest generation” theory? Responses have varied, but for the most part the answer has been “no”—their students today either show the same initial low-level of competency, or alternatively the same high-level of competency, as their students did a decade or two ago.

During my recent conversation with Robert Darnton, I received one of the most interesting comments ever. Darnton taught history at Princeton for nearly forty years before moving to Harvard in 2007. He has perhaps been in the business longer than any other academic I have spoken to, and thus has an interesting “long view” personal perspective:

I have been teaching freshmen and they are not so good at what you might call “gutting” a text—extracting its central argument. The notion that a book has a central argument or a series of related arguments seems to be somewhat alien to them. They seem to be good at getting out information, but not at grasping the general thesis of a book. I developed a kind of gimmick with students in my seminars: I get them to summarize the central argument of a book while standing on one foot. They find it difficult—not the standing, as their equilibrium is quite good—but they go on and on. But what I want is, in one or two sentences, the *essence of the argument*. I think that kind of reading is not as well developed today as it was a generation or two ago (Darnton, 2009e).

Darnton wonders if this skill deficiency, as he perceives it, may have resulted from the fact that students no longer have to take notes like students did in the past. I know that for myself, the best way to understand something is to try to summarize it in my own words. But when text is always at our fingertips, the practice of going to the library and taking notes on reserve readings or books from the stacks has very nearly become a lost art.

Or maybe something else has changing along with the transformation from text on paper to digital text? To investigate that prospect further, we will need to take a short look at the world of neuroscience, and some of the research that is just now emerging on reading and the brain.

THE NEUROSCIENCE OF READING: SCREEN VS. PAPER

As you read these words, an amazingly complex and lightning-fast activity is taking place in your brain. Your retina sees the black squiggles we call letters and sends these images to a region of your brain which then puts the letters together into words that carry meaning. In less than one-fifth of a second, your brain can identify each word you read from among the 50-100 thousand words that you automatically recognize. (A little disconcerting to think about it while doing it, isn't it?)

As an expert reader, this rapid process is only paused briefly when you encounter a word not immediately recognizable—or perhaps when your cellphone rings, bings or vibrates, a student knocks at your door, your head begins to nod, the ocean breeze flips a page (how I wish!), or your 5-year old daughter jumps in your lap (that's my world at the moment). As an aside, hopefully thinking about what your brain does while it is doing it does not induce in you a case of lexical anhedonia. (See, you just stopped for a second.) But there is no need to run to Google or the OED—lexical anhedonia, if you do not already know, is the inability to feel pleasure while reading.

But you also routinely hit the figurative pause button for a moment in order to *think* and reflect about something you are reading. This is a crucially important aspect of reading, but one which we often take for granted.

Although reading may appear to be as automatic and natural as breathing or hearing, it is not. Consider the fact that it takes years of education to become a fluent reader. And it is far from a natural process—as Maryanne Wolf puts it, *there are no reading genes*. Our brains did not evolve to read, although they are flexible enough to learn new things. When we learn to read, “neuronal recycling” takes place—our brain rearranges itself and makes use of various neural pathways previously devoted to other activities (Doidge, 2007, p.292-3; Wolf, 2008, p.19). As Doidge's book title puts it, the brain changes itself. It is highly “plastic.”

New neuroimaging technologies such as functional magnetic resonance imaging (fMRI) can literally show a picture of the brain as it changes as we become readers (Poldrack & Sandak, 2004; Yarkoni, Speer, Balota, McAvoy, & Zacks, 2008). Partly as a result of fMRI, in recent years we have begun shedding new light on the study of reading and the brain, through the field of cognitive neuroscience—the relatively new multidisciplinary science focused on the neural basis of human cognition, or the connection between the body, most specifically the brain, and the mind.

One of the conclusions of cognitive neuroscience is that reading is a cultural activity that has physiologically changed our brains. But there is a limit to the placticity of the brain. As the French cognitive neuroscientist Stanislas Dehaene puts it in his new book, the brain did not evolve for culture, but culture evolved to be learnable by the brain (Dehaene, 2009). Through history all writing systems have shared common traits—they tend to be a series of strokes that the brain can be trained to readily interpret. And so over the millennia that we have been reading, our reading technologies have evolved from strokes on clay, to scrolls, to modern-day paper books, in order to meet the limited adaptability of our brains. This cultural evolution has brought us to what Jonah Lehrer calls the book we all know today—a “perfect cultural product” (Lehrer, 2009).

So, from a cognitive neuroscience perspective, does the old process of reading books on paper differ from the new process of reading on screen? As it turns out, there are many differences, in terms of comprehension, reading speed, cognitive focus, brain activation, and the physical contextual environment.

Speed & Comprehension

Do people read quicker online? No, perhaps the opposite. Seminal research done by Dillon in the early 1990s suggested that reading was 20-30 percent slower on a screen than on paper (Dillon, 1992). More recent research continues to suggest that reading on paper continues to be faster, although some studies have begun finding no significant difference between the two (Noyes & Garland, 2008).

Is it easier to understand content in print? Maybe. In the early studies, it was found that comprehension levels were lower on screen, but in more recent years the gap between comprehension when reading on a screen versus on paper has been decreasing. However, one of the conclusions that has been found is that the factor of *time* is important to comprehension. Speed reading and browsing online results in an overall decline in the level of comprehension (Dyson & Haselgrove, 2000).

In recent years, researchers have been calling for more recognition among educators about the differences between reading online versus reading print (Burke & Rowsell, 2008; Leu et al., 2008; Mokhtari, Reichard, & Gardner, 2009). It has been suggested that online reading is a more “cognitively complex” process due to the phenomenon of hyper-linking (Coiro & Dobler, 2007).

Essentially, the conclusion is that the choices offered to the reader by online hyper-links require more mental decisions to be made, and thus require the use of more brain “real estate”.

Distracted: The Myth of Multitasking

Research has also suggested that the old CRT computer screens with their “flicker” effect can affect mental processes, which used to make reading on screen less effective at establishing attention than reading print (Geske & Bellur, 2008). But we all know that distraction still affects us on our flat screens, even though they do not flicker like the old CRTs. In his much-discussed article in *The Atlantic*, Nicholas Carr admits that, for him personally, the “deep reading that used to come naturally has become a struggle”:

I think I know what’s going on. For more than a decade now, I’ve been spending a lot of time online, searching and surfing and sometimes adding to the great databases of the Internet. The Web has been a godsend to me as a writer. Research that once required days in the stacks or periodical rooms of libraries can now be done in minutes. A few Google searches, some quick clicks on hyperlinks, and I’ve got the telltale fact or pithy quote I was after. Even when I’m not working, I’m as likely as not to be foraging in the Web’s info-thickets’reading and writing e-mails, scanning headlines and blog posts, watching videos and listening to podcasts, or just tripping from link to link to link. (Unlike footnotes, to which they’re sometimes likened, hyperlinks don’t merely point to related works; they propel you toward them.).... Once I was a scuba diver in the sea of words. Now I zip along the surface like a guy on a Jet Ski (Carr, 2008, p.57).

As I mentioned previously, research has shown that this behaviour is typical for all of us (CIBER, 2008; Rowlands et al., 2008). We all do what Darnton calls “leapfrogging”—clicking, or “leaping” from one thing to another on our screens (Darnton, 2009e). A “screen-based reading behaviour” is emerging from the research:

The screen-based reading behavior is characterized by more time spent on browsing and scanning, keyword spotting, one-time reading, non-linear reading, and reading more selectively, while less time is spent on in-depth reading, and concentrated reading. Decreasing sustained attention is also noted. Annotating and highlighting while reading is a common activity in the printed environment. However, this “traditional” pattern has not yet migrated to the digital environment when people read electronic documents (Z. Liu, 2005, p.700).

One researcher has found that when we are working with digital information we switch activities every three to ten minutes, pointing to an obvious conclusion: “it is just not possible to engage in deep thought about a topic when we’re switching so rapidly” (A. Liu, Aamodt, Wolf, Gelernter, & Mark, 2009; Makoto Su & Mark, 2008). Liu suggests that online we switch between “bad kinds of reading”—“tunnel vision” reading when we read a single bit of text without a sense of the context,

and “marginal distraction”, which, for example, happens when we read textual “feeds” on the sidebar of a website such as a blog (A. Liu et al., 2009).

We used to think that multitasking was something we should try to master in our personal and work lives. However, there is a mounting body of evidence that suggests that it takes longer to do two tasks simultaneously than it does to complete the same tasks one after the other, and that knowledge gained in dual-task situations can be applied less flexibly in new situations (Foerde, Knowlton, & Poldrack, 2006; Rubinstein, Meyer, & Evans, 2001). There is little evidence that the case is any different for our seemingly constantly distracted teenagers who do their homework while simultaneously listening to their iPods and checking their Tweets (Tapscott, 2009, p.107). They would understand what they are reading more deeply, be able to apply what they learn more creatively, and even get it done faster, if they simply turned off their gadgets, and did one thing at a time.

Brain Activation

Multitasking, the *modus operandi* of life in the online world, requires a lot of mental effort. As I mentioned before, research indicates that online reading requires more mental effort due to all the hyperlinked options. It has been shown, for example, that readers display more cognitive effort when reading an online news story that was selected from a wide array of stories (Wise, Bolls, & Schaefer, 2008). News websites, like newspapers, are more likely to get their readers to invest more energy in reading a story if they were stimulated with many story choices on the first page.

It has been found that optimizing the screen layout of a website so that readers do not have to scroll decreased mental workload (Wästlund, Norlander, & Archer, 2008). Meanwhile, Gary Small’s most recent research fMRI tests lead to the general conclusion that searching the internet on a topic stimulates more neural circuitry than reading about the topic in a linear e-book (Small, Moody, Siddarth, & Bookheimer, 2009). So now we know why we feel so mentally exhausted after a day in front of our screens. Being part of the “electronic mob” is simply a lot more tiring than being in the physical world (Siegel, 2008).

Another aspect of brain activation that I find intriguing is how psychologically tied we suddenly are to our cellphones, which of-course, are now our personal computers as well. At the *Learning and the Brain Conference* which I mentioned previously, during his keynote to an enormous hotel ballroom audience, Gary Small asked us all to take out our cellphones. When he asked how many of us had already checked our email since he had begun his presentation only a few minutes earlier, virtually

every hand was raised. And he was an engaging speaker, so we were not all thumbing on our cells out of boredom.

