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Published in:
Information Literacy through Theory

2023

Document Version:
Early version, also known as pre-print

[Link to publication](#)

Citation for published version (APA):
Haider, J., & Sundin, O. (2023). Sociomateriality. In A. Hicks, A. Loyd, & O. Pilerot (Eds.), *Information Literacy through Theory* Facet Publishing.

Total number of authors:
2

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Sociomateriality

Jutta Haider & Olof Sundin

Introduction

Sociomateriality as a theoretical perspective has its roots in Science and Technology Studies (STS), organisation studies and feminist research. It is one of many traditions within a broader framework of practice-based research. Sociomateriality is a broad theoretical church and as such, it encompasses a variety of different interpretations and terminologies. Nevertheless, several assumptions are commonly shared by the different thinkers and schools of thought united under the umbrella of sociomateriality, although there are nuances that are also reflected in terminological variations. In this chapter, we explain these assumptions, introduce a selection of commonly used notions, and discuss how they can be applied in information literacy research.

The chapter mainly refers to sociomateriality as it was developed in the works of Karen Barad (2003, 2007), Silvia Gherardi (2013), Lucas Introna (2013; Introna and Hayes, 2011), Wanda Orlikowski (2007) together with Susan Scott (Orlikowski and Scott, 2015; Scott and Orlikowski, 2014) and Lucy Suchman (2014). In addition, we follow the reasoning of Paul Dourish (2017, 4), whose work is specifically concerned with information, when he writes: "...the material arrangement of information – how it is represented and how that shapes how it can be put to work – matters significantly for our experience of information and information systems". Based on these works, we would like to present a dynamic understanding of sociomateriality that supports the analysis of information literacies within the specific infrastructural settings of contemporary society and is open to further development.

We should emphasise at the outset that the theoretical framework presented in this chapter is not just for developing an understanding of information literacy in terms of today's commercial, digital information infrastructure. There is nothing digital built into it, so to speak. That being said, it is based on certain assumptions that we think become particularly clear when we shed light on the enormous challenges that society currently faces concerning information seeking and the evaluation of

information sources in an algorithmic information infrastructure in which machine learning challenges traditional notions of, for example, trust, agency, intentions, and even knowledge.

The chapter begins by contextualising sociomateriality, introducing some of the current challenges in information literacy research and explaining how sociomateriality can help us. It introduces some important questions that sociomateriality can help information literacy research to answer. This is followed by an overview of some key notions and central tenets of sociomateriality. We then turn to theoretical issues and assumptions, how they are folded into information literacy research, how sociomateriality relates to other information literacy research, and what methodological considerations arise from sociomateriality. The chapter concludes with a call to accept a certain degree of definitional and conceptual ambiguity.

Sociomateriality and a rapidly changing information infrastructure

In recent decades, the relationship between society, people and information has changed in profound ways. Whereas it used to be assumed that people actively find the information they are looking for, today it is increasingly the other way around: information finds people, often without them knowing how and sometimes without them knowing why. Commercial platforms such as search engines, social media and various algorithmic recommendation systems form the backbone of a rapidly changing market for curating, publishing, communicating, searching, and evaluating information. In previous writing, we have discussed the various challenges associated with this as a crisis of information that is interlaced with a variety of other contemporary crises, including a crisis of democracy and the climate crisis (Haider and Sundin, 2022).

This crisis of information entails an increasing fragmentation, individualisation, and emotionalisation of information (see also Davies, 2018). What people find in their various feeds on social media, via search engines, chatbots or recommendation systems often depends on the algorithms of commercial platforms and generative language models trained on often undisclosed data. End users, but also legislators and even content producers, have limited insight into how these algorithms work or the data they collect, interpret and are trained on. This is a situation with obvious implications for how information literacy can be conceptualised. The fragmentation of information is evident in the way short messages, decontextualised film clips, heavily edited or even completely made-up but still realistic images, memes or status updates converge on the same devices. Every person's feed is different and it is increasingly difficult to know how and in what combinations others will come

across information. Content is created, distributed, made visible and reassembled in new configurations across platforms. Often this happens in ways designed to trigger emotional responses to increase traffic and engagement by end users.

