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## Humanistic Data Research: An Encounter between Epistemic Traditions

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# 1. Humanistic Data Research

## An Encounter between Epistemic Traditions

*Eef Masson*

*The majority of information graphics [...] are shaped by the disciplines from which they have sprung: statistics, empirical sciences, and business. Can these languages serve humanistic fields where interpretation, ambiguity, inference, and qualitative judgment take priority over quantitative statements and presentations of 'facts'?*

– Johanna Drucker<sup>1</sup>

### Introduction

Humanities scholars, in many cases, do not seek to establish unassailable, objective truths. Unlike their colleagues in the natural sciences, historians, literary scholars or media scholars often do not proceed by measuring or testing observable phenomena in order to conclusively demonstrate tendencies or relations between them (although there are certainly some who do).<sup>2</sup> Instead, they approach their objects of study from interpretive and critical perspectives, acting in the assumption that in doing so they necessarily also preconstitute them. However, with the introduction of digital research tools, and tools for data research specifically, humanistic scholarship seems to get increasingly indebted to positivist traditions. For one, this is because those tools, more often than not, are borrowed from disciplines centred on the analysis of empirical, usually quantitative data. Inevitably, then, they incorporate the epistemic traditions they derive from.<sup>3</sup> Another reason

<sup>1</sup> Drucker 2014: 6–7.

<sup>2</sup> For evidence of the latter, see for instance Bod 2013, which traces empirical tendencies in humanities scholarship from Antiquity to the present. Bod argues that there is an ‘apparently unbroken strand in the humanities that can be identified as *the quest for patterns in humanistic material on the basis of methodical principles*’ (7) – a strand which, in his view, contemporary philosophy of the humanities tends to ignore (7, 10). Arguably, this pattern-seeking tendency is more central to some disciplines (for instance, linguistics) than to others (e.g. literary studies).

<sup>3</sup> Knorr Cetina provides an in-depth analysis of the operation of what she terms epistemic ‘cultures’ (1999). I prefer to use another noun here, because I consider much more basic conceptions as to how knowledge is or can be produced. (Knorr Cetina, indeed, is interested in the minute ontological and methodological differences between, very specifically, the natural

is that data research in the humanities is necessarily interdisciplinary: it involves collaborations between scholars with backgrounds in different fields – and therefore, different views on how knowledge takes shape.

Over the past decades, this encounter between scholarly traditions has led to a number of frictions. While some humanists have adopted digital tools in the hopes of making their results more verifiable, others have questioned the underlying assumptions, arguing that they threaten to undermine the very project of the humanities. By succumbing to the lure of scientism, those commentators fear, humanists run the risk of forgetting what they excel at – critical interpretation – and by the same token, of impoverishing their practice. At the same time, debates emerging from the encounter between research traditions have also engendered a series of profound developments in terms of how data research is performed.

In the past 20 years, the use of digital tools in humanities projects has become increasingly widespread.<sup>4</sup> In the early years, those tools were seen as mere aids: technical devices that could support the actual scholarly work, as performed by human researchers (Berry 2012: 3). At the time, the practice was most often referred to as ‘humanities computing’. In the late 1990s, the denominator ‘digital humanities’ became more common. According to N. Katherine Hayles, this change in name ‘was meant to signal that the field had emerged from the low-prestige status of a support device into a genuinely intellectual endeavour with its own professional practices, rigorous standards, and exciting theoretical explorations’ (2012: 43).<sup>5</sup>

Although generalizations on the topic are contested, many agree that this shift in function was accompanied by a series of transformations in the nature and focus of the scholarship conducted. Early adopters, in many cases, were interested in the computer’s capabilities for encoding, searching and retrieving large amounts of text, and for automating their analysis. Their research was focused predominantly on the detection of patterns and structures in an abundance of empirical data and geared towards

sciences; see pp. 3–4 of her introduction.) By using the term ‘traditions’ I seek to highlight the relation between attitudes towards data research, and assumptions and practices that long predate the use of computers in humanities scholarship.

4 The ‘origins’ of this practice are often traced to the 1940s, but the use of digital tools has grown more popular with the introduction of the World Wide Web (in the early 1990s). See for instance Hayles 2012: 42.

