Communicative AI and Techno-Semiotic Mediatization: Understanding the Communicative Role of the Machine

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Abstract

Mediatization discourse has so far mainly been centered on media from institutional or social-constructionist approaches. The technological developments within communications industries coupled with the wider societal process of datafication might, however, beg for dusting off the smaller, although the long-time existing, technological approach to mediatization as a complement to the two other approaches, in order to understand aspects of automation and human-machine communication. This theoretical article explores how existing mediatization approaches can refocus to include lessons learned from human-machine communication. The first section accounts for the main mediatization approaches. The second section discusses debates on communication, artificiality, and meaning-making. The last section takes the example of the recruitment interview for discussing how mediatization theory can benefit from including a technological approach with influx from human-machine communication, as well as how human-machine communication can learn from wider discussions within mediatization theory.

Keywords: communicative AI, mediatization, technology, communication, meaning-making

Introduction

A large portion of media research over the past 2 or 3 decades has taken point of departure in the radical transformation of social and cultural life that has followed from the digitization of all media. Media technologies and contents have multiplied, paving the way

for increased opportunities for commercial media to monetize behavior and to develop refined business models built on audience management. The possibilities for communication have also multiplied, where everyday media users have been equipped with relatively cheap means of production (although not the resources of large-scale media corporations). Communication takes place on an increasing number of technological platforms, involves more communicating agents, but also includes a wider variety of communicative agents—including nonhuman communicators. The popularization of interfaces for conversational text interaction such as ChatGPT has further amplified textual production, adding to the vast amounts of textual expressions in digital space.

Mediatization theory has over this time arisen to theorize this increased multiplicity of communication platforms, agents, communicative types, and textual outputs. However, European mediatization research has so far mainly been centered on media from institutional or social-constructivist approaches (Hepp, 2020a; Hjarvard, 2013; Lundby, 2014). The technological developments within communications industries coupled with the wider societal process of datafication might, however, beg for dusting off the smaller, although long-time existing, techno-semiotic approach to mediatization as a complement to the two other approaches, in order to understand how aspects of automation and human-machine communication can feed into processes of mediatization. Arguably, this approach, grounded in the medium theory of Marshall McLuhan (1964), structural anthropology, and semiotics could enrich the two main approaches by putting a stronger emphasis on the communicative and textual aspects of mediatization. The approach was introduced by Jean Baudrillard (1971/1981) in the early 1970s, and can also be found in Latin American mediatization debates (e.g., Carlón, 2020), but has been largely absent from the main European debates. An integration of the techno-semiotic approach could therefore provide with a more nuanced mediatization theory, that could also take into consideration textual expressions and communicative dimensions. Mediatization theory has thus had its main focus on *the media*—as institutions, and as technological (and sometimes also textual) environments—and less on *communication*. This means that questions of *communicative AI* (Guzman & Lewis, 2020), that is "devices, applications, and algorithms capable of communicating in natural language and adapting to real-life conversational situations" (Laaksonen et al., 2023, p. 137), has had difficulties in being integrated in the debates on mediatization. The aim of this theoretical article is therefore to explore how mediatization theory can be advanced by incorporating a techno-semiotic dimension that can be beneficial for the understanding of the implications of automated and algorithmically managed forms of human-machine communication. Reversely, it is hoped that this discussion could also inform debates in human-machine communication.

In the first section, I will account for the differences between the institutionalist and social-constructivist traditions of mediatization as well as the more latent techno-semiotic approach rooted in medium theory, semiotics, and structural anthropology. I will then, in a second section, discuss the role of communication (rather than *the media*) in both mediatization and human-machine communication contexts in order to explore how they can inform each other. In a third section, I will illustrate how such an integration of debates from human-machine communication can be beneficial for certain types of mediatization processes by briefly discussing how a communicative practice such as the recruitment interview has become mediatized over the years. The paper then concludes with an argument for

a more holistic approach to mediatization that can be beneficial for understanding the role of human-machine communication in this process.

