Introduction

Reading is universally thought to be good for you and deep reading is thought to be even better. For scholarly purposes, reading tends to be measured in the very rough and ready terms of papers read or, increasingly, PDFs downloaded. Downloads are the metric by which satisfaction is attributed or performance calculated in the virtual space (they are a sign or surrogate for deep reading); and of course downloads are the means by which libraries determine whether they are getting value for money for their membership of Big Deals. They are therefore clearly pivotal in the world of scholarly production and communication. However, they are the culinary equivalent of the three-course meal and just as most people no longer eat that way, so, as the CIBER research discussed in this paper shows, they do not consume information like that anymore. Indeed, it is questionable whether they ever did. In the light of this, publishers need to revise the way they present, package, and charge for information and measure satisfaction.

Most studies of scholarly reading (e.g. Tenopir et al.[1]) are based on self-report methods and are consequently dependent on memory (partially overcome by using critical incident methodology[2]) and therefore are prone to error and exaggeration. After all, for academics, reading is a virility symbol; that is what they are supposed to do and nobody is going to admit to doing little of it. Also questions about

POINT OF VIEW

'Reading' in the digital environment

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ABSTRACT. *For ten years CIBER has been studying the logs of scholarly publishers, and what was clear from the very beginning was that scholars conducted very brief visits to websites and spent very little time reading when there, yet publishers envisaged they would dwell; and if not dwell, then at least deep read the PDF later. Yet CIBER's research points to the fact that 'lite' reading is in fact endemic: younger people prefer it anyway and older people are getting used to it for the speed and convenience it brings. PDFs are largely a means of archiving and collecting and are not the gold standard reading metric people think. User satisfaction comes not from a PDF but from the ability to deep dive into a site and snatch what you are interested as quickly as possible. Publishers are still not comfortable with that and this article helps explain why they have to be.*

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reading are always dogged by what people actually mean by reading. Thus researchers who were asked what they actually considered to be 'reading' for a recent CIBER RIN-funded study said that that this included everything from quickly skimming abstracts – and even searching a document just for images or tables – and the reading of the full-text of articles.[3]

So, allowing for their methodological weaknesses what do self-report studies actually tell us? The aforementioned RIN study asked researchers how much of the last 'important' article they had read and 40% said they had not read the whole article. On this evidence for reading we should not naturally assume deep reading or the consumption of a full-text article. This might well be the explanation why Tenopir and King's[4] annual surveys of faculty across the United States found that the number of readings has increased but that the time spent per reading has declined. Of course this also raises another methodological question: can people really remember how long they spent on the last article they read?

Deep log or digital footprint analysis, CIBER's methodology of

choice for investigating scholarly behaviour, gives a better understanding of how people consume information these days in the place they generally consume it (the Web). Deep log analysis furnishes robust evidence of what people actually *do* in the digital space and not what they *say* they did or *wished* they did. No problem of recollection here and it is also a non-intrusive methodology through which we can study behaviour in the anonymous and remote virtual space.

The millions of digital footprints scholars leave behind when visiting a website or using a digital information service, irrespective of what platform they use – mobile, laptop, or personal computers – tells us that scholarly behaviour, including reading, has fundamentally changed as a result of our migration to the virtual space. Or, alternatively, it tells us we never really new how we behaved before. Either way it amounts to the same thing. Ironically, the writing has been on the wall for many years but few publishers took time to read it: they are clinging on to the old, flawed paradigm.

The evidence on reading in the virtual environment

The really big 'shock' is that nobody appears to do much reading in the virtual space – or certainly not what is traditionally thought to be reading (digesting large amounts of text at a single sitting).[5] When CIBER first noticed this about a decade ago we thought there must be a mistake in our methods/data because web designers and content providers make much of the importance of being a destination site, site stickiness, and the need to encourage consumers to dwell in their websites. The way to achieve this was thought to build ever-deeper (and stickier) websites. However, it turns out that scholars were not going to play ball.

Web designers had wrongly assumed that users would carry over a form of behaviour (they believed) they had developed in the physical world (largely developed as a result of the shortage and restriction of supply) to the digital world, but nobody had bothered to look at the logs to see what was happening in practice. What also was overlooked was the transforming and liberating force of the digital transition, bringing with it massive and changing choice, and the fact that we knew very little about reading behaviour in the physical environment. By contrast, the logs disclose a great deal about how people 'read' in the virtual environment because they all leave their 'footprints' behind.

