

Exploring Reading in Social Semiotics: Theory and Methods

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Abstract

The aim of this paper is to critically review how social semiotics has contributed to the study of reading and to develop an agenda for further research. We consider the theoretical and methodological resources that social semiotics has developed to account for multimodal text in the contemporary semiotic landscape, and explore how they can be used to teach critical reading skills to young people to support their participation in different social domains. We reflect on the possibilities and limitations of different analytical frameworks, highlighting barriers and possibilities for advancing social semiotic scholarship on reading and beyond. We end with a sketch of a new research agenda for social semiotics, in the light of technological change and its implications for reading.

Introduction

Social semiotics explores the systems, principles, and resources that people develop to make meaning of, in and with the world around them. It examines the mechanisms through which material formations are made to mean, that is, how people conjoin forms and formations with meanings. It recognizes that material (stone, light, ink, air, muscles, et cetera) can be manipulated and explored in distinctly different ways, offering distinct possibilities and limitations for meaning making; *and* that it is possible to describe, at a more abstract level, common principles for making meaning, considering, for example, the commonalities and differences between writing on paper, drawing on an iPad, communicating on a video conferencing platform, and building with Lego blocks.

That is a big ambition. Scholars often work separately on specific types of semiotic formations, such as talk, writing, drawing, painting, photography, film, installation, performance arts, and so on. There are good reasons for scholars to divide the world up along such lines, even if these lines often reflect old notions of meaning making and institutionalized professional boundaries. After all, it is not feasible for any single semiotician to grasp the specialist workings of all these different types of formations. Each one is embedded in a set of social semiotic practices, reflecting and constituting the social worlds of specific communities of practice and the affordances of the material resources in use. Yet increasingly expressions in the contemporary digital world defy old disciplinary boundaries, thus forcing those who aim to understand their practices -to inform teaching, for example- to radically rethink existing theoretical and methodological frameworks.

In this paper, we will be considering examples of semiotic formations that are (a) shared with, and usually made (scripted/orchestrated) for an audience; and (b) appear on a two-dimensional surface, such as books, tablets, banners, canvasses. This leads us to attend to different types of graphics –writing, image, moving image- and sounds played concomitantly, whether as speech, music, sound effects or otherwise; and the ways in which they are combined to form *multimodal text*. In so doing we significantly expand the traditional notion of text, which was focused almost entirely on writing. From a social semiotic

perspective, all texts that children encounter or make themselves are worthy of detailed attention, providing a unique window onto their social worlds.

We recognize that our perspective is at odds with many school curricula, in which not all types of texts, or all aspects of text, are valued equally. In part, this is related to a view of 'reading' associated mainly with written text. For instance, in England's National Curriculum for children ages 5-11, reading is defined in terms of two 'dimensions': word reading (where phonic decoding is emphasised) and comprehension (stressing the importance of vocabulary and grammar). It states:

The overarching aim for English in the national curriculum is to promote high standards of language and literacy by equipping pupils with a strong command of the *spoken and written word*, and to develop their love of literature through widespread reading for enjoyment. (Department for Education, 2013: 3. Emphasis added)

Teachers are therefore expected to select some texts and background others, draw attention to selected features of texts, and introduce students to selected languages for explicating 'how text works'. Often these texts privilege and prioritise writing and do not reflect the diverse multimodal texts children routinely encounter and create themselves beyond the classroom.

We propose an alternative perspective, drawing on arguments for multimodal literacies which recognise and support children's capacities (Kress, 1997; Cope et al., 2000; Kress, 2003; Jewitt and Kress, 2003). This perspective has informed policy making in some countries. For example in Singapore, there have been concerted efforts in teacher training to support students' critical reading and design of their own multimodal texts (Lim & Tan, 2018). Similarly, in Australia a broad definition of 'text' and 'reading' has been adopted, contrasting the narrow English curriculum noted above:

Literacy involves students listening to, reading, viewing, speaking, writing and creating oral, print, visual and digital texts, and using and modifying language for different purposes in a range of contexts ... [Texts] can be written, spoken, visual, multimodal, and in print or digital/online forms. Multimodal texts combine language with other means of communication such as visual images, soundtrack or spoken words, as in film or computer presentation media. (Australian Curriculum, Assessment and Reporting Authority, 2020)

However, there is still a way to go in challenging and changing established curricula and educational practice across the globe. Social semiotics can help by making explicit the principles underpinning multimodal text of all kinds, across the contemporary semiotic landscape. In so doing it offers an entirely different starting point for ongoing discussions about children's reading today, giving, for example, due recognition to the multimodality of children's books, magazines, learning materials, television, film, games and social media content produced by children themselves. It also supports the development of 'critical readers' by developing means to describe and reflect on multimodal text, which in turn supports creative and critical production of such texts. This paper reviews what those means currently look like and are capable of, and how they might be developed further.