Then he unnerved everyone: “Please pass your cellphone to a stranger seated near you for a moment,” he asked. Once everyone realized he was serious, the room filled with the hum of conversation and nervous laughter as people reluctantly let go of their precious gadgets, while the few university-aged kids in the audience cut short their texting—sos jk lol Ill Xpln l8r g2g—and gave their gadgets over into the hands of a total stranger. Clearly our phones are an important part of us. Something has wired our brains to them. Small’s conclusion is that our evolving brains are addicted to our technology (Small & Vorgan, 2008).

The cyborg has arrived—it is the iPhone, the iPod, and the iPad. How exactly are these ubiquitous computers going to further change the human brain? We do not know. But we do know that we are, in fact, changing the human brain. For the sake of the emerging generations whose brains are taking part in this worldwide real-life neurological experiment, and the sake of the generations who come after, I hope the experiment is a success. In my conversation with her, Maryanne Wolf considers this real-life experiment:

We are doing what no internal university review board would ever allow. As a society we are going beyond anybody’s knowledge, and just doing it. We are lurching into a whole new culture, and we don’t know what that is going to do to the young brain.

We need a program of research to show what the brain is doing when we are reading. Are students activating as much of their brains as you and I activate when we read? We do not know any of that. We need longitudinal research (Wolf, 2009).

Meanwhile, public concern appears to be growing over the negative effects of our near-constant use of our ubiquitous screens. Research has confirmed what many of us have intuited for a long time. For example, the American Academy of Pediatrics recommends that our youngest children—those under two years of age—get no screen time at all, while it is recommended that older children get a maximum of one to two hours per day (American Academy of Pediatrics Council on Communications and Media, 2009). This is partly because of its negative effect on brain development.

Our teenagers do not appear to be listening to that advice. Fifty percent of Canadian teenagers spend at least two hours a day on their computers (Bibby et al., 2009, p.88). In terms of total screen time, nearly one third of teenagers are spending an average of nearly six hours a day in front of their televisions and laptops (Pearce, 2008). Just this year, the average time that Canadian adults, of any

age, spend on the internet surpassed their time watching television—2.6 hours a day online and 2.4 hours watching television (Kenney, 2010).

The Context is the Message

Another interesting aspect of the neurological differences between reading on paper and on screen has to do with the context provided by each. In my interview with him, Robert Darnton spoke about how the literary critics' notion of the "paratext"—the framework of a text—affects the meaning that a reader derives from that text. Just as a book's cover, dedication, and acknowledgements make a "frame" that shapes a reader's interpretation of a book's main text, the paratextual elements of online text are important. Darnton began by speaking about the paratext of print newspapers:

I used to be a reporter for the *New York Times* and so I am very attached to the paper version of it. But it's not simply that. I think the older readers are used to looking at page one and treating page one as what I call a map of yesterday. The way page one is organized by the *Times* is telling you what was most important in what happened yesterday. There are all kinds of typographical signs: the nature of the headline, if the story is on the right hand side (which indicates it is more important than if it is on the left hand side or below the fold), etc....So that is a dimension of reading that has to do with what a lot of literary critics call "paratexts". But the paratextual orientation of readers is really crucial—when that drops away through texts appearing on machines, what is lost is a kind reading.... Of course, on a machine there is a different kind of paratext. The paratextual ingredients to reading on a hand-held device or a computer are very different (Darnton, 2009e).

Meanwhile, interesting experimental research on e-book readers has suggested that the physical context of the device itself has an influence on the sensations that people may feel while reading on the device, and subsequently on their interpretation of the text. For example, participants were more likely to perceive humour in the text when reading on a device that is "happy, light and clear" (Morineau, Blanche, Tobin, & Gueguen, 2005, p.342). In a very real way, it appears that the medium truly is the message, as Marshall McLuhan first told us nearly fifty years ago (McLuhan, 1964; 1967).

“EASIER ON THE EYES”, “I DON’T GET DISTRACTED”: STUDENT PREFERENCES FOR PAPER VS. SCREEN

Research on university students’ preferences concerning the format of the text they use for their studies backs up much of what I have personally discovered over the years of my experience as an academic librarian: students prefer to read on paper, but they also want the convenience of online digital text. Liu has found that graduate academic library users like the access provided by online electronic resources, but prefer to print out the electronic documents in order to read them (Z. Liu, 2006). In a study of students at the National University of Mexico, the majority of students preferred print, and 63 percent reported that they could bear reading a document on a computer screen for no more than one hour (Ramirez,). In a recent survey of students at a university in China, an interesting gender imbalance was found in the paper/electronic preference: 73 percent of the female students prefer print, while only 51 percent of male students prefer print (Z. Liu & Huang, 2008). The habits of the female readers in that survey revealed them to be “more linear and thorough readers” (622).

The preliminary results from the first year of my E-READ survey has begun to tell a similar story. Following a series of questions about their reading habits and preferences—with respect to reading for their studies, their jobs, and reading for leisure—students were asked for their overall general preference. Of the 78 students (74 undergraduates, 4 graduate students) who have participated in the study so far, 61 students (78 percent of the total survey respondents) preferred paper:

<i>Do you generally prefer to read text on paper, a computer screen, or a mobile device screen?</i>		
	Number of students	Percent of respondents
text on paper	61	78%
text on a computer screen	13	17%
text on a mobile device screen	0	0%
no preference or qualified preference	4	5%

Those who either expressed no preference, or who qualified their preference with an explanation, generally said similar things to what respondents in Liu’s study reported: access to the electronic is convenient, but they prefer to actually do the reading from a printed copy. Many students commented that paper was “easier on the eyes”, and that it allowed highlighting, underlining, and making handwritten notes.

These results confirm what students have been telling me over the course of the past decade or so since we began to invest heavily in e-journals and other electronic resources: if they are going to actually *read* it, they want it on paper. The access is necessary, and it facilitates research and citation

in many ways, but if they think they need to really understand the content, they want it physically in hand and on paper.

The E-READ survey asks students much more than their print/electronic preferences. All the data from the first year have not yet been evaluated, and it will take a few more years of data to start getting results that really matter. However, there are already some other noteworthy comments emerging from the study participants. Perhaps much of this is predictable for those of us who work in the field, but I still look forward to discovering exactly what results will appear over the coming years. Perhaps I will find some surprises. Here is a very short but somewhat representative sample of comments from this first year:

“[I prefer] text on paper, because I can concentrate on that subject more and not get distracted.”

“I like to read in huge blocks of time to get a grasp on what I am reading.”

“[Over the past 5 years] I have become much more attentive to content, instead of just reading to get through it.”
[fourth year undergraduate]

“I wish I had more time for leisure reading.”

Other researchers have found that when reading narratives or fiction, print is, perhaps unsurprisingly, the marked preference—readers like to scribble on pages, fold over page corners, bring their books to the beach and the bathtub, and also appreciate the psychological sense of closure achieved by closing a book’s cover (Evans & Po, 2007; Mangen, 2008). Indeed, the phenomenon of reading a printed page and reading on a screen are very different, in many ways and on many levels. They simply are two different things. Neuroscientists, for example, are beginning to embrace the differences instead of look for how the two are, or are not, equivalent (Noyes & Garland, 2008).

IN WITH THE NEW, KEEP WITH THE OLD—FOR ALL OF US

I imagine most of us have very specific preferences between reading print and electronic text. Andrew Dillon, Dean of the University of Texas School of Information, whose work I cited earlier, has been a leading researcher on the screen versus paper since the early 1990's. In a recent blog entry, this is how he summed up his own personal preferences:

Those of us who watched this world and studied reading on screen over the years predicted an inevitable time when e-reading would be routine but most of us, well me at least, argued that print would not die as a result but instead, the two media would co-exist, perhaps even synergistically. I still put my shirt on that outcome (digital for management, search, comparison, facts etc., paper retained for leisurely lengthy reading, deep study of narratives, or tasks that require perspective and overview of lengthy document contents) and have not had a chance to play seriously with any e-book tool that I would want to take to the beach, but I see the future getting nearer. What is interesting is how many people are now reporting, at least informally, that they have switched to digital for the lengthy leisurely reads I felt to be paper's greatest provision. Few if any studies have been reported on this as yet but it's definitely an interesting question. Meanwhile, I expect I'll still be buying and reading paper for the rest of my life but I might just be purchasing more e-texts along the way (Dillon, 2010).

Many writers have observed the fact that new technologies often do not supplant older proven technologies that accomplish a similar task—video did not kill the radio star after all, just like the cellphone did not kill the land line, the word processor did not kill the pen, the lighter did not kill the match, movie theatres did not kill live theatre, the treadmill did not kill the idea of running outside, and the pool did not kill the beach (okay, maybe the beach is not a human technology, but you get the point).

I suspect the same thing will hold true for the world of the codex. The book is far from dead. The simple technology of the bound book took millennia for it to evolve into its current state of near-perfection. Screens have not killed it, but instead have been co-existing happily alongside it. Have you ever seen a screen, except perhaps in an Apple commercial, that did not have printed text sitting alongside it or being carried somewhere near it? Even in-transit business executives, professionals, and politicians with nothing but their Blackberries or iPhones in hand still have reams of paper waiting for them back at the office and at home.

Michael Ridley, long-time Canadian academic librarian, futurist, and self-described “wacko”, points out that the internet is the “largest, most comprehensive information resource ever assembled. It represents the triumph of literacy not its demise” (Ridley, 2009, p.211). Yet he provocatively suggests that we are headed to a “post literate” world, because literacy is so very hard to master and,

he suggests, is elitist. Instead of reading, he sees some sort of a Kurzweilian cyborg in our future (Kurzweil, 2005).

But given the power—and *empowering* nature—of reading, I think that view is itself elitist and unnecessarily complacent, as are the comments of many other writers who have delved into the topic recently. Consider, for example, the renowned novelist Ursula Le Guin’s comments in *Harper’s* about “the alleged decline in reading.” Le Guin writes that “in its silence a book is a challenge”:

Readers aren’t viewers; they recognize their pleasure as different from that of being entertained. Once you’ve pressed the on button, the TV goes on, and on, and on, and all you have to do is sit and stare. But reading is active, an act of attention, of absorbed alertness.... it can’t lull you with surging music or deafen you with screeching laugh tracks or fire gunshots in your living room; you have to listen to it in your head. A book won’t move your eyes for you the way images on a screen do....Reading is not “interactive” with a set of rules or options, as games are; reading is actual collaboration with the writer’s mind. No wonder not everybody is up to it (Le Guin, 2008).