At the same time, even in many formerly stable democracies, we can observe a decline in trust in societal institutions (Kavanagh and Rich, 2018), where groups in society tend to trust, for example, formal experts, scientific institutions, professional journalism, etc. less. During the COVID pandemic, this decline in trust became fatal in many countries (Gisondi et al., 2022). The COVID pandemic has made some information inequalities visible. These include unequal access to content behind paywalls, inequality of opportunity or the education gap, all of which are linked to increasing economic inequality along race, class, and gender lines. Such inequalities are certainly nothing new, but as always, they are typical of the times and at the same time shaped by historical developments. Today's information infrastructure brings together different spheres of life in new constellations. Public debates intertwine with private conversations and professional or educational concerns within the specific commercial logic of multisided platforms. Moreover, the activities of people within the information infrastructure are themselves constitutive of the infrastructural arrangements that emerge. This also highlights some of the challenges of AI-based services in general, namely the increasing absence of direct control by (human) end users, accompanied by an invisible form of agential control by technology.

With regard to information literacy, a number of questions come to the fore. For instance, how can an understanding of an ever-changing information infrastructure, invisibly folded into the practices and discourses of everyday life, be achieved and supported? How can we envision information literacies that support critical engagement with information and include an understanding of the mechanisms that sustain the institutions that produce information as trust in those institutions diminishes? What theoretical tools are needed to develop and support the analysis of information literacies in a situation where pervasive and dominant information systems are largely beyond society's control? These are not questions that can be answered once and for all with an empirical study, certainly not in this chapter. Rather, they are questions that shape the way we as researchers understand and conceptualise information literacy. In this chapter, we propose sociomateriality as an approach that enables such an understanding.

Key notions and core elements of sociomateriality

A cornerstone of sociomateriality is anti-anthropocentrism. That is, it stems from a critique of traditional views that place humans at the centre of the world. Instead, sociomateriality assumes that nonhuman entities, such as technologies and other

tools, also have agency that enables them to play a role in shaping the social and material world. From a sociomaterial perspective, humans and nonhumans are seen as actors in the shaping of the world, and the focus is on understanding the various ways in which they are entwined. For this reason, sociomateriality is referred to as an example of *posthumanism* (Gherardi, 2016). This entails a critique of many traditional approaches in the humanities and social sciences that assign an overriding role to humans, their sense-making, agency, and unique intentions. Instead, sociomateriality strives to extend analytical interest to include various nonhuman entities as actors.

In line with anti-anthropocentrism, sociomateriality, as the name suggests, starts from "the materialities of bodies, technologies, discourses, meanings and material-institutional contexts of interconnected practices" (Gherardi, 2017, 50). In other words, it pays particular attention to things, artefacts, and other entities and their becoming in the world. Importantly, in sociomateriality, material is not equivalent with tangible (Dourish, 2017, 47), but also includes the materiality of the digital as well as that of the discursive, not just that of physical artefacts. For instance, the code, algorithms, data and software that enable digital technologies are considered material entities that shape and are shaped by social practices. Information too can be cast in such a way.

To establish a foundation, we first present a set of key notions in sociomateriality focusing on some that we consider particularly useful for information literacy research. We then return to how materiality is conceived providing additional nuance to the notion. Sociomateriality is a field that is notoriously cluttered with figurative and often suggestive concepts, including some neologisms that attempt to capture terminological, analytical, or other forms of nuance. In the following, we introduce a selection of these and use them to outline some of the fundamental assumptions in sociomateriality. It should be noted that there are numerous other notions that we cannot discuss here. The notions discussed in this section are entanglement and co-constitution, intra-action and agential cut, becomings, performativity, configurations and lastly infrastructure. Some of these notions are foundational to sociomateriality, others overlap, or their use extends across different takes on sociomateriality, while some are strongly associated with a particular thinker.