Sign making

Our theory of reading, and of meaning making more generally, is grounded in the notion of the sign. The sign is the basic unit of meaning making. Eco (1976), following Peirce, defines it as “everything that, on the grounds of a previously established social convention, can be taken as something standing for something else” (p. 16). The model of the sign we adopt in this paper originates from Saussure (1916), and has been adapted by Kress (2010) to refer to conjunctions of meaning and a material form. *Social* semiotics is concerned with the ways in which people recognize (selections of) forms and invest them with meaning. Inscriptions, sounds, vibrations, shapes, shades and movements are all examples of forms (‘signifiers’) that can come to stand for something (‘signifieds’) to somebody. Meaning is always the product of human agency, of someone performing a semiotic act, of whatever kind.

Social semiotics draws on four basic premises about sign making. The first premise is that sign makers draw on *regularities* and *conventions* developed from social histories. Over time, some forms have come to be associated with particular meanings among a social or cultural group. The regularities are the result of social interactions. At the same time, they enable members of the group to communicate: they are generative, allowing people to guess, with some degree of plausibility, what others mean by the forms they produce. Social semiotics sets out to identify regularities that a given social network has developed over time in response to their social needs.

The second premise is that sign makers build and recognize *configurations* of and *relations* between different forms: they create semiotic formations. For example, readers of a textbook make connections between (selections of) graphic elements that are arranged on a spread: orthographic elements, diagrammatic elements, photographic elements, and so on; and their relation with e.g. someone’s pointing gesture indexing one of these elements. Parties to face-to-face encounters also make connections between forms of various kinds: a co-occurring string of sounds and hand movement may be recognized as a speech-gesture-whole, carrying meaning that is greater than and different to the sum of its individual parts. Social semiotics aims to identify the principles underpinning these operations.

The third premise is that sign making is always *particular* to a sign maker and a situation. That means that even if a social or cultural group can draw on a long history of social interaction and strongly developed shared understandings, their meaning making is never entirely predictable. Shared understandings may have been made explicit in grammars, dictionaries, textbooks, and so on, yet these ‘code books’ do not account for the situated semiotic work of an individual sign maker. Sign makers use regularities in sign making as resources, rather than as prescriptions, in response to dynamic, unpredictable, emergent situations. The signs that people make, even when orienting to what appears to be the ‘same’ form, will vary depending on their prior professional/life experiences. Social semiotics sets out to identify how sign makers through each new semiotic act transform meaning potentials of forms, thus expanding possibilities for interpretation and expression (Kress 2010).

The fourth premise is that *semiotic effort* is gradual: the work that sign makers put into interpretation and expression varies. Their commitment is not evenly spread; some

signifiers are given more attention than others. Engaging with Twitter, for example, 'reading' might mean anything from scrolling down five tweets per second to identifying tweets that might contain relevant information through a hashtag to skim-reading a text of 180 words and scrutinizing a drawing. Equally, a teacher making a drawing on the interactive whiteboard will focus their efforts on those elements that they want to highlight and deem of particular relevance to the communication. Social semiotics aims to identify the principles of selection and distribution of effort. This includes a concern with the means that sign makers have at their disposal to shape the semiotic efforts of others.

Multimodal text

New technologies are having significant impact on text making and reading. Readers engage with text using different technologies (tablet, mobile phone, virtual reality head set) in different media (film, magazine, social media) and genres (short story, adventure game, instructional text) on different platforms (Instagram, YouTube, TikTok). These texts are differently configured (linear-non-linear, still-moving) and projected (two-dimensional, three-dimensional), using different 'modes' (writing, image, speech, music), thus facilitating different kinds of engagement/reading: instant and intense, intermittent and extensive, and so on.

