

Towards a post-digital humanities: cultural analytics and the computational turn to data-driven scholarship

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**TOWARDS A POST-DIGITAL HUMANITIES:
CULTURAL ANALYTICS
AND THE COMPUTATIONAL TURN TO DATA-DRIVEN SCHOLARSHIP**

PART 1: THE DIGITAL HUMANITIES AND THE COMPUTATIONAL TURN

As Mark Poster emphasized some time ago, one of the interesting things about computer science is that it was the first case where “a scientific field was established that focuses on a machine” and not on an aspect of nature or culture, as is the case with the physical, life and social sciences. More interesting still is the way Poster was able to demonstrate the relation to this machine in computer science is actually one of misrecognition, with the computer occupying “the position of the imaginary” and being “inscribed with transcendent status.” His argument was that “since Computer Science found its first identity through its relation to the computer, that identity remains part of the disciplinary protocol of the field, even if the actual object, the computer, changes significantly, even unrecognizably, in the course of the years” (Poster 1990, 147).¹ However, it is a misidentification on the part of computer science that also has significant implications for any response we might make to the so-called *computational turn* in the humanities (Berry 2012, 11; boyd and Crawford 2011).

The latter term has been adopted to refer to the process whereby techniques and methodologies drawn from computer science and related fields - including interactive information visualization, science visualization, image processing, geospatial representation, statistical data analysis, network analysis, and the mining, aggregation, management and manipulation of data - are used to create new ways of approaching and understanding texts in the humanities. Indeed, thanks to increases in computer processing power and its affordability over the last few years, along with the enormous amount of cultural material now available in digital form, number-crunching software is currently being applied to millions of humanities texts in this way.

It is not my intention here to equate this computational turn with the digital humanities *per se*. Although the latter is sometimes known as humanities computing, or as a transition between the “traditional humanities” and humanities computing (Meeks 2010), what has come to be called the digital humanities and this computational turn in the humanities should not be perceived as being equivalent to one another. Instead, I want to emphasize the importance of maintaining a distinction between them, especially if we are to develop a rigorous understanding of what the humanities can become in an era of networked digital information machines. So far (and as we shall see in Part II), the traffic in this computational turn has been predominately one-way. As the term implies, it has been *mainly* concerned with exploring what direct, practical uses computer science can be put to *in* the humanities, in terms of performing operations on sets, flows and networks of data so large that, in the words of the NEH *et al.* Digging Into Data Challenge, “they can be processed only using computing resources and computational methods” (2009). Witness Dan Cohen and Fred Gibbs’ text mining of “the 1,681,161 books that were published in English in the UK in the long nineteenth-century,” and Lev Manovich and the Software Studies Initiative’s use of “digital image analysis and new visualisation techniques” to study “20,000 pages of *Science* and *Popular Science* magazines” (D. Cohen 2010a; Manovich 2012a, 467). Just as interesting as what computer science has to offer the humanities, however, is the question of what the humanities - in both their *digital* and *traditional* guises (assuming the two can be distinguished in this way, which is by no means certain, as we shall see) - have to offer computer science; and, beyond that, what the humanities themselves can bring to the understanding of computing and the shaping of the digital. Do the humanities *really* need to draw quite so heavily on computer science to develop a sense of what they can be in the age of new media and big data? Together with a computational turn in the humanities, might we

not also benefit from more of a *humanities* - and, as I shall point to in my conclusion, perhaps even *post-humanities* - turn in our understanding of the computational and the digital?

Poster's argument about the relation to the machine in computer science being one of misrecognition takes on added importance in the light of such questions. It suggests that as a field computer science is not *necessarily* the best equipped to understand itself and its own founding object, let alone help those in the humanities with *their* relation to computing and the digital. In fact, counter-intuitive as it may seem, if what we are looking for is an appreciation of what the humanities can become in an era of networked digital information machines and data-driven scholarship, we may be better advised seeking assistance elsewhere, other than primarily with computing science and engineering, science and technology, or even science in general. One almost hesitates to suggest this in the current political climate when government, research council and private funding in the UK is focused on the STEM subjects (science, technology, engineering and mathematics) - although it may be important to do so for just this reason - but perhaps we should turn to the literary critics, philosophers and theorists of the humanities right from the start.

Thirty years ago the philosopher Jean-François Lyotard showed how science, lacking the resources to legitimate *itself* as true, had, since its beginnings with Plato, relied for its legitimacy on precisely the kind of knowledge it did not even consider to be knowledge: non-scientific narrative knowledge. Specifically, science legitimated itself by producing a discourse called philosophy. It was philosophy's role to generate a discourse of legitimation for science. Lyotard proceeded to define as *modern* any science that legitimated itself in this way by means of a metadiscourse that explicitly appealed to a grand narrative of some sort: the life of the spirit, the Enlightenment, progress, modernity, the emancipation of humanity,

the realisation of the Idea. What makes Lyotard's analysis so significant with respect to the emergence of the digital humanities and the computational turn is that his ambition was not to position philosophy as being able to tell us as much, if not more, about science than science itself could. It was rather to emphasize that, in a process of transformation that had been taking place since at least the end of the 1950s, such long-standing metanarratives of legitimation had themselves become obsolete. So what happens to science when the philosophical metanarratives that legitimate it are no longer credible? Lyotard's answer, at least in part, was that science (or a certain stabilized, ideologically "accepted" version of it) was increasing its connection to society, especially the instrumentality and functionality of society (as opposed to a notion of public service, say) (Lyotard 1986, 63).² Science was doing so by helping to legitimate and "augment" the power of States, companies and multinational corporations by optimizing the "global relationship between input and output," between what is put into the social system and what is got out of it, in order to get more from less (46, 11).