Entanglement and co-constitution: A central assumption of sociomateriality is that the social and the material are entangled and mutually constituted. Rather than viewing the social and the material as distinct levels in an analysis, sociomateriality emphasises their inseparability. Since they are mutually constituted, we cannot understand what is happening in the world if we draw a line between a social and

a material side of things. From a sociomaterial perspective that remains true to its anti-anthropocentric position, the notion of materiality as separate from something called 'the social' or society makes no sense. Instead, the approach assumes that the world is sociomaterial and is constantly being recreated and reshaped in various arrangements and practices of co-constitution.

Intra-action and agential cut: Karen Barad (2003, 2007) has developed a number of influential concepts making up what she calls material-discursive theory or agential realism, but which we include in a broader church of sociomateriality. In particular, the notions of intra-action and agential cut are useful in clarifying some aspects of the ideas of entanglement and co-constitution presented above. To explain, intra-action differs from the notion of interaction, which presupposes that entities first come into being and then enter into relation with each other. In contrast, intra-action emphasises that social, including discursive, and material entities are not fixed with clear boundaries, but are constantly being created and shaped. Intra-action is a means of describing how phenomena are never just there, but they are constantly being produced and acquire meanings through different and changing connections. Barad (2007, 333) explains that "phenomena are the ontological inseparability of intra-acting 'agencies'". In this sense, everything is to some extent dependent on everything else, but in continuously shifting constellations. At the same time, it is important to note that she still considers phenomena in certain situations as stable enough to be studied. Barad calls this local stabilisation an "agential cut", which not least provides researchers with an analytical tool to decide what to include and what to exclude in a given study. In other words, it is a momentarily stable configuration that can be examined and that is achieved through temporal, spatial and relational severances, or cuts. We will return to this idea in the context of methodological considerations later in this chapter.

Becomings: Another concept that originates in the work of Barad is that of *becomings*. She describes the relationship between phenomena in the world as "not a static relationality but a doing" (2003, 803). This idea of *doing* is closely connected to the notion of *becomings*, which is an important idea in sociomateriality that refers to the constant change and development of things and their relations. Sociomaterial research often speaks of actors, bodies, or entities as emergent. This implies that tangible and intangible material entities are conceived of as being in constant states of becoming in which their meaning is established and re-established. Such a focus on constant becoming necessarily presupposes that nothing is essential. Drawing on the work of Judith Butler, Barad (2003, 821) describes "matter as a process of materialization".

Performativity: The notion of performativity refers to the idea that things and entities are not passive, but actively participate in creating and shaping the sociomaterial world, and also historically and culturally contingent. In other words, things do not simply exist but their meaning is emergent and they are actively involved in producing meaning and shaping the world. In the words of Karen Barad (2007, 141), "agency is not an attribute but the ongoing reconfiguring of the world." As such, performativity occupies a central position in sociomaterial thinking. It is often invoked to describe how various qualities, such as agency, take place in practices, i.e. how they are performed. Related theoretical examples can be found in the work of Michael Foucault (e.g.1980), who shows how knowledge, bodies and power do not simply exist, but are continuously produced in relation to each other and in that of feminist scholar Judith Butler (2010), who laid the foundation for understanding gender as performatively produced (Introna, 2013, 336).

Configurations: In addition to the notion of entanglement, terms such as assemblage, apparatus or configuration are common in sociomateriality. These and similar expressions are used to describe the fluctuating ways in which people and nonhuman actors or other kinds of elements join up and how material and discursive entities and practices come together to shape the world and each other. In particular, the idea of configuration is discussed by Lucy Suchman (2007, 2014), who understands the configuration as "a device for studying technologies with particular attention to the materialities and imaginaries that they *join together*" (Suchman, 2014, 48, italics in original). One aspect, in particular, is relevant here, namely how thinking in terms of configurations helps to draw boundaries that are culturally and temporally specific, which is a prerequisite for articulating and delimiting objects of study. In other words, similar to the notion of the agential cut (Barad 2007), configuration is primarily an analytical device.