To separate our approach to the traditional focus on decoding writing, we use the terms 'engagement', 'interpretation', 'signification' to refer to the ways in which audiences make meaning of a semiotic formation. We reserve the term 'reading' to refer to audiences making meaning of multimodal *text*. Thus, we differentiate between the general principles of engaging with semiotic formations, and that which is distinctly different about reading text, which we just defined as semiotic formations that are shared with, and usually made (scripted/orchestrated) for an audience, and that appear on a two-dimensional surface, such as books, tablets, banners, canvasses. We assume that engaging with text is different from engaging with, say, a teddy bear, or a gesture, given, for example, the different senses involved and the different possibilities for examination. These differences are only now beginning to be explored (see e.g. work on touch by Jewitt et al., 2020). In relation to this, we want to note that much of what we will say about reading in this paper applies only to readers with eyesight, which is testimony to one remarkable gap in social semiotic research.

In the past two decades or so, 'mode' has become a defining dimension of text, in social semiotics and beyond. Thus text is now commonly broken down and described in terms of the different 'modes' in which the signs that make up the text are made. A number of definitions of mode have been proposed (Kress, 2014) (Bateman et al. 2017). Our working definition is that modes are conventionalised means of communicating meaning that are organised around a particular set of material resources and means of and tools for manipulating these resources. For example, writing is produced by manipulating materials (with pen and paper or keyboard and screen) to produce conventionalised marks on a surface. Marks are made to represent letters; they are arranged into formations – words – that can be arranged into bigger formations – sentences and paragraphs. In that way, signs are made through choices of, e.g. font, lexis, grammar. Each of these choices produces meaning.

The other commonly postulated mode is 'image'. While the constituent elements of drawings are unlike letters, images are also made through choices of various kinds that produce meaning. Social semiotics has produced schemes to begin to describe these choices, with Kress & van Leeuwen's 'Reading Images' (2006) being one of the most widely used. Analogous to Halliday's systemic functional analysis of language (1978), they describe some of the mechanisms that are used to shape representation ('ideational metafunction'), create author-reader relationships ('interpersonal metafunction'), and integrate signs in image ('textual metafunction'). This scheme has been applied widely to texts by and for children. For example, Mavers (2011) looked in detail at children's drawings, revealing the resourcefulness and purposiveness in texts which may usually pass unnoticed. Others have looked at picturebooks, ebooks, film and video games (see, for example, (Serafini, 2010; Bateman & Schmidt, 2012; Burn, 2013; Painter et al., 2013). Schemes have also been proposed to describe how writing and image are integrated, thus making a text that is more than sum of its parts, with implications for the teaching of reading (see Bearne et al., 2007; Serafini, 2014; O'Halloran et al., 2017; Lim, 2018).

Textual formations can be observed in the real world and subjected to close inspection. Claims made about text can be made plausible by sharing (scans, photographs, stills of) the text. Principles of production can be inferred from the text. For example, Gunther Kress, one of the founders of social semiotics, often presented the example of a drawing made by his then 3-year-old son (see e.g. 2010). By offering (a scan of) the original drawing and a snippet of what the son said to the father as he presented his drawing ("this is a car") he evidenced his claim that the marks made by the boy represented circles, and that the child operated on the principle of analogy ('wheels are like circles'). Kress also shared some knowledge of the child's lifeworld; for example, what car he was used to being in (a Volkswagen Golf). Yet on the whole, this semiotic account relies almost exclusively on the text itself; it does not detail how the drawing event unfolded through action and interaction.

To illustrate this text-analytical approach further, we present a multimodal analysis of a video posted on Tiktok, (<https://www.tiktok.com/@ling.kt/video/6771839650446331142>), a social media platform that is popular in China, the US and elsewhere, especially among young people. TikTok describe themselves as "the leading destination for short-form mobile video", with a mission to "inspire creativity and bring joy" (tiktok.com: 22 Feb 2020). The platform hosts content created by young people themselves, which, we assume, they learn to engage with through participation, without explicit teaching, as with e.g. canonical literary text of the school. At the time of this paper, the above video was watched 504,600 times, liked 112,600 times, and had received 143 comments. We draw on Burn's multimodal analytical scheme, which recognizes that film is the product of a number of distinct domains of semiotic work, each involving a different set of modes, including 'embodied modes' ('dramatic action' and 'speech'), 'auditory modes' (music) and 'visual modes' (lighting and set design), as well as the modes of filming and editing. (see Figure 1).