It is at this point that we return directly to the subject of computing. For Lyotard, writing in 1979, technological transformations in research and the transmission of acquired learning in the most highly developed societies, including the widespread use of computers and databases and the "miniaturization and commercialization of machines," were already in the process of exteriorizing knowledge in relation to the "knower" (4). He demonstrates how this general transformation and exteriorization is leading to a major alteration in the status and nature of knowledge: *away* from a concern with "the true, the just, or the beautiful, etc". (44), with ideals (48), with knowledge as an end in itself (5, 50); and precisely *toward* a concern with improving the social system's performance, its efficiency (xxiv). Thirty years later we do indeed find numerous discourses in the sciences taken up with exteriorizing knowledge and information in order to achieve "the best possible performance" by eliminating delays

and inefficiencies, and by solving technical problems (77). Thus we have John Houghton's 2009 study showing that the open access academic publishing model championed most vociferously in the sciences is actually the most cost effective mechanism for scholarly publishing. Others meanwhile have detailed the increases open access publishing and the related software make possible in the amount of research material that can be published, searched and stored, the number of people who can access it, the impact of that material, the range of its distribution, and the speed and ease of reporting and information retrieval – facilitating what one of the leaders of the open access movement has referred to as “better metrics” (Suber 2009). Even the data created in the course of scientific research is being made freely and openly available on the Internet for others to use, analyse and build upon. Known as Open Data, this initiative is motivated by more than an awareness data is the main research output in many fields. In the words of another of the leading advocates for open access, publishing data online on an open basis bestows it with a “vastly increased utility:” digital data sets are “easily passed around;” they are “more easily reused,” reanalysed and checked for accuracy and validity; and they contain more “opportunities for educational and commercial exploitation” (Swan 2009).

In a further move in this direction, all seven Public Library of Science (PLOS) open access journals now provide a broad range of article level metrics and indicators relating to usage data on an open basis. PLOS has positioned this programme as enabling science scholars to assess “research articles on their own merits rather than on the basis of the journal (and its impact factor) where the work happens to be published,” and they encourage readers to carry out their own analyses of this open data (Patterson 2009). Yet it is difficult not to see article-level metrics as also being part of the wider process of transforming knowledge and learning into “quantities of information;” quantities that are produced more to be exchanged, marketed

and sold – for example, by individual academics to their departments, institutions, funders and governments in the form of indicators of “quality” and “impact” - than for their “‘use-value’” (Lyotard 1986, 4, 5).

Certainly, the current requirement to have visibility, to show up in the metrics, to be measurable, encourages researchers to publish as much and as frequently as they can. Consequently, the peer-reviewed academic journal article has been positioned by some as having now assumed “a single central value, not that of bringing something new to the field but that of assessing the person’s research, with a view to hiring, promotion, funding, and, more and more, avoiding termination” (Kempf 2010). In such circumstances “it is not hard to visualize learning circulating along the same lines as money, instead of for its ‘educational’ value or political (administrative, diplomatic, military) importance” (Lyotard 1986, 6). Just as money has become a source of virtual value and speculation in the era of American-led neoliberal global finance capital, so too has education, research and publication.

Of course, such discourses around openness, efficiency and utility are not confined to the sciences – or even the university. There are also wider political initiatives, dubbed ‘Open Government’, with both the Labour and the Conservative/Liberal Democrat coalition administrations in the UK making a great display of freeing government information. The former implemented the Freedom of Information (FOI) Act in 2000. In January 2010 Labour also launched a website (www.data.gov.uk) expressly dedicated to the release of governmental data sets; a website the Conservative/Liberal Democrat coalition has continued to make extensive use of. So much so the latter established an Open Data Institute in 2012 expressly designed to build on the demand for open data.

Nor is this a phenomenon restricted to the UK: if anything the situation is even more extreme in the United States. Here, throughout his initial presidential election campaign Barack Obama repeatedly promised to make government more open. He followed this up by issuing a memorandum on transparency the very first day after he became President, committing to make openness one of ‘the touchstones of this presidency’” (Obama in Stolberg 2009). How much he has honoured this commitment is questionable, the Obama administration having since withdrawn the bulk of funding from the US open government website www.data.gov. Nevertheless, whereas in the UK a serving Secretary of State (Mo Mowlam) could conceal a malignant tumour from both the public and the Prime Minister, such is the emphasis on freedom of information in the US that knowledge of President Obama’s resting heart rate (56 beats a minute), blood pressure (105/62) and cholesterol level (54.mmol/litre) is publically available (Crippen 2010, 2).

From a liberal perspective, freeing publicly funded and acquired information and data – whether gathered directly in the process of census collection, or indirectly as part of other activities (crime, healthcare, transport, schools and accident statistics) – is indeed seen as helping society to perform more efficiently. Openness is said to play a key role in increasing citizen trust, participation and involvement in democracy, and in fact government, as access to information – such as that needed to intervene in public policy – is no longer restricted either to the state or to those corporations, institutions, organizations and individuals who have sufficient money and power to acquire it for themselves. But neoliberal conservatives also support making the data freely and openly available to businesses and the public on the grounds it provides a means of achieving what Lyotard referred to as the “best possible input/output equation” (46). Such openness and communicative transparency is perceived as

ensuring greater value for (taxpayers') money, helping to eliminate corruption, enabling costs to be distributed more effectively, and increasing not just choice, competitiveness and accountability, but enterprise, creativity and innovation too. Companies are able to build new businesses based on the use of public data, for example. In fact, McKinsey Global Institute suggests "analyzing large data sets—so-called big data—will become a key basis of competition, underpinning new waves of productivity growth, innovation, and consumer surplus" (2011).

To what extent do such developments cast the computational turn in the humanities in a rather different light to the celebratory data-fetishism that has dominated much of this rapidly emerging field? Is the direct, practical use of techniques and methodologies drawn from computer science and various fields related to it, including management, business and design, here too helping to produce a major alteration in the status and nature of knowledge?