Infrastructure: Another key concept of sociomateriality is infrastructure, which refers to the background systems and structures that support and shape practices, amongst other things. It can include physical infrastructures such as roads, buildings or fibre optic cables, but also intangible infrastructures such as the intangible part of the internet or various software systems. Importantly, infrastructures incorporate standards, build on layers of older infrastructures, and they go unnoticed until they break down (Star, 1999). Understanding the role of infrastructure is important for understanding how different entities and practices are shaped, enabled and constrained by the systems and technologies that support them. The notion of information infrastructure then describes the sociomaterial relations implicated in configuring the entities and practices associated with how information (in its material form and as an imaginary) is produced, organised and accessed. This means that information infrastructure is never completely stable, but

neither is it completely formless. Therefore, if we think in sociomaterial terms, information infrastructures should rather be understood as entanglements that emerge in and through specific (sociomaterial) practices (Bowker and Star, 1999; Star and Bowker, 2010; Bowker, et al. 2009; see also Orlikowski, 2007; Orlikowski and Scott, 2008). In our research on information literacies, we build on the work of Susan Leigh Star and Geoffrey Bowker to develop an understanding of information literacies that accounts for the particularities of the corporate information infrastructure that pervades contemporary society. We suggest that infrastructural meaning-making should permeate conceptualisations of information literacies (e.g. Haider and Sundin, 2019, 2022). (Also see Johansson's chapter in this volume for further discussion of infrastructure).

After this introduction of a selection of central notions and elements of sociomateriality, we can now return to the issue of materiality. Here, despite the fundamental importance of materiality, there are also ever-so-slight variations in the way different thinkers elaborate the notion in their respective works. Karen Barad (2007, 350), for example, insists: "Matter is /.../ not to be understood as a property of things but, like discursive practices, must be understood in more dynamic and productive terms /.../" and also speaks of matter as "not a thing but a doing" (Barad, 2007, 351). Paul Dourish (2017), on the other hand, offers a slightly different perspective, bringing in aspects from media archaeology and software studies. Writing in the same tradition, he also emphasises the interdependence between the social and the material (or the cultural and the digital) and their emergent character, but he describes the materialities of information in terms of "properties of representations and formats that constrain, enable, limit, and shape the ways in which those representations can be created, transmitted, stored, manipulated, and put to use - properties like their heft, size, fragility, and transparency" (Dourish, 2017, p.6). This is indicative of a terminological ambiguity that is characteristic of sociomateriality. However, it is also seductive and, importantly for information literacy research, dynamic and productive in that it allows for a rich and detailed consideration of information technologies while avoiding technological determinism (see also Dourish 2017).

In summary, the terms, concepts and definitions presented here are, as already mentioned, only a selection of those available. Taken together, however, they provide a good picture of the core tenets of sociomateriality, particularly for the study of information literacies. It is important to bear in mind that some of the terms overlap, some might even contradict each other or are ambiguous in how they relate to each other. It goes without saying that it is not advisable to use all of the above terms in the same study.

Theoretical Questions

In what follows, sociomateriality is anchored in the information literacy tradition by discussing its potential contribution in relation to other traditions. To begin with, the question of materiality is re-examined in relation to intention and agency.

Materiality in information literacy research

Sociomateriality helps research on information literacy to recognise the role of technology as co-constitutive and in this way makes it analytically perceptible and relevant. It represents a departure from the anthropocentric assumptions that have dominated most previous information literacy research, in which humans are, as a matter of course, the sole focus of enquiry, while information literacy technologies are assigned a subordinate role (also see the discussion Hicks' chapter in this volume). In contrast, sociomateriality does not separate technologies and information literacies, but sees them as interdependent. An early proponent of the need to focus on the interdependence of literacy and technology is Bertram Bruce. As early as 1997, he wrote: "the technologies of literacy are not optional add-ons, but are part of the definition of every form of literacy" (Bruce, 1997, 304).