Perhaps, in the end, not everyone is up to it. But before we conclude that, on a social level or on an individual level, we had better consider all the consequences. Those of us who call ourselves readers ought not to be quite so content to keep the benefits of reading a secret to ourselves. Society around us, and the corporate pressures that have so completely infiltrated it, make screened technology seem very attractive. The printed word does not sell nearly as well by itself—we, the world’s readers, have to spread the word. Unless that is, we are happy with the “word inequality” in the world around us.

Most of us do not need any more persuasion to buy gadgets. It takes a lot of persuasion, and years of education and discipline, to be able to fully critically read what is on our gadgets, and what is between the lines on them. Those critical reading skills remain very, very expensive and very, very difficult to obtain. And this is especially true for our vulnerable children. If my ten-year old kids’ friends are any indication, not to mention the college-aged kids I see every day, then we have our work cut out for us. When there is not money enough to buy everything, then the DSi, iPod, iPhone, or iPad will trump a seemingly silent book any day.

Consider the business executive and University of Toronto lecturer Don Tapscott’s recommendations:

Why should we spend agonizing hours in school memorizing long passages or historical facts when you can look them up in an instant?...You still need to know that events like the Battle of Hastings happened if you want to look them up on Wikipedia. But you might not have to stress about the details—those you can check (Tapscott, 2009, p.115).

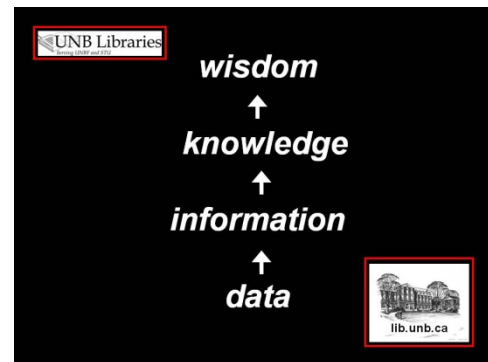
Now there is a slippery slope, especially in a world where many kids now have the internet in the palm of their hand all the time. How do we distinguish between what is an unimportant detail, and what other facts need to be remembered, if even for a relatively temporary period, in order for the full picture to be understood? With such short-sighted comments coming out of our business schools, it is no wonder that Western capitalism has recently nearly destroyed itself. Yet again.

Details are data that matter. Data of some form is always a precursor to any full understanding of anything. Without fully digesting—and *remembering*, if even only for a temporary period—some of the facts, we cannot hope to understand holistically. Is the data-information-knowledge-wisdom hierarchy, which librarians were at one time all taught in library school, not still true? T. S. Eliot said it best:

Where is the wisdom we have lost in knowledge?

Where is the knowledge we have lost in information?
(Eliot, 1971, p.96)

I often allude to the data-to-wisdom hierarchy in my classes, but maybe I have grown old before my time. Perhaps such ‘philosophical’ things are not important anymore. Maybe Bay Street and Wall Street would be better off if we forgot about things like disciplining the brain of the next generation. Such a waste of time—educating our kids to think beyond their own space and time—when there are far more relevant things to think of, like making money. Perhaps even my own old library school has left T. S. Eliot behind, now that it has merged with a business school.



Those of us who already are blessed enough to walk amongst the highly literate and educated elite of society should be careful of the messages we may be helping Steve Jobs to send to the more vulnerable segments of our society—especially to the young boys who seem more naturally wired for things other than reading.

Consider the young kid who is persuaded by society around him that he does not *really* need to read well, despite what all his teachers through his years in school have told him. The only things in the *real* world requiring reading are the Tweets and emails on his iDevice. Not only will that kid be unlikely to ever become the next Prime Minister or President (although some notable exceptions apply), but he is unlikely to ever excel in any profession, and he will never be fully engaged in the civil society around him. Maybe he will become the next NHL or Idol star, or perhaps he will win the lotto. Or, the most likely scenario, he will spend his adult life mowing the lawns of the Tapscotts of the world. Not that there is necessarily anything wrong with mowing lawns for a living.

It is an honourable job. But the guy in that job should be there because he has freely chosen it, not because the establishment has lied to him.

Perhaps we will have transcended our biology and the old-fashioned need to read some year in the future. But I do not think the technological singularity will be here by 2015, nor 2050, except maybe on *Star Trek* re-runs and Pixar films. In the meantime, we have to ensure that the next few generations do not forget the value of education, and the information literacy and critical reading skills which go hand-in-hand with any education that is worth more than the proverbial ink on the diploma.

A MORNING BACK IN KINDERGARTEN

As I mentioned before, my professional discoveries and intellectual ruminations surrounding general societal reading trends has coincided with the reading discoveries that have been taking place on a much more personal level within my own family. One such discovery happened on a recent morning earlier this year, a morning on which I had the privilege to travel back to kindergarten.

On the morning in question, my five-year old daughter, Emmelie, gave me a tour of her classroom and its various “learning stations” during a day set aside for “student-led conferences” at her school. This is a regular event to which parents are invited, in order to have their kids become the teacher for a day and show us parents all they have learned throughout the proceeding months. We live in Marysville, described on our neighbourhood signs as “Canada’s only intact 19th-century English-style mill town”, but which is rapidly becoming a white collar residential area within the City of Fredericton—a small and relatively comfortable middle-class university/government town (City of Fredericton, 2010).

Our overcrowded school, which is destined to be replaced in 2012, was built in the 1920s and is very visibly restricted by its own once-elegant architecture. There is no school library—besides a tiny classroom in the corner of the basement. Unfortunately, Alexander Gibson, Marysville’s industrialist founder, was not able to leave a lasting Carnegie-like legacy of literacy to outlast the last decades of the twentieth century, a part of history which appears to have been a cultural dark age for our province.

But back to the school open house. During the morning classroom tour, some kids’ parents were drawn to the flashy baking soda and Kool Aid science experiment, the tasty M&Ms math project, the colourful interactive art table, or the computers in the front corner. Since I was in the midst of this reading project, I noticed the reading section first. It was a revealing—and inspiring—moment for me.

There it was, prominently located on the large comfortably-carpeted front left-hand side of the room: the reading “corner”. More than a corner, it appeared to take up nearly a quarter of the whole classroom. Clearly this was an important space, the heart of the room. Books formed a half-wall on one side. Audio reading stations formed another wall. Kid-sized chairs littered the floor. And the walls above were covered in white boards, flip-charts, and other simple pedagogical gadgets—all

covered in words, words, words, and more words. The picture made me think of Griswold's terminology—this was a sacred place.

Emmelie, who had just begun to read a few months prior, sat me on a tiny chair, and proceeded to proudly read the brief story on the white board aloud to me. I was truly uplifted by this most-recent view into our public education system. Our teachers—especially our primary school teachers—are perhaps the most important professionals in our society.

Unfortunately, the school library, directly subject as it is to public underfunding and the whims of misguided politicians, no longer holds a prominent place in many of our schools. New Brunswick is not alone in this. Looking at my kids' old school library, there is a striking resemblance to the third-world libraries I regularly see pictured in the newsletters of the libraries being built and supported by the Canadian International Development Agency (Canadian Organization for Development through Education, 2010). I am not sure exactly where to lay the blame for my kids' school library—certainly not at the feet of the school's competent new administration, teachers, or friendly part-time library staff member who visits my kids' tiny library room a few hours each week.

But somewhere, sometime, as a community, we failed our children.

Thankfully, when the school is replaced soon, we will have the chance to right that wrong and build a prominent real library that the kids will love—a place that is the heart of the school building as much as the reading corners are the heart of each individual classroom. And in the meantime, thank God—most of our over-dedicated and under-paid teachers have it figured out right, and the classroom library remains important within their individual realms of influence.

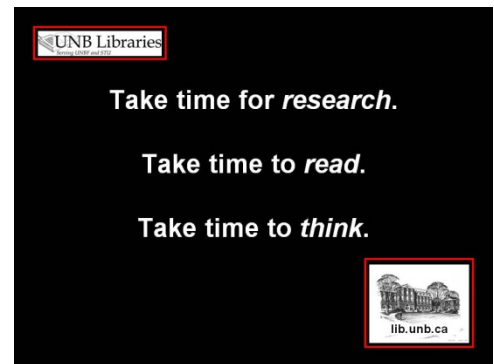
If only the politicians and senior bureaucrats in charge of our education system were as convinced of the value of books and reading. Currently a proposal for a much-needed “New Brunswick Digital Library” is under discussion at the Department of Education, a proposal which would bring an enormous wealth of electronic resources to schools and the general public. While the proposal for this tremendously worthwhile endeavour is explicitly intended to complement physical libraries and their books (such as they are), our Province's poor track record in this area leaves me fearful of the decisions that could be made.

“TIME TO THINK BEYOND”

At several places in this essay, I have alluded to what I believe to be the central benefit of reading—*time*. As one librarian puts it, “print and slowness have a close relationship”:

Print has endured because it is still the superior technology for reading anything of length, quality or substance. While digital technology lends itself to discovering and remixing ideas in novel ways, slow reading of books is still essential for nurturing literacy and the capacity for extended linear thought (Miedema, 2009).

Over the course of the past few years, time—for research, for critical reading, for thinking—has been a theme of my own teaching, often lurking behind the content of the more concrete information literacy skills I try to impart. I have long suggested to students in my undergraduate classes that learning to manage time well is one of the most important general skills they should be learning over the course of their degrees. I also bring up the subject to my graduate classes, usually in the context of the time-saving research tools that the library provides. I do not really say very much about time to either undergraduates or graduates, although I do sometimes quickly insert a slide about it, if I am teaching using slides. But the concept of time—time required and time saved—has always been an underlying theme of my teaching.