In what seems to be almost the reverse of the situation we saw Lyotard describe, many of those in the humanities *do* now appear to be looking increasingly to science (*and* technology *and* mathematics) – if not always computer science specifically - to provide their research with a degree of legitimacy. This includes some of the field's most radical thinkers. Witness Franco "Bifo" Berardi's appeal to "the history of modern chemistry on the one hand, and the most recent cognitive theories on the other," for confirmation of the compositionist philosophical hypothesis: "There is no object, no existent, and no person: only aggregates, temporary atomic compositions, figures that the human eye perceives as stable but that are indeed mutational, transient, frayed and indefinable" (Berardi 2009, 121, 120). It is this hypothesis, derived from Democritus, that Bifo sees as underpinning the methods of both the schizoanalysis of Deleuze and Guattari and the Italian Autonomist Theory on which his own compositionist philosophy is based.

This *scientific turn* in the humanities *has* been attributed by some to a crisis of confidence brought about, if not by the lack of credibility of the humanities' metanarratives of legitimation exactly, then at least in part by the "imperious attitude" of the sciences. It is an attitude that has led the latter to colonize the humanists' space in the form of biomedicine, neuroscience, theories of cognition and so on (Kagan 2009, 227). From this perspective, the turn toward computing appears as just the latest manifestation of, and response to, this crisis of confidence in the humanities. Can we go even further, however, and ask: is it evidence that certain parts of the humanities are attempting to increase *their* connection to society;³ and to the efficiency, instrumentality and functionality of society especially? What are we to make of the fact that such a turn toward computing is gaining momentum at a time when the UK government is emphasizing the importance of the STEMs and withdrawing support and funding for the humanities? No doubt it would require a long, complex, multi-faceted analysis that goes some way back in history to answer this question. Still, one of the reasons all this is happening now may indeed be due to the fact that the humanities, like the sciences themselves, are under pressure from government, business, management, industry and increasingly the media to prove they provide value for money in instrumental, functional, performative terms. Can the interest in computing therefore be seen as a strategic decision on the part of some of those in the humanities? After all, one can get funding from the likes of Google (D. Cohen 2010a). In fact, in the summer of 2010 "Google awarded \$1 million to professors doing digital humanities research" (P. Cohen 2010).

At the very least, a question can be raised regarding the extent to which the take up of practical techniques and approaches from computing science is providing some areas of the humanities with a means of defending and refreshing themselves in an era of global economic

crisis and severe cuts to higher education, through the transformation of their knowledge and learning into (ideologically acceptable) quantities of information – deliverables. But the computational turn can also be positioned as an event created to justify such a move on the part of certain elements within the humanities (Frabetti 2010). In which case it might be advisable to use a different term than *digital humanities* if we do not wish to simply go along with the current movement *away* from what remains resistant to a general culture of measurement and calculation. For the idea of both the computational turn and the digital humanities seems to imply that, thanks to the development of a new generation of powerful computers and digital tools, the humanities have somehow *become* digital, or are in the process of *becoming* digital (Frabetti 2010). Yet one of the things I am attempting to show here by drawing on the thought of Lyotard and others is that the digital is not something that can now be *added to* the humanities - for the simple reason that the (supposedly pre-digital) humanities can be seen to have *already had* an understanding of, and engagement with, computing and the digital.

Certainly, something that is particularly noticeable about many instances of this turn to data-driven scholarship - especially after decades when the humanities have been heavily marked by a variety of critical theories: Marxist, psychoanalytic, post-colonialist, post-Marxist - is just how difficult they find it to understand computing and the digital as much *more* than tools, techniques and resources, and thus how naive and lacking in meaningful critique they often are (Higgen 2010; Liu 2012). Witness the emphasis on making the data not only visible but visual, even aesthetic. Stefanie Posavec's Literary Organism, which visualizes the structure of Part One of Jack Kerouac's *On the Road* as a tree, provides an oft cited example of this aestheticization of data (2013).

There is a long history of critical engagement within the humanities with ideas of the visual, the image, the spectacle, the spectator and so on: not just in critical theory, but also in literary studies, cultural studies, women's studies, queer studies, media studies, film and television studies. Such a history of critical engagement stretches back to Guy Debord's influential 1967 work, *The Society of the Spectacle*, and beyond. For instance, in his introduction to a 1995 book, *Visual Display: Culture Beyond Appearances*, Peter Wollen writes that an excess of visual display within culture has "the effect of concealing the truth of the society that produces it, providing the viewer with an unending stream of images that might best be understood, not simply detached from a real world of things, as Debord implied, but as effacing any trace of the symbolic, condemning the viewer to a world in which we can see everything but understand nothing—allowing us viewer-victims, in Debord's phrase, only 'a random choice of ephemera'" (1995, 9). It can come as something of a surprise, then, to discover that this humanities tradition in which ideas of the visual are engaged critically appears to have had comparatively little impact on much of the current enthusiasm for data visualization that is so prominent an aspect of the turn toward data-intensive scholarship.

Of course, this (at times explicit) repudiation of criticality could be viewed as part of what makes certain aspects of the digital humanities so intriguing at the moment. Exponents of the computational turn are endeavouring to avoid conforming to accepted (and often moralistic) conceptions of politics that have been decided in advance, including those that see it only in terms of power, ideology, race, ethnicity, gender, class, sexuality and so on. Refusing to "go through the motions of a critical avant-garde" (Latour 2004), they are responding to what is perceived as a fundamentally new cultural situation, and the challenge it represents to our traditional methods of studying culture, by avoiding such conventional gestures, and

experimenting with the development of fresh methods and approaches for the humanities instead.⁴

There may well be a degree of “relief in having escaped the culture wars of the 1980s” - for those in the United States especially - as a result of this move “into the space of methodological work” (Croxall, response to Higgen 2010) and what Tom Scheinfeldt dubs “the post-theoretical age” (P. Cohen 2010). The problem is, however, without such reflexive critical thinking and theories many of those whose work forms part of this computational turn find it difficult to articulate exactly what the point of what they are doing is, as Scheinfeldt readily acknowledges (Scheinfeldt 2010).