As mentioned earlier, sociomateriality and practice theory (e.g. Cox, 2012; Lloyd, 2014; Pilerot et al., 2017) share several starting points in terms of framing information literacy (Also see Lloyd's chapter on practice theory in this volume). In particular, they share a critique of general models of information literacy. A focus on practices rather than individual intentions and behaviours brings to the fore that information literacies need to be understood in the plural to capture how literacies are necessarily always dependent on the actual practices of which they are part. Nevertheless, the specific interest in materiality that underlies sociomateriality and that enables concrete technologies to come into view is usually absent from other practice-theoretical research on information literacy. On occasion, a practice-theoretical approach to understand practices of information seeking and information literacy may even contribute to obscure the technologies, as the approach deliberately – and often for good reason – emphasises practices over information systems (Cox, 2012). However, this may also hinder the emergence of a deeper understanding of the co-constitutive relationship between information systems and practices and of the creation of social meaning through these configurations (Haider and Sundin, 2019, 36).

There is certainly research on information literacy that develops a theoretical notion of information technology. In their highly cited article *Information Literacy as a Sociotechnical Practice*, Kimmo Tuominen, Reijo Savolainen and Sanna Talja (2005) creatively combine a focus on practices and materiality to examine information literacy that is in some ways similar to that supported by sociomateriality. However,

it is important to note that they do not explicitly refer to sociomateriality and several significant distinctions can be made out. Strictly speaking, they consider the interaction between technology and practices rather than how their relations are co-constitutive and configured in sociomaterial practice. In other words, the analytical focus is on the getting together of distinct phenomena with distinct meanings that exist separately. A sociomaterial approach to information literacy, on the other hand, would emphasise how all actors involved are always in processes of becoming, how relationality happens and meaning arises through this performance.

Although it is not the most common approach in information literacy research or information studies more broadly, there are numerous interesting examples of more or less rigorous applications of sociomateriality (e.g. Bates et al., 2019; Ekström, 2021; Haider and Sundin, 2019; Huvila, 2018; McCoy and Rosenbaum; 2019; Rivano Eckerdal and Sundin, 2015; Rivano Eckerdal, 2012; Veinot and Pierce, 2019). These examples – along with others that could not be listed – should give ideas on how to go about researching information literacy and related information issues with a sociomaterial framing.

Understandings of information literacy

Research on information literacy traditionally starts from the doings and sayings of students, workers, or other groups of people and from there on investigates their knowledge (or rather lack thereof) about and experiences from using certain information systems in schools, at workplaces and in other spheres of everyday life. Often this research tends to have a detached relationship to materiality. In Carol Kuhlthau's (1991) famous research on information seeking in schools, the focus is on the experience of students' feelings, emotions, and thoughts, while the material aspects of information seeking are almost invisible. The result of Kuhlthau's groundbreaking research is formulated as a generalised model of a typical information-seeking process. Her research deliberately distanced itself from what she referred to as a *source approach*, in which the focus of the research was on learning how to use different information sources or the order in which those sources ought to be used (Kuhlthau, 1987). Kuhlthau's research was developed during the end of the 1980s and early 1990s, at a time when there was a growing interest in cognitive and constructivist research on information seeking and information literacy. A title of a chapter by Brenda Dervin (1992) illustrates how at the time information systems tended to be viewed: "From the mind's eye of the user". Ever since a so-called user perspective has been strong in information literacy and information literacy research.

There is, of course, much research on information literacy and in particular on information literacy as a professional practice that deals with search engines,

bibliographic databases, and the evaluation of information sources. However, this research (and professional practice) tends to lack theoretical depth. Information literacy technologies are mostly viewed as neutral tools that people interact with or ignored altogether in the analysis. Read with a sociomaterial lens, it might be argued that such a way of conceptualising information literacy neglects the materialities involved as it forgets to consider how information literacies are integrated with literacy technologies (compare Bruce, 1997). Sociomateriality is, in a sense, a re-appropriation of information sources and retrieval technology into information literacy research and professional practice; not as something outside literacy, but as a part of literacy practices as such. Furthermore, sociomateriality, at least potentially, opens up for a critical understanding of why people meet the kind of information they do on social media, via chatbots, in recommendation systems, search engines and so forth. From a perspective of learning and literacy, these platforms can be referred to as information literacy technologies. In such a way, information literacy can contribute to *infrastructural meaning-making* (e.g., Haider and Sundin, 2019). With an interest in infrastructural meaning-making, we can ask questions such as: Why do we meet what we meet on information systems? Or how are information systems related to each other? What are the implications of these material relations for the emergence of meaning?