Institutional, Social-Constructivist, and Techno-Semiotic Mediatization

The by far most common way in which researchers have discussed mediatization is through an institutional approach. This is where the concept of *the media* means media institutions, either in the form of media companies such as the television broadcasting companies BBC, Globo, NBC or press organizations such as *The Times*, *Le Monde,* or *Corriere della Sera*, or in the form of societal institutions such as *journalism* or *politics*. Irrespective of which, the concept of media refers to *mass media*, and the temporal perspective is that of the 20th century and onward, most often the latter half of that century. Quite often causal explanations are emphasized: the institution of *the media* or *journalism* impacts on another institutions, for example *politics*, having the latter adjust to the working principles or the logics of the first. This is, for example, how one of the pioneers in the mediatized politics tradition, Kent Asp (1990), analyzed the ways in which politics gradually became reliant on the mass media. Many of the proponents of this approach, including Asp, have taken their source of inspiration in Altheide and Snow's (1979) seminal theory of *media logic*. In the same vein, Jesper Strömbäck (2008) discusses *four phases of mediatization* through an historical analysis of the relations between what he calls a "media logic" and a "political logic," where the latter is becoming increasingly dependent on the media. The mediatization of politics is one of the major avenues through which research has traveled, and besides the temporal distinction of the mediatization process in historical phases that Strömbäck has engaged in, there are also refinements of the theory in terms of the features of mediatization; for example, by the breaking down of the process in the four aspects: extension, substitution, amalgamation, and accommodation (Schulz, 2004).

Danish mediatization scholar Stig Hjarvard has probably been the one that most elaborately has theorized the institutional approach. The benefits of this approach, Hjarvard argues, is that it conducts its analysis on the meso level, is relatively easy to operationalize, and deals with "changes in inter-institutional relationships" (Hjarvard, 2014, p. 199). Hjarvard has also used the institutionalist approach on other phenomena, such as children's play and religion (Hjarvard, 2013).

The other dominant approach is usually referred to as the social-constructivist. This approach adopts a longer time perspective, reaching back to early forms of communication in archaic society, drawing the long historical lines from cave paintings to AI. This naturally means that not only mass media are in focus, but all kinds of communication technologies. Because of its basis in social constructivism, it is less focused on causal explanations, and rather emphasize that media and communication develop *with* society in complex ways, rather than affects society from the outside. Its focus is on the media as environments in which we live, and the ways in which social subjects orient in mediatized space. To the contrary of the meso-level analysis of the institutionalist approach, this strand of research often adopts a macro perspective on societal change. This approach has its advocates in, for example, Nick Couldry and Andreas Hepp (2016) in their book *The mediated construction*

of reality. Hepp (2020a) has then further developed this analysis for the datafied world in his book *Deep mediatization*. According to Hepp, deep mediatization should be understood as "the stage of mediatization in which the analysis of algorithms, data and artificial intelligence become crucial to our understanding of the social world," and should be read as resonating with concepts such as "deep learning" or "deep analytics" (Hepp, 2020a, p. 7).

Both these approaches are well represented in edited collections (e.g., Driessens et al., 2017; Kopecka-Piech & Bolin, 2023; Lundby, 2009; Lundby, 2014), but while the main debates about the process of mediatization were introduced in the early 1990s, and more widely debated in the first 2 decades of the new millennium, Jean Baudrillard used the concept a couple of decades earlier in his "Requiem for the media" (Baudrillard, 1971), where he discussed "l'information médiatisée" in connection to a wider discussion of the possibilities and limitations embedded in media technologies (see the more detailed account in Bolin, 2014). This approach to mediatization is in research overviews acknowledged to exist but is also dismissed as having had too little impact on the mediatization debate (Hepp, 2020a; Jansson, 2018). This is unfortunate, since the approach with its focus on the technological affordances and limitations for communication has some important contributions to make to research on communicative AI and human-machine communication.

Baudrillard's argument about mediatization has its background in the medium theory of Marshall McLuhan (1964) and the technological philosophy of Walter Benjamin (1936/1977), coupled with theories from structural anthropology and semiotics. It can foremost be found in his early works (e.g., Baudrillard, 1971, Baudrillard, 1976/1993). Baudrillard's emphasis is dual: first, on the technology itself as a channel of communication that privileges certain communicative forms while setting limits to others. Second, it also emphasizes the semiotic codes in which communication occur, and the way in which these affect communicative exchange. This form of exchange is at the root of Baudrillard's understanding of communication:

> What characterizes the mass media is that they are opposed to mediation, intransitive, that they fabricate non-communication—if one accepts the definition of communication as an exchange, as a reciprocal space for speech and response, and thus for *responsibility*. In other words, if one defines it as anything else than the simple emission/reception of information. (Baudrillard, 1985, p. 577)

