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Introduction

Multimodality takes as its point of departure the common-sense assumption that semiotic modes – types of resources for making meaning – are deployed and encountered in combinations. Thus, diverse genres, such as children’s storybooks, instruction manuals and print advertisements, typically combine the written word and pictorial images. The combining of ‘types of resources’ goes well beyond relations between text and image to encompass all potentially meaningful resources in a given instance of communication – font, colour, layout, gesture, facial expression and so on – not least because all modes, such as writing or speech (Kress and van Leeuwen 2001), rely on material substrates for their expression.

Fundamental though they may be, questions about what constitutes these modes – their internal organization and how their use might vary in different contexts – remain very much alive in multimodal research (see, e.g., Kress in Jewitt 2009, Bateman 2011). Moreover, and perhaps because of the acknowledgement of the significance of materiality, from the early days of multimodality scholars have taken a keen interest in its relationship with digitalness and the implications of this for our understanding of literacy (see, e.g., Cope and Kalantzis 2000). This interest in digitalness coincides with a growing acknowledgement of a need for scalable, empirical methods through which to approach multimodality (see Bateman 2008, Jewitt 2009, O’Halloran et al. 2016). Such scalable methods entail computational processing. Finally, multimodality is entering a phase of reflection on its identity as academic discipline (see, e.g., Wildfeuer et al. 2019).

This article seeks to bring these current core concerns of multimodality into dialogue with approaches identified with media archaeology (e.g. Parikka 2012, Ernst 2013). In order to construct this dialogue between the two literatures, I make extensive uses of quotations – though I have attempted to frame these such that my interpretation of their respective contributions is transparent. Essentially, I ask whether there is a complementary relationship between multimodality and media archaeology. Given my background in multimodality, it is perhaps inevitable that I am particularly conscious of what multimodality might learn from media archaeology. In this sense, I am primarily addressing the multimodal community of which I consider myself a member, though I hope the discussion is of interest to humanists engaged in digital methods more widely.

Given my specific interest in graphic communication, I also draw on work in information design (notably Bertin 2010, Waller 1987). My motivation here is that information design provides perspectives attuned to the visual aspects of meaning-making, which complement multimodality through their grounding in practice and specialist expertise. Moreover, as a community, information design combines artistic sensibilities and connoisseurship (Waller 2017) with what some have characterized as an engineering mind set (e.g. Drucker 2009) – and as such might be seen to exhibit a kind of disciplinary ambidexterity.

In recent years both multimodality and media archaeology have become buzzwords in academic discourse in the (digital) humanities – and, in each case, the label has been used rather loosely. Perhaps most conspicuously, multimodality refers both to a phenomenon, arguably an essential feature of communication, and a community of scholarship or emergent discipline, through which a variety of methodological approaches have been developed. Meanwhile, in his review of three major books on media archaeology, Natale (2012: 526) refers to ‘the impression that media archaeology should be regarded as quite a heterogeneous set of instruments and inspirations to be used by historians of media, rather than as a coherent theory about the development and history of media technologies.’ Similarly, in response to Anthony’s review of his book (2012: no page numbers), Parikka suggests: ‘If media archaeology sounds like an eclectic collection of ideas and methodologies then perhaps it is because it *is* an eclectic set’.

Despite or, perhaps better, through this heterogeneity, common themes and points of reference gain salience in both multimodality and media archaeology. Both make a commitment to go beyond (propositional) content analysis (see, e.g., Bateman 2008: 18-19; Ernst 2013: 104-105) towards serious engagement with questions of materiality, affordances, agency and behaviour (see, e.g., Kress & van Leeuwen 2001; Parikka 2012: 75, 88). More specifically, both communities are actively exploring the role of computation in our engagement with cultural artefacts and the potential for exploiting this in analysis. This article will explore such themes.

I begin by considering the development of multimodality in relation to the emphasis that media archaeologists, such as Parikka (2012), place on non-linear and parallel histories, the relativity of 'newness', and cyclical thinking. I will then move on to consider some of the respective conceptual undergirding of multimodality and media archaeology, focussing on key issues of materiality and media specificity, signs and signals, media convergence and commensurability. I argue that this juxtaposition brings fresh perspectives to the question of 'mode' (see, e.g. Parikka 2012: 35-36, 127; Ernst 2013: 71). Significantly, these are attuned both to social and formal considerations, but in ways that differ from both social semiotic orientations (e.g. Kress in Jewitt 2009) and Bateman's approach to multimodality (e.g. 2011). Having considered these fundamentals, I will turn to questions of interactivity, product and process, and the blurring of boundaries between categories such as reading and writing. As a final intersection, I bring the growing interest in integrating quantitative, corpus-based methods in multimodal analysis (Bateman 2008; Jewitt 2009, O'Halloran et al. 2016; Thomas 2019) into dialogue with the prioritization of the digital archive as a site of specific media archaeological interest (Parikka 2012) with inherent potential for algorithmic manipulation (Ernst 2013). I will conclude with some observations about the status of multimodality and media archaeology as communities and, more specifically, the potential for complementarity between them..

Progress, cycles and parallels

While it has drawn on diverse sources of disciplinary nutrition, the term itself having been borrowed and extended from the sense in which it had previously been used by psychologists of perception (van Leeuwen in Norris and Maier eds 2015: 22), multimodality crystallized around work inspired by Hallidayan linguistics (Halliday 1978). Van Leeuwen describes his own intellectual journey through structuralist semiotics to the 'breakthrough' which came when he encountered the Halliday's functionalism (van Leeuwen in Norris and Maier eds 2015: 19-20). In turn, Norris explains how her discovery of Kress and van Leeuwen's book enriched her interaction analysis, which had been founded on the sociological approaches of Erving Goffman and the ethnographic sociolinguistics of Ron Scollon (Norris in Norris and Maier eds 2015: 15). Bateman tracks the movement of systemic functional linguistics-informed natural language generation into multimodal territory (Bateman in Norris and Maier eds 2015: 25-27).

Given this heritage, it is not surprising that the emergence of multimodality, both as field of study and as cultural phenomenon, is often defined in relation to language. For example, in their seminal *Reading Images*, Kress and van Leeuwen talk of 'the move from the verbal to the visual' (1996: 21-33). More recently, Kress has characterized the rise of multimodality as an acknowledgement that "'Language" isn't a big enough receptacle for all the semiotic stuff we felt sure we could pour into it.' (Kress 2010: 15). Similarly, in Jewitt's words, 'multimodality approaches representation, communication and interaction as something more than language' (Jewitt in Jewitt 2009: 1).

