INTERVIEW WITH FRIEDRICH KROTZ

Mediatization as Metaprocess

A Historical-process Perspective

La mediatización como metaproceso

Una perspectiva histórico-procesual

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Friedrich Krotz is one of the most prominent figures in the field of mediatization studies in Northern Europe and a pioneer of such perspective in Germany, having first introduced this concept and approach to communication science research in that country in 1995. After a long career at various German and Swiss universities, as well as a number of important research stays at various universities around the world, Krotz is currently Professor Emeritus of Communication and Media at the *Universität Bremen* (Germany). In conversation with *InMediaciones de la Comunicación*, he reflects on his academic career, his assumptions or epistemic starting points, his strongly historical perspective, the processual nature of his approach, and his key original contribution to the field: mediatization as a (historical) "metaprocess", analogous to other "long-term transcultural metaprocesses" studied by the social sciences, such as globalization, individualization, modernization, literacy, and industrialization, to name a few. His emphasis on the construction of a "metatheory" should not be understood as pointing to abstract processes, but rather to the multidimensionality and diversity of the contexts in which the always concrete processes of mediatization operate, affecting everything (for example, the political, the economic, the cultural, etc., and at the same time, multiple levels of analysis, such as the micro, the meso and the macro).Thus, mediatization as a holistic approach or view of concrete phenomena and processes reflects his conception of theory as a construction that is not axiomatic, but inseparable from praxis and the concrete experiences of people in the social worlds they inhabit. On this point, Krotz draws on the important influence of British cultural studies and their dimension of cultural and political intervention in social reality. Thus, Krotz has always advocated for the role of civil society and its democratic institutions insofar as they represent potential democratizing regulatory forces (in all *Lebensbereiche* –spheres of life– and *Sozialwelten* –social worlds–) over the hegemony of either the state or dominant economic interests (as forces that threaten democracies).

As a corollary to the interview, Krotz presents his thesis on the *current determination* (in the last instance) of the economy through a "new division of intellectual labor" between humans and computers (the conditions imposed both by market capitalism in almost the entire world and by state capitalism in China). This determination of the economy within a history such as that of mediatization, marked by *indeterminacy* (or non-linearity) and by the long term, is thus a feature that, while specific to our contemporary world, is also historically contingent, making it clear that such economic determination is not a necessary feature of the processes of mediatization or digitalization. In this sense, Krotz calls on civil society and its democratic institutions, rather than the economy, to take control of the future development of digitalization, and to ensure that this new division of intellectual labor is for the common good and the benefit of all, rather than an instrumental function aimed at maximizing profits, whether corporate or state.



MARIO CARLÓN (M.C.), JAIRO FERREIRA (J.F.) & GUILLERMO OLIVERA (G.O.): As demonstrated early on in your university *habilitation* thesis entitled "Die Mediatisierung kommunikativen Handelns. Der Wandel von Alltag und sozialen Beziehungen, Kultur und Gesellschaft durch die Medien" ('The Mediatization of Communicative Action. The transformation of everyday life and social relations, culture and society through the media', completed in 1999 and published in 2001), you began to develop the perspective of mediatization in the mid-1990s and early 2000s, that is, very early on (1995), as a true pioneer in the German and English-speaking contexts, whose first works (published in English language) date from 2004 (Schulz), 2008 (Livingstone) and 2009 (Lundby). Could you please tell us how you came up with this concept in the mid-1990s, coming from an academic background initially in mathematics and then in sociology, but in a context of strong political commitment in all your academic work as a professor and researcher? To what extent did all this vital political and scientific commitment, from so early in your life, led you to develop your own perspective on mediatization in the 1990s and 2000s? What political, scientific and personal concerns and interests found a catalyst in the processes of mediatization?

FRIEDRICH KROTZ (F.K.): In order to answer this question, and also as a starting point for my responses to all your (very precise) interview questionnaire, I must first formulate three assumptions that are fundamental to my understanding of communication science and also to my work on mediatization (Krotz 2001; 2007; 2017a).