As an example, let us take a closer look at Google Search – an information literacy technology that has often been strangely ignored or considered only as a neutral tool in much information literacy research. When we approach Google Search from a sociomaterial perspective on information literacy, particular aspects are brought into relief. First, the role of materiality (including intangible, digital materiality) comes into view; materiality not as something that stands alongside the social, but as enacted with it in sociomaterial practices of co-constitution or, to use Barad's concept, intra-actions.

Second, compared to many other theories of information literacy (e.g. cognitive and phenomenographical notions), a sociomaterial approach directs attention to configurations and entanglements and to how performance occurs, not in general, but situated, with an agential cut, at a specific moment. An enormous number of components are involved and can be considered in a Google search: For example, there are algorithms, a huge index, bots, websites, language models, and not least the data that people provide to the search engine. There is also physical technology such as devices, cables, data centres, hard drives and their cooling units. In addition, it involves a large number of people: Programmers, raters and data labellers, advertisers, legislators, content producers and providers, end users in their practices, and so on. Each time someone searches for something in whatever way (using voice control, images, written queries, or by following a suggestion offered

by the system), these and many other components come into play. And they come into play together with their politics, values, and ideologies and – it could be said – every time this happens an instance of information literacy is performed. This way, information literacy relates to the emergent, or the *becoming*, character of dominant information systems. Yet, when subject to analysis, it is also situated in one specific configuration of commercial platforms, algorithms, the flow of data, practices, actual demands, constraints and lived experiences and particular implications for people's lives, bodies and relations.

Thirdly, another aspect of information literacy that has received much attention is the evaluation of information sources. The need for such evaluation is often justified by the increased awareness of the conditions of contemporary digital culture with regard to various types of false or harmful information (e.g. misinformation, disinformation, malinformation). To apply a sociomaterial perspective to information literacy is to place the evaluation of information sources in the realm of the (digital) infrastructure in which they intra-act, and, thus, to recognise that this infrastructure is constantly in the making. The vetting of information and meaning-making more broadly can then be related to the emergent character of the infrastructure, and also to values, interests or limitations that arise from the practices of which they are a part. After all, all evaluation of information sources is situated. This means it takes place in practices and these practices are constitutive components of infrastructures and vice-versa.

Information literacies configure sociomaterialities in different ways (and the other way around). This implies that the co-constitutive relationships of people, platforms, institutional requirements, social expectations, laws and regulations, technical devices, cultural and educational resources, and so on play out differently each time. But, and this is important, not arbitrarily different. Since they are also practices, these relationships are stable enough to be recognised as such and related to each other. When evaluating search results, for example, their meaning must be established in relation to the infrastructure that generated them, and this infrastructure includes, not least, the action of whoever performed the search in the first place. In other words, infrastructural meaning-making clearly matters. However, infrastructural meaning-making can only take place if one understands not only that, but also how practices are sociomaterial. Concerning the example of Google search, then, understanding the sociomaterial entanglement of search and its performance is a prerequisite for critically evaluating information and information sources. That is, we cannot focus only on a source per se without understanding how the source is interwoven with other components in the various sociomaterial arrangements that make it possible in the first place. Finally, Orlikowski (2007, 1440) makes the point that when you search with general-purpose

commercial search engines like Google, you are not looking for reality as represented by that search engine. From a sociomaterial theoretical point of view, reality emerges during the search, or as Orlikowski and Scott (2014, 8739) write: "reality is enacted through performance".

To reiterate, sociomateriality opens up the possibility of taking the material aspects of information literacy seriously, in a way that allows for a better understanding of how practices, technologies and information literacies are jointly constituted. Today, a rapidly evolving digital information infrastructure, with its dominance of a few global, multisided platforms, co-produces the practice of finding information, of evaluating its credibility and of much of public debate.