5 For a more profound analysis of the (then-recent) lexical shift from ‘humanities computing’ to ‘digital humanities’, see Svensson 2009. The author here examines ‘how [the field’s] naming is related to shifts in institutional, disciplinary, and social organization’ (n.p.). Matthew Kirschenbaum for his part has highlighted on several occasions the tactical impulse behind this change in name (e.g. Kirschenbaum 2012).

generating quantitative results (Evans & Rees 2012: 23; Hayles 2012: 43).<sup>6</sup> Towards the end of the last decade, projects with a qualitative slant also became more common, and practitioners increasingly sought to answer interpretive questions. In the 2009 version of their 'Digital Humanities Manifesto', Jeffrey Schnapp, Todd Presner and Peter Lunenfeld observe that digital humanists, at the time, not only began to tackle a broader range of research objects than previously – advancing from digitized printed text to media forms and practices in the widest sense, including born-digital ones – but harnessed 'digital toolkits in the service of the Humanities' core [...] strengths: attention to complexity, medium specificity, historical context, analytical depth, critique and interpretation' (2). Inevitably, this entailed an interest also in matters of methodology: practitioners increasingly engaged in reflection on the underpinnings of computational approaches, both technical and epistemological.

As these trends continue, the role of information technologies for humanities research is being thoroughly reimagined. Computers, software and data are increasingly seen as generative: they are taken to afford new forms of scholarship, centring on questions that so far have lain outside the scope of academic endeavours. By the same token, humanities research and digital methods or tools are more often thought of as inextricably intertwined. Leighton Evans and Sian Rees, in their contribution to the introductory volume *Understanding Digital Humanities* (2012), claim that we are currently beginning to see the emergence of a 'field influenced by computation as *a way of* accessing, interpreting, and reporting the world' (29; emphasis added). For David M. Berry, editor of the volume, 'computational technology has become the very condition of possibility required in order to think about many of the questions raised in the humanities today' (3). These days, the most ambitious of digital humanities practitioners see computation as an opportunity to profoundly transform cultural criticism, and humanities research more broadly.

6 Such research, of course, is still being conducted today. The following URLs provide access to some examples of recent projects in quantitative data research, in the fields of history, literary studies, and linguistics respectively: <http://www.herts.ac.uk/digital-history/cliodynamics-lab> (the webpage of the Cliodynamics Lab at the Digital History Research Centre of the University of Hertfordshire, UK; cliodynamics uses mathematical modeling techniques to study historical dynamics in the social, cultural, and/or economic domain); <http://novel-tm.ca/> (the website of NovelTM, a North-American inter-university initiative devoted to mining patterns in novels); <http://research.dbvis.de/text/research-areas/digital-humanities/linguistic/> (the webpage for the Linguistic Data Analysis research area of the Data Analysis and Visualization Group at the University of Konstanz, Germany).

In this chapter I discuss in an exploratory manner how, over the course of the past two decades, humanistic data research has served as the backdrop to an encounter between two sets of epistemic traditions – hermeneutic and empirical – that had previously wielded their influence in more or less distinct areas of academic practice.<sup>7</sup> First, I identify some of the sites for this encounter, touching successively upon the tools scholars work with, the methodological underpinnings for those tools, and practices of cross-disciplinary collaboration. Next, I consider the frictions this encounter entailed, zooming in on some major points of critique directed at practitioners (most of them, indeed, concerning the status of interpretation in data research). Finally, I briefly contemplate how this criticism eventually helped shape developments in the digital humanities at large (as briefly outlined above).<sup>8</sup> As I shall argue, efforts to set new agendas for digital research are motivated in part by a wish to reclaim some of the core tasks of humanists – tasks often seen as interpretive in nature – but also, in some cases, to bridge the gap between disparate epistemic traditions.<sup>9</sup> While this chapter considers the humanities more broadly, I take my examples primarily, though not exclusively, from the study of media, and in particular film (historical), research.

7 I should stress, here, that ‘areas of practice’ does not mean ‘disciplines’. Both traditions, indeed, co-exist within the same academic departments – although in those cases, they are often relevant to different groups of practitioners. Compare also Bod 2013: 351.