There is a developmental, temporal aspect to such accounts – a sense of realization, progress, perhaps even a suggestion of inevitability. Bateman et al. talk of a 'multimodal turn', which is 'fast working its way through all disciplines and practices' (2017: 9–15). Moreover, we can distinguish the dynamism inherent in this turn from the eternal nature of the phenomenon itself: 'Multimodality also needs to be seen as always having been the norm. It is more the compartmentalism of historically more recent scientific method that has led to

very different disciplines, practices and theories for distinct forms of expression' (Bateman et al. 2017: 15). Bateman et al. go on to suggest that 'the omission of materiality' represents 'a particular historical stage in the study of communicative situations rather than any inherent lack in semiotics as such' (2017: 63). Multimodality is thus a response to the limitations of compartmentalism, with materiality a central concern.

It is perhaps a combination of novelty and universalism that has engendered forms of analysis which have attracted claims of 'linguistic imperialism' (see, e.g. Mitchell cited by Machin in Jewitt 2009: 189). Of course, within multimodality scholars have placed firm emphasis on the need to avoid imposing analytical methods from language on objects, such as pictures, which have very different organizational properties (see, e.g., Bateman 2014: 46). Moreover, beyond methodological tactics, multimodalists have emphasized the need for a cooperative model of disciplinary interaction, rather than 'one of replacement or colonisation' (Bateman et al. 2017: 21).

From a media archaeological perspective, Parikka (2012: 156) highlights the need to take seriously the (potential) contribution of multimodal practices to research:

In the same way that university curricula and ways of assessing students are slowly taking into account that verbal and written words are not the only modality of expression, and that one can do media critique through production (audiovisual, software- and network-based, performance, installation and so forth), there is an urgent need to promote the understanding of such practices in/as research.

This said, Parikka's approach – and that of media archaeology more broadly – is explicitly critical when it comes to the notion of progress. To take a handful of indicative examples, Parikka cites Bolter and Grusin's (1999) formulation that 'new media remediates old media' (2012:3), Marvin's (1998) point that 'old technologies had once been new' (2012: 11) and Gabrys' (2011) notion that 'dust is a more accurate marker of media technologies than the "accelerating speed of information"' (2012:166). Of course, we might add that obsolescence – and the gathering of 'dust' – is itself culturally specific and geographically uneven; for example, while it might have fallen out of use elsewhere, the fax remains in active use in Japan, as an efficient means of transmitting hand-written messages in the context of a writing system that does not favour keyboard-based input.

Crucially, Parikka makes clear that this foregrounding of the cyclical is no accident, but rather strategic; in the midst of a discussion of the work of media archaeologists Huhtamo and Zielinski, he states that: 'Thinking cyclically has been one media-archaeological strategy for critiquing the hegemony of the new' (Parikka 2012: 11). Thus, media archaeology offers readings of history which are cyclical and relative, rather than linear.

Indeed, this relativity is also present in the literature on multimodality – as suggested in Bateman et al.'s (2017) reference to 'more recent scientific method' cited above. Furthermore, close, practice-informed engagement with genre-specific examples make clear that 'progress' in document design is not linear, but a function of iterative, recursive developments in technology. As Waller (2012: 238) has it, 'When new technologies are developed for text, when we discuss it and analyze it, when we design systems to store and retrieve it, there is a consistent default assumption that text is little more than a linear string of words and sentences.'

Taking by way of illustration a series of plant guides, Waller (2012: 239) observes:

Viewing medieval manuscript books one is struck by their typically close integration of the visual and the verbal [...] But when Gutenberg developed moveable type, a side effect of his communication revolution was that the typically high integration of image and text

found in manuscript books was largely lost, only reappearing on a large scale with the invention of chromolithography and photo-engraving, and with the growth of mass literacy, newspapers and magazines. Printing had such an impact on the spread of knowledge, science, and education that the relative poverty of its graphic form could be overlooked [...] Something similar is happening, possibly temporarily, with the development of electronic publishing.

The rise of the printing press since the 15th century led to unforeseeable, subtle yet profound consequences. O'Halloran notes that printing favoured the Hindu-Arabic positional decimal number system and therefore 'contributed to the scientific revolution which used algebraic analytical methods to derive results' (2009: 103). The echo of this that perhaps resonates most strongly with the emergence of digital culture is picked up by the historian of print, Elizabeth Eisenstein:

The discarding of Roman numerals or rhymed verses in old French represented changes that cut across town-gown divisions and penetrated college halls. These changes were well reflected in the new printed materials turned out by applied mathematicians, whose books often served to advertise their instruments. Thus diverse textual traditions, previously transmitted by separate channels, were freely combined. [...] The new possibility of printing tables and maps led to practical compromises that violated philosophical dogma but produced genuinely useful paper tools. (1979: 531)

Here Eisenstein draws our attention to two parallel sets of developments: (1) societal, i.e. the blurring of 'town-gown' distinctions; (2) discursive, i.e. the integration of semiotic modes, such as tabular layout, and a new cohabiting of textual genres, generating promotional and informative hybrid text types, for example. That these should come together can be seen as illustrative of the close interrelation of genre and social action.

Eisenstein also highlights implications both for academic and commercial worlds:

Uniform mathematical symbols brought professors closer to reckon-masters. They did not separate academicians from artisans, although they did move scientists away from poets. [...] Higher mathematics was detached from the concerns of medieval natural philosophers, much as business arithmetic was taught without reference to moral or theological concerns. Both developments reflected the rapid expansion of a new knowledge industry after print. (Eisenstein 1979: 532)

Thus, profound structural change in social and economic terms followed the introduction of print. Such change might be seen to resonate in current debates around the internet of things, the effects of social media, and the ways in which the lines between what had been seen as distinct realms of modern life, such as work and leisure, are becoming blurred. We shall return to these themes below.

We might also discern curious reverberations on a more concrete level, for example in the exploitation of changes in the possibilities for the reproduction of images. In early printed Bibles the same woodcuts were used to represent scenes such as key births and battles interchangeably for scenes featuring different characters and narrative moments (Schapiro quoted in Bateman 2014: 34). In contemporary media – thanks largely to the affordances of digital reproduction and distribution – stock photographs are used interchangeably to depict generic scenes, rather than specific people. In a novel twist on the use of the generic to substitute for and appeal to the individual, one which reflects the logic of consumer choice, image banks such as Getty have recently sought consciously to break the constraints of stereotypes to portray gender identities and relations in more diverse and inclusive ways (Aiello and Woodhouse 2016).

Thus, once again though on a rather different scale to Waller's plant guides, we can identify cycles of social and semiotic practice in response to the affordances of (relatively) 'new' technologies of production and distribution.

In addition to cyclical thinking, historical parallels figure prominently in media archaeological writing. To take one example, Parikka (2012: 118) points to the contemporaneous emergence of the modern museum and the telegraph – and alludes to their respective roles in the colonialist enterprise. To take another example from closer to home – both temporally and in terms of the topic of this paper – the development which we might trace from Hallidayan approaches to language through social semiotics to multimodality is paralleled quite precisely in the development of humanities computing towards digital humanities. As the Text Encoding Initiative launched in 1987, Hodge and Kress published *Social Semiotics* in 1988. Both projects reach new stages of maturity in the mid-1990s, with the first version of TEI Guidelines (P3) being published in 1994 and Kress and van Leeuwen's *Reading Images* appearing in 1996.