Interestingly, Scheinfeldt suggests that the problem of theory, or the lack of it, may actually be a matter of scale and timing:

It expects something of the scale of humanities scholarship which I’m not sure is true anymore: that a single scholar—nay, every scholar—working alone will, over the course of his or her lifetime ... make a fundamental theoretical advance to the field. Increasingly, this expectation is something peculiar to the humanities. ... it required the work of a generation of mathematicians and observational astronomers, gainfully employed, to enable the eventual “discovery” of Neptune... Since the scientific revolution, most theoretical advances play out over generations, not single careers. There is just too much lab work to be done and data to analyzed for each person to be pointed at the end point. (Scheinfeldt, 2012b)

Notice how theory is again being marginalized in favour of an emphasis on STEM, and the adoption of expectations and approaches associated with mathematicians and astronomers in particular.

None of this is to deny we should experiment with the new tools, methods and materials that digital media technologies create and make possible, including those drawn from computer science, in order to bring new forms of Foucauldian *dispositifs*, or what Bernard Stiegler refers to as *hypomnemata* (that is *mnemonics*) into play (2010, 167-168). Still, there is something intriguing about the way in which many defenders of the turn toward computational tools and methods in the humanities evoke a sense of time in relation to theory.

Take the argument – apparent in the emphasis Scheinfeldt places on scale and timing - that critical and self-reflexive theoretical questions about the use of digital tools and data-led methodologies should be deferred for the time being, lest they have the effect of strangling at birth what could turn out to be a very different form of humanities research before it has had a chance to properly take shape. Viewed in isolation, it can be difficult, if not impossible, to decide whether this particular kind of limitless postponement is serving as an alibi for a naive and rather superficial form of scholarship (Meeks 2010); or whether it is indeed acting as a responsible political or ethical opening to the (heterogeneity and incalculability of the) future, including the future of the humanities. After all, the suggestion is that now is *not the right time* to be making any such decision or judgement, since we cannot *yet* know how humanists will *eventually* come to use these tools and data, and thus what data-driven scholarship may or may not turn out to be capable of, critically, politically, theoretically.

This argument would be more convincing as a responsible political or ethical call to leave the question of the use of digital tools and data-led methodologies in the humanities open, however, if it were the only sense in which time was evoked in relation to theory in this context. Significantly, it is not. As we have seen, advocates for the computational turn do so in a number of other and often competing senses too:

- a) That the time *of* theory is over, in the sense a particular historical period or moment has now ended (for example, that of the culture wars of the 1980s);
- b) That the time *for* theory is over, in the sense it is now the time for methodology (Scheinfeldt 2012);
- c) That the time to return to theory, or for theory to (re-)emerge in some new, unpredictable form which represents a fundamental breakthrough or advance, although possibly on its way, has not arrived yet, and cannot necessarily be expected to do so for some time (given that “most theoretical advances play out over generations”) (Scheinfeldt, response to D. Cohen 2010a).

All of which gives a very different inflection to the view of theoretical critique as being at best inappropriate, and at worst harmful to data-driven scholarship. Even a brief glance at the history of theory’s reception in the English-speaking world is sometimes enough to reveal that those who announce its time has not yet come, or is already over, that theory is in decline or even dead, and that we now live in a post-theoretical world, are more often than not endeavouring to keep it at a temporal distance. Positioning their work as either pre- or post-theory in this way in effect grants them permission to continue with their preferred techniques and methodologies for studying culture relatively uncontested (rather than having to ask rigorous, critical and self-reflexive questions about their own practices and justifications for

them). Placed in this wider context, far from helping to keep the question concerning the use of digital tools and data-led methodologies in the humanities open, the rejection of critical-theoretical ideas as untimely can be seen as both moralizing and conservative.

In saying this I am reiterating an argument made by Wendy Brown in the sphere of political theory. Yet can a similar case not be made with regard to the computational turn in the humanities, to the effect that the “rebuff of critical theory as untimely provides the core matter for the affirmative case for it?”⁵ Theory is vital from this point of view, not for conforming to accepted conceptions of political critique that see it primarily in terms of power, ideology, race, ethnicity, gender, class, and so on, but “to contest the very sense of time invoked to declare critique untimely” (Brown 2005, 4).

PART 2: THE CULTURAL ANALYTICS OF LEV MANOVICH AND THE SOFTWARE STUDIES INITIATIVE

To think further and in more detail about the relation between data-driven scholarship, theory and critique, let us turn to what has frequently been positioned as one of the most interesting and influential examples of the computational turn: the Cultural Analytics of Lev Manovich and The Software Studies Initiative.⁶ For Manovich, it is not simply a matter of the widespread use of computers and databases exteriorizing knowledge in relation to the knower; given that in 2012 there were “2.2 billion email users worldwide... 634 million websites... 2.7 billion likes on Facebook every day,” it is a case of there now being so much cultural production in the twenty-first century *it can no longer be known by the knower* (Schroeder 2013). Manovich sees the sheer scale and dynamics of this new media landscape

as presenting the accepted means of studying culture, the kind of theories, concepts and methods appropriate to producing close readings of the content of a relatively small number of texts that were dominant for so much of the twentieth century, with a significant practical and conceptual challenge. In the past, “cultural theorists and historians could generate theories and histories based on small data sets:” American literature of the 1960s, for example, or the films of Alfred Hitchcock. “But how can we track ‘global digital cultures,’” he asks, “with their billions of cultural objects, and hundreds of millions of contributors?” (Manovich 2009a)

Manovich’s solution to this data deluge is to turn to the very computers, databases, software and vast amounts of born-digital networked cultural content that are creating the problem in the first place, and to use them to help develop new methods and approaches adequate to the task at hand. This is where Cultural Analytics comes into play. While scientists, businesses, and government agencies are using data analytics to extract not just figures from big data but also useful ideas for action, the “key idea of Cultural Analytics is the use of computers to automatically analyze cultural artefacts in visual media, extracting large numbers of features that characterize their structure and content” (Manovich, 2009c). And what is more to do so not just with regard to the culture of the past, but also with that of the present, including real-time data flows.

