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The digital transformation of knowledge order: a model for the analysis of the epistemic crisis

Christoph Neuberger ^{a,b}, Anne Bartsch ^c, Romy Fröhlich^d, Thomas Hanitzsch ^d,
Carsten Reinemann^d and Johanna Schindler^d

^aInstitute for Media and Communication Studies, Freie Universität Berlin, Berlin, Germany; ^bWeizenbaum Institute for the Networked Society, Berlin, Germany; ^cDepartment for Media and Communication Studies, Leipzig University, Leipzig, Germany; ^dDepartment of Media and Communication, LMU Munich, Germany

ABSTRACT

In a proclaimed age of ‘post-truth,’ scholars have raised concerns about the spread of false information and the questioning of epistemic authorities. In this paper, we develop an analytical model to capture the digital transformation of knowledge order. Drawing on insights from social epistemology, sociology and history of knowledge, and media history, we identify epistemic practices as basic elements of knowledge order. We then analyze how epistemic practices are organized into an overarching structure of knowledge phases, contexts, roles, and hierarchies. Digital media tend to destabilize the traditional knowledge order. This destabilization is characterized by a more flexible order of phases, a dissolution of boundaries between contexts, an opening of professional roles to new actors, and a flattening of hierarchies.



KEYWORDS

Knowledge; knowledge order; epistemic practices; digital transformation

Introduction

Current discourse about the state of the digital public sphere is dominated by diagnoses of an “epistemic crisis of democracy” (Dahlgren, 2018), an “epistemic crisis in contemporary democratic societies” (Benkler et al., 2018, p. 4), and a “disinformation order” (Bennett & Livingston, 2018). The Internet is seen as “a bloody, messy battleground for the truth wars” (Lynch, 2016, p. 66) and is believed to bring “the end of truth” (Kakutani, 2018). Such perceptions of an epistemic crisis have become a matter of public concern and have sparked considerable research efforts, especially in liberal democracies in North America and Europe, which are the focus of our current analysis.

What has caused this impression of a deep epistemic crisis? It seems tempting to blame digital media technologies, but a more comprehensive analysis reveals that the current epistemic crisis has evolved from long-term developments of the media and political systems in the United States (Bennett & Livingston, 2021), Europe (Norris & Inglehart, 2019) and in other liberal democracies in other world regions (Newman et al., 2021). A main characteristic of these media systems is a process of ongoing differentiation (Mancini, 2013), specifically with regard to the proliferation of broadcast channels and the digitalization of media technology, creating an increasingly high-choice media environment (Van Aelst et al., 2017). At the same time, developments in the political system have exacerbated the potential for conflict among contradictory claims to knowledge and

CONTACT Christoph Neuberger  christoph.neuberger@fu-berlin.de  Institute for Media and Communication Studies, Freie Universität Berlin, Berlin, Germany

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the questioning of epistemic authorities. These trends include the rise of authoritarian populism (Norris & Inglehart, 2019), increased political polarization, and growing efforts of domestic and foreign actors to strategically influence public opinion (Benkler et al., 2018). Current crises such as the Covid-19 pandemic and Russia's war on Ukraine have brought these developments into the spotlight of public conversation.

The unfolding of these trends preceded digitalization, but they gained particular momentum in the realm of social media, where strategic actors spread (dis)information without journalistic verification before publication. As a result, the conditions of knowledge generation, verification, distribution, and appropriation have changed dramatically – sometimes, but by far not always for the better. On the one hand, claims to participation can be more easily fulfilled, for example, in the form of collaborative knowledge-work (Sunstein, 2006) or easier access to knowledge (Weinberger, 2007). On the other hand, the rise of data-driven social media platforms, which pursue primarily economic goals (Zuboff, 2019), has also led to massive growth in the dissemination of uncertain, controversial, and false claims to knowledge (fake news, rumors, conspiracy myths; e.g. Ha et al., 2021; Tsfaty et al., 2020). A variety of deception strategies, including those based on algorithms, are being employed to distribute disinformation (e.g. Benkler et al., 2018). A large and growing body of research is concerned with studying the effects of false information on the audience and effective ways to combat disinformation (confirmation bias, illusion of knowledge, the backfire effect; e.g. Kahne & Bowyer, 2017; Lewandowsky & van der Linden, 2021; Nyhan & Reifler, 2010; Weber & Koehler, 2017).