This discussion of the historiographical practices of media archaeology has foregrounded the tendency of media technologies to develop in cycles, rather than through linear progress. I have identified traces of this cyclical development in textual artefacts, as well as in the social and cultural contexts, at higher levels of abstraction. Aside from the self-awareness that foregrounding such considerations might afford multimodality as an emerging discipline, such an orientation might also provide a way of negotiating the concurrence of universalism and historicism in the ways we think about multimodality as cultural phenomenon. Considering parallel developments pursues a second dimension through which to contextualize our observations within the broader ecology. In turn, this orientation is supportive of the cooperative interdisciplinary relationships called for above (see Bateman et al. 2017: 21). Now I will turn to intersections between media archaeology and multimodality that are conceptual in nature.

Materiality and media specificity

Within multimodality, the question of what constitutes a mode is a fundamental concern. In Bateman's words: 'The assumption of particular modes holding even prior to empirical investigation is one major reason why the vast majority of multimodal "analyses" still go little beyond detailed description' (2011: 18). Similar critiques are readily found elsewhere in the literature on multimodality, though they might foreground different issues, such as the descriptive nature of much of the work (e.g. Forceville 2007: 1236) or a lack of conceptual rigour in relation to the inner workings of particular modes (e.g. Machin in Jewitt 2009: 186).

Analogous assumptions are made, and questions raised, in relation to medium-specificity in media archaeology. For example, Parikka asks, 'is it the technology, some components of the technology (software that can be emulated, the platform which affords its aesthetics), the unfolding in use of – for instance – game systems, the social context, practice or what that defined the medium?' (Parikka 2012: 122).

Indeed, attention to the specificity of a particular medium is an important part of what distinguishes media archaeology from other forms of media studies:

Samuel Weber raises the question of a "distinctive specificity of the medium," in opposition to the content-determinism of current television analyses: "What we most often find are content-analyses, which could just as well apply to other media, for example, to film or to literature." (Ernst 2013: 104)

While, on the one hand, these comments would seem to corroborate Bateman et al.'s claim that 'disciplinary accounts' of communication often fail 'to separate out levels of representation sufficiently' (2017: 77), on

the other, this conception of media specificity resonates strongly with observations on genre and multimodality, such as this analysis of the difference between print and online news:

Making them “co-generic” with respect to their assumed identity as “newspapers” certainly tells us something useful about the reasons why the two documents contain information of similar kinds: i.e., “news”. [...] It does not, for example, give us a particularly accurate indication of the interpretative strategies the documents require of their readers. (Bateman, 2008: 179)

The interest in modes and media, in both media archaeology and multimodality, is underpinned by an engagement with materiality. Indeed both Ernst (2013: 40) and Bateman (2014: 24) directly cite Lessing’s 18th century distinction between spatial and temporal forms and the implications of this. Similarly, Kress (e.g. 2005: 12-13) emphasizes the different ‘logics’ of time and space. In particular, multimodalists have foregrounded Gibson’s notion of affordances, ‘the possibilities for action that (an object) opens up for an agent in an environment’ (Bateman et al. 2017: 90). As is characteristic of the literature in multimodality, the interest in materiality and affordances seems to stem from the realization that language is not ‘fully sufficient for all of human representation’ (Kress in Jewitt 2009: 58). More broadly, Bateman et al. observe that it is ‘precisely the material aspect of meaning making that is now playing an ever more important role in pushing disciplines beyond their original boundaries’ (2017: 89).

Media archaeology shares this interest in the specific affordances of particular media. As Ernst (2013: 104) asks, ‘has not the character of television shows after the introduction of color sets been determined decisively – indeed down to the clothes of the hosts – by the new standard and what it can do in terms of color and motion?’ We might further observe that, in black and white, football team strips were typically distinguished by pattern (e.g. of stripes) rather than by colour.

Other, cognate fields such as information design have elaborated the interaction of (material) functional constraints and genre cues. Waller (1999: 5) writes of ‘design imperatives that were at one time genuinely functional but which have now taken on a functionality of their own – to signal the genre of a document, and trigger appropriate expectations, interpretations and strategies among its users.’ Thus, the ‘default Bible’ remains ‘a leather-bound book printed on thin paper with gold edges and a two-column layout’ (Waller 1999: 7-8). This, again, disrupts any suggestion of linear progress, whilst also shedding light on more nuanced dynamics in the development of media artefacts.

Returning to Parikka’s notion of ‘unfolding in use’, while the human-computer interface might include a ‘grammar of meaningful actions’ (Manovich 2001: 69), it cannot simply be assumed that software tools will be maximally supportive of effective communicative choices or design decisions. In his preface to the 2010 edition of Bertin’s *Semiology*, Howard Wainer recalls:

I thought software would be built with sensible default options, so that when the software was set on maximal stupidity (ours not its), a reasonable graph would result. The software would force you to wring its metaphorical neck if you wanted to produce some horrible, pseudo 3-D, multicolored pie chart. (Bertin 2010: xi)

In other words, the default options are either too weakly suggested to the user or they are themselves unhelpful. From the point of view of an expert practitioner, the software is not supportive of good decision-making by the (lay) user. Moreover, such ‘default options’ have become more pervasive as software increasingly offers users a series of ready-made templates into which to incorporate their content, whether this be a WordPress website, a flyer created in Microsoft Word or a Facebook page.

In sum, then, media archaeology and multimodality share conceptual foundations which support their complementarity. While work such as that of Bateman and colleagues place greater emphasis on conceptual

specificity, both are fundamentally interested in the identification and exploration of particular levels of abstraction and representation of media objects. Both pay attention to the affordances of media – as both artefacts and their possibilities for interaction. I will return to the issue of interaction in greater detail below, as part of a broader discussion of digitalness. Both bring nuances to the common sense observation that the development of media objects is at once supported and constrained by technology, specifically in the sense of knowledge embedded in tools. Moreover, the analysis of media artefacts benefits from an understanding of how this operates in material terms. As observed previously in relation to Waller's (2012) plant guides, the emergence of new technologies does not inevitably lead to improvements in our ability to produce meaningful media objects. Where the multimodality and media archaeology do differ quite fundamentally is in the perspectives they offer on meaning and semiotics. However, again, I argue that this difference is complementary, rather than conflictual.

Signals and signs

Reflecting its founding principle that language is not all there is, multimodality takes an overtly inclusive approach to text; tending to see everything meaningful as text and all text as multimodal. Hence, Kress observes 'wherever meaning is the issue, the concepts of mode and multimodality are rapidly gaining significance' (2009, 54).