What makes Manovich and the Software Studies Initiative’s Cultural Analytics research so interesting is the way it is clearly striving to open the humanities to some of the new disciplines, frameworks and forms of knowledge digital media technologies may make possible:

What will happen when humanists start using interactive visualizations as a standard tool in their work, the way many scientists do already? If slides made possible art history, and if a movie projector and video recorder enabled film studies, what new cultural disciplines may emerge out of the use of interactive visualization and data analysis of large cultural data sets? (Manovich 2009/2012b)

And, to be sure, Cultural Analytics is able to demonstrate some of the things software tools and quantitative analysis can do in this respect, particularly when it comes to identifying patterns, relationships, trends, tendencies and structures in large sets of cultural data - or variations in, disruptions of, and exceptions to those patterns and trends. Information such as the colour “palettes of films as a whole,” “the individual or group aesthetic impression of what typifies the ‘essential’ character of a film and... which shots or scenes best correspond to that assessment,” and which can be visualized but not necessarily described in language (Douglass 2009). Interactive visualizations of this kind may even have the potential to open up new directions in the analysis of film in terms of patterns, rhythms, and dynamic flows that change over time. Still, “visualisation only shows patterns – it’s up to the researcher to interpret them as meaningful” (Manovich 2010a). Significantly, the role of actually interpreting such patterns as meaningful, let alone reflecting critically on the practice of doing so (how does the ascription of meaning to the underlying cultural patterns and relationships revealed by visualization avoid becoming some kind of twenty-first century new media formalism/structuralism?) is one Manovich frequently downplays, if not indeed marginalizes, from his accounts of Cultural Analytics, preferring to leave it to other researchers to fulfil at some unspecified point in the future. “What we need is to have as many people as possible start using these tools -- and then we will see what will emerge” (Manovich 2008). Consequently, what Cultural Analytics is *not* so clearly able to

demonstrate – at least not yet anyway – is precisely the kind of rigorous critical interpretation and self-reflection that might actually open up new directions in the analysis of cinema, say, and turn all this data and information into a *new argument or hypothesis about culture*. It is often difficult to get a sense of what the resulting cultural criticism *would* look like from Manovich’s descriptions of Cultural Analytics.

To raise this issue is not to imply some forms of quantitative literary and cultural analysis or cultural analytics *cannot* be used critically and self-reflexively to help explore and research the vast, networked nature of twenty-first century post-industrial society – and even creatively analyze and *resist* culturally dominant discourses, including some of those associated with openness, efficiency, instrumentality, transparency and so forth. A large part of the appeal of Manovich’s particular enactment of the turn toward computing and data-driven scholarship (and this is partly why I have chosen to focus on his account of Cultural Analytics) lies with the way he *does* continue to talk about asking “larger theoretical questions about cultures (as opposed to more narrow pragmatic questions” asked by professional fields associated with science, business and government) (Manovich, 2009a). Manovich acknowledges that, with Cultural Analytics, he wants to create tools “to enable new type [*sic*] of cultural criticism and analysis appropriate for the era of cultural globalization and user-generated media” (ibid.). So, contra boyd and Crawford’s (2011) characterization of many debates over big data, Manovich is not suggesting “other forms of analysis can be sidelined by production lines of numbers, privileged as having a direct line to raw knowledge,” and that consequently we give up on critique and on asking theoretical questions. Nevertheless, it is surprisingly hard to find actual instances where Manovich articulates in a rigorous fashion exactly how Cultural Analytics *can* be used to develop and perform such a new form of cultural criticism.

Take, as a very brief example - but one Manovich regularly refers to in talks and lectures, and which for all its brevity is nonetheless indicative of the general problem - his use of Cultural Analytics to study the history of art. What Manovich does in this respect is take a set of canonical images illustrative of the development of art over a particular period of time – from “mid-19th century, realism, through impressionism, post-impressionism, leading up to early 20th century geometric abstraction” – and automatically extract their different visual qualities by computer (Manovich 2009d). This then enables him to show how the resulting data, arranged into graphs, to all intents and purposes corresponds to the history of art as it is conventionally understood. So, as far as the pace of cultural change and revolution is concerned, “around 1870, things are going to get faster, as you have the development from realism to modernism. Then around 1905, the speed... increases quite dramatically” (ibid.). Yet how interesting is it that Cultural Analytics should more or less confirm the accepted history of art, rather than offer a significant challenge to that history, or even address it particularly critically (Shanken 2009)? And how surprising is it, given that the study is based on canonical images taken from that same history?

Far from enabling him to avoid having to answer the kinds of questions often associated with the close reading of a relatively small number of texts that were dominant for so much of the twentieth century, could Manovich’s Cultural Analytics approach to art history not here be said to be based on the assumption that such apparently untimely questions *have already been answered* - to the extent they now appear to be relatively unimportant and unproblematic issues, if not a given? To put things in what are merely the most obvious of terms: what is being understood and brought together as illustrative of the artistic canon? What is left outside: perhaps because it is not perceived as art, or as a canonical image, or because it does

not belong to this particular version of art history? How are all these selections and decisions being made? Who (or what) by? With what authority and legitimacy? (And this is before we address technical issues such as those concerned with how accurately the colours, tones and intensities of a variety of different paintings can be reproduced and compared on a digital screen, let alone across the HIperSpace display wall of 70x30 inch monitors Manovich uses [Manovich 2010b; Shanken, 2009].)

Even if Manovich is merely using art history as one of many examples to demonstrate what Cultural Analytics is potentially capable of with regard to broadening the “canon of cultural material under consideration by humanities scholars” and analyzing large sets of cultural data, now and in the future, a number of questions remain (Burdick et al 2012, 41). For instance, the Cultural Analytics page of the Software Studies Initiative’s website describes one of the key goals of Cultural Analytics research as being to “create much more inclusive cultural histories and analysis - ideally taking into account all available cultural objects created in particular cultural area and time period” (Manovich 2009/2012b). Yet what would *all* the available cultural objects created in a particular cultural area and time period be? What *theory* of the cultural object - or cultural area and time period, or indeed culture - is being used to underpin such research? And, again, what types of analysis and questions are being privileged? How are all these images and objects being structured for retrieval and analysis? What is being left out? (At the very least everything that cannot be so digitized and structured presumably?) And how do such (non)decisions affect the analysis?