In this context of growing media differentiation, political polarization, and distribution of unverified content, the question of who can legitimately claim knowledge and truth in public discourse, and based on which practices, is an object of heated disputes now more than ever. Oftentimes, these disputes bring up pointed criticism of traditional epistemic authorities such as journalism and science, as well as criticism of dominant platforms (e.g. Facebook, Twitter, and YouTube), which have failed to provide functional alternatives to legacy media as intermediary institutions. These debates have stimulated new lines of research and have advanced empirical insight into the role of media in the embattled fields of knowledge and truth.

The primary goal of this paper is to develop an analytical model of 'knowledge order' to integrate the above research and to systematically describe and explain how digital media have changed the processes of generation, verification, distribution, and appropriation of knowledge in public discourse (Deutsch, 1952, pp. 360–361; Shoemaker et al., 2004, pp. 107–144). Equipped with this analytical toolbox, we are in an informed position to identify both challenges and regenerative potentials of knowledge order amid its current crisis, which is the second goal of this paper.

Our theoretical approach is grounded in conceptualizations of *knowledge order* as developed by Burke (2016), Renn (2020), and Spinner (1993, 1994). Spinner (1993) defined knowledge order as "a fundamental order of knowledge which specifies the constitutive presuppositions, internal regulations and external conditions for the production, application, distribution, administration, implementation, utilization, etc., of knowledge in society" (p. 136). This order applies to all knowledge types and degrees of quality (Spinner, 1994, pp. 33–36). Besides 'knowledge order,' there are other labels for these knowledge-related structures of society, such as "knowledge economy" (Renn, 2020, p. 146), "knowledge system," "knowledge cultures," and "knowledge regimes" (Burke, 2016, p. 8, 26, 27). The model of knowledge order we propose in this paper builds and elaborates on these earlier concepts with a special focus on the impact of digital media on knowledge practices and their structural relationship with regard to four dimensions of knowledge order: its processes, contexts, hierarchies, and roles.

To clarify the broader theoretical context that informed our model of knowledge order, we start with a short overview of concepts and insights from several fields of research beyond communication studies, including epistemology, sociology of knowledge, and history of knowledge and media. Based on these insights, three premises of our model are derived: First, we argue that *media* have come to occupy an important role as intermediary institutions in the knowledge order of modern societies. Second, we assume that, despite critical changes in the overarching structure of knowledge order, *epistemic practices* can be identified as basic elements of knowledge order

that allow for flexible rearrangements rather than a total collapse of knowledge order. Third, we argue that the overarching structure of knowledge order and its current structural changes can be understood along *four structural dimensions* that constitute a given knowledge order as a system of interrelated epistemic practices: (a) *knowledge processes*, which include specific practices for each phase, (b) several *knowledge contexts* with distinct standards of accepted practices, (c) *knowledge hierarchies* between these contexts, and (d) a set of *knowledge-related roles*, which legitimize actors to perform certain practices. Our model of knowledge order assumes that all four structural dimensions are profoundly shaped by the use of media as part of epistemic practices. To demonstrate the model's analytic value, we first apply it to the mass media era and then to the digital transformation. Finally, we provide an outlook on innovative potentials of epistemic practices and structural developments that might contribute to a regeneration of knowledge order from its current crisis.

Fields of research related to knowledge order

The theoretical premises of our model of knowledge order were derived from various domains of research, including epistemology, sociology of knowledge, history of knowledge and history of media. In the following, we give a short overview of the core concepts and theoretical insights that have informed our model.

Epistemology

As an area in philosophy, epistemology examines the questions of whether and how access to reality is attainable for human beings. We follow a *veristic* approach, which takes a middle position between extreme skepticism (relativism, constructivism), which denies any access to reality (Boghossian, 2006, pp. 25–28), and naïve (everyday) realism, which has no doubts about the attainability of truth. Drawing on the distinction between absolute truth and attainable knowledge, a veristic position does not assume that complete certainty about knowledge ('truth') is attainable. This "weaker" understanding of truth (Goldman, 1999, p. 5) acknowledges the essential nature of doubt but still requires justification with 'good reasons' and accepts evidence, at least provisionally (Boghossian, 2006, pp. 10–16; Lynch, 2012, pp. 1–6). As a consequence, knowledge claims must be justified and are always open to further scrutiny. A veristic approach is consistent with a position held from ancient philosophy through Enlightenment to modern science, according to which knowledge is defined as justified true belief.