8 It might be useful to explicate here that the denominator ‘digital humanities’ is commonly used to refer to a broader category of practices than the ‘humanistic data research’ mentioned in my chapter title. For instance, the term is often also used by those involved in the creation or curation of online collections, or to refer to alternative (i.e. non-print) forms of knowledge production and dissemination. I shall use the terms alternately, depending on which category my claims are more relevant to.

The website of the Alliance of Digital Humanities Organizations (ADHO, an umbrella organisation for national and international associations of digital humanists) gives a useful overview of information on and resources for digital humanities research; see especially the sections ‘publications’ (<http://adho.org/publications>) and ‘resources’ (<http://adho.org/resources>, which lists key conferences and platforms, such as blogs). The City University of New York’s Digital Humanities Resource Guide ([http://commons.gc.cuny.edu/wiki/index.php/The\\_CUNY\\_Digital\\_Humanities\\_Resource\\_Guide](http://commons.gc.cuny.edu/wiki/index.php/The_CUNY_Digital_Humanities_Resource_Guide)) also references publications, events and tools, and provides links to leading centres for digital humanities research. The website of centerNet, a network of digital humanities centres, provides a more inclusive listing of research initiatives worldwide (<http://dhcenter.net.org/centers>).

9 Christian Gosvig Olesen’s chapter in this volume, which can be read as a companion piece to this text, demonstrates that in spite of such attempts, projects in humanistic data research still vary greatly in terms of how they deal with the empiricist underpinnings of the tools they work with.

## Tools, Methods, Cooperations

In the epigraph to this chapter, Johanna Drucker points out that tools for information visualization are inevitably indebted to the disciplines from which they derive. The same, one might add, applies to tools for data scraping, and for the cleaning, sorting or otherwise processing of collected data. For digital humanists, this is particularly relevant, as the tools they use are rarely purpose-produced (or if they are, then they tend to refashion tools that were designed to serve the needs of other disciplines). For example, the Cultural Analytics toolkit developed by Lev Manovich's Software Studies Initiative, featured in this book, includes among others the application ImagePlot. This tool is an extension of the open-source image-analysis program ImageJ (previously known as 'NIH Image') that was originally developed for use in medical research (among others for the viewing of tomography scans and X-rays, but later also in biological microscopy; see Schneider, Rasband & Eliceiri 2012). Other examples are software initially designed for use in the geosciences (mapping tools for instance), to perform statistical operations in the study of economics, or even, to serve as aids in the business and management sectors.

At the most basic level, the indebtedness Drucker speaks of can be understood as a set of built-in presuppositions about how knowledge is obtained. In this context, it is important to consider not only the assumptions of the practitioners for whom the tools were designed (in the above examples: health or geoscientists, or economists) but also those of the software engineers who conceived them. In their contribution to *Understanding Digital Humanities*, summarized in their chapter for this book, Bernhard Rieder and Theo Röhle point out that the 'digital helpers' humanists use 'rely on sets of assumptions, models, and strategies' that determine how 'units of analysis, algorithms, and visualisation procedures' are defined (2012: 70). These models and strategies derive in turn from such fields as statistics, information or computer science, or mathematics: disciplines that even the most experienced digital humanists can be only minimally familiar with. In the tools themselves, moreover, they necessarily take on a technical form, which means that they are not easily 'readable', *even* for experts (75-76). In spite of this, the conceptual underpinnings of one's methods and tools profoundly affect the results of the data processing done, and how these should be interpreted (see also Drucker 2012).

In the absence of readily legible clues as to their epistemic foundations, computational research tools are often assigned such values as reliability and transparency (Kitchin 2014: 130). As Rieder and Röhle observe, the

automated processing of empirical data that they enable seems to suggest a neutral perspective on reality, unaffected by human subjectivity (2012: 72). Drucker, a specialist in the history of graphics, makes a similar point, focusing more closely on practices of data visualization. She argues that the tools used for this purpose are often treated as if the representations they render provide direct access to 'what is'. This way, the distinction between scientific observation ('the act of creating a statistical, empirical, or subjective account or image') and the phenomena observed is being collapsed (Drucker 2014: 125; see also Drucker 2012: 86).