First, Baudrillard argued that the technological affordances of the mass media, such as television which was the new medium of the time when he was writing, were seen as mere technological channels for one-way communication that were engaging in "speech without response" (Baudrillard, 1971/1981, p. 169). Television, Baudrillard argued, could never work emancipatory since the technology itself prevented true communication. Baudrillard thus models his concept of communication on human speech and symbolic exchange: communication was for him always concerned with establishing a relation between two subjects. This is partly rooted in dialogic theory, but also in theories of gift economies (Mauss, 1925/1990), where the symbolic exchange of gifts creates a bond between giver and receiver. This type of exchange is permeated with symbolic meaning, whereas the mass media

"fabricate non-communication" (Baudrillard, 1971/1981, p. 169), that is, they are merely simulating communication.

Second, this simulation is not only coupled with the technological mediation of information or communicated content. It also stems from the semiotic codes by which communication occurs, and the paradigmatic limits of discourse. The communication of signs is subsumed with the cultural rules, grammars, and other semiotic qualities of communication. This part of Baudrillard's theory is particularly relevant to questions of communication related to AI and automation, as the semantic logic of communication is more reminiscent of algorithmic rules, prompts, and protocols, where signs are managed in more instrumental ways.

Simulation is also related to representation and leads to the three stages of simulacra, as Baudrillard (1981/1994) discusses in his *Simulacra and simulation*. In the first stage of simulacra, the relation between the representation and its referent in social reality is obvious—no one would mistake the painting *Mona Lisa* by Leonardo da Vinci for the real person portrayed (Lisa del Giocondo). With the advent of photography, the relation between the representation and its referent changes and becomes less obvious. This is because of the indexical relation between reality and its photographic representation, where the light of the portrayed person actually sets its mark on the celluloid film. It thereby establishes a direct relation between the portrait (say, the famous image of Che Guevara by photographer Alfred Korda), and the person portrayed (the actual person Che Guevara). This is where the conflation appears between representation and person represented that French painter René Magritte ironically comments on with his famous painting *Ceci n'est pas une pipe* (This is not a pipe)—a naturalistic painting that of course is not a pipe, but represents a pipe. Today, with image-generating software such as DALL-E or Midjourney, we can safely say that we have reached what Baudrillard called the third order of simulacra, when the relation between a representation and its referent is dissolved. A machine-generated image does not have any identifiable referent in social reality but is built from extracts from the millions of images that the software is trained on. I deliberately write *identifiable*, since there are of course referents, but no single person could connect each bit of the generated picture with its original source.

Baudrillard's legacy has, naturally, been discussed widely, although less so in debates on mediatization. However, although he does not use the concept "affordance" explicitly, his focus on the possibilities and limitations of the medium can be seen as similar to how media technological affordances have been thematized in theories of human-machine communication; for example, in the debates on human-chatbot interaction (Mygland et al., 2021), where research has followed Norman's (1999) elaboration of Gibson's (1979) original idea of affordances, and theorized them as the "actionable properties" of technology as perceived by a social actor (see, e.g., Rodriguez-Hidalgo, 2020). Baudrillard's insistence on symbolic exchange would, however, mean that all human-machine communication would be simulation. Nonetheless, his theory of simulation and techno-semiotic affordances is also one way to refocus the attention in mediatization theory to questions of communication, and thereby act as a bridge to human-machine communication. Reversely, an influx of institutional and social-constructivist mediatization theory could potentially enrich the theoretical frameworks for debates in human-machine communication.

To sum up this discussion, we could say that the three approaches to mediatization emphasize institutional, sociocultural, or technological changes within culture and society. While the institutional and the techno-semiotic approaches to mediatization conduct their analyses at meso-level, the social-constructivist arguably is a macro-level approach. In its longer temporal perspective, and wider inclusion of media technologies and expressive forms, it is also more holistic. Arguably, it includes in its analysis also media institutions as well as the techno-semiotic ways in which the media operate. A consequence of this long historical perspective—"the longer the better" as Latin American scholar Eliseo Verón (2014, p. 2) argued—is that we could say that we have always been mediatized. However, the ways in which societies have been mediatized have depended on the specific communication technologies at hand, and the uses they are put into. The task for mediatization research then, is not to analyze *whether* we have been mediatized, but *how*.