First, I take an action-theoretical approach: in their actions and experiences, humans are natural beings who also live in a symbolic world (Cassirer, 2007). This symbolic world is primarily constructed by language, but also includes images, sounds, gestures, and other symbolic forms of expression. It is the foundation of culture and society, and it enables and encompasses all human actions and experiences, especially communication, thinking, reflection, and interpretation. This also presupposes, secondly, that human communication (Krotz, 2008), alongside other activities and abilities, is an indispensable foundation for humanity and at the same time one of its distinctive features. This further implies that the communicative media and their development are also

of essential importance for humanity, because they enable ever new forms of human communication and thus also transform culture and society.

The third assumption relates to science. In my work as a mathematician and social scientist, I have learned that mathematics and formal logic can be helpful in empirically investigating facts and developing or improving theories based on them. However, I have also learned that these formal sciences are not sufficient to describe and understand human actions. This is because the symbolic worlds in which people live, and thus also their social and cultural activities, are based on meaning and significance, as Max Weber (1978), George Herbert Mead (1973) and Alfred Schütz (2004) have already shown. Mathematics and statistics can describe observable behavior, but they cannot capture subjective meaning or processes such as mutual understanding. And formal logic can structure thinking and action, but ultimately it can only take causal or deductive relationships into account and structure theories, but it cannot contribute to an understanding of the social world. This requires human creativity, qualitative research and the consideration of dialectics and reciprocal relationships.

In summary, it must be said that I have based my work on an interdisciplinary view of humanity that has shaped my work over the last decades in terms of theory, methodology, and scientific concepts, and has also been and continues to be fundamental to my understanding of mediatization.

In order to provide you with some context for the emergence of my work on media and communication, in the second half of the 20th century, communication science was primarily concerned with the so-called Lasswell formula (1948), namely "Who says what in which channel to whom with what effect?". The reduction implied in this concept, both of comprehensive communication studies and of the associated view of humanity and society, makes it clear that here, as in many social sciences and humanities, human communication was assumed, but was only examined in more detail in special cases. Its significance for the forms of human coexistence was also hardly acknowledged.

I came to communication studies at the age of almost 40 on the basis of my personal political engagement and my professional career as a mathematician and doctor of sociology, who had also researched political science and taught computer science. Together with others, I then contributed to establishing Cultural Studies in Germany and developing a more fundamental understanding of communication, both empirically and theoretically, to which Martín-Barbero (1993) also contributed. This took place in the context of the accelerating development of new media and digitalization, which changed the way people lived together. Media thus became important not only as a potential in people's everyday lives, but also increasingly influenced social spheres. For example, international soccer became increasingly dependent on media payments, the economy took control of the internet, and political discussions became more prevalent in emerging digital networks. I then referred to this as mediatization



(Krotz 1995) and called for new social institutions such as a media testing foundation to help people deal with all of this (Krotz 2010). So much for the emergence of the term mediatization, as far as I am concerned. After writing many books and articles, in 2010 I obtained funding from the German Research Foundation DFG (*Deutsche Forschungsgemeinschaft*) to organize a so-called Priority Program for six years, which comprised 36 research projects from more than a dozen of German Universities.

M.C., J.F. & G.O.: You have suggested that mediatization is a meta-process rather than a process, distancing yourself from the arguments put forward by innovation theories (diffusionism). Why is it so important to construct a "meta-theory", and what would it consist of? What are the advantages of conceiving social and cultural change from a "meta-theory"? Is it possible to identify some processes that are specific to *contemporary* mediatization, beyond postmodernity? Could you single out some processes at the micro, meso and macro levels, and explain how these three are articulated from a "meta" perspective? Does the 'meta' perspective constitute a further level of abstraction with respect to these three more concrete levels of analysis (micro, meso and macro)?

F.K.: Mediatization is a process concept. It describes the relationships between two interrelated developments –the transformation of the media in connection with the transformation of everyday life, culture, and society–. This cannot be captured by the concept of diffusion of innovations, which is often used in sociology. This concept refers to a fixed innovation, a fixed area of investigation, and a few useful variables whose change can be used to measure the spread of this innovation. Complex developments that continue worldwide over many periods of time, affecting different cultures in different ways, and which cannot be described as more or less confined to a particular region, but which involve very different sub-developments, cannot be described empirically in this way. Rather, they are a kind of theoretical construct that describes such complex developments –e. g. globalization, individualization, mediatization, but also the European Enlightenment or worldwide literacy, which has been taking place for millennia–. I have proposed the term "metaprocess" for this (Krotz 2003, 2011). They comprise many sub-processes that do not have to take place continuously or simultaneously, cannot be described

linearly, and often, cannot be presented without contradictions because they consist of movements and counter-movements. But they exist nonetheless as a helpful concept, and they consist of micro, meso, and macro processes, as the scientific literature shows. The emergence of writing and today's digitalization are also related to this. The social and cultural world is not structured logically and mathematically, but is developed by people themselves in a wide variety of ways. It is precisely in this *indeterminacy* that these concepts are helpful across disciplines.