Over the course of this research some of the most profound thoughts that I have encountered on the special relationship between reading and time come from Maryanne Wolf. Towards the end of her book, she reflects on the history and science of the reading brain:

The brain’s design made reading possible, and reading’s design changed the brain in multiple, critical, still evolving ways....By its ability to become virtually automatic, literacy allowed the individual reader to give less time to initial decoding processes and to allocate more cognitive time and ultimately more cortical space to the deeper analysis of recorded thought....A system that can become streamlined through specialization and automaticity has more time to think. This is the miraculous gift of the reading brain....Few inventions ever did more to prepare the brain and pose the species for its own advancement (Wolf, 2008, p.216).

Wolf goes on to discuss what the internet, with its immediacy of access to information, has done to our concept of time:

Throughout the story of humankind, from the Garden of Eden to the universal access provided by the Internet, questions of who should know what, when, and how remain unresolved. At a time when over a billion people have access to the most extensive expansion of information ever compiled, we need to turn our analytical skills to questions about a society's responsibility for the transmission of knowledge....Will unguided information lead to an illusion of knowledge, and thus curtail the more difficult, time-consuming, critical thought processes that lead to knowledge itself? Will the split-second immediacy of information gained from a search engine and the sheer volume of what is available derail the slower, more deliberative processes that deepen our understanding of complex concepts, of another's inner thought processes, and of our own consciousness? (Wolf, 2008, p.221)

When I interviewed her, Wolf pointed out another time-related concept about reading and the brain—the speed with which the print to digital revolution has taken place, compared to the slow pace of change in writing systems of the past:

If we look at history in terms of the Sumerian and Akkadian writing systems, one lasted about 15 hundred years. Then what you saw is the Sumerian scribes and the Akkadian scribes sitting side by side and maintaining both. You had a long period in which the best of one could be incorporated within the other. That was over a millennium of time that they were being simultaneously taught. We have no such moment (Wolf, 2009).

Wolf acknowledges that for herself reading online is cognitively different from reading in print, because of the context. In my interview with her, she describes her own online reading:

I know minds. And I know that when I read online, it is different. I can force myself to slow down when I go and hold a book. When I am online, I am going to the next sentence and the next sentence, and I have to hurry up and get the idea, because I have email waiting... (Wolf, 2009).

Wolf is particularly concerned about the potential impact of what I will call “internet time” on our kids, many of whom are now growing up with the internet always “on” in the palm of their hand. With the upcoming digital natives we are beginning to see our first glimpses of the digital brain that could replace the reading brain. Librarians will recognize the information literacy concepts underlying Wolf's words:

I do wonder whether typical young readers view the analysis of text and the search for deeper levels of meaning as more and more anachronistic because they are so accustomed to the immediacy and the seeming comprehensiveness of the on-screen information—all of which is available without critical effort, and without any apparent need to go beyond the information provided. I ask, therefore, whether our children are learning the heart of the reading process: going beyond the text.

....And within children's particular vulnerable transition to the level of fluent, comprehending reader we must exert our greatest efforts to ensure that immersion in digital resources does not stunt our children's capacity to evaluate, analyze, prioritize, and probe what lies beneath any form of information. We must teach our children to be “bitextual,” or “multitextual,” able to read and analyze texts flexibly in different

ways, with more deliberate instruction at every stage of development on the inferential, demanding aspects of any text. Teaching children to uncover the invisible world that resides in written words needs to be both explicit and part of the dialogue between learner and teacher, if we are to promote the processes that lead to fully formed expert reading in our citizenry.

...I fear that many of our children are in danger of becoming just what Socrates warned us against—a society of decoders of information, whose *false sense of knowing* distracts from a deeper development of their intellectual potential (Wolf, 2008, p.225-6).

In her argument, Wolf describes the protest of Socrates, who in the Greece of the fifth century BC, railed against the demise of learning orally that was brought about by the Greek invention of the alphabet, which was then in its infancy. Socrates thought the written word was too inflexible to contain complex thoughts, that it would lead to the destruction of memory since text would make the need for remembering everything less important, and that it would lead to a superficial understanding of things, since information would be widely accessible to many without directly coming from a teacher. Luckily, Socrates' own student Plato quietly disobeyed his teacher and ironically recorded his objections.

Wolf also gives reference to the renowned French poet Marcel Proust, who describes the deeply changed consciousness we experience as a result of reading. Speaking of the role of the author, Proust states “that which is the end of their wisdom appears to us as but the beginning of ours” (Proust, 1971). Wolf brings both Proust and Socrates into the picture when she gives her final comment on reading and time:

Socrates never knew the secret at the heart of reading: the time it frees the brain to have thoughts deeper than those that came before. Proust knew this secret, and we do. The mysterious, invisible gift of *time to think beyond* is the reading brain's greatest achievement; these built in milliseconds form the basis of our ability to propel knowledge, to ponder virtue, and to articulate what was once inexpressible—which when expressed, builds the next platform from which we dive below or soar above (Wolf, 2008, p.229).

Perhaps it is all about time after all. Perhaps it is the time that reading affords us to think beyond ourselves that makes reading a “sacred” activity, as Wendy Griswold describes it. In my conversation with her, Griswold described the secular “sacredness” of this leisure reading:

I feel it is more virtuous to spend an hour reading even something very light like Stephen King, than to spend that hour watching a Stephen King movie. But there is no way I can defend that. It is the ideology of reading—it is sacred. Reading is a sacred activity. Watching films are not. I think a lot of academics think that way, even if they do not read that much themselves. And parents want their kids to read in their free time, even if they do not read much themselves. They have a notion of reading being sacred, even if the particular reading material their kids have is not contemplative in itself. And most reading is not. Reading is a sort of sacred thing which I participate in, and believe in, but cannot really defend (Griswold, 2009).

The concept of the sacred is connected to time. In its definitions of the word sacred, the Oxford English Dictionary includes the phrases “not to be lightly intruded upon or handled”, and “a peculiar depth of significance” —words which imply time taken (Sacred, 1989). Perhaps many people would say that it is a stretch to call a Stephen King novel “sacred”, but I think what Griswold was trying to put her finger on there has something to do with time—the time that our brain has to imagine a world of fiction, those millisecond pauses taking place in our brains, as described by Wolf.

When I spoke in person with her, Maryanne Wolf elaborated further on her concerns surrounding digital text with specific reference to university-aged students—readers who may not yet have learned the skill of taking time to read deeply, to read “sacredly”:

I am worried about kids who are immersed in digital culture. They will get to college and they will have been Twittering so much that they won't have the patience to read those really long cognitively convoluted and complex sentences. They may not have developed those rich networks which are required in order to read at a high level of sophistication. They will be the less.

The *effort* is what we are going to lose. Who would bother to expend all that effort if it seems like it is free? Did you see the movie *Wall-e*? These humans were being given everything, and they are fat and slothful—that is the new reading brain. They are becoming not so much a lazy reader, but an atrophied reader (Wolf, 2009).

CONCLUSIONS

Reading can change the world. It already has.

Reading reflects the power of words, the power of ideas. The power of reading comes largely as a result of the power of *time*—time to digest words, time to reflect on ideas. Time to appreciate a long view of history, or of time itself—the all-important time to think beyond one’s self, one’s place, one’s time.

Literacy is a sacred gift that humanity has been allowed to give itself. It has changed the world. For those of us with a humanist streak but who still wholeheartedly embrace a spiritual life, our reading has even helped bring us to an understanding of God. And while the printed word has spread religions around the globe, it also facilitates the workings of secular governments. Furthermore, it is easy to see that what is missing from the dangerously misplaced religious fervour in the world today comes from the failure of so-called believers to actually read their sacred texts.

Reading also enables both democracy and industry. It has spread cultures, and has been the medium of free thought like no other form of expression. It gives us perspective. Makes us laugh out loud.

Over the course of my last two years of “reading about reading” I have encountered many words for the type of advanced reading that we in academe attempt to inspire in our students, and ultimately hope to help spread to the world around us—writers have called it *critical, deep, expert, intensive, reflective, contemplative, inferential, analytical*. Serious words for a serious phenomenon. Yet ironically, the adverb I like best, which comes from Robert Darnton, is very different. It is *loose*. In my interview with him, Darnton talked about how in-depth reading differs from the fast reading of a narrative:

It is reading intensely and *loosening* up a bit—allowing yourself to pursue ideas as they are touched off by the work (Darnton, 2009e).

Another favourite thing I read about reading lately comes from a writer who has a unique ability to take himself very seriously and yet “loosen up”, in perhaps another sense, at the very same time. It is A. J. Jacobs, author of *The Know-It-All: One Man’s Humble Quest to Become the Smartest Man in the World*, a brilliantly funny memoir of a venture in reading the entire *Encyclopaedia Britannica* from A to Z. It

had been awhile since I laughed out loud while reading a book, especially a work of so-called “serious” non-fiction. This is one of my favourite passages from A. J. about the power of reading:

But even better than the origin of the word "essay," I like the story of how Marie de Gournay—a French intellectual at the time—fainted from excitement when she read Montaigne's work for the first time. She fainted from reading. What a great image. We've become far too jaded. I've been intrigued, bored, titillated, annoyed, amazed, but I've never even come close to fainting while reading any book.

Which is sad. I wish ideas could still get people so excited that they fainted. I wish people—including me—had a more visceral reaction to reading. The closest I've come to fainting during Operation Britannica was when I felt queasy after reading about the botfly, which lays eggs in horses' nostrils, and I had to stop eating my ice cream sandwich (Jacobs, 2005, p.210-1).

I wish I could say that I have fainted from reading. Yet reading has changed my life, like it has the life of every reader, in ways and on levels that we perhaps have only begun to understand and appreciate, now that it appears to be threatened.

While on-screen reading has given me needed information, made me think, and made me laugh, printed books have absolutely changed my life—I have been carried along with the narrative, I have often stopped to think, I have laughed out loud, and I have cried. For myself, the magazine industry's recent ads hold true—“the internet is impulsive, print is immersive.”

Reading's value to humanity absolutely cannot be overstated, and if we take it for granted as we move into the brave new world of the cyborg, we do so at our peril. And that most brilliant of beautiful human designs—the proven technology of the humble paper book—is perfectly suited to facilitate our thoughtful reading like nothing else we have ever before invented for ourselves.

Personal Plans

As for myself, in my role as a parent, I will continue to read to my kids, with even more interest than before I embarked upon this study of reading nearly two years ago. I may read to them from the screen of a gadget sometimes, but mostly, we will hold a big book together in our hands, taking the time to touch the pages as we digest the words and are captivated by the pictures.