Furthermore, central to the institutional and the social-constructivist approaches is a focus on the media, rather than communication. This is also why Baudrillard's emphasis on communication, technology, and semiotics is of relevance for bridging mediatization and human-machine communication theory. The next section will discuss in more detail the role of communication in *traditional* media theory and in human-machine communication in order to find some common ground in which the debates can be integrated.

Communication and Meaning-Making in Communicative AI

As has been clear from the above, one distinction between the different approaches to mediatization is rooted in the way in which the media has been theorized: as institutions/organizations, technologies, or symbolic environments/sign systems. As new communication technologies have entered the media landscape, we are now at a point where we also need to distinguish between different types of *communication*. In the history of communication, the term has often referred to the concept's Latin roots in *communicare* (to share, to make common) and the rhetoric activity of *communication* (Peters, 1999). In Raymond Williams's words, communication is "the process of making unique experience into common experience" (Williams 1961/1965, p. 55), that is, an act of sharing that involves two subjects each of who constitutes "a morally autonomous self" (Peters, 1999, p. 20) that has the ability to construct intersubjective meaning in the process (mediated as well as interpersonal).

Such ritual approaches to communication centered on the meaning-making character of communication has always had their counterpart in the transmission approach, which is centered on the dissemination of messages in space (Carey, 1975). In the age of communicative AI, such approaches would seemingly be more relevant, since communication no longer presupposes two communicating subjects, as in human-machine communication (Fortunati & Edwards, 2020; Gunkel, 2012; Guzman & Lewis, 2020). Accordingly, alternative conceptualizations and modifications of existing approaches to communication have been introduced. Banks & de Graaf (2020, p. 24), for example, seek to merge the two approaches and argue for an "agent-agnostic transmission model," where machines "participate in the meaning-making process." The basis for this argument is that meaning-making is defined as "a system's response (behavioral, computational, or otherwise) to an environmental signal from which information is extracted and during which value is assigned"

(Banks & de Graaf, 2020, p. 24). It is, however, unclear what is gained from defining meaning-making as mechanical responses to incoming prompts.

From another theoretical approach, Elena Esposito (2017) has, inspired by Niklas Luhmann's systems theory, argued for the analysis of AI not in terms of intelligence, but of communication. She finds that we can indeed speak of communication between humans and machines if we strip our concept of communication of intersubjective meaning-making. This follows from the concept of communication that Esposito borrows from Luhmann, who emphasizes the receiver as the definer of whether communication occurs or not: communication occurs, according to him, when someone (i.e., a social subject) perceives of something as communicated, a definition of communication well fitting for human-machine communication (Esposito, 2022, p. 7). Since machines, following Alan Turing (1950), cannot really think but only simulate thinking, a concept of communication that would include machines needs to be relieved of all kinds of references to intersubjective meaning-making, and be closer to the mathematical theory of communication. Claude Shannon, who formulated this mathematical theory, persistently argued that the "semantic aspects of communication are irrelevant to the engineering problem" (Shannon, 1948, p. 379), and although his colleague Warren Weaver tried to expand on the theory to include meaning-making (Shannon & Weaver 1949), it seems more relevant for the purposes of this discussion to stick to Shannon's original ideas, and leave meaning-making as a dialogical and intersubjective activity that is founded in understanding, experience, and self-reflexivity out of the picture.

In fact, this is also what Esposito (2022) proposes in her theory of artificial communication as a replacement concept for artificial intelligence. But if we agree to call the semiotic exchange between humans and machines as communication, why do we then need the prefix *artificial*? What does artificial stand for in this conceptual combination? As has been pointed out in previous discussions of "natural and artificial intelligence" (Sokolowski, 1988, see also Gunkel, 2020, p. 7f), artificiality in relation to intelligence, communication, and other such transient or intangible things are different from, as is Sokolowski's example, artificial flowers. Plastic flowers are *fake* flowers—they have no smell, and if you touch them, their texture betrays them as fake. Artificial light such as that produced by a light bulb does not differ from the light waves produced by sunlight. The light waves are the same, although their origin differ. The same can be said about communication via a chatbot that passes the Turing test in the sense that it produces sentences that humans can find intelligible. And if it passes the Turing test, is it not then communication?