M.C., J.F. & G.O.: Mediatization has been described as an ambivalent and discontinuous process, 'non-linear, sometimes chaotic, whose direction is *indeterminable*' (Grenz & Pfadenhauer, 2016, p. 8), and there have even been discussions, in the German-speaking context, focused on moments of *De-mediatesierung* ("de-mediatization") as inherent processes within the meta-processes of mediatization: Do you agree with this idea? Is de-mediatization an inherent or constitutive process of mediatization as a meta-process? Could you identify specific processes of de-mediatization in our contemporary era?

F.K.: Because of the above-mentioned *indeterminacy* of mediatization as a metaprocess, it can therefore be said that de-mediatization processes are also part of the overall social meta-process, as are the consequences and effects of such a meta-process. For example, fewer and fewer people read newspapers today, but whether this actually leads to a de-mediatization of politics or democratic action by civil society is not apparent at present. And even if sub-processes of mediatization are stopped and banned for religious reasons, for example, the nature of the mediatization process in question affects changes, but it does not shut them down. That is why, old media are by no means disappearing – television did not make radio obsolete, and even today, stone tablets are still used when a gravestone or monument is needed. At the individual, institutional, and societal levels, very different and even contradictory processes can take place, but together they constitute the mediatization push.

M.C., J.F. & G.O.: What are the specific links between mediatization and the other three metaprocesses of social change that you consider central to the contemporary era: globalization, individualization and commercialization ("*Ökonomisierung*")? How do these four metaprocesses interact with each other today? In what sense do you argue that commercialization is the metaprocess that lies 'at the base' of all other metaprocesses? Does this mean that commercialization operates as a condition or determining factor "in the last instance"? Does commodification play a role in these processes? Could you please give some examples of these interactions between metaprocesses in the contemporary world?



F.K.: In addition to the meta-processes I have mentioned, there are certainly other, and probably even more, types of processes, such as rationalization or Christianization. The concept of "process" still seems to be a concept that has not been further investigated and divided in different categories. At least today, however, it must be assumed that many entities in the social sciences are actually processes.

The fact that mediatization contributes to globalization and vice versa has become indisputable, at least with the advent of digitalization, as the Chinese state and large US companies determine the essential forms of use and development of the offerings, thus generating new international forms of division of labor and exploitation. Conversely, globalization is driving the worldwide spread of digital media and thus mediatization. At the same time, however, these meta-processes can also hinder each other –because globalization draws a lot of money out of countries and pays hardly any taxes, and the cultures of the global South, often flooded with US-specific cultural offerings, can ultimately only defend themselves by distancing themselves from them and care for their own cultural forms.

Accordingly, different connections can be found between each of these two meta-processes. If, for example, individualization in the sense of Ulrich Beck (1986) is understood not only as isolation, but also as a loss of collective ties and traditional customs and myths, for example through mobilization, and if we take into account that new institutional dependencies arise within the framework of capitalism and state institutions such as educational structures and pensions, then many relationships between these meta-processes can be assumed and empirically derived.

As far as the significance of the metaprocess of "commercialization" ("*Ökonomisierung*") is concerned, it must be assumed that the countries of the world are primarily organized along private capitalist or state capitalist lines. This rarely results in fair social conditions; instead, there are currently some super-rich and a growing number of poor people, as well as hundreds of millions who still suffer from hunger or lack access to clean water. This directly implies that social power, even in democracies, lies with the privileged, while the others must increasingly adapt. Therefore, *the economy determines* what ultimately happens worldwide, and the other meta-processes must continually adapt to this.

M.C., J.F. & G.O.: At the same time, you have defined the media themselves as "processes" (rather than "fixed, given and stable realities" or stationary objects of study), also arguing that the approach to mediatization is to be constructed, "conceptually, from a *process perspective*" (Krotz, 2017b). In what sense do you understand each single medium of communication (or each media) to be, in itself, a process?