This said, it is important to note that, drawing a contrast to earlier semiotics, multimodality explicitly eschews the subjection of all 'text' to linguistic analysis. As Bateman et al. explain, 'it is necessary to revise "models of textuality" so that the notion of "text" is *not* limited to the ways of meaning making we find in language' (2017: 132). In this broadened conception, the common property 'shared by all of these communicative or signifying artefacts or actions' is that '*they are all structured in order to be interpreted*' (Bateman et al. 2017: 132).

A passage such as the following from van Leeuwen is illustrative of this inclusive approach:

Almost everything we do or make can be done or made in different ways and therefore allows, at least in principle, the articulation of different social and cultural meanings. Walking could be an example. We may think of it as non-semiotic behaviour, basic locomotion, something we have in common with other species. But there are many different ways of walking. [...] Through the way we walk, we express who we are, what we are doing, how we want others to relate to us, and so on. Different ways of walking can seduce, threaten, impress and much more. (van Leeuwen 2005: 4)

In other words, while certainly not discursive in a 'traditional' sense, and without drawing direct analogy with linguistic analysis, van Leeuwen is treating walking as a (potentially) semiotic act. In contrast, Ernst (2013: 45) makes clear that 'Media archaeology concentrates on the nondiscursive elements in dealing with the past'. Indeed, this can be seen as a more literal take on the materialism previously identified as an intersecting interest between multimodality and media archaeology. In a characteristic passage, Ernst (2013: 60) observes that:

The phonograph as a media artefact not only carries cultural meanings as do words and music but is at the same time an archive of cultural engineering by its very material fabrication – a kind of frozen media knowledge that, in a media-archaeological sense, is waiting to be unfrozen, liquefied. [...] The microphysical close reading of sound, where the materiality of the recording medium itself becomes poetical, dissolves any semantically meaningful archival unit into discrete blocks of signals.

Of course, we can ask questions about whether a given sound is 'structured in order to be interpreted'. To take an example from Bateman et al.:

whereas the scratches and clicks on an old vinyl music record might not have been intended and are the result of material limitations in methods of production and reproduction, it might also be the case that identically sounding scratches and clicks introduced on a purely digitally produced composition could well be intended, perhaps as a sign of simulated age or origin. (2017: 85)

However, media archaeology insists that a question may not require a semiotic response; that there are 'meanings' other than the semiotic. To return to van Leeuwen's example of walking, while a semiotic interpretation may be possible it may not be relevant, for example, if we are primarily interested in the geographic range of human locomotion. Again, in the interests of clarity, I am not suggesting that multimodality denies the validity of such questions, but rather that there might be something to be gained through taking seriously this perspective from a cognate discipline with a shared interest in objects.

Parikka (2012: 125) takes Ernst's observation perhaps further, emphasizing the 'agency of the machine':

technical media are themselves technological constellations that are able to store and process data in ways that are beyond our cultural analytical tools – an old phonograph captures much more than we can decipher semantically, and analysis through Fourier transformations and other mathematical tools reveals completely new layers of hitherto unperceived non-semantic data. Instead of the phenomenological approach to material – what we can see with our own eyes, and understand with our own ears – we rely on mathematical tools to decipher, analyse and calculate archives.

Thus, media archaeology takes interest in the very mechanistic essence of media.

Significantly, albeit more or less literally, the concepts of signal and noise figure in both multimodality and media archaeology – and, once again, information design can provide some interdisciplinary bridging. Parikka (2012: 95) draws on Shannon's 'well-known diagram of a general communication system':

Even though noise is seen as coming from the outside and invading the mediating powers of a communicative act, it still is diagrammed as an integral part of the system. Hence it is accorded a position within the diagrammatic framework instead of residing as pure noise outside the communication act. In this sense, conceptually, noise is a modality of modern communication systems that by definition deal with signals, not with signifying, meaningful signs.

While this is perhaps an area in which media archaeology might draw on multimodality in terms of theoretical refinement, it is worth giving some consideration to what the concept of noise might bring in terms of method. In a perhaps more metaphorical sense, Bateman (2008: 13) talks of the 'rather weak signal we are currently capable of receiving from the multimodal artefacts'. This said, there is a more literal intersection between the materiality of Ernst (2013: 47) when he writes that 'the photograph is an assemblage of optical signals' and Bertin's (2010: xiv-xv) conception of two-dimensional documents as combinations of x-y coordinates and 'variation in light energy' at each point.

Similarly, there is an interest in information design in distinguishing the purposeful, from the accidental or artefactual – which, akin to Shannon's 'noise', is seen as an intrinsic part of the communication. Thus Waller (1987: 179) distinguishes between the active decision to begin a new page and the arbitrary space left at the end of a section in 'a conventional book':

The use of a new page marks the writer's topic boundary and an access point for the reader, but is not constrained by the shape or size of the page. The amount of blank space remaining at the end of the previous chapter, however, is solely a function of the page size, and is therefore artefactual. Any attempt by the reader to interpret it as topically significant is erroneous.

I should also note that Waller's model has influenced multimodality significantly; his functional constraints informing the Genre and Multimodality (GeM) framework, in particular (see Bateman 2008; and Hiippala 2017 for a survey of subsequent work). More specifically, Delin et al. (2002: 56-57) elaborated Waller's (1987) artefact structure to articulate what they called 'canvas constraints'. This acts as an important brake on over-interpretation – helping to resolve questions not so much of 'what is a mode' as 'what is not a (semiotic) mode'. In the digital realm, traces of the artefact structure can be seen in algorithmic accidents – visible, for example, in the differing messages displayed on otherwise identical ticket vending machines (see Fig 1). Here, a semantic interpretation of discourse would be misplaced.

Fig. 1 Ticket machines displaying 'Out of Service' and 'Sorry. This Machine Is Out Of Service', respectively.

It is perhaps helpful to emphasize that the respective extent or delicacy of theoretical development in the fields of multimodality and media archaeology is not the primary issue here. I am more interested in what can be gained to considering the two orientations towards a shared object of study together. Multimodality – and especially that propounded by Bateman and colleagues – offers an empirically motivated and theoretically precise semiotics, with a stratified definition of mode (Bateman 2011). While careful to avoid analytical contamination from the linguistic realm, this nonetheless resonates with the stratified model of language propounded by Halliday (see, e.g., 1978). Part of the attraction of Halliday's model is that it allows us to account for meaning-making from the material (phonological) through the technical features (lexicogrammatical) to the cultural context and discourse world (semantic) within a single system. While analyses within this approach may prioritize one stratum over another, there is an inherent privileging of the higher levels of abstraction. Bateman et al. frame this nicely thus:

regardless of an artefact is static, or a performance is live and unscripted, or a participant is immersed within a designed environment, there is always the constellation of an interpreter who is interacting with these situations and engaging in abductive discourse hypotheses concerning their "meaning" or signification (2017: 222)

As we shall see in the next section, media archaeology turns this on its head, essentially de-privileging the human interpreter. In turn, this offers a perspective that differs radically from that of multimodality. It also affords an orientation which foregrounds the agency of the machine. I will return to questions of roles, activity and literacy below, but first let us consider some key implications of digitalness proper.