If a human subject interprets the signs produced by the machine, there is meaning produced on part of the human, but the meaning production is not reciprocal—meaning-making is only occurring on the human part in the exchange. This is then a question of transportation of symbols and signs, rather than symbolic exchange. Humans can indeed produce meaning also out of material or content that is produced by, say LLMs such as ChatGPT, but the reverse is not true; machines cannot produce meaning for themselves. As Bender & Koller (2020) point out, this is because communicative AI is based on models trained on extremely large datasets; that is, trained on form rather than content, and therefore cannot produce meaning. If we on the other hand, as Baudrillard clearly does, have interpersonal and co-present communication between humans as our measuring stick, then human-machine communication is deviating from that norm (i.e., is artificial, fake,

or a simulation of communication). But if our definition of communication is more in line with what Esposito proposes, or Shannon for that matter, there is no need for the prefix artificial. It is merely a question of whether we consider communication as the transmission of signs/data from one point to a recipient who might produce meaning out of it, or whether we reserve the concept of communication for a ritualistic intersubjective exchange of meaningful symbols.

We might thus want to think of this as two kinds of artificiality, referring to material (tangible) and intangible objects respectively. Only material objects can be considered fake, while intangible phenomena such as light or communication only differ in their origins of production. If communication is defined as transportation or transmission of signs, then the origins of these signs might vary, but it would nonetheless be communication. However, if communication is about the making of unique experience into common experience, as Williams argues, then we can put into question whether machines can have any *experience* to share. Such shared understanding would presuppose shared meaning-making, and we cannot say that machines experience and make meaning—at least not in the sense of a *morally autonomous self* (Peters, 1999).

In those instances where there is a perception on part of the interpreting subject that they are actually engaged in intersubjective communication, we thus can speak of communication. In such a successful *imitation game*, there then arises a specific kind of deception where the interpreting subject believes they are communicating with a human subject. Simone Natale (2021) has discussed the role of deception in media theory and in relation to communicative AI:

> Communicative AI departs from the historical role of media as mere channels of communication, since AI also acts as a producer of communication, with which humans (as well as other machines) exchange messages. Yet communicative AI is still a medium of communication, and therefore inherits many of the dynamics and structures that have characterized mediated communication at least since the emergence of electronic media in the nineteenth century. This is why, to understand new technologies such as AI voice assistant and chatbots, it is vital to contextualize them in the history of media. (Natale, 2021, p. 12)

In this statement, Natale (2021) aligns himself with the common trope in HMC that previous research has treated the media as mere platforms for the interaction between humans, while today, we are also communicating with technology: "communication theory has historically conceptualized people as communicators and technology as mediators" (Guzman & Lewis, 2020, p. 79; see also Ertzrodt et al., 2022, p. 441; Gunkel, 2020, p. 23; van der Goot, 2022, p. 555f). This is true insofar as the media means the media as technologies. However, if one thinks of the media not only as technologies, but also as institutions or sign systems it is not. Media organizations are indeed communicators, and sign systems certainly have a role in the communication process. These are also approaches to media present in traditional media research. Admittedly, it is easy to find examples where traditional media research has regarded the media as mere platforms for the actions of others, but there is also much media research that have indeed regarded the media as an active agent in the communication process (see the review in Bolin & Ståhlberg, 2015). Again, the way in which one

approaches this question will depend on how the concepts of media and communication are defined. For example, to Baudrillard (e.g., 1971/1981; 1976/1993; 1981/1994), mediated communication is measured as a deviance of interpersonal communication between social subjects. On the other hand, it is also Baudrillard's (1971/1981, p. 169) main point that the technology itself, in combination with the codes of communication, does something with the communicative situation: it produces *speech without response*.

Now, it is tempting to think of human-to-human communication as more dialectic and about shared meaning-making, and human-machine communication as more instrumental and linear. It is, however, important not to overemphasize the differences since there are also instrumental aspects of mediated communication between social subjects (see also Kellerman, 1992). However, traditional media and communication theory has never been naive of the impact of mediation for communication. Mediation, as the term is used here, refers to the technological transfer of information, contents, and signs from one point to another. Mediation is thus at the center of the mathematical theory of information. *Mediation* is to be understood as a technological feature of communication, as theorized in the transmission model of communication (Carey, 1975), to the contrary of *mediatization* as a meta-process on par with *globalization* and *individualization* (Krotz, 2007). But this is not saying that mediation does not affect the mediated representations, or that the media are mere *channels* for the transmission of information. The type of mediation also affects what is mediated, which in turn has consequences for the things or representations communicated.