Logs tell us accurately, precisely, and conclusively that few people spend any significant amounts of time reading in the digital environment. Most website visits see only 1–3 pages viewed and at least half of all visitors never come back – they are promiscuous, preferring always to move on to something else. Typically, a few minutes is spent on a visit and 15 minutes is a very long time to stay in a site, which in the physical world – a library for instance – would not be long at all. If it is an article they are interested in, then they spend 3 or so minutes on it. Short articles have a much bigger chance of being viewed. If the article is long, however, the summary (abstracts are very popular) will only be read and/or it will be squirrelled away for a day when it will *not be read*; something CIBER calls digital osmosis – the act of downloading which somehow, painlessly and magically, transfers the contents of the article to the brain via the keyboard or mouse.

So, if scholars are not deep reading online, then maybe they are doing it offline, at a more convenient time and place, and in a more suitable form (e.g. on paper)? And of course this is partly true, but only partly. So how do we know that? Firstly, in the follow-up interviews to log studies we have conducted with scholars they tell us that at least half of the full-text articles they download they never read, they just keep them as insurance for a day when they might need them, and for reasons given earlier, this is likely to be an optimistic estimate. Secondly, we know from surveys conducted by media regulators like Ofcom in the UK[6] that people's work and leisure time is squeezed in today's pressure-cooker environment. People spend most of the day when they are not eating, sleeping, travelling, and socialising, on the computer, on the telephone, or watching the television; there is very little time left to read. Thirdly, and most importantly, because of time, convenience, and preference, much 'reading' is done online, happily in the case of young people and necessarily in the case of older people. With the advent of reading devices, like the iPad, there will be even more reading conducted online.

The explanations

There are a number of explanations for the characteristic behaviour described above and why it will become more widespread in the future.

The digital transition has resulted in scholars moving from a vertical to a horizontal information seeking and consuming model, a process that leads to them becoming viewers rather than readers

As a consequence of massive, expanding, and unparalleled consumer choice, being taken all over the digital space by search engines and by being constantly enjoined to click on one link or another, it comes as no surprise that people tend to view lots of things for very short periods

of time. In other words, they have moved from vertical to horizontal information seeking and reading. Their behaviour is variously described as bouncing, flicking, or skittering: they move rapidly along the digital surface, usually with frequent light contacts or changes of direction. Power browsing has replaced reading and, of course, it is the only thing you can do given the enormity of what is available (and consequent information overload), brought to you courtesy of Google. In today's digital environment navigating through titles, headings, contents pages, snippets, and abstracts at a huge rate of knots is a pleasurable experience and something which occasioned one publisher to comment – only partly jokingly – why not charge for abstracts and give away PDFs?

Articles are not that attractive to read anymore

The elephant in the room really; *the* reason that people would rather not mention. There has been a drop in the quality of articles as a result of big increases in their production; partly the result of India and China entering the scholarly publishing field big-time and partly the result of publishers expanding their portfolio because of the big financial returns to be had. The market is now saturated with second-rate articles, many lacking genuine interest or novelty and far too many duplicating research published elsewhere. Add in the fact that their contents and packaging are looking increasingly dated in the light of competition from social media tools, with their instant messaging opportunities, and it could be argued that, while they might still have a role for authors in terms of career development, articles are less appetising for readers. No surprise then that scholars spend very little time on many of them.

Interestingly, when this was raised at a recent APE conference[7] even the publishers in the audience, while plainly uncomfortable with what was being said, did not loudly dispute this.

The Web is a visual platform, like television in many respects, and reading from a laptop or PC is hardly a pleasurable experience

People probably go online to avoid reading, so it should be no surprise that they view rather than read. However, this could change. As a result of the rapid rise of tablet computers (iPads) and reading devices (Kindle) with their high-definition touchscreens, people could be drawn back to reading again, if they have not forgotten how to do it! iPads, an Apple product, in particular are seen as 'cool' among the young (an added incentive to read) and most people like the massive list of titles available and the freedom to navigate around which the digital world gives you. However, any benefits could be lost in the rush towards connecting to the Internet via the smartphone, a platform hardly ideal for reading – something that will be picked up later.

Multitasking is the norm

One of the prime reasons for the brevity of a visit or a read (view) is that most people multitask when online. While they are at their laptop or desktop they will keep a number of browser windows open, check their email, and might also be on their mobile phone checking their Twitter feed, and, just possibly, also listening to the radio or television as well. We do not seem to like to do any one thing for long; we would always rather do many things – it's more interesting.