Digitalness, media convergence and commensurability

While the phenomenon of multimodality may be universal, its emergence as a field of enquiry parallels developments in computing, as has been noted earlier. Looking back to the mid-1990s, van Leeuwen notes that 'the integration of different modes which had already been common in the mass media [...] now had come within reach of every computer user' (in Norris and Maier eds 2015: 22). Whereas, writing at the time, Kress and van Leeuwen (1996: 39) proclaimed: 'The multimodality of written texts has, by and large, been ignored, whether in educational contexts, in linguistic theorizing or in popular common sense. Today, in the age of "multimedia", it can suddenly be perceived again.' Beyond this perception of multimodality, Bateman et al. (2017: 14) point to the relationship between multimedia and multimodal production: 'The prevalence of media convergence as a new norm for our everyday engagement with information is one supposed

consequence of the ease with which digital technologies allow very different forms of expression to be combined and distributed.'

From a social semiotic perspective, perhaps the most salient consequence of digitalness is the shift from expertise and specialization towards generalization and unification – in terms both of practical skills and textual analysis. Kress and van Leeuwen (2001: 2) illustrate this nicely:

In the past, and in many contexts still today, multimodal texts (such as films or newspapers) were organised as hierarchies of specialist modes integrated by an editing process. Moreover, they were produced in this way [...]

Today, however, in the age of digitisation, the different modes have technically become the same at some level of representation, and they can be operated by one multi-skilled person, using one interface, one mode of physical manipulation, so that he or she can ask, at every point: "Shall I express this with sound or music?", "Shall I say this visually or verbally?", and so on.

Here again, there is apparent confluence between Kress and van Leeuwen's 'technically the same' and Ernst's (2013: 84-85) observation that 'digital code renders commensurate texts, images, and signals.' However, Ernst (2013: 71) remains oriented towards the materiality of media and the agency of the machine:

Media-archaeological analysis, on the contrary, does not operate on the phenomenological multimedia level; instead it sees all so-called multimedia as radically digital, given that digital data processing is undermining the separation into the visual, auditive, textual and graphical channels that on the surface (interface) translate data to human senses.

Of course, this is not to say that Ernst (2013: 118-9) is unaware of human perception, simply that this is not his focus:

in digital space, the difference between the aesthetic regimes exists only for the human user, stimulating the audiovisual human senses under one surface. A close reading of the computer as medium, though, reveals that there is no multimedia in virtual space but just one medium, which calculates images, words, and sounds basically indifferently because it is able to emulate all other media. The term multimedia is a delusion.

Again, drawing on the specific materiality of the medium, and on the work of media theorist Friedrich Kittler, Parikka (2012: 35) distinguishes between digital and optical images:

Kittler (2001) argues for a perspective into the pixel-centred image that, despite its phenomenological qualities (i.e. how we perceive the image as image), is basically very different from other modes of visibility, and certainly from optics. Computer graphics is a two-dimensional coordinate space of pixel-neighbourhoods, where every pixel is a mixture of intensities of red, green and blue – the RGB colour model of three primary colours.

While the two accounts resonate with one another, Bertin's (2010) commitment to the graphic surface perhaps glosses over this distinction. Indeed, the distinction raises interesting questions about the relation of process to product – and our perception. As we saw above, Kress and van Leeuwen (2001: 2) address questions of production within their account. Bateman et al. also allude to the significance of physical processes of production in relation to embodied perception, taking as an example the forces involved in

Japanese calligraphy (2017: 120). The observations here surfaced in media archaeology deepen this specifically into the affordances of digital media. Seen in such terms, while they bring their own prioritization, media archaeological approaches seem to offer another way into the question of what is a mode. Furthermore, this is compatible with Bateman's approach, both to semiotic modes, which build on material substrates (2011), and genres, whose interpretative strategies are likewise media-specific as we saw in the discussion of newspapers referenced above (Bateman, 2008: 179).

Such media archaeological orientations also lead us to ask a slightly different set of questions about 'content' versus 'metadata', where the relationship is perhaps distinctive in digital materiality:

To paraphrase Kirschenbaum (2008: 12-13), an image consists of a pixelated bitmap, metadata of how it was created, a digital watermark perhaps, and other forms of details that one can view with different software functions (whether through the Show Header function, or through a 128-bit encryption key). Throw in considerations of the protocols, display settings and multiple platforms on which images unfold and you are approaching key questions of what the image is in software culture. (Parikka 2012: 127)

In sum, then, media archaeological approaches to materiality – and, specifically, digitalness – might help inform productive and critical orientations to key questions of mode in terms compatible with multimodality, albeit from complementary perspectives. In particular, they draw attention to the self-documenting quality of digital media, which we might exploit for analytical purposes in working with multimodal corpora.

Interactivity

Both multimodality and media archaeology identify interactivity as a key site for explorations of digitalness. Parikka (2012: 76) points to crucial features of early human-computer interface design, which 'opened up computing as a medium for lay human beings: not only for number crunching, but for symbol and graphic object manipulation, and hence meant for the eyes (graphic user interface screens) and hands (the keyboard, mouse) and encompassing complete ecologies of objects and processes'.

The interactive affordances of the then relatively new hypermedia generated considerable interest among prominent early multimodalists, as illustrated by Lemke (2002: 300):

Hypermodality is more than multimodality in just the way that hypertext is more than plain text. It is not simply that we juxtapose image, text, and sound; we design multiple interconnections among them, both potential and explicit. [...] Meaning on a time- and text-scale long compared to the typical scale of linked units (e.g. a paragraph or page) becomes a creation of the user/reader that is far less predictable to the designer than in the case of a printed book whose narrative or argument has a single conventional sequence.

While it would be easy to be carried away in Lemke's exuberance, other voices have nuanced the consequences of hypertext for interactivity. For example, Waller (2012:238) brings to bear the importance of genre and purpose:

Although the Internet is usually assumed to be the more interactive experience, the reader of the online version (of a newspaper) actually has the more linear experience at the page level, although readers can still look back and ahead within the story—and, of course, they have the huge benefit of being able to search electronically, and connect directly to intertextual references or citations.

This echoes the earlier observation from Bateman et al. (2006: 169) in their discussion of (contemporary, online) newspapers that ‘there is only one dimension of presentation available’ and once again points to the cyclical, or non-linear, relationship between the development of technology and media experience.