Following from the fact that mediated images are representations rather than being the reality they represent, we should be cautious in juxtaposing human-machine communication with mediated interpersonal communication. Mediation, as it were, does something with the quality and type of communication by "narrowing the range of symbolic cues," as John Thompson (1995, p. 85) argued. We thus must take into consideration the *effect* of the communication technology or channel. Some of these channels provide "speech without response," as Baudrillard (1971/1981, p. 169) argued, while others indeed allow for response and exchange and transaction of signs in both directions. Many digital media, including chatbots and communicative AI, can simulate communication to the extent that it deceives the human communicator. Mediation thus occurs irrespective if it is a question of mediated interhuman communication or human-machine communication.

An example of communication within organizations might further illustrate why we should be cautious to make too sharp distinctions between human-to-human and human-machine communication. In many large workplaces, different departments communicate via mediated systems: email, but also other kinds of systems. Universities often use Canvas, itslearning, Teams, or other platform solutions. As university employees we also send emails to function addresses (e.g., economy@sh.se) which are most often responded to by social subjects rather than machines, but where we do not know which specific social subject will answer. Sometimes these subjects will sign off their response with their first name (e.g., Lisa) in order to minimize the *mediation effect* and make the message more personal. However, since we are communicating with an organization or organizational department rather than a social subject, we will often treat the representative of this department instrumentally, rather than individually—even if we know that they are social subjects. We will, in the terminology of Jürgen Habermas (1981/1992), adopt a communicative position

related to strategic rather than communicative action. Strategic action is goal-oriented (we want to know how our research accounts are doing and how much remains of the budget), to the contrary of communicative action that aims for understanding and shared meaning. When approaching a university department, be it the IT department or the HR department, we do that because we have an errand. Although we will often treat the representative of the department with respect, we do not wish to engage in long conversations about how they feel (if they are sad because a relative just died, or happily looking forward to their partner's birthday celebration). When we address them with: "How are you?", this is what courtesy prescribes, and we are generally not really interested in how they are feeling. This approach, in fact, is more similar to how we treat a robot or chatbot, and, as Stina Bengtsson (2018) has pointed out, the degrees of courtesy we invest in our communicative efforts is more a question of how we think of ourselves as human beings, rather than what we think of the machine or the human other.

As humans communicating with communicative AI in the form of, for example, LLMs, we are thus communicating with what has been described as "stochastic parrots" (Bender et al., 2021, p. 610), that is, communicators that are assembling sentences constructed out of signs from the vast databases on which they have been trained. This is why LLMs, however large they may be, also have their limits. In fact, they follow the basic principles of probabilistic semiotic processing, and can only produce an utterance (parole) based on what is already there in the paradigm (langue) (Saussure, 1916/1972). This is also how Baudrillard theorizes communication in his early writings, where the code and the technological mediation restricts the abilities to achieve real symbolic exchange (e.g., Baudrillard, 1971/1981, 1976/1993). In the next section I will bring these two paradigms together by way of discussing an example where communicative AI is introduced in contexts which have previously been dominated by interpersonal communication. The example is the automated recruitment interview—a communicative situation that can be argued to have become technologically mediatized over the past 100 years.

Exemplification: The Mediatized Recruitment Interview

Now, if we can agree that human-machine communication is a specific kind of communication, where the possible production of meaning lies solely among the human component in the interaction, how can we conduct a processual analysis of how this communication has become mediatized? Communicative AI is used in many areas in society, but is increasingly implemented in areas where processing of large volumes of information is required, and where there are hopes that Communicative AI will rationalize processes previously involving interpersonal communication (whether mediated or not). We could thus speak of a technologically-based mediatization of these types of communication.