Conditioned to accept fast information (as we have accepted fast food)

Scholars have been conditioned to communicate, disseminate, and digest quickly by email, text messaging, PowerPoint, Twitter, and mobile phones generally. In these circumstances long and disciplined reading is becoming a luxury, a thing of the past. Speed is the essence. The only unknown is how fast, abrupt, abbreviated, and cryptic it can really get? What Marshall McLuhan called 'the Gutenberg galaxy' – that universe of linear exposition, quiet contemplation, disciplined reading, and study – is imploding, and we do not know if what will replace it will be better or worse. But at least you can find the Wikipedia entry for 'Gutenberg galaxy' in 0.34 seconds.

E-books will increase the prevalence of 'lite' reading behaviour

The rise and rise of e-books[8] will see a migration of even more people into the digital world, people (the old, humanities scholars, and undergraduate students) who have been in the slow lane of the digital transition. Now that digital information-seeking highways (links) have been opened up within books and between books we shall see similar patterns of reading; everything seems to be conspiring against deep reading and making it easy to snatch small bites of information. In a recent JISC study CIBER found that there was very little extended reading of e-books; everyone was interested in snippets of information.[9]

Smartphones are going to take it all to another level

With the impending big switch from the use of static to mobile platforms to access the Internet – mobile platforms are forecasted to be the platform of choice by 2013[10] – big changes in information and reading

behaviour are bound to happen.[11] This is because Internet use via mobile phone offers a different user experience: information on the go, in the social space, from virtually anywhere and at any time, and on smaller devices which typically have less functionality than personal computers. The talking phone, iPhone 4S,[12] which enables you to use your voice to send messages, schedule meetings, make phone calls, and request information, is bound to take its toll of reading, perhaps even viewing.

The Google Generation[13]

Those born digital, and who have been conditioned since birth, are unsurprisingly the ones with the greatest appetite for fast information and skittering. The televised experiment CIBER undertook with the BBC[14] showed that the Google Generation were the quickest searchers, spending the least amount of time on a question – a fraction of the time spent by adults.[15] The knee-jerk 'digital natives' interpretation is that young people are whizzes at technology, and using the Web is as natural as breathing. However, by their own admission, they were the least confident about their answers. Their lack of confidence was explained by their behaviour – they viewed fewer pages and domains and undertook fewer searches in answering questions. It was as though the goal of the experiment was to get past the finishing line first, never mind whether you were carrying the baton (the answer) or not. Their search statements were much closer textually to the questions posed, making them, not just the fast food generation, but also the 'cut-and-paste' generation. Cut and pasting must represent the polar opposite of deep reading. As for multitasking, which anecdote has it that young

people excel at, yes they did a lot of multitasking, but not very well.

The young have been fast forwarded from a world where the focus was on knowing one big thing really well to a world where you need to know many things, but not very well. And they are presented with the cultural and scholarly relics or artefacts of a world they never saw. Irrespective of whether the clocks can be turned back (they cannot) there is still a need to consider whether the reading and viewing behaviour described in this paper among young scholars (and not so young scholars) represents a form of cultural or educational dumbing down, and, if so, can its worst effects be ameliorated – for instance, through information or digital literacy programmes? Certainly that is what most librarians believe, but publishers have been less forthcoming. Perhaps we cannot blame them though because coming up with a judgement is not that easy. Take the true story of one of the authors' daughters, a fully subscribed member of the Google Generation. While the author was working at home trying to understand the full implications of what was emerging from the logs – lots of skittering and bouncing – she was 'watching' television. Her idea of watching television, like millions of others, was to lie prone on the sofa and point the remote controller at the television and flick from channel to channel from the hundreds available to her. The author never watches television like that because he had been conditioned by having to press buttons (manually) to change channel, and only had four to choose from, so he did not have to do that very often. Irritated at what he saw as poor behaviour (and annoyed at himself for not understanding the logs) he said to her, 'Can't you make up your mind what you want to watch?' She replied,' Dad, I am watching it all.'

She then explained that when something got boring or repetitious she went to another channel and stayed with it until it too became boring and then would go back to see if the earlier programme had moved to something more interesting. This, of course, was exactly the behaviour that was being witnessed in the logs; they, and we, are watching it all.

So the million-dollar question for those that want to intervene is whether the author's behaviour is superior to that of his daughter? Well, again, the answer is not a simple or straightforward one as a CIBER web behaviour test conducted with the BBC[16] showed. Members of the general public (100,000 of them) who did the test were described as one of eight web animals according to their performance and it was found that there was quite a high degree of diversity in people's web behaviour and it was not all age related. The experiment showed that employers or professions who require deep and patient readers might be best adopting web profiling in their recruitment procedures, choosing a web hedgehog perhaps? Web hedgehogs are careful Internet users, taking their time to find the right information. They prefer to go it alone, rarely relying on social networks and are specialized web users, best suited to concentrating on one thing at a time. In contrast web foxes, like the author's daughter, are good at finding information quickly. They are highly social, maintaining complex relationships with the other members of their social group, often using social networks, or other sites whose content is created by its users, as sources of information. Web foxes are multitaskers, able to do several things at the same time. They like to know a little about a lot of things. Web foxes tend to be younger (16–24).[15]

The big issues for publishers

- The propensity to rush, rely on point-and-click, first-up-on-Google answers, along with an unwillingness to wrestle with uncertainties and an inability to read, digest, and evaluate information, keeps the young especially stuck on the surface of the 'information age'; not fully benefiting from the information society and being attached to the big, fat information pipe. Whose responsibility is this – teachers, librarians or publishers?