Lev Manovich paints with a broader brush, claiming that in ‘computer-based media, the concept of interactivity is tautology’ (2001: 55) and pointing to the interactivity that is readily found in ‘old’ media:

All classical, and even moreso (sic) modern, art is “interactive” in a number of ways. Ellipsis in literary narration, missing details of objects in visual art, and other representational “shortcuts” require the user to fill in missing information. Theater and painting also rely on techniques of staging and composition to orchestrate the viewer’s attention over time, requiring her to focus on different parts of the display. With sculpture and architecture, the viewer has to move her whole body to experience the spatial structure. (Manovich 2001: 56)

Ernst (2013: 120-1) makes characteristic reference to the interactive possibilities of earlier media as they emerged – and to the destabilizing effects and cyclical nature of technological change:

Another key element defining multimedia, namely, interaction, is an aspect Bertolt Brecht highlighted in the 1920s for the emerging medium radio, insisting that it could be used bidirectionally rather than being broadcast unilaterally. The unidirectional communication of books still dominated the user experience. The computer, through its possibilities for interactivity, “play,” and the creativity of hypertext, is now rapidly undoing that idealization of stability and returning us to a kind of textuality that may have more in common with the pre-print era.

While interactivity certainly was a feature of text and other media before the digital, Adami (2015: 137) points to key conceptual and experiential differences from a social semiotic perspective:

Actions afforded by printed media, such as turning the page or opening a book, are clearly analogous to the functions performed by hyperlinks in digital texts; however, in non-digital environments, these interactive options fall outside of what is considered as text, since, quite simply, they are not performed through signs. [...] Now an interactive site/sign for the posting of a comment not only signifies an invitation to do that (e.g. “to send a letter to the editor write to ...” in a printed periodical) but also embeds its performance.

One consequence of Adami’s perspective is that the digitalness of media challenges the distinction between text, context and (social) action, thus raising interesting questions, not least in terms of genre and the status of reading and writing, production and consumption, to which Lemke alluded above and to which we will now turn our gaze.

Writing as reading, reading as writing and mixing things up

Both multimodality and media archaeology, as well as cognate fields of information design and cultural theory, hold that the mediation of digital technology has radically destabilized traditionally understood roles, such as reader and writer, producer and consumer, expert and amateur. Manovich (2001: 79), for example, suggests there has been a key shift in terms of access: ‘in contrast to cinema where most “users” are able to understand cinematic language but not speak it (i.e. make films), all computer users can speak the language of the interface.’ This said, while computer users certainly have access to the interface, the effectiveness with which they can ‘speak its language’ remains moot.

Indeed, long before the emergence of multimodality as such, experts working in fields related to graphic design, such as cartography and typography, had drawn a distinction between possession of the means of production and the ability to make effective use of them. Bertin, for example, commented that electronics 'afford us increasingly powerful means of dealing with data. But at the same time they multiply the number of arbitrary choices without changing our natural means of perception in the slightest' (2010: xiv). He goes on to assert that 'graphics is learned, not inherited' (2010: xv). In terms compatible with Bertin's, Waller (2012: 248) has more recently pointed to the shift in terms of channels of communication and the distinction between access and proficiency, noting that 'digital channels are now open to all, but the skills required to communicate effectively are not universal.' While the concerns and interests of professionals are clearly articulated by practitioner-theorists such as Bertin and Waller, groups of differing status and expertise are now making use of the same techniques.

Moreover, and crucially, in what Parikka calls 'codec culture' what we produce is necessarily subject to further mediation, or conditioning, by machines, through its creation, storage and distribution: 'we are in a culture of coding and encoding colour intensities in a gridded pixel space, conditioned at a variety of levels from the image production software to capacities of screens, and in-between a whole plethora of protocols for compression and transmission' (Parikka 2012: 36).

Furthermore, as Manovich suggests, it is not simply that different kinds of users now have access to the same tools and techniques, we now make use of them across different aspects of our lives:

Today, the subject of the information society is engaged in even more activities in a typical day: inputting and analysing data, running simulations, searching the Internet, playing computer games, watching streaming video, listening to music online, trading stocks, and so on. Yet in performing all these different activities, the user in essence is always using the same few tools and commands: a computer screen and a mouse; a Web browser; a search engine; cut, paste, copy, delete, and find commands. (Manovich 2001: 65-66)

From a broader, sociological perspective, this blurring of boundaries and convergence in practice parallels aspects of Bauman's 'liquid' modernity, in which work and leisure come together as shopping (2000: 73-74). In Cronin's (2003: 19) words, 'although there are over 6,000 languages on the planet, there are only two systems of voltage, three railway gauges and one language for addressing air traffic control. Technology unites where culture separates.'

A further blurring of distinctions between production and consumption arises from the 'meaningful actions' (Manovich 2001: 69) supported by software interfaces or, in Kress' terms, the 'participatory affordances' (2010: 144) of current technologies. Input method editors for languages with non-alphabetic writing systems, such as Chinese, essentially transform writing into reading as users select characters (morphemes) from a menu of options. Even for alphabetic scripts, which are more amenable to keyboard input, predictive text input suggests a menu of words based on dictionaries and user history. In terms of mechanics, writing becomes reading.

In turn, this raises questions about roles in the communicative situation. It could be argued that the writer is moving towards the role of reader, interacting with a mutable ergodic text (cf. Bateman et al. 2017: 105-109), which is evolving through private dialogue with an algorithmic mediator. Alternatively, the role of the writer may be seen as retaining more traditional agency, though the repertoire of signs from which they must select is made visible and constrains the scope of possible action.

The essential modularity and manipulability of digital media (Manovich 2001) affords selection and reproduction with an ease and absence of cost unthinkable even in the mechanical age, leading to a further

shift in focus for questions around creation, provenance and, in Benjamin's sense, authenticity (1973). Indeed, in Kress's (2010: 24) view, "In downloading, 'mixing', cutting and pasting, mashing, 'sampling', re-contextualization, questions such as 'where did this come from, who is the original/originating author' seem not the issue they once had been."

Consequences of this shift can be seen in the value ascribed to content curation in social media – and more broadly in the rise of *curationism* as a 'dominant way of thinking and being' (Balzer 2014: 9) in popular-consumerist culture. Conversely, as Parikka (2012: 145) has noted, 'what were traditionally seen as art methods are part of everyday creativity in post-Fordist cultures where a lot of avant-garde art discourses and views have been adopted in how we work and perceive labour'.

Indeed, as writing becomes reading, on some level at least, reading becomes writing. From a media archaeological perspective which foregrounds the processual, Ernst (2013: 121) points out that 'in multimedia space, [...] the act of reading, that is, the act of re-activating the archive, can be dynamically coupled with feedback.' Similarly, Parikka (2012: 129) cites Thibodeau (2002) in noting that: 'any retrieval is always, in a computer and software environment, a processing of that object and introduces dynamics and change.'