For the most part, rather than taking the time to reflect rigorously on such questions and seriously engage with them, Manovich’s Cultural Analytics in effect abstracts the (large sets of) visual cultural objects it chooses to work with from the particular historical, social and

cultural contexts, practices and sets of relations associated with their production, mediation, interpretation and consumption (the law, politics, the market economy, and so forth), to focus primarily on the formal aspects of their contents and structure of composition (e.g. the color saturation of Time magazine covers). Cultural Analytics proceeds to treat these (large sets of) cultural objects and artefacts *as if* they constitute more or less identifiable, stable, self-identical, some might say *essentialist* forms, which can be analyzed automatically by using “image processing and computer vision techniques” in order “to generate numerical descriptions of their structure and content,” thus transforming these (sets of) cultural objects into data (Manovich, 2009a). This then allows the Cultural Analytics researcher to perform various “new” kinds of operations and procedures borrowed from computing science and software using these numerical descriptions, such as searching, sorting, copying, combining, comparing, correlating, visualizing, graphing, sharing and remixing. In doing so, however, Manovich’s Cultural Analytics takes too little account of the constitutive force of its own analysis: the way in which, just as critical theory tells us that the reader of a text is constituted as a subject in and by the very process of reading, so the (large sets of) objects of Cultural Analytics research do not exist outside of and prior to the analysis in any simple or straightforward sense, but are performatively constructed by it in the very process of being analysed, translated into data and operated on, regardless of whether this is done automatically or not. What can variously be understood in terms of the irreducible violence, ambiguity, fictionality or, following the philosopher and quantum physicist Karen Barad (2007), *intra-action* that is inherent to all analysis, interpretation and mediation, the implications of which the last five decades of critical theory have spent a good deal of time endeavouring to understand and think through: hence theory’s interest in writing, literature, *poesis* and so on.

Indeed, would it be going too far to suggest that, in his desire to develop what he refers to as “new paradigm for the study, teaching and public presentation” of cultural artefacts, Manovich has neglected to pay sufficient attention to taking on and assuming (rather than merely repeating and acting out), the implications of one of *the major insights* regarding language and technology acquired from twentieth-century theory (2009b)? It is a lesson the latter has been teaching us since at least the work of Heidegger in “The Question Concerning Technology” (though there are traces as far back as the “first mechanized philosopher” Nietzsche (Kittler 1999, 200), and the development of the typewriter); a lesson moreover by now well-known: namely, that it is not just we who speak and act through language and technology, it is also language and technology that speaks and acts through us in a process of co-constitution. What this means is that we need to ask questions about more than how we can control, search, find, access, order, structure, mine, map, visualize, graph, audit, interpret, analyse and assess vast amounts of cultural data through software tools and techniques and approaches drawn from computing science. We also need to devote great care and attention to asking questions about how these software tools and computational techniques and approaches are controlling, searching, finding, accessing, ordering, structuring, mining, mapping, visualizing, graphing, auditing, interpreting, analysing and assessing *through, around and as part of us*.⁷ And thus how they are involved in the process of constituting and organizing our culture and society - and with it our literary and cultural criticism as well as our sense of the humanities, humanists and the human - in the twenty-first century.

All of which points to a key problem with the attempt to shift from an interest in the kind of critical theories that dominated the humanities for so much of the twentieth century to an interest in tools, techniques and methodologies adapted from computer science and related fields. For if we do not explicitly *do* theory - because we either think we have left it behind or

relegated it to some as yet unspecified point in the future - we do not end up *not doing theory*. Every methodology contains theory. If we do not explicitly *do* theory, we end up doing simplistic and uninteresting theory that remains blind to the ways it acts as a relay for other forces, including those that are part of the general movement in contemporary society Lyotard associated with the widespread use of computers and databases and the exteriorization of knowledge. As we have seen, it is currently a movement *toward* STEM subjects and away from the humanities; *toward* a concern to transform knowledge and learning into quantities of information and to legitimate power by optimizing the social system's performance in instrumental, functional terms, and *away* from questions of what is just, right and true; and *toward* an emphasis on openness, efficiency and transparency and *away*, not just from a concern with public service, but also what is capable of disrupting and disturbing society and what, in remaining resistant to a culture of measurement and calculation, helps to maintain much needed elements of dissensus, dysfunction, ambiguity, conflict, unpredictability, inaccessibility and inefficiency.

In this respect there is a temptation to agree with those who have insisted Manovich's Cultural Analytics is "unconvincing" (Shanken, 2009). But could we go further? Could we say his data-driven cultural research functions as an alibi for an unthought-out and rather shallow form of humanities scholarship that has itself been colonized by, and "passionately" imitates, the concerns of scientists, businesses, and government agencies (Manovich 2010b)? In following "the templates established by the professionals" and marginalizing positions that go against this emphasis on instrumentality, does such scholarship constitute merely a "further stage in the development of [*sic*] 'culture industry' as analyzed by Theodor Adorno and Max Horkheimer" (ibid.)?

Certainly, as a result of his repeated failure to *be rigorously critical and self-reflexive*, think long and hard about the consequences of considering computers as analytical tools, and ask “larger theoretical questions” about contemporary culture and how to make decisions regarding what is just and right, it is often difficult to discern how Manovich is doing too much more in his Cultural Analytics research than augmenting the power and control of States, companies and multinational corporations by using computers and software to produce deliverables that can be marketed and sold, not least in exchange for funding. Yet one of the things that makes his Cultural Analytics so fascinating, as I read it, is the way it is clearly striving to open the humanities to some of the new disciplines, frameworks and forms of knowledge that digital media technologies may make possible. So let me conclude this attempt to use Cultural Analytics to think through some aspects of the relation between data-driven scholarship, theory and critique, by taking Manovich at his word and treating his stated interest in cultural criticism, theory and self-reflexivity seriously. To return to the question with which we began: what might the kind of twenty-first century literary and cultural criticism he points us toward - but which at the time of writing he himself apparently is as yet unable to enact - actually look like?