Reflections on methodological choices

In research on information literacy, the empirical focus has often been on the study of different user groups. The individuals who make up these groups have usually been taken for granted as the focus of interest – either through questionnaires, interviews or observation. Oftentimes, researchers studying information literacy have assumed a norm of how to evaluate or search for information, and their study has then measured the extent to which a particular group of people meets that norm. However, frequently, this kind of research lacks adequate reflection on its own norms (see e.g. Haider & Sundin, 2022, chapter 3 for a discussion). Highlighting this blind spot does not necessarily imply a critique of a normative information literacy agenda as such. However, a sociomaterial approach gives us a certain methodological direction. The most obvious of these is the valorisation of nonhuman actors in research. Also, with sociomateriality, the focus is not on either people or nonhuman actors, but on how they are configured in certain practices. Obviously, such an approach also poses challenges. For example, how do we get close enough to the specific sociomaterial practices? How can we get at what data and algorithms are doing when platform companies in most cases restrict access to their trade secrets? Today, research usually has to make do with the results of the configurations that people remember, because the specific sociomaterial arrangement at any given time is difficult to observe. Research has to take what we can get, with a 'good enough' attitude. This attitude is also rooted in defiance of the corporate takeover of large parts of society's basic and necessary information infrastructures, politely referred to as *platformisation* (Plantin et al., 2018). Most importantly this attitude makes it possible to see value in working with presets, defaults, and approximations, and indeed with failures, glitches and breakdowns. After all, these are the *agential cuts* where the materiality of infrastructural arrangements comes into being most of the time and where the historical, cultural, and even political layering that constitutes them becomes most palpable.

Much of sociomaterial research begins with the assertion that nonhuman actors should play as important a role in the analysis as human ones. This theoretical assumption is also present in most practice theory (Pilerot et al., 2017). At the same time, traditional methods of data creation – questionnaires, interviews and observations – are still favoured and materiality is "invited" (Hultin, 2019) through these. When nonhuman actors are included in the analysis, it is usually through the senses of the people being studied. This critique of a lot of work on sociomaterial information literacy, including our own, can and has also been made of empirical information literacy studies in other theoretical traditions, most notably practice theory. In reply to this, two points can be raised. Firstly, it is important to note that a sociomaterial approach does not mean that all well-established qualitative research methods for data creation, such as observations, interviews or focus groups, should be abandoned. Rather, it can be argued, what is important is *how* one approaches interviews, observations, focus groups or similar methods. Materiality needs to be invited, so to speak, as Lotta Hultin puts it when she points out how she has shifted the focus in observations "from the sayings, doings, and interactions of primarily human actors to how the temporal flow of practice enacted conditions of possibility to speak, act, and interact in certain ways." (Hultin, 2019, 98). A second important consideration can be found in the compound material-discursive. This term is often used to describe not least Karen Barad's theoretical work and it reflects even clearer than the notion of sociomateriality itself how the discursive is material and the material is discursive. That said, discourse or the discursive are not synonymous with language. As Barad (2007, 146) so neatly summarises Foucault in this regard: "Discourse is not what is said; it is that which constrains and enables what can be said. Discursive practices define what counts as meaningful statements." These statements include language-based ones, among and in conjunctions with other things.

Another concern of methodological significance arises from the specific understanding of materialities, which may seem overwhelming. If everything is material, yet at the same time, matter does not exist as such, but only takes on meaning in processes of co-constitution, then how exactly can the role of materiality come into view and how can co-constitution become noticeable to the researcher? Here it helps to think of sociomateriality as a theoretically informed sensitising concept as David Ribes (2019, 58) suggests for the study of materiality in STS more broadly: "A materialist approach should not be a dogma – a drive for materialist purity – rather it is a sensitizing tool of the analyst, allowing us to hone in and make sense of the central aspects of the study at hand." Moreover, research is itself a practice that studies another. The phenomenon at hand thus consists of two practices that are distinguished from each other by how they are intra-actively performed, to use a sociomaterial language. Such a perspective, which situates

research in relation to the configuration being researched, also supports an understanding of how seemingly identical materialities are performed differently in and through different practices.