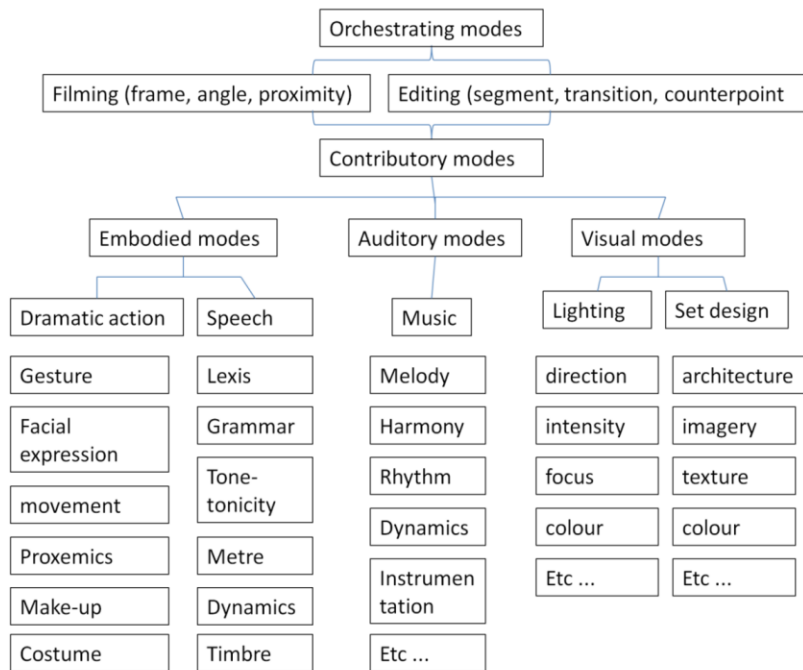


Figure 1: Burn’s framework for analyzing moving image (from Burn 2013).

The video is twelve seconds long, and has six scenes of about two seconds each. Acoustic-style guitar music plays throughout. The video is accompanied by the description, ‘Anyone can relate?’, and several hashtags including ‘#girlfriendvsboyfriend’. We present video grabs of each scene in Figure 2 below. Each scene contains visual material and a short text. In the first scene the camera moves from left to right, offering, first, a close-up of a girl, and then of a boy sitting next to her. The writing, ‘This is my boyfriend’, is projected onto the video from the beginning, in black font against a white backdrop. The camera work and writing positions the depicted girl as the narrator who introduces her boyfriend to the viewer. Both girl and boy being represented are interacting with the viewer: they look into the camera, and the boy tilts his head to get into the frame then raises his eyebrows. Their clothing and backdrop suggest a homely environment, their bodily expressions content and comfort.