In my conversation with him, Robert Darnton spoke eloquently of his own experiences reading to his three children:

I taught all three of them how to read, not to push them or to make them superstars, or have them be in the fast track academically, but partly for selfish reasons—it is so much fun to teach reading.

With our first child there was a moment when you could almost hear the “click”, when he read something that was funny and got the joke and laughed out loud. It is very moving for me when I think back over it. There is a book called *The Duck on the Truck*, and I remember when my son got it for the first time. We were sitting in the back seat of the car...It changed his life.

Reading to my children in the evening was a time wonderful intimacy. In reading the words aloud I could imagine them perceiving the narrative, so I was simultaneously reading it through their eyes and through my own. It became just a wonderful, magical time of day.

I certainly think the best thing parents could do for children is to read books to them—to initiate them into the pleasures of reading and to present reading, not as a grind or something you have to do for your homework, but something that opens up worlds for you (Darnton, 2009e).

I have experienced the very same moving experience of reading to my own children, and as a result I will do what I can to spread the word on the magic of reading to kids. I will certainly do what I can to support my kids’ elementary school library, especially as it embarks upon its new building plans. Because, as Dr. Suess put it best:

The more that you read,
the more things you will know.
The more that you learn,
the more places you’ll go (Seuss, 2008).

And like Theodore Geisel and A. J. Jacobs, and nearly every child young and old that I have ever met, I will not forget the value of a smile and a laugh. I thank God that I have kids, so I can read all those simultaneously fantastically funny and unbelievably profound children’s books without raising any eyebrows.

As for my other reading, I will likely continue to do most of my daily professional reading online—the latest large screen that I have attached to my laptop at the office makes that task relatively comfortable. For this research project, I have read a lot on my large screen, although the vast majority of things I have read have required some time to digest, and those for things I have chosen the medium of print on paper.

I will likely eventually buy a second or third generation iPad too, for when I am away from my large screen at the office. I will let Apple's first few million consumers work out the kinks in the iPad for Steve Jobs first, waiting instead for some new features to come along, perhaps including colour e-ink, and maybe even a virtual keyboard. Or perhaps I will buy a dedicated e-reader without the distraction of the internet.

But for much of my personal and professional *sustained* reading, I will stick to print (whether a book or something that comes out of my office printer down the hall) for the foreseeable future. Print on paper—that beautiful technology that lets me scribble on the margins while sitting in the garden or at the beach or enroute to somewhere, while simultaneously keeping my mind happily unplugged from email and the web and the rest of the madding crowd—will likely remain my medium of choice for any sustained reading, personal or professional. Time and the book go hand-in-hand. And if I am going to devote my time to something, I want it to be the best experience possible.

Ongoing Research Plans

I expect that my interest in the changing nature of reading will continue for some time. To return to the analogy with which I began this essay, I expect to continue down this professional path for awhile longer. I believe that I have encountered something profoundly important in this research, and I am continuing to investigate it despite having returned to my regular professional work, far removed from the peaceful shores of my beloved Newfoundland, where I spent a portion of my sabbatical. Somehow I will make time in between the collections, teaching, reference and other professional and academic responsibilities that make up my normal workload.

In May I plan to attend the Book Expo America (BEA) in New York, the annual conference and trade show for booksellers and book industry professionals, an event which I have never attended before. Immediately following that, I plan to attend the Canadian Federation for the Humanities and Social Sciences Congress 2010 to hear Robert Darnton's keynote on technology and the book, and to visit the Congress Book Fair. I also expect to continue to interview more leaders in the field of books and reading.

In addition, I hope to continue to conduct the E-READ student survey through future academic years, and hopefully expand it to include students in classes that I teach at St. Thomas University, as well as UNB.

As far as the dissemination of my research is concerned, a small portion of this sabbatical report will form the basis for a journal article or some other document I hope to have published. In addition, I have been invited to present an overview of my project at an upcoming staff retreat at UNB Libraries. I expect to eventually give a presentation or two to a wider audience at professional or academic conferences.

Some Recommendations for UNB Libraries

As I have worked upon this project, I have thought about various implications for the profession of academic librarianship generally, and for UNB Libraries in particular. Perhaps most of this has already been discussed in one forum or another. In any case, I will summarize my own thoughts on some of the implications for UNB.

❖ **Information Literacy Teaching**

Our teaching within libraries should always take into account the varying levels of cognitive development amongst our entering undergraduates, as well as between students in different years of study. Our teaching programs always need to be informed by the fact that the development of advanced intensive reading skills is a *process that takes time*.

Critical reading is hard to do when you are first introduced to the complex sentences and dense language that we sometimes take for granted in academic literature, while critical evaluation of information sources continues to be a skill that many students have not begun to master until they begin university. We cannot expect everyone just to do it because we tell them to—perhaps that unengaged guy sitting in the back row did not read the article because he *couldn't* read the article, and would rather fake laziness than appear stupid. On a physiological level, their reading brains have not developed to the extent we expect. I have needed to remind myself of that, so perhaps other librarians could use a reminder too.

Another implication of the placticity of the brain discussed in this essay is an affirmation of the old adage, “use it or lose it”. As was mentioned earlier, literacy rates fall over time when reading is not practiced on an ongoing basis over one’s life-course (Willms & Murray, 2007). Therefore, in our various library services, especially our information literacy instruction, we

need to think about how we motivate students to embrace lifelong learning through lifelong reading, and not merely focus exclusively on the concrete research task at hand.

Part of this sort of motivation to learn will require us to perhaps concentrate more on the “why” than the “how” in our teaching. I realize that students, like faculty, still need to know the mechanics of how to use our catalogue as it goes through major changes, as well as the best methods of using our new databases as they come along. But most of that they can figure out on their own, if and when they need to. If we need an hour to describe how to use a database, then there is a problem with the database. What we should focus on instead is motivating our users by getting them to appreciate all the reasons why they should want to come to our website, our databases, and our buildings, in the first place.

We are doing well at UNB, but there is always room for improvement. For example, we could be doing more to reach out to our local senior high school students. In addition, we still have been unable to establish layered year-by-year curriculum-integrated instruction programs in many subject areas. I cannot see either happening unless we are able to find a way to devote more staff resources to information literacy teaching.

❖ **Print Collections, Printing, & e-Readers**

The McCain Foundation’s generous donation towards our book collections will soon be exhausted. From the perspective of a book selector, the impact of the McCain funding on my ability to develop a collection of core social science titles cannot be overstated. It is only since that funding began in 2006 that I have truly felt comfortable calling myself a “collections librarian”, as prior to then the small amount of funding available to me made the title seem totally inappropriate. We need more money devoted to paper books on an ongoing basis.

I also suggest we continue to plan for massive amounts of in-house printing, and encourage the university to help students pay for that printing. Given students’ clear preferences for print, our printer hubs will continue to be a crucial aspect of our operation. We should also continue to consider the possibility of printing books on demand through a device like the Espresso Book Machine. Not only has it become a popular tool within bookstores such as the Harvard Bookstore which I have had an opportunity to visit a few times recently, but Google Books is paying attention to it too (Badger, 2009). And say what you will about Google, these guys have a knack for knowing where the future lies.

Furthermore, with the likelihood that the iPad and other similar tablets will be popular with students over the next few years, we need to consider all the possibilities and ramifications of making our resources, including e-books, available to our users via these devices. We may also want to consider loaning out e-reader devices as we now do for laptops. The current plan to create a version of our website for mobile devices is a great start in this direction.

❖ Physical Spaces

If the medium is the message then the library is the message too. What messages do our public spaces send to our students about reading? As the Harriet Irving Library is the building I know best, and it is our flagship location, I will limit my comments to this building.

We desperately need to continue the major facelift begun through the recent construction John B. McNair Learning Commons. Compared to the attractiveness and functionality of the Commons area, the dilapidated state of most of the rest of our building is embarrassing and not meeting our users' needs—including the often-mentioned desire for more quiet study space.

But beyond embarrassing, we are sending an unintentional, but yet unforgivable, subtle hint to our students: *reading and quiet individual study in not what we are about*. Our Commons area rightly focuses on group work, computing, service transactions, and reference and classroom instruction. But when one looks beyond the refurbished Commons areas to the unfinished central corridor, or up the decaying front stairwell that leads to the upper floors, or if you dare to risk your life by entering the ancient elevators, the whole building virtually screams “come near at your peril.”

How many years now have we been waiting for off-site storage to hold some of our materials? This, of course, could free up more of the building for readers (by which I mean the people, not the mobile devices). Perhaps we should consider some radical proposal, like closing and locking the fire doors that lead upstairs and making most of the building a closed stacks area. That would give the attendees at the 2012 Congress something to talk about. At the very least, while we wait for some larger renovation, we should repaint the embarrassing stairwells, replace all the stairwell titles in the front main stairwell, as well as in the main floor corridor that runs between the lobby and the back stairwell.

Ironically, the Harriet Irving Library, from both an aesthetic and functional point of view, has enormous potential. The attractive views offered of the campus and the city could be the envy of many other libraries, and the beautiful symmetrical harmony of the building could be used to its fullest advantage. With a relatively small amount of effort, we could be a little gem amongst libraries on an international scale—a cultural artefact of which New Brunswick could truly be proud.

The building's structure lends itself to the potential of creating distinct floor-specific user spaces throughout the building, moving from the bustle of mostly group activity on the main floor, all the way up to quiet intensive study of graduate work on the fifth floor. The entire building could act as a metaphor for the gradually increasing depth of study we expect from students across their ongoing years of study.

Certainly we could be so much more than the enormously overstuffed warehouse of mostly underused and improperly stored material that we currently are. That is not a library. In fact, it is a health hazard, as our overstuffed stacks gradually deteriorate in a space without appropriate temperature or humidity controls.

And in the meantime, our basement, with its dark spaces, secluded stacks, and single public access point, is not suited for any public access at all.