F.K.: Media change and, accordingly, mediatization can arise in very different ways –through technical or other inventions that can be used for communication, through social change, such as new human needs or changed social conditions, including economic changes or censorship–. But the communicative media themselves also change over time, as the history of each individual media shows. As offerings, they must adapt to their users; they must, not least in capitalism, attract their users and pass them on to advertising. A good example of this is the history of radio, which has always developed new program formats, including the famous soap operas. And when television took over many of the functions of radio, it reestablished itself as a medium for music and accompaniment in everyday life. The deeper cause for the processual nature of media is the necessity that people do not always want to enjoy the same content and media forms, but also always expect something new from the process of communicating with or through media, which, however, does not exclude the fact that texts such as the Bible or the Koran are read again and again.

M.C., J.F. & G.O.: You have argued that, necessarily and intrinsically, "the theory of mediatization *contains* a historical perspective: it is interested in changes in the media of previous eras and in the corresponding changes that also occurred in everyday life, culture and society. It also seeks to understand the change we are witnessing today in the context of historical developments". (Krotz, 2017b, p. 15). How is this historical-processual perspective reflected in your own empirical research on current phenomena of mediatization? In turn, this historical perspective on mediatization is, as you have argued, what 'allows us to observe a growing differentiation ("*Ausdifferenzierung*") of the media and communication'. How do you address these processes of 'long-term differentiation' in your empirical research? And how do you methodologically operationalize this (necessarily) historical perspective in your research? How are these growing differentiations between media and communication empirically identified?

F.K.: In my research focused on mediatization, I have, as often as possible, not only examined the previously selected research question, but also always reconstructed the respective mediatization push, on which the research question was focused in its specificity. For example, a collaborative project with Japanese colleagues focused on the question of how computers were used in elementary schools there and in Germany. To this end, it was also necessary



to take into account that German children learn an alphabet and are therefore familiar with a keyboard, whereas in Japan there are three different scripts for different types of content, two of which do not have letters, but only characters for syllables or whole words. Such considerations gave rise to a variety of other problems. And for studies on how images are handled under the conditions of digital transformation, it was also helpful to know that human vision has a cultural history, in that "renaissance perspective vision" had to be developed first in order to then become self-evident.

Reading also has a history (Illich, 2010): according to this, at the turn of the first millennium in Europe, Christian monks always read aloud and with their whole bodies, which was also due to the book culture of the time. At that time, they also made an effort to memorize the content they read and to believe what was said. It was only in later centuries that Europeans learned to question what they read, which is central to us as scientists today. This variability in cultural attitudes to reading is important when considering the question of in which direction the practice of reading will change in the age of Artificial Intelligence (AI) summaries. Nothing that humans do with media is natural or God-given but has a cultural history.

The historical perspective has three functions. First, it asks how developments relevant to today came about and in what contexts they must be considered –for example, in the European Middle Ages, religion must always be taken into account as a powerful ideology–. Similar ideological contexts may also be relevant for current developments. Second, it is therefore also necessary for current studies to determine whether and how these earlier conditions still have an impact. For example, US standards regarding what images can be shown on Instagram and other social media of today, are still strongly based on Christian values. Third, it is always a question of what we can learn for today from past studies of earlier mediatization processes. Wikipedia, as an encyclopedia for everyone, wants to build something today in the context of digitization that was also developed three hundred years ago for book printing, as it is well known.

Another example comes from literacy research (Stein, 2010). Education in schools for all in European countries is considered a democratic advance that was intended to give people access to reading. But historical studies show that compulsory education was introduced because industry and the military

needed a better-educated workforce. And on top of that, children learned and continue to learn to read and write, but not to participate in democracy at this level. Today, it would be necessary to examine more closely whether the digital transformation is actually intended to improve the lives of users with little IT training, or whether the entire technology is focused on ensuring that a few experts understand the background and the vast majority simply do what AI and the like dictate.

M.C., J.F. & G.O.: What are the advantages of the metaprocess approach over other approaches that study media change in relation to sociocultural change (e.g., media logic/s, other social constructivist approaches, etc.)? Why is this level of abstraction –denoted by the prefix 'meta'– necessary to truly understand social change (in relation to media changes) from a historical perspective?