Scene 1



Scene 2



Scene 3

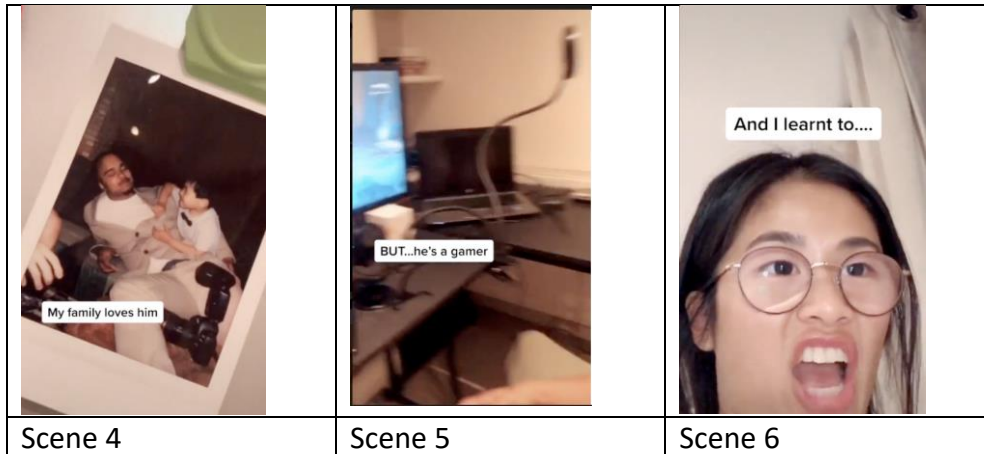


Figure 2: Screen grabs from a video posted on Tiktok

In Scene Two the narrator takes the viewer to a different time and place by showing a photograph of the couple on a stage in a 'Hard Rock café', smiling, wearing performance outfits, holding an electric guitar, and posing for the camera. The writing reveals that 'We've been together for 7 years'. As the camera zooms in on the medium-shot photo, another text box appears, this time in white against a pink backdrop, saying, 'Throw back omg'. The writing thus frames the scene depicted in the photograph as a 'happy memory'. In Scene Three the narrator takes the viewer back to the present and homely environment by showing a close-up of a cat on its back, surrendering to padding under its chin by someone with long nails (the narrator?) and writing that 'We have a fur baby together' followed by an emoticon of a smiley face surrounded by hearts. Scene Four maintains this warm, homely atmosphere, showing a Polaroid photo of the boy lying on the floor while playing with a little boy (a nephew?), while writing that 'My family loves him'. The photo's tilt relative to the camera frame resembles a common layout of family photo albums.

Scene Five introduces a twist. The viewer is shown a room. As the camera moves from left to right, we see a clock and a computer camera, a big screen that displays animation graphics, and the arm of someone sitting in front of it (presumably the boyfriend). The writing frames this scene in contrast to the previous ones: 'BUT...he's a gamer'. Scene Six completes the story by presenting the narrator's resolution to the conundrum she has just sketched. The resolution is presented in two parts. The first part is in writing: 'And I learnt to...'. The second part appears in the music, which until then sounds an upbeat guitar accord, now plays a man singing 'shut the fuck up', in a light-hearted tone. The girl mouths along, with strong dramatic facial expression.

Burn's scheme can serve as a checklist to consider how the video was built, i.e. how different sets of semiotic resources were used to construct a scene (the 'ideational metafunction'), establish a relationship with the audience (the 'interpersonal metafunction'), and develop a coherent narrative ('the textual metafunction'). In doing so we can give due recognition to meanings made, and to the semiotic work (skills!) that went into it. Burn's scheme helps us to draw out different domains of that work -in this case: dramatic embodied action, set design, filming, editing, music, writing- and the ways in which they interact. Looking across corpora of texts we could expand this account and look at conventionalization, i.e. how certain forms come to be associated with meanings among

particular groups of makers and readers: a recurring facial expression, phrase, dress feature, dance move, backdrop, beat, camera angle, and so on.

Our example illustrates how multimodal textual analysis draws attention to and names features of contemporary text making and reading. It makes explicit tacit semiotic knowledge that gives access to participation in communication and identity work within particular social networks. It also makes this knowledge available for learning and critical reflection, both by wannabe-participants and interested outsiders, including teachers who are looking to make connections with the canonical texts that are prescribed by the school curriculum.

Limitations of multimodal social semiotic analysis of text

While multimodality provides a useful overarching frame for theorizing text making and reading, some pressing questions have yet to be settled. First, *modes* are often presumed, and ill-defined. Some signs are automatically classified as separate modes, while others are automatically clustered together. Is colour separable from image and orthography? What about graphics such as emoji's – are they 'image' or 'writing' – neither or both? Are drawing, photography and moving image all part of the mode of image, or do they constitute separate modes? Second, while multimodal analytical schemes draw attention to some resources, they also close down prematurely the process of *discovering and classifying signs* if they are simply imposed onto new text. We propose that definitions and lists of 'modes' are not taken for granted; that each time a text is considered, modes are defined anew. The aim should be to aptly categorize and name signs identified in a text, not to map all signs onto a limited list of pre-defined modes. Third, as demonstrated in our example above, in a textual analysis the question of *authorship* is hardly considered; in the above example we simply assumed that the author of the video was the person who posted it and who was presented in it as the narrator. We didn't ask, precisely what semiotic work was done by whom and how?

Nor did we ask, What was done by the presumed author, and what was done by algorithms, filters, and other digital tools (also called 'semiotic technologies' – see Djonov & Van Leeuwen, 2018; Zhao et al., 2014)? As possibilities for digital editing and distribution evolve, the question of semiotic agency becomes both more poignant and more difficult to address without ethnographic understanding of the process of production. There is also a risk that the more we try to tease out the semiotic work that went into the making and/or reading of a text, the less our categories resonate with actual experiences and practices of text makers and readers? What categories do the makers and readers of, say, memes, use to describe their own semiotic work? And do we get any closer to understanding and explicating their tacit knowledge by focusing on the social semiotic notion of 'mode'?