Summary and conclusion: embracing definitional ambiguity and a punk approach to sociomateriality

This chapter is written for a theory book on information literacy. Of course, we hope that the chapter will encourage readers to approach information literacy research from the point of view of sociomateriality. Nevertheless, we would like to emphasise that the chapter is not a cookbook for analysis. Indeed, we oppose any form of theoretical literalism that ends in a categorical distinction between right and wrong. Theories are always in motion and not meant to be rigid templates; they are always being adapted and further developed in the research process. Just as it emphasises the constant becoming and performance of the world, sociomateriality itself is not a fixed and stable theoretical position. Rather, it is an approach or a way of thinking, made up of allied analytical moves grouped around a set of central ontological assumptions and concepts that share a particular interest in materialities and the social as situated, co-constituted and emergent. We are not advocates of a purist understanding of sociomateriality. Instead, the terminological creativity and ambiguity that characterise the field can be understood as an invitation to adopt an eclectic approach to sociomateriality. Such an approach, in our view, might also be necessary to engage analytically with the ever evolving and fast-moving messiness of society's infrastructural arrangements without getting lost in discussions about terminological precision or conceptual consistency. That being said, an eclectic approach to sociomateriality, while allowing for terminological plasticity, must nevertheless adhere to some central tenets of sociomateriality to ensure theoretical coherence and not fall into the trap of technical determinism. Moreover, an eclectic interpretation of sociomateriality allows for a degree of definitional ambiguity and is open to methodological inventiveness (Lury and Wakeford, 2012). This, we argue, is a prerequisite for examining information literacies in relation to the corporate and platformised information infrastructure that increasingly defines and pervades much of contemporary society. Furthermore, it is a way to facilitate the inclusion of other theories that may be better suited to understanding, for example, power, democracy, economic or political structures, history, etc. in an investigation.

We argue for an approach we have earlier in this chapter described as 'good enough', which aims to create an understanding based on playful – and sometimes angry or defiant – relations with configurations of commercial information infrastructures. A fitting term to describe this approach would be a punk approach to sociomateriality. This includes an interest in things like autosuggestions, default settings, or the repurposing of marketing tools for situated data creation, and it

allows the researcher to constantly perform sociomateriality through their own actions. Such a punk approach entails a critical, yet dynamic stance and responsiveness to the messiness of the world, but also a deeply rooted social justice ethos and a Do-It-Yourself (DiY) attitude (Smith et al., 2017; Stewart and Way, 2023). Instead of aiming for perfection and frictionless conceptual consistency, we propose to get to work creating the data, respecting people's limits and ethical, personal and other boundaries. However, we must not be intimidated by the limits set by the corporate information infrastructure or fetishising technology and technological progress in a way that shrouds the various systems we live by in such mystery that studying and controlling what they do and refusing them becomes the privilege of a minority.

When we point out in the introduction to this chapter that information in contemporary society tends to find people rather than people finding the information, this is a statement that is made from such a position. Thus, a response informed by sociomateriality would emphasise that we need to understand more precisely how the agency of the information infrastructures is performed in and through sociomaterial practices. A punk approach to sociomateriality then would add that since there is only so much we can – or are allowed to – know and what we can know is always already past, the fastest and loudest path to creating the data is to create it, from the people who want to tell us and from the systems we can access in the way we can access them. Analytically, on the other hand, such a sociomaterial approach implies most of all employing materiality as a sensitising concept (Ribes, 2019) throughout when approaching the data and letting this tie the different parts of the analysis together.

This situation fundamentally challenges the conditions for knowledge, ignorance and doubt in society. It also changes the conditions for the deliberate spread of misinformation and the online mobilisation of people for various causes. The creation, dissemination and amplification of harmful information can be and has been automated. However, from a sociomaterial perspective, we should also ask ourselves critical questions like: To what extent can and has information literacy been automated and how? What would it mean if information literacy were delegated to AI systems? What about information literacy can be and what ought not be automated? Can a bot ever teach information literacy in a way that is beneficial and for what? A punk approach to sociomateriality based on such inquiries asks: what is the price - in terms of suffering or harm - of training an AI model for such a purpose, who will pay that price and who will profit? And above all: how can we refuse and what theoretical and analytical allies do we need to bring on board to do so?

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