Summary of Findings

The following points summarize my overall conclusions, drawn from reflections on my extensive literature review, in-person interviews, as well as some preliminary results from the UNB / St. Thomas University student E-READ survey:

- ❖ *Reading is a cultural phenomenon that has taken humans millennia to develop, and it continues to be a difficult skill for individuals to acquire.*
- ❖ *Literacy has had a profound impact upon human culture and scientific progress. The beautiful cultural artefact of the printed book has largely been the medium by which literacy has brought that profound impact to humanity.*

- ❖ *Within just the last decade and a half, the internet and mobile technologies have begun to bring a far-reaching global shift towards ubiquitous access to digital text, with academic library holdings being just one example of this digital shift.*
- ❖ *In recent decades, voluntary sustained reading (reading for leisure or information) may be declining within the general populations of the Western world. But people have not stopped reading because of the internet—in fact, there is a strong correlation between internet use and voluntary reading. People who are online are readers, of both online and print materials.*
- ❖ *There is also a correlation between a reading culture, including a public library culture, and both cultural and social capital and engagement. However, New Brunswick students in particular are poor readers, and do not benefit from a widespread reading culture with its implicit social, cultural, and intellectual benefits. Although basic worldwide literacy rates are increasing, advanced literacy lags within developed countries, such as Canada, in particular provinces such as New Brunswick.*
- ❖ *Today’s university students, digital natives immersed in information technology nearly since birth, typically lack adequate information literacy skills (and perhaps critical reading skills) upon entering university. Being online does not automatically produce information literacy.*
- ❖ *On a cognitive and neurological level, reading on screen and reading print are very different. One is suited to the efficient access of information, the other is suited to the time-dependent acquisition of knowledge.*
- ❖ *We are in the midst of an enormous nexus of reading revolutions—the ability is just about here for most every human being to have the world’s ever-growing heritage of print constantly available at their fingertips. Yet, the need for global society to take the time to ‘read beyond ourselves’ has perhaps never been greater, while at the same time never more at risk. Libraries and librarians are perfectly positioned to be able to facilitate and encourage the emerging digital brain so that it does not simultaneously cease to be the reading brain.*
- ❖ *University students prefer print over screen when doing sustained and critical reading. As academic librarians, we need to ensure that we keep giving them what they want—at least in circumstances such as this, when that also happens to be what they need.*
- ❖ *UNB’s Harriet Irving Library has the potential of becoming the Province’s cornerstone for a yet-to-evolve widespread reading culture, with all the widespread social and intellectual benefits that a reading culture produces. In addition to the necessity for renewing the building, we also must find additional funding to replace the dwindling McCain fund for new books. And in our teaching, we need to enhance our ability to promote vital information literacy skills on campus, throughout our Province, and to all the international locales to which our reach extends.*

A SHORT NOTE OF THANKS

My work on this project has been facilitated greatly by Kathryn Irvine-Bray, who transcribed my interviews and who kept my overflowing brain relatively sane by removing all my considerable stacks of “books about books” and numerous files of printed documents off my desk and into a RefWorks database.

Data from the E-READ survey has been entered into a spreadsheet by the Leah Grandy, whose invaluable help has seen all data from the year’s survey results successfully entered into an Excel file.

And finally, my colleague Jamie MacKenzie has willingly put up with my overly excited rants in his office about the world of reading, offering a much-needed listening ear, as well as valuable advice on statistical and other aspects of my research.

And since this is in part a personal essay, I should also thank Jasmine, my wife and life partner, who has supported me through many long days and nights of research and writing—days and nights that could have perhaps been spent more leisurely on something else. I think I forgot that the word “sabbatical” means a rest. In any event, here’s to more of those days of leisure to come.

REFERENCES

- 13 of the Brightest Tech Minds Sound Off on the Rise of the Tablet. (2010, April). *Wired*. Retrieved from http://www.wired.com/magazine/2010/03/ff_tablet_essays/all/1
- ACRL Standards Committee, American Library Association. (2000). *Information Literacy Competency Standards for Higher Education*.
<http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm>
- American Academy of Pediatrics Council on Communications and Media. (2009). Media Violence. *Pediatrics*, 124(5), 1495-1503. doi:10.1542/peds.2009-2146
- Anderson, I. (2010). *Hurting Toward the Finish Line: Should the Google Books Settlement Be Approved?* Retrieved from <http://www.cdlib.org/cdlinfo/2010/02/16/hurting-toward-the-finish-line-should-the-google-books-settlement-be-approved>
- Association of Research Libraries, & Texas A&M University. (2004). *LibQUAL+ Spring 2004 Survey*. Retrieved from <http://www.lib.unb.ca/staff/misaligned/LibQUAL2004/UniversityofNewBrunswick.pdf>
- Association of Research Libraries, & Texas A&M University. (2007). *LibQUAL+ 2007 Survey* Retrieved from <http://www.lib.unb.ca/staff/misaligned/LibQUAL2007/LibQUAL2007report.pdf>
- Badger, B. (2009, September 17). Books Digitized by Google Available via the Espresso Book Machine. Message posted to <http://booksearch.blogspot.com/2009/09/books-digitized-by-google-available-via.html>
- Bauerlein, M. (2008). *The dumbest generation: How the digital age stupefies young Americans and jeopardizes our future (or, don't trust anyone under 30)*. New York, NY: Jeremy P. Tarcher/Penguin.
- Beck, R. (2008). *Learning Objects: An Introduction*.
http://www4.uwm.edu/cie/learning_objects.cfm?gid=55
- Bibby, R. W., Russell, S., & Rolheiser, R. (2009). *The emerging millennials: how Canada's newest generation is responding to change & choice*. Lethbridge, AB: Project Canada Books.
- Blount, R. J., Blume, J., Cummings, P., Egan, J., Gleick, J., Petre, P., & Darnton, R. (2010, January 14). Google & the Future of Books: An Exchange. *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2010/jan/14/google-the-future-of-books-an-exchange>
- Bly, R. (1997). *The sibling society*. New York: Vintage Books.

- The Book Retail Sector in Canada*. (2007). Vancouver: Turner-Riggs. Retrieved from http://www.pch.gc.ca/pgm/padie-bpidp/rep/rapp-rep_07/rapport-pdf-report-eng.pdf
- Bowker LLC. (2009). *Bowker and BML Join Forces to Produce First Side-by-Side Comparison of Consumer Book Buying Habits in U.S. and Great Britain* Retrieved from <http://www.bowker.com/index.php/press-releases-2009>
- Bowker LLC. (2010). *Bowker Reports Traditional U.S. Book Production Flat in 2009* Retrieved from <http://www.bowker.com/index.php/press-releases>
- Brin, S. (2009, A Library to Last Forever. *The New York Times*, Retrieved from <http://www.nytimes.com/2009/10/09/opinion/09brin.html>
- Building on our Competencies: Canadian Results of the International Adult Literacy and Skills Survey 2003*. (2005). Ottawa: Statistics Canada; Human Resources and Skills Development Canada. Retrieved from <http://www.nald.ca/fulltext/booc/booc.pdf>
- Burke, A., & Rowsell, J. (2008). Screen Pedagogy: Challenging Perceptions of Digital Reading Practice. *Changing English: Studies in Culture & Education*, 15(4), 445-456. doi:10.1080/13586840802493092
- Byrne, G., DeYoung, M., Drayson, P., Ellis, R., Murphy, L., & Romane, L. (2010). *Canadian University Library Benchmarks* Retrieved from <http://www.cla.ca>
- Canadian Internet Use Survey*. (2008). Statistics Canada. Retrieved from <http://www.statcan.gc.ca/daily-quotidien/080612/dq080612b-eng.htm>
- Canadian Association of Research Libraries. (2008). *CARL Statistics / Statistiques de l'ABRC 2006–2007 Table V - Library materials expenditures*. Retrieved from http://www.carl-abrc.ca/projects/statistics/pdf/2007_CARL_publication.pdf
- Canadian Organization for Development through Education. (2010). *CODE: Our Story*. <http://www.codecan.org/en/code/our-story>
- Canadian Urban Libraries Council. (2009). *2007 Canadian Public Library Statistics*. City of Mississauga. Retrieved from http://www.mississauga.ca/portal/residents/librarystatistics?paf_gear_id=9700018&itemId=105000733n
- CANARIE. (2010). *Preserving Knowledge for our Children's Children - and Beyond*. http://www.canarie.ca/templates/news/releases/19_04_10_E.pdf
- Carr, N. (2008, July/August). Is Google Making Us Stupid?: What the Internet is doing to our brains. *Atlantic Magazine*. Retrieved from <http://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/6868/>
- Carr, N. (2010, April 1). *The post-book book*. Message posted to http://www.routhtype.com/archives/2010/04/the_postbook_bo.php

- Carr-Hill, R. (2008). *International Literacy Statistics: A Review of Concepts, Methodology and Current Data*. UNESCO Institute for Statistics. Retrieved from <http://www.uis.unesco.org/template/pdf/Literacy/LiteracyReport2008.pdf>
- CAUT Objects to Google Books Deal. (2010). *CAUT Bulletin*, 57(2). Retrieved from <http://cautbulletin.ca/>
- Cellphone Services - Recent Consumer Trends* (2008). Industry Canada, Office of Consumer Affairs. Retrieved from [http://www.ic.gc.ca/eic/site/oca-bc.nsf/vwapj/FINALCell2008Info-Apr21-eng.pdf/\\$FILE/FINALCell2008Info-Apr21-eng.pdf](http://www.ic.gc.ca/eic/site/oca-bc.nsf/vwapj/FINALCell2008Info-Apr21-eng.pdf/$FILE/FINALCell2008Info-Apr21-eng.pdf)
- CIA. *The World Factbook: Canada*. <https://www.cia.gov/library/publications/the-world-factbook/geos/ca.html>
- CIBER, & University College London. (2008). *Information behaviour of the researcher of the future*. <http://www.bl.uk/news/pdf/googlegen.pdf>
- City of Fredericton. (2010). *Statistics* Retrieved from <http://teamfredericton.com/en/communityprofile/Statistics.asp>
- Coiro, J., & Dobler, E. (2007). Exploring the Online Reading Comprehension Strategies Used by Sixth-Grade Skilled Readers to Search for and Locate Information on the Internet. *Reading Research Quarterly*, 42(2), 214-257. Retrieved from <http://www.jstor.org/stable/4151792>
- Cull, B. W. (2005). Voices in the Wilderness: A Report on Academic Information Literacy Instruction in Atlantic Canada. *The Canadian Journal of Information and Library Science*, 29(1), 1-26. Retrieved from <http://www.lib.unb.ca/instruction/bcull/CJILS2005.pdf>
- Currie, L., Devlin, F., Emde, J., & Graves, K. (2010). Undergraduate search strategies and evaluation criteria: Searching for credible sources. *New Library World*, 111(3/4), 113-124.
- Darnton, R. (2008, June 12). The Library in the New Age. *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2008/jun/12/the-library-in-the-new-age>
- Darnton, R. (2009a). *The case for books: past, present, and future*. New York, N.Y.: PublicAffairs.
- Darnton, R. (2009b, February 12). Google & the Future of Books. *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2009/feb/12/google-the-future-of-books>
- Darnton, R. (2009c, December 17). Google and the New Digital Future. *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2009/dec/17/google-and-the-new-digital-future>
- Darnton, R. (1990). *The kiss of Lamourette: reflections in cultural history*. New York: Norton.
- Darnton, R. (2009e, July 9). Personal Interview with Barry Cull.