Considering the association of digital methods and tools with such profoundly positivist ideals, it is hardly surprising that initially, it was primarily humanists already inclined towards empirical work who elected to use them. Computational methods were attractive to them because these promised more reliable, accurate or 'scientific' answers to their research questions than they had previously been able to obtain. In his contribution to a volume on computation in literary studies, Stephen Ramsay detects such motivations in projects since the 1980s, and even earlier (2008). Recent examples from media studies that seem similarly inspired are film historian Yuri Tsivian's efforts to automate quantitative approaches to the analysis of silent film style (dealt with at some length in Christian Gosvig Olesen's chapter in this volume) or the work of such practitioners of New Cinema History as John Sedgwick, who attempts to measure the historical popularity of films (2009; 2011).<sup>10</sup> However, as the use of digital methods gets more pervasive, the promise of mechanically obtained objectivity and transparency seems to entice even those humanists who traditionally premised their scholarship on constructivist, rather than positivist, principles. As I discuss further on, this has provoked a good deal of criticism.<sup>11</sup>

Aside from the chosen methods and tools, cooperation is also an important factor in the encounter between epistemic traditions in humanistic data research. As many authors have argued, collaboration in digital projects between scholars in different fields is the rule rather than the exception (e.g. Hayles 2012: 51). One reason for this is that using digital tools, and in some cases also their development or fine-tuning, requires different sets of skills than most humanities researchers have. In addition, digital projects tend to be increasingly large-scale and take ever more complex forms; as such, they require a broad range of specialist (disciplinary) expertise. As Schnapp, Presner and Lunenfeld point out, such projects are about the building of

10 For an introduction to the concerns of New Cinema History, see Maltby 2011.

11 For a critique of the statistical analysis of film (style) specifically, see Gunning 2014.

'bigger pictures' (2009: 4) and therefore require combinations of perspectives, some of those not even humanistic at all. Regardless of the participants' motivation to succeed, this inevitably means that they have to negotiate the terms of their cooperation and, in particular, find ways to reconcile their disparate epistemic positions. Experience shows that even explicating those positions and communicating about them to others – whether these 'others' are software developers and computer scientists, or colleagues in other academic fields, in or outside the humanities – is not self-evident (e.g. Heftberger 2012: n.p.; Sculley & Pasanek 2008: 409-410; Van Zundert et al. 2012).

## Resistance and Critique

As they engage in data research, humanists not only have to explain their ways to collaborators with different scholarly backgrounds. Over the years, they have had to justify themselves also to colleagues in their own specialist fields. For as long as humanities scholars have made use of digital tools, they have met with critique from fellow practitioners. At its most fundamental, this critique stems from the perception that the projects conducted do not do justice to the critical-interpretive legacy of much humanities research.<sup>12</sup> Roughly speaking, critics here divide into two groups. On the one hand, there are the sceptics, who are convinced that there is nothing to gain from the use of digital tools in the disciplines they engage in. Usually, these commentators have not tried their hands at digital research themselves, but voice their apprehension in reaction to work done by peers.<sup>13</sup> On the other, there are those scholars who, although recognizing the potential of computational approaches for addressing humanities concerns, make a case for a more critical engagement with the tools, methods, questions and results that are used or obtained, and especially their positivist underpinnings. Some of them even argue for a radically different approach to data research: one that could ultimately meet the hermeneutic standards of much 'traditional' humanities work.

At least two sets of arguments, used by members of both groups, are relevant here. First, there is a concern that much data research practice today

<sup>12</sup> There are also other points of critique, which do not follow as directly from the friction between epistemic traditions discussed above. For example, some have argued that the proliferation of digital projects leads to an 'instrumentalization' of humanities (teaching and) research (e.g. Grusin 2014).