F.K.: Of course, it is possible to approach media and communication studies from perspectives other than the mediatization approach, such as political economy, psychology, or linguistics. No single theoretical perspective can encompass the entire development of a meta-process, not even mediatization research. But every such research perspective must always take into account the communication science approach to mediatization and the political economy of digitization. This is because the communication science approach focuses on the transformation of human communication, which is fundamental for the human conditions of life, while the political-economic perspective focuses on the actual driver of this entire development, namely capitalism. Therefore, the specific results of these two research approaches are relevant for all other perspectives, the first because it deals only with the core, the transformation of human communication as the basis of culture and society, the other because it raises the question of power and its effects. All other disciplines are fundamentally dependent on results of this kind.

There are at least three reasons for this. First, it obviously makes sense to understand today's digitalization as mediatization. The term "digitalization" emphasizes technical change, i.e., the existence of networked, programmable digital devices. As AI and large language models (LLMs), these devices have a massive impact on people's symbolic worlds and their communication. Unlike humans, computers are mechanical machines that, according to Turing (2002), can simulate mechanical devices. Humans cannot be simulated in this way because computers do not understand meaning or significance, nor do they understand the sequences of letters they themselves produce. This is because all the data they use is observational data that says nothing about meaning or significance. And the so-called AI learning process is a behaviorist learning process that is simply geared toward statistical optimization; computers are therefore behaviorist devices that differ fundamentally in their operations from



those of humans. The relevant differences can primarily be identified in an information technology-informed communication science (Krotz 2022; 2024). The mediatization approach is also oriented toward the potential of technology, but a medium is not just any technology, but rather a technology that addresses strings of characters, e.g., as texts, images, or sounds, to humans, which are produced at the level of meaning and significance. Computers cannot do more than produce characters, even if this can result in complete and grammatically correct sentences. However, their symbolic meaning and thus their sense and truth or falsehood must be added by the people who receive them. Anthropomorphizing the machine therefore does not work or is misleading. This is important for all other disciplines.

The second reason is that approaches such as media logic are often not process-oriented and, only capture certain aspects of media change. They define something as essential, but this something changes in the course of change. For example, the media logic of TikTok or Facebook is in flux, but the concept is limited because it presupposes a stable media landscape and constructs a stable concept. Third, the mediatization approach understands humans as media-related beings whose communicative actions are changed by the transformation of the media. However, because communication is at its core an indispensable foundation for culture and society, which we humans must cherish and should not or cannot delegate to mechanical machines, the transformation of human communication must be taken into account centrally – and this is precisely what the mediatization approach does.

For all these reasons, mediatization must be understood as a meta-process that, in its parallelism, takes into account both media change and cultural and social change in their contexts, and does so in relation to very different cultures and societies and their communicative conditions. Such a comprehensive concept must also be seen in terms of its significance for neighboring disciplines.

M.C., J.F. & G.O.: What contributions do you think have been made (or should be made) from the perspective of mediatization to the understanding of our contemporary era, that could potentially be considered fruitfully by other approaches as well? How could the mediatization approach benefit a broader, collaborative, interdisciplinary understanding of our present?

F.K.: Historically, human communication has always been taken for granted by all scientific disciplines. The significance of this ability for all forms of human coexistence, for all knowledge, for all human practice, and for all human-created institutions and structures is itself historical, a long-term process that was only recognized late by the sciences and has so far only been partially recognized. It is only now becoming clear that this human communication, as a fundamental practice for the individual and collective symbolic worlds of humans, is changeable and is changing. Presumably, human thought also arose only through communication.

The concept of science as we know it can only emerge when people are able to read and think critically. And every idea that is thought for the first time only becomes an idea because it can be anchored in people's symbolic world on the basis of their communicative practice. This communicative dependency applies both to Descartes' "I think, therefore I am" and to the theory of relativity. (See also my answers to your questions about my historical perspective and the history of mediatization/s above). Today, it is also becoming clear how sensitive this symbolic world of human communication is, how much potential for manipulation exists here, and that technology can contribute to reducing humans to the level of mechanical machines in their communication if they are treated accordingly for long enough. The mediatization approach can help counteract this because it understands humans as communicative beings. This concept is also helpful for other scientific disciplines. I have frequently received related inquiries in Germany, and accordingly, the term mediatization is also used in educational science, social work, religion, politics, sociology, etc.