One example of such mediatized encounters we can observe in the past few years is the recruitment interview. The interview is gradually technologically mediatized in the sense that for the most part in modern history, interviews have been made face-to-face, but later via telephone, or with the help of written questionnaires (Buckley et al., 2000). Recruitment interviews, or selection interviews more generally, have since the early 20th century been a communicative situation that has been the focus for attempts at automation in order to get rid of the biases that follow from human evaluation in social situations. Early on,

that is, already in the 1910s, it was discovered that the effectiveness of selecting successful applicants through interpersonal job interviews was problematic (Eder et al., 1989, p. 21). Thomas Alva Edison was among the first people to try to solve this problem with interview bias through pre-screening via questionnaires (Dennis, 1984), and as Buckley et al. (2000, p. 113f) has shown in their historical overview, attempts to refine the technologies of recruitment have followed continuously, thus successively mediatizing the practice. Lately, Communicative AI has been introduced to solve the perceived problems with bias, validity, and so forth that follow from interpersonal interviewing. A market for Communicative AI services has thus started to being formed, which includes systems of exchange as well as the formation of organizations that operate in this market. As with all markets, the agents involved promote their services through various persuasive arguments, many of which are based in the problems with bias, validity, and reliability that previous techniques have supposedly carried, and that the new AI technological solutions should remedy.

On this market, several companies have developed sophisticated interview robots and chatbots with the purpose to sort, rank, and select top candidates in situations of mass hiring. The services are offered to customers that engage in large-scale recruiting projects, where there can be expected a large number of applicants, sometimes up to several thousands, and where there is a need to pre-sort applicants into a group of top candidates. Among the high-profile international companies to offer such services is HireVue, a US-based video platform that enables candidates to be interviewed at any time of day and uses algorithms to evaluate their answers and facial expressions. Through "ethically-designed algorithms, candidates' responses are evaluated against identical criteria, every time" (HireVue, 2023), is the promise they make to customers. Another company is 98 Sparks, which has developed a recruiting system where candidates answer questions on their smartphones, which are then analyzed based on language performance which "eradicates the need to read over CVs and eliminates all forms of biases" (98 Sparks, 2023). UK start-up JamieAi (jamieai.com) focuses on matching candidates with the right credentials for relevant job openings, seeking to eliminate bias by excluding demographic factors, such as name, age, or ethnicity.

HireVue, Pera, and JamieAI are only some examples on this market—there are many more similar companies that offer AI-based services for recruitment. A specifically interesting example from a communications perspective is Tengai, a communicative AI system produced by Furhat Robotics, an artificial intelligence (AI) and social robotics company born out of a research project at the Royal Institute of Technology in Stockholm, Sweden (Savage, 2019). Tengai is more than a chatbot in that it also has the form of a head with "morphological human likeness" (Fortunati et al., 2023, p. 547), with the ability to mimic human facial expressions. In the looks, Tengai resembles Sophia the robot, with a human-like face (Fortunati et al. 2022). However, just like Sophia, Tengai is a *roboid*, that is, it neither is, nor is perceived as, a real robot with autonomous capabilities (Fortunati et al., 2021). She—the robot is just like Sophia, a gendered female—is rather a mixture between what Andreas Hepp (2020b) calls a "social bot" and a "workbot." Social bots are "software processes that are programmed to appear to be human-generated within the context of social networking sites," in the words of Robert Gehl and Maria Bakardjieva (2016, p. 2), but Tengai is also something more in that she also has a physical shape. She is a bust with the height of 41 cm, with a head in natural size on a pair of shoulders, which, of course, contributes to the roboid appearance. She interviews the candidate synchronously (as opposite to

asynchronous interviews, where an interviewee responds to questions when they chose the time themselves; Suen et al., 2019).

Synchronous interviews can be of two kinds with Tengai: one which is similar to a traditional face-to-face interview where the interviewee comes to an office and sits down with the Tengai roboid, and one online, where the interviewee is communicating with Tengai via a screen over the internet, or with an avatar (gendered male). In their promotional material on the web, Tengai, just as the other companies mentioned above, emphasizes the unbiased nature of the analysis that the automated system allows for. What is more important for the human-machine communication aspect is that PR discourse emphasizes the interaction as being with "actual humans," that there is a "perceived social presence" and "behavioral realism" on part of Tengai which creates a "feeling of being there with a real person" (Tengai, 2023). This supposedly means that the interviewee will *treat the interview as reality*, and that there is a sense of *intimacy* together with Tengai. It is striking how much the marketing language is deeply influenced by the language of human-machine communication, such as *social presence theory* (see, e.g., Edwards et al., 2019), and there is already a growing body of research into *anthropomorphization* and perceived humanness (e.g., Banks & de Graaf, 2020; Laaksonen et al., 2023; Lunberry & Liebenau, 2021; Westerman et al., 2020).