Inherent in this definition of knowledge is the act of justification, or reason-giving (Mercier & Sperber, 2017, pp. 8–9). The focus of a veristic approach on the justification of knowledge draws attention to the *practices* of knowledge production and distribution. "According to practice theory, practices are socially recognized forms of action that are not only shaped by cultural and social forces, but also shape these forces through their iterative enactment" (Reich & Barnoy, 2020, p. 967). For example, epistemic practices guide action in newsrooms and are often set as tacit professional norms (Schudson, 2001, p. 151), like cross-verification, source transparency, and the separation of news and opinion (Kovach & Rosenstiel, 2007). Based on an analysis of social practices of knowledge justification, which constitute the basic elements of knowledge order, a veristic approach then turns to an analysis of normative implications of knowledge practices. "The main question for veristic epistemology is: Which practices have a comparatively favourable impact on knowledge as contrasted with error and ignorance?" (Goldman, 1999, p. 5). Such normative expectations have been analyzed concerning both the micro and macro levels of communication.

(a) On a *micro level of communication*, individuals in the roles of communicator and recipient exchange testimony-based, secondhand knowledge (Godler et al., 2020, pp. 217–221). From the perspective of the communicator, Williams (2002) identified "two basic virtues of truth, which I

shall call Accuracy and Sincerity: you do the best you can to acquire true beliefs, and what you say reveals what you believe" (p. 11; see also Rosenfeld, 2019, p. 17). Both virtues, *accuracy* and *sincerity*, have a complement in the information processing of the recipient. The corresponding virtues are high degrees of *elaboration* (vs. heuristic processing) and *openness* (vs. predetermined outcomes) (Forgas, 1995). Ideally, processes of knowledge generation and verification should be both elaborated and open-minded, that is, they should involve the most elaborate practices, with no predetermined expectations regarding the results other than discovering the truth. However, recipients may deviate from these standards, both in the case of heuristic processing (Petty & Cacioppo, 1986) and in the case of motivated reasoning with predetermined results, such as the confirmation of specific ideologies and group identities (Kruglanski & Webster, 1996; Kunda, 1990).

The knowledge relationship of communicator and recipient has been described in terms of epistemic trust and epistemic vigilance (Sperber et al., 2010; Lynch, 2016, pp. 39–40). Epistemic trust is based on a recipient's expectation that the virtues of accuracy and sincerity are fulfilled by a specific source or communicator (Sperber et al., 2010). The more accurate and sincere a communicator is perceived to be, the more trusting and open-minded recipients are to considering a change of opinion based on information and arguments communicated. Conversely, the concept of epistemic vigilance refers to cognitive mechanisms "targeted at the risk of being misinformed by others" (Sperber et al., 2010, p. 359). While the erosion of trust in public discourse is often lamented in communication research, epistemology has drawn attention to the productive function of epistemic vigilance, critical elaboration, and counter-arguments for clarifying knowledge claims collectively (Mercier & Sperber, 2017).

(b) On a *macro level*, the institutional conditions of knowledge practices are analyzed. Our model of knowledge order draws on a *social epistemology* approach (Goldman, 1999), which has recently been applied as a new paradigm to journalism and media studies by Godler et al. (2020). The social epistemology approach analyzes the social conditions for satisfying claims to truth. Besides science (Oreskes, 2019), there are several other contexts in modern society with distinct epistemic standards: "Journalism, law, politics, and education are also crucial domains in which accuracy of judgment and communication should be a desideratum, and in which the impact of different institutional practices needs to be explored" (Goldman, 1999, p. viii). These epistemic practices are often institutionalized as professional norms of the knowledge process (Schudson, 2001), for example, as scientific methods or journalistic standards curated in textbooks (e.g. Kovach & Rosenstiel, 2007, p. 79) or written codes of conduct (van der Wurff & Schönbach, 2011). Professionally recognized practices are, in turn, subject to a meta-discourse where they are negotiated and legitimized (Carlson, 2016). Here, the key questions are why "some methods are better than others in leading to the truth" (Williams, 2002, p. 130) and how to reach a "consensus on the veristically best practices" (Goldman, 1999, p. 81).