- Darnton, R. (2009e, July 9). Personal Interview with Barry Cull.
- De Rosa, C., Cantrell, J., Hawk, J., & Wilson, A. (2006). *College Students' Perceptions of Libraries and Information Resources*. Dublin, Ohio: OCLC Online Computer Library Center, Inc. Retrieved from <http://www.oclc.org/reports/pdfs/studentperceptions.pdf>
- Dehaene, S. (2009). *Reading in the brain: the science and evolution of a human invention*. New York: Viking.
- Dillon, A. (1992). Reading from paper versus screens: a critical review of the empirical literature. *Ergonomics*, 35(10), 1297-1326.
- Dillon, A. (2010, February 01, 2010). Has the Ebook Moment Arrived? Message posted to <http://sentra.ischool.utexas.edu/~adillon/blog/archives/234>
- Doidge, N. (2007). *The brain that changes itself: stories of personal triumph from the frontiers of brain science*. New York: Penguin Books.
- Dyson, M. C., & Haselgrove, M. (2000). The effects of reading speed and reading patterns on the understanding of text read from screen. *Journal of Research in Reading*, 23(2), 210. doi:10.1111/1467-9817.00115
- Eliot, T. S. (1971). *The complete poems and plays: 1909-1950*. New York: Harcourt, Brace & World.
- Evans, E., & Po, J. (2007). A break in the transaction: Examining students' responses to digital texts. *Computers and Composition*, 24(1), 56-73. doi:10.1016/j.compcom.2006.12.003
- Foerde, K., Knowlton, B. J., & Poldrack, R. A. (2006). Modulation of Competing Memory Systems by Distraction. *Proceedings of the National Academy of Sciences of the United States of America*, 103(31), 11778-11783. Retrieved from <http://www.jstor.org/stable/30051608>
- Geske, J., & Bellur, S. (2008). Differences in brain information processing between print and computer screens. *International Journal of Advertising*, 27(3), 399-423. Retrieved from <http://search.ebscohost.com>
- Google & the Future of Books: An Exchange. (2010, January 14). *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2010/jan/14/google-the-future-of-books-an-exchange>
- Google Corporate Information: Company Overview. (2010). <http://www.google.ca/intl/en/corporate>
- Graham-Rowe, D. (2010). Touch screens that touch back: New piezoelectric technology will make screens more tactile. *Technology Review*. Retrieved from <http://www.technologyreview.com/computing/24679/?a=f>
- Grenier, S., Jones, S., Strucker, J., Murray, T. S., Gervais, G., & Brink, S. (2008). *Learning Literacy in Canada: Evidence from the International Survey of Reading Skills* Statistics Canada. Retrieved from <http://www.statcan.gc.ca/pub/89-552-m/89-552-m2008019-eng.pdf>

- Griswold, W. (2008). *Regionalism and the reading class*. Chicago: University of Chicago Press.
- Griswold, W. (2009, July 5). Personal Interview with Barry Cull.
- Griswold, W., & Wright, N. (2004). Wired and Well Read. In P. N. Howard, & S. Jones (Eds.), *Society online: the Internet in context* (pp. 203 - 222). (pp. 203-222). Thousand Oaks, CA: Sage.
- Gross, M., & Latham, D. (2007). Attaining information literacy: An investigation of the relationship between skill level, self-estimates of skill, and library anxiety. *Library & Information Science Research*, 29(3) doi:doi:10.1016/j.lisr.2007.04.012
- Hargittai, E. (2002). Second-Level Digital Divide: Differences in People's Online Skills. *First Monday: Peer-Reviewed Journal on the Internet*, 7(4) Retrieved from <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/942/864>
- HathiTrust. (2010). *HathiTrust Digital Library*. <http://catalog.hathitrust.org>
- The Institute for the Future of the Book*. <http://futureofthebook.org>
- International Digital Publishing Forum. *Industry Statistics*. Retrieved from http://www.idpf.org/doc_library/industrystats.htm
- International Telecommunication Union. (2010). *Measuring the Information Society*. Geneva: International Telecommunication Union. Retrieved from http://www.itu.int/ITU-D/ict/publications/idi/2010/Material/MIS_2010_Summary_E.pdf
- Internet Archive. (2010). *Internet Archive*. <http://www.archive.org>
- Jacobs, A. J. (2005). *The know-it-all: one man's humble quest to become the smartest person in the world* (1st Simon & Schuster pbk ed.). New York: Simon & Schuster Paperbacks.
- Johnson, C. A. (2010). Do public libraries contribute to social capital? A preliminary investigation into the relationship. *Library & Information Science Research*, 32(2), 147-155.
- Johnston, W. (2009). *The Old Lost Land of Newfoundland: Family, Memory, Fiction, and Myth*. Edmonton: NeWest Press and Canadian Literature Centre.
- Kafka, P. (May 10, 2010). Chill Out!: Obama doesn't Hate your iPad. Message posted to <http://mediamemo.allthingsd.com/20100510/chill-out-obama-doesnt-hate-your-ipad/>
- Kenney, J. (March 22, 2010). Internet usage overtakes television watching: report. *National Post*. Retrieved from <http://www.nationalpost.com/story.html?id=2710876>
- Kurzweil, R. (2005). *The singularity is near: when humans transcend biology*. New York: Viking.
- Le Guin, U. K. (2008, February). Staying awake: Notes on the alleged decline of reading. *Harper's Magazine*. Retrieved from <http://www.harpers.org/archive/2008/02/0081907>

- Lehrer, J. (2009). *Reading, E-Books and the Brain* Retrieved from http://scienceblogs.com/cortex/2009/10/reading_e-books_and_the_brain.php
- Leu, D. J., Coiro, J., Castek, J., Hartman, D. K., Henry, L. A., & Reinking, D. (2008). Research on instruction and assessment in the new literacies of online reading comprehension. In C. C. Block, & S. R. Parris (Eds.), *Comprehension instruction: research-based best practices* (pp. 321-342). New York: Guilford Press.
- Liu, A., Aamodt, S., Wolf, M., Gelernter, D., & Mark, G. (October 14, 2009). Does the brain like e-books? *The New York Times*, Retrieved from <http://roomfordebate.blogs.nytimes.com/2009/10/14/does-the-brain-like-e-books/>
- Liu, Z. (2005). Reading behavior in the digital environment: Changes in reading behavior over the past ten years. *Journal of Documentation*, 61(6), 700-712. doi:10.1108/00220410510632040
- Liu, Z. (2006). Print vs. electronic resources: A study of user perceptions, preferences, and use. *Information Processing & Management*, 42(2), 583.
- Liu, Z., & Huang, X. (2008). Gender differences in the online reading environment. *Journal of Documentation*, 64(4), 616-626.
- Makoto Su, N., & Mark, G. (2008). Communication Chains and Multitasking. Paper presented at the Florence, Italy. Retrieved from http://delivery.acm.org/10.1145/1360000/1357069/p83-su.pdf?key1=1357069&key2=8768832721&coll=GUIDE&dl=GUIDE&CFID=86204178&CF_TOKEN=11075694
- Mangen, A. (2008). Hypertext fiction reading: Haptics and immersion. *Journal of Research in Reading*, 31(4), 404-419. doi:10.1111/j.1467-9817.2008.00380.x
- Manguel, A. (1998). *A history of reading*. Toronto: Vintage Canada.
- Markoff, J. (2008, January 15). The Passion of Steve Jobs. Message posted to <http://bits.blogs.nytimes.com/2008/01/15/the-passion-of-steve-jobs>
- McLuhan, M. (1964). *Understanding media; the extensions of man*. New York: McGraw-Hill.
- McLuhan, M. (1967). *The Gutenberg galaxy: the making of typographic man*. Toronto: University of Toronto Press.
- Miedema, J. (2009). *Slow reading*. Duluth, Minn.: Litwin Books.
- Mobile commerce: New experiences, emerging consumer* (2010). Industry Canada, Office of Consumer Affairs. Retrieved from [http://www.ic.gc.ca/eic/site/oca-bc.nsf/vwapj/Mobile_Commerce_mobile-eng.pdf/\\$FILE/Mobile_Commerce_mobile-eng.pdf](http://www.ic.gc.ca/eic/site/oca-bc.nsf/vwapj/Mobile_Commerce_mobile-eng.pdf/$FILE/Mobile_Commerce_mobile-eng.pdf)
- Mod, C. (2010, April 2010). Embracing the digital book.