M.C., J.F. & G.O.: Your latest book *Die Teilung geistiger Arbeit per Computer. Eine Kritik der digitalen Transformation*[1] (Krotz, 2022), foregrounds the rise of a new phase or "form of capitalism" derived from a new "division of intellectual labor between humans and computers", which has been made possible by two emerging conditions in contemporary society: a) a computerized infrastructure that, for the first time, is functioning as the basis for all symbolic operations in a society; b) network interconnection (*Vernetzung*, networking) as a generalized organizational form. What does this new division of intellectual labor consist of? What consequences is this new "digital economy" bringing about to our present, and potentially to the future, both to current forms of work and production (capitalism) and to the ways in which we relate to one another in our social lives (conviviality, individualism, ideologies, etc.)? If, as you had suggested in a previous work, digitization is already "yesterday's news", how do all these new contemporary digital transformations relate to the (meta)process of mediatization?

F.K.: More and more social and personal areas of human life, work, culture,

1 This book will soon be translated into English.

and society are changing today due to the rapid development of digitalization. This process is undoubtedly of great importance for human life and development. But digitalization has been controlled for many years by the digital economy, represented by the greatest enterprises in human history, such as Amazon, Microsoft, Meta, Alphabet, and others. They dominate hardware, software, data, the networks and their use by people, and especially complex software such as AI and LLM. They promise us the best life ever in the near future (Tegmark 2019), but if we look at empirical research, these companies are mainly only interested in their business models (Krotz, 2022; Krotz, 2024).

AI, for example, is controlled either by US digital companies or by the Chinese state. However, that cannot be allowed to happen – the direction in which forms of human coexistence develop, and which are, of course, primarily affected by AI, cannot be determined within the framework of the economy or by the state. Instead, it is the right and duty of democratic institutions and, in particular, civil society, i.e. the right and duty of all of us. We must enforce this with the help of a democratically controlled state and its institutions.

From a communication science perspective, it must be assumed that digitalization can automate and control technology, as Turing (2002) has pointed out. This applies, for example, to cars, medicine, and assembly line production. AI can thus improve the industrialization that began in the 18th century by automating many processes. That is why, socially just policies must ensure that jobs are not endlessly destroyed or that poor-quality new jobs are created. They must also ensure that the profits from automated production are taxed appropriately and that development thus serves society as a whole. Unfortunately, this is hardly the case at present.

However, this digital control and automation of mechanical machines is not the central topic of communication science. It does not have to deal with machine-machine communication, but rather with human-machine communication. And it must address the fact that more and more human-to-human communication is taking place under digital conditions, for example in networks and on platforms. In these cases, programmable computers interfere with the symbolic worlds of humans and thus become relevant for human knowledge, thinking, informing, feeling, and other practices.

It is obvious that the entire digitalization process can be understood as today's mediatization push. Usually, this process started in the 1940s with the first large computers. The idea of artificial intelligence also originated in the 1950s. In the 1970s, small computers were developed and were mainly used in offices and households, and in which the first large collections of computer data were created. In a further phase, computers were networked and used primarily for communication; this was followed by a phase of economization of the networks, then followed the phase of datafication, and finally the current phase leading up to the programming of ChatGPT, LLM, and AI.

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However, this development has an important prehistory that sheds light on an essential influence. It was not Zuse, IBM, and Aiken who were the first to invent a computer; they only built the first computers. It was actually the economist and mathematician Charles Babbage who developed the first abstract computer concept (Babbage, 1832). He also attempted to actually build his computer. He would have succeeded if he had received sufficient funding, because at the end of the 20th century, engineers demonstrated this by implementing his blueprint with the means available at the time.

What is particularly significant here is that Babbage based the construction of his first calculating machine, which he then developed into the idea of the programmable computer, on the work of the French mathematician Gaspard Riche de Prony. As Babbage himself describes, in the early 1790s, during the French Revolution, de Prony was commissioned by the government to produce volumes of tables, including one containing the squares of all numbers between 1 and 200,000. This was intended to be a service for the further development of the economy, shipping, military capability, and also architecture and science, all of which increasingly required mathematical calculations. Tables were supposed to be helpful for this purpose because at that time hardly anyone was proficient in complex multiplication or division –there was no compulsory schooling.