PART 3: LITERARY AND CULTURAL CRITICISM IN THE TWENTY-FIRST CENTURY

One starting point for speculating on these questions is provided by the artist, writer, theorist and fellow participant in the Software Studies Initiative, Eduardo Navas, when he claims that Cultural Analytics, as it is practiced by Manovich, “is bringing together qualitative and quantitative analysis for the interests of the humanities. In a way Cultural Analytics could be

seen as a bridge between specialized fields that in the past have not always communicated well” (2009). It is an interpretation that finds support from a recent account of some of “the promises and challenges of big social data” in which Manovich, displaying more signs of critical reflection than in much of his Cultural Analytics-related research, comes closest yet to articulating what form such a new cultural criticism might actually take. Here, the study of culture and society throughout the twentieth century is positioned as having relied on two very different kinds of data:

“surface data” about lots of people and “deep data” about the few individuals or small groups. The first approach was used in all disciplines that adapted quantitative methods (i.e., statistical, mathematical or computational techniques for analyzing data). The relevant fields include quantitative schools of sociology, economics, political science, communication studies, and marketing research.

The second approach was used in humanities fields such as literary studies, art history, film studies, and history... The examples of relevant methods are hermeneutics, participant observation, thick description, semiotics, and close reading. (Manovich 2012a, 461-462)

However, Manovich sees the rise of social media in the middle of the 2000s, along with computational tools able to handle extremely large data sets, as making possible a “new paradigm” based on a combination of “quantitative and qualitative approaches” (ibid., 472, 473). Consequently, no longer must we endeavour to chart a third path between these two approaches such as that represented for Manovich by statistics and sampling, enabling researchers as they do to “expand certain types of data about the few into the knowledge

about the many,” with all the problems attendant on such an expansion (462). Indeed, we do not have to “choose between data size and data depth” at all (462-463). Rather, ““surface is the new depth”” (472) in the sense that:

we can use computers to quickly explore massive visual data sets and then select the objects for closer manual analysis. While computer-assisted examination of massive cultural data sets typically reveals new patterns in this data which even best manual “close reading” would miss – and of course, even an army of humanists will not be able to carefully “close read” massive data sets in the first place – a human is still needed to make sense of these patterns. (468-469)

Encouraged by this line of argument, it is tempting to imagine all we need to do to resolve the situation facing literary and cultural criticism in the twenty-first century is find a means of marrying the quantitative methodologies and cultural analysis characteristic of Manovich’s research, along with the necessary “expertise in computer science, statistics, and data mining” he sees humanities researchers as typically lacking (470), with the kind of rigorous theoretical critique and self-reflexivity he maintains should *also* be a part of any Cultural Analytics study. We should proceed with care, however. For once embarked on this path, we are likely to find ourselves confronted by a variation on a problem I have detailed elsewhere (Hall, 2002): that it is not necessarily possible to enhance the performative theoretical interpretations that have long been a prominent feature of the humanities with the kind of positivistic, empirical methodologies and “tools of quantitative analysis often found in the hard sciences” (Navas 2009). It is not possible for the simple reason that these different approaches to culture and society do not ‘complement’ each other, as Cohen and Gibbs have it (D. Cohen 2010b), but rather remain incommensurable - not least because the dialectical

impulse to combine theoretical critique with empirical and quantitative analysis is itself a quite traditional one that theory has in many of its guises worked hard to challenge.⁸

To be clear, this incommensurability does not mean these “specialized fields” are incapable of communicating or interacting: only that they are not able to do so quite as smoothly and straightforwardly as Manovich and others imply. It means they cannot be married, merged or synthesized, for example (D. Cohen 2010a; Drucker 2012, 87; Navas 2009); that “human ability to understand and interpret – which computers can’t completely match yet - and computers’ ability to analyze massive data sets using algorithms we create,” cannot be *simply* combined (Manovich 2012a, 469). But what it also means is that any rigorous attempt to think these approaches together needs to begin by explicitly recognizing the incommensurable nature of their relation and thematizing it accordingly. We can thus see that far more time and care needs to be spent on how any such communication can be achieved between the respective partners in this impossible relationship than has been devoted to it so far.

This is where the lack of rigorous attention on Manovich’s part to some of the theories that dominated the humanities for much of the twentieth century is felt most keenly.

For certainly Marxism, post-Marxism, psychoanalysis and deconstruction are in their different ways *all* capable of providing a potential means, not of reconciling the kind of “deep,” close reading and self-reflexive theoretical critique that has been so important to the humanities with the “surface,” quantitative analysis and empirical methodologies more readily associated with the sciences and social sciences, but of producing a consciously developed theory of their incompatibility. Such a theory might even be capable of showing how they can both be practiced at the same time, as two incommensurable positions, in an

irresolvable yet productive tension, so that the questions, issues and approaches specific to each are capable of generating new findings, insights and realisations in the other - to the point where both of their identities are brought into question. For the process of developing such a theory would involve more than merely negotiating the difficult relationship between the two: co-switching emphasis and attention from one to the other and back again, as appropriate. It would *not* be a case of shifting the epistemological ground so that (in the words of some of those who have *also* been critical of the computational turn toward data-led methodologies and who have made a case for the continuing importance of the traditional humanities to the digital humanities), the humanities can push back culturally, as well as intellectually, “against the dominant models of a kind of quantitative and empirical approach,” and regain some of their confidence in what they do (Drucker 2010).⁹ Nor of performing quantitative statistical modelling and analysis in a less naïve and more sophisticated manner than has been carried out by many digital humanists to date, with more emphasis being placed on modelling conditions and probabilities than on counting things. Nor even of harnessing “digital toolkits in the service of the Humanities’ core methodological strengths: attention to complexity, medium specificity, historical context, analytical depth, critique and interpretation” (Schnapp and Presner 2011). Instead, the development of such a theory would require opening literary and cultural criticism to disciplines, frameworks and forms of knowledge that are neither close nor distant in their reading practices (Moretti 2000), methodological *nor* theoretical, quantitative *nor* qualitative, deep *nor* surface, digital *nor* traditional humanities - *nor* “humanistic,” *nor* “human,” for that matter (Burdick et al 2012, 135, 82).¹⁰ Rather, they would be, in the words of one twentieth-century commitment to theory, “*something else besides;*” something that challenges the conventional distinctions between them and, in so doing, “contests the terms and territories of both” (Bhabha 1994,