The archive and the corpus

Recent years have seen growing interest in integrating quantitative, corpus-based methods in multimodal analyses (Bateman 2008; Jewitt 2009, O'Halloran et al. 2016; Thomas 2019). This turn might itself be seen in cyclical or recursive terms, in relation to developments in linguistic analysis (see Fig. 2). The growing awareness, since the 1960s, of the value of attested data for our understanding of linguistic systems led, by the 1990s, to the collation of large corpora of language in use. The ground-breaking work of Kress and van Leeuwen (e.g. 1996) again drew general inferences from individual, hand-selected examples (see, e.g. Thomas 2014, for a critique) and, once again, there are now renewed calls for more robustly empirical approaches.

Fig. 2 Development of linguistic and multimodal analysis in relation to evidence.

Here media archaeology offers specific insights of particular interest to multimodality. Firstly, the archive is seen 'as a central concept for digital culture' (Parikka 2012: 160). Moreover, the archive is accorded privileged status in methodological terms:

Media archaeology starts with the archive – the implicit starting point for so much historical research that it itself, as a place and a media form, has been neglected, become almost invisible. This is the fate of media that become too effective in what they do. They vanish from view, do their job of mediating, and leave the illusion that all there is is content passing through the channels. (Parikka 2012: 113)

In terms both of fields of interest and historical echoes, Parikka's observation here about mediation vanishing resonates with Beatrice Warde's (1932 / 1999) crystal goblet as a metaphor for typography, and Lawrence Venuti's (1995) thesis on the invisibility of the translator.

In parallel, multimodalist scholars have also recently given explicit focus to the nature of archives and corpora. As Bateman et al. (2016: 131) have it, 'the division between archives, databases and corpora is fast becoming one of disciplinary access and research methods rather than reflecting technical distinctions. But these differences in disciplinary usage can readily become misaligned with the functionalities that are actually required of the systems so described.' In other words, the different naming of things itself masks their similarity, but a nuanced understanding is needed of the fit between technical functionality, or

affordance, and research methods. Moreover, in a sense that echoes Ochs (1979), it is crucial to recognise that the kind of interrogation that can be performed is a function of the form in which data is represented.

Media archaeology places specific emphasis on the affordances of the digital archive and the specifics of its materiality. In common with Bateman et al. (2016), media archaeologists suggest that digitalness makes the parallel between the archive and the corpus closer. Indeed, the way they describe the 'archive' perhaps resonates more strongly with how multimodalists conceive of the 'corpus'. Thus, Parikka (2012: 123) cites Ernst in arguing that, 'the algorithmic searchability of archives transforms them to an instance of real-time computing, which underlines that, instead of being collections of objects in the traditional sense, "net archives are a function of their software and transmission protocols rather than of content"' (2009b: 85). Moreover, Ernst points to specific opportunities for multimodal research, 'the digital commensurability of text, image, and sound means that the digital archive (as a component of operatively linked electronic data networks) is accessible to mathematical operations down to the last detail – with prodigious consequences compared to the hitherto static, classificatory concept of the archive' (Ernst 2013: 92).

Fundamentally, this orientation embraces the dynamism of the digital through its commitment to the material. This move away from the 'classificatory concept' resonates with the GeM conception of genre. As Delin et al. (2002: 55) explain: 'Modelling genres as single entities [...] will not capture their interrelationships, and will always be slightly out of date.' Rather, Delin and colleagues prefer to see genres as 'sets of interrelating parameters, and the resulting framework as a "space" of possibilities for realisation [...] As such, they are not only able to 'explore the relationships between existing genres, but hypothesise [...] "genre-bending" examples of document genres that don't currently exist, but which easily might' (Delin et al. 2002: 55). As an aside, this in turn resonates with what Parikka identifies as 'one of the key driving ideas that feeds into media archaeology', i.e. that 'it could have been otherwise' (Parikka 2012: 13).

This openness to the possible, or indeed the imagined, combines, on the one hand, with a commitment to empirical rigour, certainly in the multimodality of Bateman, Delin and colleagues, and, on the other, with a foregrounding of what Ernst (2013: 45) has called 'the agency of the machine.' As Ernst (2013: 58) has it, 'media are not only objects but also subjects ("authors") of media archaeology.'

In multimodality, as with the linguistic analysis which preceded it, data representation has often entailed forms of transcription and annotation. Certainly since Elinor Ochs' seminal 1979 paper, the problem of selectivity has been a regular feature of the literature: 'the problems of selective observation are not eliminated with the use of recording equipment. They are simply delayed until the moment at which the researcher sits down to transcribe the material from the audio- or videotape' (Ochs 1979, 44). Thomas (2014: 164) developed the semi-automated implementation of multimodal annotations, in part as an attempt to mitigate the influence of subjective perception, 'by delaying interpretation insofar as possible until it becomes unavoidable.'

Ernst invokes the notion of the 'cold gaze' (2013: 25, and throughout) in his brand of media archaeology and emphasizes methodological importance of 'performing media archaeology by means of such machines (measuring, calculating)' (2013: 59). In a passage that recalls Bateman's 'rather weak signal' (2008: 13), Ernst explains that:

sometimes the iconological impulse of human image reading and ear listening hinders knowledge and insight. Suspending human perception for a moment in favour of measuring instruments can reveal insights that cultural codes simply do not perceive – the blessing of the media-archaeological gaze. (2013: 68)

Returning to the quality of dynamism, identified above by Ernst as being inherent to the digital archive, we can again see parallels in document analysis. From his perspective as typographer and information designer,

Waller points to some specific implications of digitalness in terms that echo Manovich's (2001) *manipulation* and *modularity*:

Traditionally, readers have almost always encountered text in the context of a document: an object with borders, with a declared aim, with a defined authorship, and within a recognized genre—with all the conventions, rules, authority, and audience expectations that are implied by that. Text (language string) has usually been situated in a text (document). (Waller 2012: 236)

While such implications might be particularly acute in the specific cases of de- / re-contextualization that Waller goes on to invoke here – social media conversation, web search and language corpus query results – the manipulability of digital media allows – indeed entails – that texts be rendered differently on different hardware devices, for example mobile phones or widescreen televisions. Moreover content is often dynamically assembled to include elements tailored on the basis of the previous behaviour of the user, not only in the timelines prevalent in social media, but increasingly also in the advertisements embedded in webpages of many kinds. In more specialist applications text is deliberately decontextualized too: for example, in the translation memories that underpin many computer-assisted translation systems. From the point of view of the analyst, as for the reader, digitalness radically destabilizes documentness.

This leads to immediate operational challenges for the capture and storage of digital documents. In their system intended for design mining the Web, Webzeitgeist, Kumar et al. (2013) implemented a solution which combines analysis of the Document Object Model with rendered screenshots. In other words, their approach exploited both features of the data and features about the data.