As a mathematician, de Prony knew that square numbers could be calculated not only by multiplying a number by itself, but also using a formula: if you know the square of two consecutive numbers, such as 5 and 6, you can use simple addition and subtraction to determine the square of the next number, in this case 7. In his report, Babbage also writes that de Prony had recently read a text by Adam Smith that established and developed the concept of the division of mental and physical labor. Armed with this knowledge, de Prony then hired about 30 employees who were good at addition and subtraction. They were then placed in a row; the first one defined the next number whose square was to be calculated, noted the squares of the two preceding numbers, and passed this on to the next one, who then performed exactly one more calculation step according to the formula, passed it on to the next adder, and so on, until the entire formula had been worked through. The last one in the row then noted the result. Then the whole process started again with the next number, 200,000 times.

This is what computer historian Rojas (2016) calls a human computer. Today's common computers have about two dozen very simple basic commands that are built into the hardware, such as how to add 1 to a number. Computers then need an operating system for organization, and then you can enter commands in a programming language so that they can operate with characters, such as numbers or letters. These programs then activate long sequences of commands from these two dozen elementary operations, which produce the desired result. You can read about this in any introduction to computer science.

From this historical account of what happened at the time, we can now draw the following conclusions. Firstly, computers are fairly simple in design; human programmers are responsible for complex programs. Secondly, computers serve to relieve humans of mental work. We all delegate mental work to computers, which then take it on if they have the right programs and data. (And the owners and programmers of the technology help determine the outcome.) Third: computers are a tool for dividing mental work. This is based on the ideas of Adam Smith, which Charles Babbage also propagated and disseminated in books that have been translated into many languages. Adam Smith's ideas focused on the division of physical labour, and Karl Marx also concentrated on this. This set industrialization in motion in the 18th and 19th centuries: At first, the steam engine was invented, which produced energy. Then, this energy was used to build railways, operate mechanical looms, and later to set up assembly lines where people worked. Since then, it was entrepreneurs who used their capital to build factories, buy machines, hire workers, and then reap the profits: capitalism based on the division of physical labor was born.

Today, an economy based on the division of intellectual or mental labour is emerging in a very similar way. Computers can output character strings that are either intended to control mechanical devices or are directed at humans. Entrepreneurs today organize and control computer programs and networks through which people communicate, shop, entertain themselves, play, write, inform themselves, and learn. We are entrusting more and more forms of intellectual work to machines and thus to digital companies, which effectively control all technology and develop it further for their own purposes. They also create huge, constantly updated and supplemented data collections on all their customers and generate profits by selling this data for advertising and all kinds of other purposes. This is because almost the entire economy is now represented on the internet and sells its products there –the information about potential and actual customers captured in data has become the decisive basis for the entire economy–. It has thus transformed from a market economy into a data-driven economy, and those who do not participate will disappear. For the things that computers cannot do, such as training AI or cleaning pornography off social media, there are now a large number of workers who take on these forms of intellectual work for little money. Other necessary intellectual work is accordingly being increasingly outsourced and paid less and less. So much for the historical analysis of the emergence of digitalization, as provided by a mediatization approach.

We must therefore fear that we are sliding into a new era of even more powerful capitalism, commercializing and exploiting what makes us human: language, thought, all forms of intellectual activity. Unfortunately, it is not at all clear today how long it will take humanity to tame this capitalism (Krotz 2022; 2024). The rules of democracy dictate that civil society must not act in an

anthropocentric manner, but must adhere to its widely accepted values – civil society does not want to and should not disregard other living beings or ruin the earth on which we all live. To this end, humanity is equipped with a critical consciousness that can be used to observe and evaluate its own actions (Krotz, 2021). Computers, on the other hand, do not possess consciousness.

M.C., J.F. & G.O.: A critique of certain ideology (increasingly dominant in society), which equates the abilities of intelligent machines with human potentialities has been a recurring issue taken throughout your work. This ideology tends to base itself on some semiotic faculties (symbolization and formalization) shared by both human and machinic agents. How do you position your criticism of the anthropomorphizing of computers and the digital world as an "ideology" of contemporary capitalism, in relation to the current anti-anthropocentric perspectives in the social sciences? Can the current "new division of intellectual labor" be interpreted as yet another manifestation of "deep mediatization", or does it have to do with other processes, which are more dependent on the political economic conditions of our present times?