- Skittering on the scale it is currently being conducted (and likely to increase) is thought by commentators like Stephen Carr to be having negative consequences for some of our treasured fundamental skills.[17] The trouble is that people love skittering so much because the brain actually rewards them for finding information; but unfortunately not for reading what they find. Skittering is then potentially chipping away at the capacity to concentrate and contemplate which leads to reading problems. Who picks this tab up?

- There is much speculation that 'digital' is actually making us stupid – even damaging the brain. Neuroscientists tell us that the digital environment is changing the pattern of the connections in the brain – introducing new ones for new tasks and dispensing with old ones like the ability to concentrate, read long passages, etc. Because of plasticity of young people's brains, theirs change more quickly. Sounds like 'lite' reading behaviour is here to stay.

- Publishers are going to have to deal with the consequences that result from what is absent from increasing numbers of our digital users, especially the born digital – lack of a mental map, no sense of what a collection or index is; they tend to view fragments and disembodied text, and have a poor idea of determining what is good/relevant/the truth in a crowded and ever-changing digital information space. Publishers are guardians of knowledge and have a responsibility for its use, and so are clearly interested parties.

- The phenomenal rise of social media, especially among the young, is exacerbating the situation by reinforcing 'lite' reading, with people preferring to ask a friend rather than research or read something themselves. And, of course, that only works if someone in the community has read or researched themselves. This is a prime area where publishers could lose out by being decoupled from the community.

The writing has been on the wall for many years now about the diminution of deep or considered reading but we have been lulled into complacency by the sheer amount of 'activity' that is taking place in cyberspace. This has been mistakenly perceived as genuine use, high levels of reading and learning, when in fact a good deal of it involves looking for things and not finding them, finding things you do not want, finding second-rate things and just plain boredom (driving around in cyberspace).

It could, of course, be argued that 'skittering' is not a wholly new (digital) phenomenon. The virtual environment allows us to view information usage and seeking and, sometimes, the resulting outcomes, in detail and on an unbelievable scale. This is because every action of everyone who uses a website is recorded and so we can spot skittering. However, this was not the case in the physical information environment and we really did not have a very good grip on how people behaved. In the information vacuum in which we found ourselves, when someone took out a book or bought a paper, the assumption made was that they had read it all. So maybe we were living a lie and now we know the reality: we have always been – or wanted to be – 'skitterers'. And this is, indeed, the opinion of Harvard Professor Robert Darnton who said

> that this cover-to-cover deep reading shouldn't be exaggerated as something that occurred in the past. We have learned a lot about the history of reading . . . and one thing we have learned is that, for example, sixteenth-century humanists rarely read a book from cover to cover. They were reading what we today would call 'snippets', or even 'tweets'.[18]

Maybe then McLuhan's universe of linear exposition, quiet contemplation, disciplined reading, and study was an ideal which we all bought into and developed educational and information services and products around. The difference is, of course, that the opportunities for skittering are now legion and this has created ever more skittering and the pace is not letting up. It is whether this is all leading to major changes in the way we obtain and consume knowledge, particularly whether this constitutes a possible 'dumbing down', that concerns us most.

Of course we are not witnessing the death of reading – just the displacement and marginalisation of deep reading. What has risen in its place is a form of reading best characterized as power browsing or reading 'lite'.

Finally, the really big question for which we all want an answer – publishers perhaps more than most – is that given the probable hard wiring of the form of reading behaviour described in this paper, will the Google Generation turn out to be fundamentally different from older generations in their attitudes, expec-

tations, and behaviour when they become doctors, politicians, lawyers, and teachers? If so, what will be the impact on these professions – and the publishers that support them; after all some professions, jobs, and roles require deep and considered reading and publishers dish such readings up in millions. No one has the answer to this yet and to obtain the answer we shall have to conduct longitudinal studies; that is exactly what CIBER is doing.[19] Even when the findings become available it is unlikely that there will be a universal agreement as to what it means. After all, many people still believe in creationism despite all the accumulated evidence.

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