Ethnography takes the documentation of 'context' further. By observing and recording the *process and conditions of text production* and interviewing authors, claims about how text means can be substantiated. For instance, it is possible to use time-lapsed animations of a painter, or cartoonist at work, to explore how text makers organise their semiotic work. In some cases, text is made in a linear process, with different steps or stages, and different sets of choices made in each. This is shaped in part by platforms. For example, when an

image is uploaded on Whatsapp, the sender is prompted to add a caption. In other cases, the process is non-linear. Often multiple 'makers' are involved, who divide up the semiotic work in certain ways. A group of young people making a meme for Tiktok might have a choreographer, a cameraperson, someone editing the video footage, choosing music, and so on. Similarly, in her ethnographic study of Filipino British youth in London, Domingo (2011) analysed hip hop music videos produced and edited by the young people in her study, closely attending to the layering of modes such as gestures, language, visual effects and sound effects, considering how these editorial decisions were used to assert social identities to their audience (see also Potter, 2005, 2010)).

While social semiotics has given much attention to texts and their production, it has somewhat neglected *reading*. According to Kress's theory of sign making, the principles of *authoring* and *reading* are the same: both authors and readers 'make' signs. Alluding to Barthes' seminal essay on 'the death of the author', he insists on the 'dominant role of the reader in communication', i.e. in processes of 'making and remaking meaning through the making of signs' (Kress 2010:34). In this perspective, reading text is a process of *transformative* engagement: readers do not simply 'adopt' meanings made by the author, they transform them, appropriate them. In some cases, the 'reader' recognizes conventional signs, attaching meaning to, say, a formation of lexical, graphic, or gestural forms relatively effortlessly. On other occasions they encounter formations that prompt close examination through inspection, touch, and so on. Many factors shape the transformative engagement of the reader, not least the design of the text, the life experiences of the interpreter, the occasion for the interpretation, and the social actions of those around the interpreter.

One key question for social semiotics is how reading can be made evident. Claims about composition can be substantiated with evidence from the text, claims about reading cannot: reading leaves no traces in a text (though navigational choices of readers are tracked on digital devices). Thus in social semiotics we can develop hypotheses about, e.g. what was 'criterial' for a text *maker* about that which is signified (in Gunther Kress's example, the wheels of a car), but we face challenges developing hypotheses about what was criterial for a reader of that text. In what follows we discuss how these challenges can be addressed.

Multimodal textual sequence

One possibility is to explore texts that are produced in response to the read text, i.e. to look at a *sequence of texts*. For instance, in their study of children reading picture books, Arizpe and Styles (2016) analysed drawings children made in response to reading picture books, looking for insights into the children's reading experiences. Drawing was seen as a particularly apt method of response since the children were reading texts that were highly visual, and so offered insights not afforded by interviews. In her research into online texts, Adami studied video responses uploaded onto YouTube videos, analysing chains of semiosis in video-interaction (Adami, 2009). Diamantopoulou et al. (2012) take this one step further by looking at more 'loosely' related texts: they looked at children's drawings to gauge their interpretations of the texts they encountered in a museum. Frederico (2018) combined observations with interviews. She observed families –preschoolers and their parents- in libraries who were given a picturebook app. She highlights the role of body in 'joint-reading events'.

We will illustrate the potential of this approach by revisiting the example from Tiktok. A selection of the 143 comments (Figure 3) shows the range of different, short, written responses that the narrator received. All reveal something about how the commentators read the text: As a 'funny' story, as a portrayal of a 'cute' couple, as a depiction an aspect of social life that the commentator identifies with ('well said', 'same with my boyfriend'), and as an invitation to give advice, e.g. about the girl's conundrum ('Play w him?') and the boy's games ('Tell him to try FIFA'), which some apparently recognized from the split second it is shown on the video).

Hahahahahaha so funny and so cute
Lol this made me laugh
Same with my Boyfriend ☐☐
I want a bf so I can play video games WITH him [rolling over the floor laughing]
He looks like Chris brown abit
I thought you was @sarahmagusara without makeup on
Play w him?
Well said
That cat ain't gonna last long
Tell him to try FIFA
Is that fortnite? Finish him if it is

Figure 3: Comments on the Tiktok video

Multimodal performance

Another way of getting at reading through a semiotic approach is to look at how text is *read out*. An early example of this work is Woodward & Serebrin (1989); they observed how a three-year-old child and his father jointly read materials selected by the child. By video-recording these 'story reading conversations' they were able to work out how the child shapes the joint reading of the text by noticing and drawing attention to features that the parents had not attended to. While they recorded authentic reading sessions, Kachorsky et al. (2017) asked children directly about the meanings they made of the picture books given to them. Whether one observes children's responses to text that are spontaneous or solicited, the analyst must take the mediating effects of the means of communication used to give expression to interpretations into account. Attention should be given to all expressions, not just those in speech; and the limits of different means of communication should be considered. Considering children's gestures alongside their speech provides a better understanding of their reading than attending to speech alone.