<sup>13</sup> A piece that exemplifies this position is literary critic and *New Republic* editor Adam Kirsch's contribution on the 'false promise' of the digital humanities (2014), which attests to a rather profound awareness of current debates on the topic.



does not involve the kind of interpretive intervention that the humanities are known for. Evans and Rees for instance wonder whether some practitioners might be getting caught in a logic of ‘abstracted empiricism’ (a term they borrow from sociologist Charles Wright Mills) ‘which focuses so minutely on macro data that it fails to refine meaning’ (2012: 29). The reasoning here is that researchers are so in awe of their data and visualizations that they ‘forget’ to also attribute meaning. Other critics react instead to the claim that digital scholars do not actually *need* to do this: that it is enough that they discover patterns (Hayles 2012: 51; Kitchin 2014: 131) as these already ‘show us what we would never have been aware of’ without our digital tools (Currie in Evans & Rees 2012: 21). For many, this assumption undermines the fundamental humanistic premise that knowledge gets produced in an encounter between a subject and his or her sources or data. To them, a kind of ‘post-human’ scholarship ‘in which human interpretation takes a back seat to algorithmic processes’ (Hayles 2012: 48) seems highly undesirable.

A second set of arguments in contrast relate to the observation that the results of data research are always, necessarily, a product of interpretation. The critique here centres on practitioners’ inability or unwillingness to recognize this, or to consider it in their process. As Hayles points out, interpretation inevitably comes into play – whether it is humans or machines who do the ‘reading’ of data. The reason is that it is the former who create programmes, use them, and in doing so, make sense of the results (Hayles 2012: 47). Drucker, speaking more specifically of information visualizations, takes this a step further, arguing that the very data we use are already infused with interpretation. Rendering information in graphical form, she claims, ‘gives it a simplicity and legibility that hides every aspect of the original interpretative framework on which the [...] data were constructed’ (2014: 128). Drucker’s point here is that data are always preconstituted, shaped by the parameters for their selection. Others have stressed that these parameters are never neutral, but construct the world as profoundly ideological (e.g. Posner 2015).<sup>14</sup> Therefore, we are well-advised to think of them not as *data* (given) but rather as *capta* (taken), ‘constructed as an interpretation of the phenomenal world’ rather than inherent to it (Drucker 2014: 128).<sup>15</sup>

14 Tara McPherson extends this argument to the computational systems – the technologies and their functionalities – that digital humanists work with (2012). See also McPherson in Jenkins 2015: n.p.

15 The term *capta*, as used in this way, is preferred also by Rob Kitchin (2014: 2), who in turn attributes it to one H.E. Jensen, writing in 1950. Alexander Galloway makes an argument similar to Drucker’s, however without using the term (2011: 87–88).

## New Agendas

Over time, such criticism has profoundly affected how data researchers have viewed their practices and responsibilities, and even more crucially, how they have approached their research. These days, more and more digital humanists find it mandatory to consider methodological and epistemic issues *as part of* the studies they conduct. Doing digital research, these scholars are convinced, requires explicit reflection on the status of one's data (how are they shaped by parameters for selection and how does this affect what one can learn from them?), one's methods and tools (which overt and covert assumptions about the world and how we know it do they incorporate, and how does this shape one's results?), and the interpretations one makes (how do they relate to calculation and representation; how do they tie in with the here and now; are alternative interpretations possible as well?). D. Sculley and Bradley Pasanek, in a piece on data mining and machine learning in the humanities, argue that these methods force us to 'trade in a close reading of the original text [a common pursuit in the traditional humanities] for something that looks like a close reading of experimental results' (2008: 417).<sup>16</sup> This requires in turn that we navigate the ambiguities and contradictions our softwares produce (*ibid.*).

Some authors however find such measures insufficient. Among others, they suggest that even those who stress the limitations of their methods or tools often concede in the process to what is ultimately a positivist ideal of establishing facts, even if they conceive of it as an unattainable one (e.g. Ramsay 2008). Instead, these commentators plead for a better integration of computational methods with the core activities of humanities research, so as to ultimately redeem its characteristic strengths. One way of doing this is to use the computer's calculation and visualization powers not to test preconceived hypotheses, but to probe data in an exploratory manner. Scholars in various fields have argued that one of the great merits of digital tools is their capacity for *ostranenie*: for 'making strange', or defamiliarizing us from, our objects of study – and by the same token, for calling into question our most profound assumptions about them (e.g. Ramsay 2008: n.p.; Schnapp, Presner & Lunenfeld 2009: 10; Manovich 2012: 276).<sup>17</sup> Embracing

<sup>16</sup> 'Machine learning', in this sentence, refers to the use of computational methods for making predictions on the basis of data.