28). What we might perhaps *begin* to think of as being not just post-digital but post-*humanities* too.¹¹

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Endnotes

¹ Such misrecognition is not confined to computing science. As Jacques Derrida points out, that a given field cannot understand itself and its founding object because of the transcendent position occupied by that object is a "general structure" (2002, 109). Furthermore, and as I have shown elsewhere, it is a general structure that also applies to humanists and their understanding of the human (Hall 2012). If there is any privilege to be granted the humanities over computing science in this respect, it rests with the fact that, while the latter *has* reflected on its own status as a science and profession (Mahoney, 2011), the former have traditionally provided the means by which the university thinks both itself, and the identity and relationship of the different professional fields within it. It is a self-questioning role that has been assigned in the UK to English literature and elsewhere to philosophy.

² I say "in part" because interestingly, given what I argue below about incommensurability in the humanities, science for Lyotard is a "model of an 'open system'", in that its pragmatics also provide for "dissension", unpredictability and moves that disturb and destabilize the accepted consensus (1986, 61, 64). Hence his interest in chaos theory and fractal

mathematics, and the emphasis he places at the end of *The Postmodern Condition* on “differential or imaginative or paralogical activity” whose function is to point out “science’s presuppositions” and to persuade those involved to “accept different ones” (65). Paralogy, for Lyotard, is thus a form of legitimation “played in the pragmatics of knowledge” (61), admissible because it can “generate ideas” (65), but distinguishable from innovation on the basis the latter is “under the command of the system, or at least used by it to improve its efficiency” (61). As such, paralogy enables Lyotard to outline a politics that respects both the “desire for the unknown” (67), and “an idea and value of justice that is not linked to that of consensus” (66).

³ As Kirschenbaum writes: “Whatever else it might be then, the digital humanities today is about a scholarship (and a pedagogy) that is publicly visible in ways to which we are generally unaccustomed... Isn’t that something you want in your English department?” (2012, 9).

⁴ This is one explanation why many exponents of the computational turn appear to display such little awareness of the research of “critical media scholars (like Matthew Fuller, Wendy Chun, McKenzie Wark and many others) and hacker activists of the past decade; research that has shown again and again how these very formalisms [that is “the ‘quantitative’ formalisms of databases and programming”] are ‘qualitative,’ i.e. designed by human groups and shaped by cultural, economical and political interests through and through” (Cramer 2009). However, it also suggests that those who have called for the development of a more critically engaged digital humanities – informed by the discussions at *#transformDH: Transformative Digital Humanities: Doing Race, Ethnicity, Gender, Sexuality and Class in DH*, for example (<http://transformdh.org/>) – may be missing the point.

⁵ Lest this aspect of my analysis appear somewhat unfair, I should stress the ongoing discussion over how the digital humanities are to be defined and understood does feature a number of critics of the turn toward techniques and methodologies derived from computer science who have made a case for the continuing importance of the traditional, theoretically informed humanities. See, in their different ways, not just Higgin (2010) and Liu (2012), but also Drucker (2010; 2012) and Fitzpatrick (2010).

For an analysis that draws attention to some of the elements of misrecognition that are in turn to be found in such a traditional, theoretically informed humanism, see what follows, including my conclusion; and also Hall (2011).

⁶ Hayles positions Manovich’s cultural analytics as a “frontier of knowledge construction” in the humanities (2012, 77). Similarly, in a version of “Where is Cultural Criticism” presented at the 2011 MLA convention, Liu positions the Cultural Analytics of Lev Manovich and Jeremy Douglass as treating “digital materials on the scale of corpuses, databases, distributed repositories, and so on—some of the specialties of the digital humanities—[as] ipso facto cultural phenomena” in a manner much of the digital humanities could learn from (Liu 2011).

⁷ In other words, it is not just the objects of knowledge that the big data phenomenon and the social theory that goes with it are changing (boyd and Crawford 2011); it us as human subjects, too. For instance, would further investigation not be capable of revealing at least some aspects of data-driven research as falling into the category of biopolitics: “the

endeavour, begun in the eighteenth century, to rationalize the problems presented to governmental practice by the phenomena characteristic of a group of living human beings constituted as a population: health, sanitation, birthrate, longevity, race” (Foucault 1977, 73). After all, thanks to social media, “for the first time, we can follow imaginations, opinions, ideas, and feelings of hundreds of millions of people” (Manovich 2012a, 461).

⁸ Wendy Brown, Judith Butler and Jean-Laplanche, in a passage that was collaboratively written, albeit unintentionally so, put it this way: “Theory is not simply different from description; rather, it is incommensurate with description” (Brown, 2005, 80-81).

⁹ For a variation on this theme, see Lovink’s argument that:

Digital humanities, with its one-sided emphasis on data visualization, working with computer-illiterate humanities scholars as innocent victims, has so far made a bad start in this respect. We do not need more tools; what’s required are large research programs run by technologically informed theorists that finally put critical theory in the driver’s seat. The submissive attitude in the arts and humanities towards the hard sciences and industries needs to come to an end. (Lovink 2012)

¹⁰ For more on the misrecognition of the human in the humanities, see n.1 as well as Hall (2011; 2012).

¹¹ According to Cramer, the era of the “post-digital” has already begun. It is “an age where, on the one hand, ‘digital’ has become a meaningless attribute because almost all media are electronic and based on digital information processing; and where, on the other hand, younger generation media-critical artists rediscover analog information technology” (Cramer 2012).