Interestingly, Parikka suggests that 'what can be seen as the biggest threats to traditional ways of thinking and doing archiving – collaborative modes of production, distributed network forms of the new cultural artefacts that are more processual than thing-like, and the sheer number of potential items to save – can be turned into a possibility as well' (2012: 120-121). Indeed, Ernst (2013: 27) develops this conception of processuality and suggests ways in which this might be exploited in practice:

both material archaeological strata and the symbolical order of the archive are progressively being conceived as essentially processual by nature, to be deciphered as operative diagrams – close to what Charles S. Peirce defined as "diagrammatic reasoning." Humans almost irresistibly relate to images in an iconologic way, to sound in a musical way, and to texts in a hermeneutic way. But there is a kind of knowledge that can instead be uncovered from within the visual, acoustic, or textual endodata: entering the digitized record itself (data immersion), which is the media-archaeological gaze that can be performed by algorithmic machines of information processing better than by human perception.

This *endodata*, as opposed to transcription, annotation and other kinds of metadata, can be seen as a means of liberating analysis from the logocentrism which has beset other corpus-based approaches to multimodality – both in operational terms (see, e.g., Thomas 2019) and, more conceptually, from assumptions of composability (see, e.g., Machin in Jewitt 2009; Bateman 2014).

While his focus and interests may differ fundamentally, Ernst (2013: 88) makes explicit reference to the potential of this shift: 'With the digital, physical signals become information. The intrinsic value of documents yields to their media-technological nature, consisting of alphanumeric and hardware. Logocentrism is replaced by the alphanumeric.' Yet, Ernst (2013: 88) goes on to note that the means by which we currently address the Web itself currently remains logocentric: 'The whole approach to indexing and automated Web crawlers remains text oriented.' He associates the continued dominance of 'the

paradigm of printing' with the alphabet-based hardware interface of the keyboard, and notes that 'progressively, though, the mouse click is replacing the keystroke as the device for directing the monitor and the orientation is shifting to visually perceived information landscapes' (Ernst 2013: 121). More recently, the categories of keyboard, mouse and monitor have collapsed at least partially in the everyday ubiquity of touch screens with haptic and audio, as well as visual, feedback

Perhaps most radically, Ernst (2013: 29) conceives of an archive which is:

no longer simply a passive storage space but becomes generative itself in algorithmically ruled processuality. Sound and images at the borderline of digital addressability can be navigated through large amounts of data unfiltered by linguistic words. Images and sounds thus become calculable by pattern recognition algorithms. Such procedures not only media-archaeologically excavate but also generate unexpected statements and perspectives. The audiovisual archive can, for the first time, be organized not just by metadata but according to proper media-inherent criteria – a sonic and visual memory in its own medium. What is being digitally “excavated by the computer” is a genuinely code-mediated look at a well-defined number of information patterns that human perception calls “sound” or “images.”

While recent work has applied computer vision techniques, and methods based on deep learning in particular, to specific aspects of multimodal research (see Bateman et al 2017: 164-166 for a brief survey), Ernst's more holistic, and admittedly abstract, vision remains some way from being realised. For his part, Ernst makes reference to early systems, such as the *ImageSorter* (2013: 91) and *Morelli* (2013: 136), which use similarity-based computational sorting of sound and image features. In a characteristically cyclical turn, he points out that, on a technical level, 'this brings us back to the visual administration of knowledge in the age of similarity (the Renaissance, the Baroque), which in the meantime had been replaced by the age of classification (the Enlightenment, neo-Classicism) ...' (Ernst 2013: 135).

In addition to the methodological liberation from logocentrism, such pattern-based approaches offer the possibility of avoiding the bottle-neck of transcription and annotation, for the first time conducting multimodal analysis on a scale that might correspond to that on which corpus linguistics has revealed such important and compelling insights about language and how it is used.

Disciplinary émigrés, nomadic enterprises and fellow travellers

Having sketched some of the regions of conceptual, methodological and teleological intersection and difference between multimodality and media archaeology, I will conclude with some brief observations about the status of the two as communities and, more specifically, to highlight points of complementarity between the two perspectives.

Ernst (2013: 21) has written that 'so often media theorists were not media theorists to begin with'. Similarly, though in rather less neutral terms, Forceville (2007: 1236) notes that

One problem besetting the theorization of multimodal discourse is that most senior scholars entering this field have been monomodally educated: they are linguists, or musicologists, or art historians. Inevitably, they are thereby biased by their original field of study, and limited by their restricted knowledge of other disciplines.

There are perhaps two key factors to acknowledge here. Firstly, disciplines have life cycles; they are not forever. Secondly, new disciplines entail transdisciplinary convergence in theory and method – often reflecting shifts in practice and technology. Together, these point to a need on the part of scholars for a

fundamental openness to change, rather than any perfective claim to resolution. Parikka (2012: 167) frames this in very positive terms, from which multimodality might perhaps learn: 'As a nomadic enterprise, a travelling discipline that moves across disciplinary boundaries in order to understand complexities of matter and time, the media-archaeological agenda includes much more than the past and the present – it points to archives of the future.'

This paper has delineated several regions of common interest between multimodal and media-archaeological approaches. Perhaps in future these can be fashioned into complementary optics through which to understand media, as both object of study and agentive subject.

Firstly, media archaeology sheds new light on the relationship between multimodality and digitalness in formal and social terms. In addition to the integration and manipulation of modes through digital interfaces, which broaden access beyond specialised communities of practice, media archaeology recognises that what we produce individually or collectively as humans is necessarily subject to further mediation, or conditioning, by machines. Moreover, with the digital, the logocentric is fundamentally replaced by what Ernst (2013: 88) calls 'the alphanumeric', though it might be more accurate to speak of discrete coding schemes which may be mapped onto letters and numbers. Significantly, the digital commensurability of what humans might perceive as modes allows in principle for common tools for pattern matching within alphanumerically mapped endodata.

Secondly, beyond a blurring of social categories, such as professional and amateur, reader and writer, the digital fundamentally destabilizes documents and other media objects, and entails a shift from thing, or product, to process. A crucial question for multimodality, then, is whether the encoding, decoding and recoding that is essential to digital media can somehow enable us to process the signal in ways which abstract at levels of granularity useful for analysis as text.

Thirdly, seeing the relationship between multimodality and digitalness through the prism of previous ruptures and inventions, such as moveable type, throws into sharp relief the cyclical and recursive nature of change, in terms not just of media, but the methods and lives of academic disciplines and communities of practice themselves.

Finally, while the trappings of disciplinarity are perhaps necessary to academic endeavour, multimodality has particular role in the broader disciplinary ecology, the characterization of which this paper has sought to make a contribution. Here the transdisciplinary starting point of multimodality seems to me essential. Indeed, if multimodality is a discipline, then perhaps it has an 'enabling function', somewhat akin to the textual metafunction of language as conceived in the systemic functional linguistics which has been so influential to its development (see Halliday 1978: 113).

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