F.K.: It is important to make a remark about the ideology with which digitalization is currently being promoted. As already noted, the drivers and controllers of this development promise us a paradise-like life today, if only we let them do their thing. In addition, it is repeatedly claimed that an AI will emerge in the foreseeable future endowed with a level of performance that will surpass that of humans in virtually all fields, and that humans will then be able to disappear from further development with dignity, wherever that comes from. However, whatever has been promised for almost a century and claimed to be certain to happen soon is extremely doubtful from a scientific point of view. Even if it were true that one day there would be an AI that could not only work faster but also intellectually better than all humans, and that could administer the world instead of all democracies, as Tegmark (2019) describes for the next million years, one could be sure that the economy would quickly shut down such an all-rounder. Because it would put an end to its business.

In communication science, ideological ideas are often based on anthropomorphic assumptions. For example, there is widespread talk about computers communicating with each other – but what humans do when they communicate with each other is completely different from what machines do when we say they communicate. Humans are concerned with understanding; they communicate on the basis of subjective meaning and can say something about the meaning and truthfulness of their statements. Computers simply transfer files as communication. And when a computer communicates something to humans, it is exclusively a string of characters or a sequence of images or sounds that are meaningless to the computer. Humans

often find these results meaningful and appropriate, but this judgment is based on their own interpretations –they assign meaning and significance to these character strings. In this way, a character-based computer message is transformed into a sentence that only appears to be meaningful, because humans are actually only communicating with themselves. Computers can contribute a few characters and possibly words to this, thereby influencing humans to some extent, but these are all human interpretations, possibly influenced by the machine in a certain direction of thought. This is because human interaction always has a symbolic dimension that can be influenced. In this regard, we actually need a new way of expressing what exactly is that which symbol-producing machines produce as "symbols", as well as how exactly they do it, so that the false impression is not always created that machines act like humans. Such misunderstandings also exist with other words that have previously only been used for human actions.

In summary, it can be said that an understanding of digitalization as mediatization must also deal with the further development of political economy. A rather vague term such as "deep mediatization" is not very helpful here, apart from the fact that the depth of a meta-process can mean something completely different at different points in time. This time, civil society, rather than the economy, should have control over such developments. A more comprehensive critique of technology could also be helpful here, for example, the reflections of Ivan Illich (1980) and his concept of conviviality and his call for humanity not to allow technologies that it does not understand – this seems to be an appropriate demand for today's complex and opaque AI programs. The shortcomings of LLM can also be made clear today – ChatGPT and the other speech machines are based on statistically evaluating and optimizing human statements. As has already been explained several times, this has nothing to do with meaning and understanding, with significance and truth.

Incidentally, the meaninglessness of such speech machines has already been described in a short story that the Argentine author Jorge Luis Borges published in an analogy as early as 1941 (Borges, 1974) about a mathematical construction of knowledge. It can be shown that every computer today can theoretically print out all of humanity's knowledge in text form, even if it would take quite a long time to do so. This is because all knowledge can be expressed in text portions of, say, 20,000 characters by using only 25 letters of the alphabet, the space bar, and full stops and commas. Mathematically speaking, each such text is therefore a combination with repetitions of these 28 characters (including the "space character" as a character created by the keyboard´s space bar). However, the computer can print them all. It can first print a text consisting of 20,000 letters A, then one consisting of 19,999 A's and one B, and vary the position of the B. Then it can add a C and so on, and ongoing in this way producing all possible texts of this length from these letters. But as a result, we

know nothing. Because every sentence, if it has any meaning at all, also appears in these texts in a negative form. Based on their optimization, today's speech machines remain just as meaningless.

For communication science as well as mediatization research, it would therefore make sense not only to always examine how people use digital media and integrate them into their respective lives. Instead, more cooperation with progressive computer science would be helpful, such as for example, collaboration with people and institutions working in favor of open software and similar topics. Then there would be more knowledge about what happens in the background of the simple and superficial use of computers as well as the often-hopeful delegation of intellectual work to these devices, and where the essential problems lie. This would also be a step forward for mediatization research.

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