Irrespective of whether these promises of Tengai (the company, not the robot) hold or not, Tengai is indeed engaged in communication as understood by Luhmann/Esposito and Turing. However, Tengai also promises "behavioral realism" and "intimacy" that would be more characteristic for ritual communication, and previous research have had difficulties in finding individuals who consider the promises made by the PR slogans such as these being fulfilled (Fortunati et al., 2022; van der Goot, 2022). Differences between the promises made in the marketing slogans of Tengai and other similar services, and the perceptions among those who encounter them might be based in the different conceptualizations of communication. The market jargon emphasizes the communicative interaction between humans and machines in terms of ritual, dialogical communication, where each partaker in the communication situation produces meaning and shared understanding. Roboids like Tengai have difficulties in fulfilling this promise, since machines cannot produce meaning for themselves, nor think *new thoughts*. They can but simulate reciprocity in the communicative situation, and thus these promises seem hard to realize, as they require a great deal of willing suspension of disbelief on the part of the human in this specific communication context—a kind of subjunctive stance where the simulation, *the humanlike*, is accepted as *human* temporarily. Accordingly, research on chat-bot interaction seem to frame its questions around the humanlike rather than the human (e.g., Banks & de Graaf, 2020; Edwards et al., 2019; Nass & Brave, 2005; van der Goot, 2022).

Furthermore, it has been pointed out that communicative AI technology "does not drive the complete decision process," as one tech specialist in HR at a larger international communication firm explained in an interview. However, it can still be useful for funneling down the number of applicants to a smaller group of top candidates that is then interviewed face-to-face. In such volume hiring situations, AI also might benefit feedback to applicants, which is more difficult in non-automated contexts. However, as with some previous technological innovations introduced, communicative AI in hiring situations seems to be more advanced than potential customers are prepared to put their trust in (see examples in Bolin & Andersson Schwarz, 2015, p. 7f). Remains of traditional methodology therefore

sometimes linger on—in this case the traditional face-to-face interview. This is somewhat paradoxical, since communicative AI was introduced to overcome problems with that type of methodology, but can be attributed to a sort of cultural tenaciousness within markets, where new techniques are met with slight suspicion until they eventually are proven successful and then more broadly implemented (Bolin, 2002). Technological affordances thus might precede institutional and sociocultural mediatization.

The mediatized encounters that occur in human-machine communication can, following from the above, be understood within a framework of *technological mediatization*, that is, in situations where technology and the semiotic codes and procedures of communication is taken into consideration. For mediatization theory, this means a much more pronounced focus on the communication aspects of contemporary media technologies, and what type of communication is privileged. This does not mean that institutional aspects should be entirely dismissed, or that we should not think of communication in the longer historical and cultural perspective. These contextual understandings are still important. But it is rather a call for not having the technological and the textual being delegated to the background. Recruitment interviews could be an empirical area that could be beneficial for exploring the relations between technological mediatization, meaning-making and communicative patterns further, and thus contribute to the understanding of the relations among techno-semiotic, institutional, and social-constructivist mediatization.

Conclusions

In this article, I have discussed how mediatization theory could be enriched by a techno-semiotic approach, especially in relations to human-machine. I have related existing approaches to mediatization to each other, arguing for the benefits of not downplaying techno-semiotic perspectives. I have also discussed different approaches to communication and argued for integrating such discussions in mediatization theory. This discussion also includes reflections on the ways in which one can think of meaning-making in relation to human-machine interaction. I have then exemplified with the mediatization of the recruitment interview and showed how there has been a long-standing tradition of automating this communicative task to automated systems in order to produce a more unbiased, fair, reliable, and valid outcome. This is also how these communicative AI systems are marketed to potential customers. I have also briefly discussed the possibility of there being institutional and sociocultural factors that work against the technological affordances of the technology, and could beg for widening the context for the human-machine interaction analysis.

Theoretically, there are good arguments for re-introducing the techno-semiotic approach to mediatization theory, especially when one sets focus on the actual communicative exchanges between humans and machines. Such exchanges are, of course, embedded in institutional settings, as well as in sociocultural histories of communication, while more holistic approaches to mediatization are wanted, which should also include a variety of communication forms. I have then pointed to some factors within mediatization theory that human-machine communication could take into consideration when analyzing chatbot interaction and communicative AI, in terms of more thoroughly extending the discussions to also include institutional and sociocultural dimensions.

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