Thus it is possible to explore reading by looking at larger semiotic formations that are jointly produced in response to a text. What we're considering here is how a text is acted out, performed, and embedded into a larger semiotic formation of signs in different modes. Now the process of jointly remaking text is in focus: how, for example, teacher and students negotiate what to attend to, through gaze, pointing, speech; how they attach meaning to the forms that they attend to; and how students respond to multimodal enactments of text. For example, Flewitt et al. (2009) draw on multimodal analysis of video recordings of read aloud sessions facilitated by a teacher (Jackie) involving a four-year-old child (Mandy) in a school for children with special needs:

Throughout this learning episode, all Mandy's communicative moves are interpreted by Jackie as intentional and meaningful. For example, when Jackie reads about the plans to make baby bear 'a birthday cake', Mandy stops sucking her thumb, leans towards the book to see the picture of the cake, begins to rock excitedly to and fro and vocalizes sounds as she does so. Quietly, before continuing to read, Jackie says to her 'you like that don't you?' and continues with the reading. Mandy's communicative 'turn' is cued by the story and Jackie's response validates her understanding, including it as a contribution to the group's enjoyment of the book reading. Jackie recognizes Mandy as a symbolic being, able to express precise meanings albeit in non-linguistic and non-conventional modes. (p. 225-230).

The teacher takes the child's bodily conduct as responses to her reading, more specifically, as signs of the child's *reading* of the text.

Eye tracking

Thirdly, semiotic analysis can be enhanced by *tracking readers' eye movements*, a technique that has been widely used in psychology, and psycholinguistics. Eye tracking glasses record what people fixate on and how they shift fixations as they engage with a semiotic formation. The recordings show what features of the formation are noticed, for how long they are considered, and in what order. For instance, Holsanova et al. (2006) tracked the eye movements of people reading of newspapers. Whilst such studies give insights into readers' visual attention, we note that this remains a partial trace of the reading experience. Much of the data generated from tracking technologies is measurement based (e.g. how often an element of the text is attended to, or how long for), but still does not tell us conclusively *why* such elements have been attended to; which is an area that social semiotics has proposed hypotheses about. For example, Holsanova et al. (2006) found that readers' engagement -as indicated by eye movements- often aligned with social semiotic accounts of the text maker's efforts to guide a reader's attention. However, their readers did not fixate on intense colours and font sizes in newspaper adverts; such items were largely ignored.

The patterns found in eye tracking studies confirm that while there is significant variation in patterns and levels of engagement, there is always a degree of selection. Readers build an interpretation on the basis of partial engagement: they concentrate on specific areas to identify specific forms, which are taken to stand for something else (e.g. 'advert that can be ignored'). The more familiar we are with the type of text it is presumed to be an instance of, the more we rely on partial engagement. Thus we draw on (tacit) knowledge of the 'criterial' features that come to 'stand for' something else. In this way, eye tracking technologies might provide helpful supplementary data for social semiotic studies of reading.

One fundamental challenge that remains is that 'meanings expressed' may not represent 'meanings made'. Kress (2010), following Saussure, acknowledges this difference by making a distinction between 'inward' and 'outward' meaning making. Regardless of whether we focus on text, or sequences of texts, or processes of text making and reading, the analyst, just like any other reader, always relies on observable expression. Expressions are shaped by the modes that are (made) available. In some joint reading in the early years, children may

be encouraged to express their understandings of the text in bodily expressions or in drawings; in interviews, they might be encouraged to articulate their understandings in speech. Neither of these modes of expression might be felt to be apt to wholly express the reader's affective responses to text.

Resetting the research agenda for social semiotics

Social semiotics has made significant contributions to a multimodal understanding of reading. By combining close textual analysis with ethnographic and eye tracking data it can render visible skills in text making and reading, and make explicit some of the principles of meaning making across different domains and sites. It recognizes the distinct possibilities for expression of all means of representation and communication, and the ways signs are combined to make meaning. It has informed educational policy in a number of different countries, encouraging teachers and curriculum designers to recognize the role of image in the contemporary digital landscape and its potential for teaching and learning, although some curricula (such as England) stay more firmly wedded to 'traditional' notions of literacy and text.