<sup>17</sup> *Ostranenie* is a concept theorized among others by the Russian Formalist Victor Shklovsky. He used it to refer to the techniques writers deploy in transforming everyday into poetic language, in order to induce a heightened state of perception in their readers.

this potential requires that one uses one's tools not to solve existing scholarly problems, but to raise new questions, trigger new ideas, or as a prompt to try out alternative perspectives on the same objects (not necessarily with the help of digital tools).<sup>18</sup>

Another way of reconciling humanistic interests with the possibilities of computation is to exploit, as Daniel Chávez Heras puts it, software's affinity with 'notions of infinity, contingency or paradox' (2012: 10). The author draws inspiration here from Drucker's proposal for a 'speculative computing' (Drucker & Nowviskie 2004). Much digital humanities work today, Drucker argues, is premised on automation: the mechanistic application of set procedures, according to an unchanging logic. The problem with such procedures is that they inevitably restrict the user's interpretive options. In her view, humanists should invest instead in tools that enable 'augmentation' (a term by Douglas Engelbart): the extension of their intellectual and imaginative capabilities. The objective here is to bring forward in the research sequence acts of – active, openly performed – interpretative intervention. Rather than making do with tools that limit interpretation to a 'reading' of that which has already been sorted and measured (according to a set of often hidden parameters), humanities researchers should work towards a kind that could, for instance, integrate their own engagements with data into the calculations and representations performed or generated by computers. Of course, such an approach not only reclaims some of the characteristic strengths of humanities scholarship (at least, as perceived by the above-mentioned critics) and puts them centre stage, it also forces far-reaching transformations in terms of how this research is performed (in Drucker's case, for example, a shift from a text-based to a fundamentally visual *modus operandi*).<sup>19</sup>

18 Note however that this approach has also been criticized, most famously by the literary theorist Stanley Fish, in a blog post for the *New York Times* (2012) which he wrote partly in reaction to Stephen Ramsay's *Reading Machines* (2011). In this piece Fish attests to his preference for the sort of deductive approach – one that involves reasoning on the basis of a hypothesis – that Kitchin calls 'hegemonic within modern science' (132). The above pleas, in contrast, open the way for a more inductive approach, where the use of algorithms serves an exploratory purpose. For more on this topic, see also Scheinfeldt 2012 (which sees room in digital humanities research for both principles and procedures).

19 David J. Bodenhamer, in an article on the use of GIS technologies for historical research, imagines a similarly flexible kind of representation (multilayered and structurally open) but specifically for geospatial information. In his piece, he adds to Chávez Heras' and Drucker's arguments that it would also help (re)position scholarship, and the spatial humanities in particular, as a conversation or negotiation between (many) experts or contributors (2013: 10-12).

Demands for a more profoundly humanistic digital practice are countered by parties who see computational methods rather as an opportunity for a more comprehensive integration of the humanities and the sciences – and in some cases, even the arts and technology. Further integration is necessary, they argue, because it can help safeguard the humanities' central role in our contemporary society (e.g. Schnapp, Presner & Lunenfeld 2009: 11) or even ensure the continuity of scholarly practice as such (Lin 2012: 296). Although formulations vary, the observation is often made in this context that cooperation in digital projects should evolve from its current inter-disciplinarity to a more profound 'transdisciplinarity', which 'radicalises existing disciplinary norms and practices and allows researchers to go beyond their parent disciplines, using a shared conceptual framework that draws together concepts, theories, and approaches from various disciplines into something new that transcends them all' (*ibid.*: 298).

Inevitably, pleas such as these suggest that the situations their authors envision have not quite materialized in practice. Today still, the participants of projects in humanities data research relate in very different ways to the research traditions they encounter, either through their various collaborations or in the tools they use. (And, as Olesen's piece in this volume suggests, dissent on how data research should be conducted also occurs between scholars working in the same specialist fields.) Moreover, they attest to the fact that it is a lot easier to formulate requirements for a truly humanistic data research than to devise the methods and tools that meet them.

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