- Mokhtari, K., Reichard, C. A., & Gardner, A. (2009). The Impact of Internet and Television Use on the Reading Habits and Practices of College Students. *Journal of Adolescent & Adult Literacy*, 52(7), 609-619. Retrieved from <http://www.jstor.org/stable/20468414>
- Morineau, T., Blanche, C., Tobin, L., & Gueguen, N. (2005). The emergence of the contextual role of the e-book in cognitive processes through an ecological and functional analysis. *International Journal of Human Computer Studies*, 62(3), 329-348.
- National Endowment for the Arts. (2004). *Reading at Risk: A Survey of Literary Reading in America (Executive Summary)* National Endowment for the Arts. Retrieved from <http://arts.endow.gov/pub/RaRExec.pdf>
- National Endowment for the Arts. (2007). *To Read or Not To Read: A Question of National Consequence* No. 47). Retrieved from <http://www.arts.gov/research/ToRead.pdf>
- National Endowment for the Arts. (2009). *Reading on the Rise: A new Chapter in American Literacy* National Endowment for the Arts. Retrieved from <http://www.arts.gov/research/readingonrise.pdf>
- Nicholas, D., Huntington, P., Rowlands, I., Fieldhouse, M., & Jamali, H. R. (2009). Student digital information-seeking behaviour in context. *Journal of Documentation*, 65(1), 106-132.
- Nielsen, J. (2008). How little do users read? Message posted to <http://www.useit.com/alertbox/percent-text-read.html>
- Noyes, J. M., & Garland, K. J. (2008). Computer- vs. paper-based tasks: Are they equivalent? *Ergonomics*, 51(9), 1352-1375. doi:10.1080/00140130802170387
- Office of Consumer Affairs. (2006). *The expansion of cellphone services*. [http://www.ic.gc.ca/eic/site/oca-bc.nsf/vwapj/CTUCellen.pdf/\\$FILE/CTUCellen.pdf](http://www.ic.gc.ca/eic/site/oca-bc.nsf/vwapj/CTUCellen.pdf/$FILE/CTUCellen.pdf)
- One Laptop per Child*. (2010). Retrieved from <http://laptop.org/en>
- Ong, W. J. (2008). *Orality and literacy: the technologizing of the word*. London: Routledge.
- Paczkowski, J. (2010, May 11). Intel: Tablet Market Will Grow Between 73 Percent and 88 Percent by 2014. *The Wall Street Journal: All Things Digital*. Retrieved from <http://digitaldaily.allthingsd.com/20100511/intel-tablet-market-will-grow-between-73-percent-and-88-percent-by-2014>
- Pearce, T. (2008, A third of teens spend 40 hours a week watching TV and surfing the Net. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/life/a-third-of-teens-spend-40-hours-a-week-watching-tv-and-surfing-the-net/article26798/>
- Poldrack, R. A., & Sandak, R. (2004). Introduction to This Special Issue: The Cognitive Neuroscience of Reading. *Scientific Studies of Reading*, 8(3), 199-202. doi:10.1207/s1532799xssr0803_1

- Price, L. (2007, December 23). You Are What You Read. *The New York Times*. Retrieved from <http://www.nytimes.com/2007/12/23/books/review/Price-t.html>
- Proust, M. (1971). *On reading*. New York: Macmillan.
- Public Information Resources, I. (2009). *Modern brains: Enhancing memory and performance in this distracting digital age*. Cambridge, Massachusetts.
- Putnam, R. D. (2000). *Bowling alone: the collapse and revival of American community*. New York: Simon & Schuster.
- Putnam, R. D., Cohen, D., & Feldstein, L. M. (2004). *Better together: restoring the American community*. New York [u.a.]: Simon & Schuster.
- Rainie, L. (2010). *Internet, broadband, and cell phone statistics* Pew Internet & American Life Project. Retrieved from http://www.pewinternet.org/~media/Files/Reports/2010/PIP_December09_update.pdf
- Ramirez, E. The impact of the Internet on the reading practices of a university community: The case of UNAM". Paper presented at the *World Library and Information Congress: 69th IFLA General Conference and Council*, Berlin. Retrieved from <http://archive.ifla.org/IV/ifla69/papers/019e-Ramirez.pdf>
- Reading and Book Buying Behaviour*. Retrieved from <http://www.pch.gc.ca/pgm/flc-cbf/publctn/rpt/104-eng.cfm>
- Richards, R., McGee, R., Williams, S. M., Welch, D., & Hancox, R. J. (2010). Adolescent screen time and attachment to parents and peers. *Archives of Pediatrics & Adolescent Medicine*, 164(3), 258-62.
- Ridley, M. (2009, March). Beyond Literacy: Are Reading and Writing Doomed? Paper presented at the Seattle, Washington. 210-213. Retrieved from <http://www.freedomtoread.org/ala/mgrps/divs/acrl/events/national/seattle/papers/210.pdf>
- Robert H'obbes' Zakon. (2010). *Hobbes' Internet Timeline*. <http://www.zakon.org/robert/internet/timeline>
- Roncevic, M. (2009). Oxford's Casper Grathwohl. *Library Journal*, 134(20), 58-59. Retrieved from <http://search.ebscohost.com>
- Rowlands, I., Nicholas, D., Williams, P., Huntington, P., & Fieldhouse, M. (2008). *The Google generation: the information behaviour of the researcher of the future* doi:10.1108/00012530810887953
- Rubinstein, J. S., Meyer, D. E., & Evans, J. E. (2001). Executive control of cognitive processes in task switching. *Journal of Experimental Psychology: Human Perception and Performance*, 27(4), 763-797. doi:10.1037/0096-1523.27.4.763

- Sacred, *a. and n.* (1989). *Oxford English Dictionary* (2nd ed.,) Oxford University Press. Retrieved from <http://dictionary.oed.com>
- Schmidt, S. (2009). Canadians pay dearly for cellphone usage. Retrieved from <http://www.canada.com/technology/Canadians+dearly+cellphone+usage/1881516/story.html>
- Scowen, P. (2010, April 9). How the iPad will deliver books from bondage. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/news/technology/personal-tech/apple/how-the-ipad-will-deliver-books-from-bondage/article1529087/>
- Seuss, Dr. (2008). *I can read with my eyes shut!*. New York, N.Y.: Random House.
- Shah, D. V., McLeod, J. M., & Yoon, S. (2001). Communication, Context, and Community: An Exploration of Print, Broadcast, and Internet Influences. *Communication Research*, 28(4), 464-506.
- Siegel, L. (2008). *Against the machine: being human in the age of the electronic mob*. New York: Spiegel & Grau.
- Small, G. W., Moody, T. D., Siddarth, P., & Bookheimer, S. Y. (2009). Your Brain on Google: Patterns of Cerebral Activation during Internet Searching. *The American Journal of Geriatric Psychiatry: Official Journal of the American Association for Geriatric Psychiatry*, 17(2), 116-126.
- Small, G. W., & Vorgan, G. (2008). *iBrain: surviving the technological alteration of the modern mind*. New York: Collins Living.
- Stieve, T., & Schoen, D. (2006). Undergraduate Students' Book Selection: A Study of Factors in the Decision-Making Process. *Journal of Academic Librarianship*, 32(6), 599-608.
- Tapscott, D. (2009). *Grown up digital: How the net generation is changing your world*. New York: McGraw-Hill.
- Tenner, E. (2006, March 26). Searching for Dummies. *The New York Times*. Retrieved from <http://www.nytimes.com/2006/03/26/opinion/26tenner.html>
- Tonkin, E. (2010). eBooks: Tipping or Vanishing Point? *Ariadne*, (62). Retrieved from <http://www.ariadne.ac.uk/issue62/tonkin>
- Uzanne, O. (1894). *The end of books*. <http://www.uiowa.edu/~obermann/endofbooks/index.html>
- Wästlund, E., Norlander, T., & Archer, T. (2008). The effect of page layout on mental workload: A dual-task experiment. *Computers in Human Behavior*, 24(3), 1229-1245. doi:DOI: 10.1016/j.chb.2007.05.001
- Watkins, K., Al-Samarrai, S., & Bella, N. e. a. (2010). *Reaching the marginalized: Summary* United Nations Educational, Scientific and Cultural Organization. Retrieved from <http://unesdoc.unesco.org/images/0018/001865/186525E.pdf>

- Weiler, A. (2005). Information-Seeking Behavior in Generation Y Students: Motivation, Critical Thinking, and Learning Theory. *Journal of Academic Librarianship*, 31(1), 46-53.
- Weinberg, N. (2006, August 30th). Google Enabling Free Downloads Of Old Books. Message posted to <http://google.blognewschannel.com/archives/2006/08/30/google-enabling-free-downloads-of-old-books>
- Weinreich, H., Obendorf, H., Herder, E., & Mayer, M. (2008). *Not Quite the Average: An Empirical Study of Web Use*
Retrieved from <http://delivery.acm.org/10.1145/1330000/1326566/a5-weinreich.pdf?key1=1326566&key2=5362312721&coll=ACM&dl=ACM&CFID=22427616&CFTOKEN=67770541>
- Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the Internet Increase, Decrease, or Supplement Social Capital? Social Networks, Participation, and Community Commitment. *American Behavioral Scientist*, 45, 436-455.
- Wente, M., & Paglia, C. (2010, April 30). A landscape of death in the humanities. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/news/national/a-landscape-of-death-in-the-humanities/article1553062>
- Willms, J. D. (1999). *Inequalities in Literacy Skills Among Youth in Canada and the United States* Statistics Canada. Retrieved from <http://www.servicecanada.gc.ca/eng/hip/lld/nls/Publications/D/inequ-d.pdf>
- Willms, J. D. (2003). Literacy proficiency of youth: evidence of converging socioeconomic gradients. *International Journal of Educational Research*, 39(3), 247-252.
doi:dx.doi.org/10.1016/j.ijer.2004.04.005
- Willms, J. D. (2004). *Variation in Literacy Skills Among Canadian Provinces: Findings from the OECD PISA* Statistics Canada. Retrieved from <http://www.statcan.gc.ca/pub/81-595-m/81-595-m2004012-eng.pdf>
- Willms, J. D., & Murray, T. S. (2007). *Gaining and Losing Literacy Skills Over the Lifecourse* Statistics Canada. Retrieved from <http://www.statcan.gc.ca/pub/89-552-m/89-552-m2007016-eng.pdf>
- Wise, K., Bolls, P. D., & Schaefer, S. R. (2008). Choosing and Reading Online News: How Available Choice Affects Cognitive Processing. *Journal of Broadcasting & Electronic Media*, 52(1), 69-85.
doi:10.1080/08838150701820858
- Wolf, M. (2009, November 21). Personal interview with Barry Cull.
- Wolf, M. (2008). *Proust and the squid: the story and science of the reading brain*. New York: Harper Perennial.
- Wortham, J. (2010, February 8). As Data Flows In, the Dollars Flow Out. *The New York Times*. Retrieved from <http://www.nytimes.com/2010/02/09/technology/09spend.html>

Yarkoni, T., Speer, N. K., Balota, D. A., McAvoy, M. P., & Zacks, J. M. (2008). Pictures of a thousand words: Investigating the neural mechanisms of reading with extremely rapid event-related fMRI. *NeuroImage*, 42(2), 973-987. doi:DOI: 10.1016/j.neuroimage.2008.04.258