We have considered visual materials produced by learners and teachers, such as drawings and social media texts. We have commented on the *rise of the visual*, in schools and beyond; and reflected on the curricular and pedagogic implications of this trend, which is likely to continue. In everyday digital communication, photographs and (live) videos are shared on a large scale through mobile technologies and social media platforms. In schools, workplaces and public spaces digital technologies will continue to replace pen and paper and create more opportunities for the digital production and dissemination of visual material. Photo- and video-editing have already become widespread, albeit often unrecognized semiotic skills, without which participation in vast swathes of social activity is blocked. 'Infographics' and data-visualization are pervading journalism and academia. Visual records have become common means of documenting learning (Flewitt & Cowan, 2019).

The visual is now taking another turn: it has gone *three-dimensional*. Augmented and virtual reality can now be used to add visual layers onto the real world and generate holograms. At the moment, AR glasses and VR headsets are still relatively expensive, and not yet widely used. But their potential for learning is already beginning to be noted, e.g. to support those learning to examine and manipulate complex physical objects -an engine, a human body- in vocational education, museums, and workplaces. Although specialist equipment is expensive, cameras on phones and tablets can be used to layer digital content. For example, the company Curiscope has produced a 'virtuali-tee' t-shirt printed with a QR code in the shape of a ribcage which, when scanned with a phone/tablet equipped with an accompanying app, displays digital animation showing the inner workings of the human body layered onto the t-shirt of the wearer (see <https://www.curiscope.co.uk/products/virtuali-tee>). Such technology opens up possibilities of visually experiencing previously unknown and inaccessible places in entirely new ways. Think, for example, how this representation differs from visual depictions in science textbooks, which already differ significantly from earlier textbooks in which image was less dominant (see Bezemer & Kress, 2010). For social semiotics, these developments prompt a return to 'old' questions about the design of and engagement with multimodal learning environments. What are the affordances? What is gained and what is lost? What do the

newly constituted texts draw attention to? How do they position the learner? (in the case of our example, a primary school student might find itself in a position that is closer to that of a medical professional)

Another trend is the rise in the automated *tracking* of (young) people's engagements with the world, and in the development of *algorithms* that can identify and visualize patterns in data thus collected. Multimodality has offered ample arguments against crude measurements of (reading) skills. Yet the new tracking possibilities can be used in different ways. Traditionally, a guide (a parent, say) might observe a learner, make a judgement, and articulate this judgement (in multimodal ensembles), thus providing feedback and instruction. Now, this guidance can be augmented with, or even replaced by, 'intelligent feedback systems', which measure and make explicit proxies of engagement and learning. As well as tracking what learners attend to on (touch)screens, *body motions* of all kinds (whole-body, eyes, hands, heart) can now be monitored, analysed, and translated into signs for learners.

Indeed, the capabilities of technologies for sensing, interpreting, communicating and learning are now such that they should be treated as *semiotic agents*. For social semioticians, and for everyone else interested in communication and learning, one task will be to account for and critically review the redistribution of 'semiotic work', and with it, of agency and power, among learner, teacher, technology designer, and technology. We need to explore what learning is made evident by what semiotic agent. What signs of learning can teachers and learners recognize in drawings and video recordings of embodied interaction, and how do they relate to the signs of learning that might be recognized by 'intelligent feedback systems'? And crucially, who dictates what signs ought to be recognized, and for what purposes? When does 'a culture of recognition' become 'surveillance capitalism' (Zuboff, 2019)?

The question of shifts in the distribution of semiotic work reaches further still. In all domains of social life, technologies are emerging as semiotic agents that get involved in signification and communication where that was, until then, the exclusive domain of human sign makers. Technologies select and arrange the multimodal texts that children read on online media platforms. They interpret the body, outperforming the diagnostic capabilities of, e.g., the radiologist. At home, they listen and respond to our spoken questions about the world and our instructions for action. They warn drivers, and intervene, when they approach objects too fast. And so on and so on. All of this has far reaching consequences for learning and communication, and for the education of today's children. It also has significant implications for the theory outlined in this contribution, which was focused on human agency, while ignoring contributions from, e.g., biosemiotics and post-humanist notions of communication. Reconsidering that focus in the light of ongoing technological and social change should be one, if not the, focus for future work in social semiotics.

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