Professional epistemic standards have their counterpart in normative expectations towards the audience. For example, in the public sphere of liberal democracies, ideals of the "well-informed citizen" (Schütz, 1976) or "good citizen" (Schudson, 1998) and a "civic duty to keep informed" (Poindexter & McCombs, 2001) refer to the obligation to not only follow the news regularly but to be epistemically vigilant and check contents for accuracy (Table 1).

A normative analysis of the interplay of professional and lay epistemic standards raises questions such as how the public sphere functions, and whether deliberation contributes to establishing truth (Bächtiger & Parkinson, 2019, pp. 29–31; Williams, 2002, pp. 213–219). The social epistemology approach leads to an output-oriented understanding of "epistemic democracy" (Brennan, 2019), which aims to produce valid knowledge for evidence-based political decisions. This approach "investigates the epistemic powers of institutions" (Anderson, 2006, p. 8) in democracy. Following John Dewey (1927/2016), Anderson (2006, p. 14) has made the case for an experimental, fallibilistic democracy that combines "all three constitutive features of democracy, diversity, discussion, and dynamism (feedback)."

Table 1. Epistemic virtues and practices.

Micro-level of communication: Epistemic virtues of actors	Macro-level of mass media: Epistemic practices as part of the institutional order
<i>Virtues of the communicator</i> accuracy, sincerity	<i>Journalism</i> professional norms for all phases of the knowledge process, peer critique
<i>Virtues of the recipient</i> elaboration, openness	<i>Audiences</i> 'duty to keep informed,' epistemic vigilance

In summary, from a social epistemology perspective, normative responsibility can be reduced neither to virtues of individual actors nor to social practices alone. Rather, a functioning and democratically legitimate knowledge order can only arise from the interlinking of micro- and macro-level processes – such that macro-structures (e.g. “epistemic infrastructure,” Herzog, 2020, p. 278; or “structural remedies,” Anderson, 2012, p. 168) support the realization of epistemic virtues (accuracy, sincerity, elaboration, and openness) in individuals’ actions on a micro-level, and in meso-level organizational practices.

In addition to the political conditions of epistemic democracy, a comprehensive macro-level analysis also needs to consider its economic, legal, and technological conditions (Goldman, 1999, pp. 161–217). Thus, from a social epistemology perspective, the macro-level institutional conditions of knowledge in a society, as well as their conduciveness to the enactment of normative principles and virtues, become empirical questions. Social epistemology can thus bridge the divide between epistemology and more empirically oriented approaches in sociology of knowledge discussed in the next section.

Sociology of knowledge

Sociology of knowledge analyzes the conditions of knowledge production and distribution in society. In contrast to epistemology, sociology of knowledge focuses on what is considered knowledge in society, rather than what is valid knowledge in an epistemic sense (Berger & Luckmann, 1966/1991, p. 26). The production and communication of knowledge are shaped by the structure of modern society. Following Luhmann (2013, pp. 87–108), we argue that society is functionally differentiated, which means that it consists of specialized subsystems, each of which fulfils an exclusive social function and covers a distinctive perspective. The two subsystems of journalism and science are particularly relevant here because they are typically regarded as *epistemic authorities* (Burke, 2016, pp. 15–17; Carlson, 2017). Both subsystems are specialized in knowledge production and supply other subsystems with the results of their monitoring of the environment.

What is recognized as knowledge in society depends not only on the quality of arguments, but also on *power* (Foucault, 1980, pp. 131–133). There is always a struggle between groups aiming to assert their claims to knowledge against rivals (Burke, 2016, pp. 7–9), and ideology that supports powerful elites is often given as truth (Eagleton, 2007, pp. 10–16). In this context of power, professional knowledge institutions like the sciences and journalism try to maintain their status as epistemic authorities and must therefore gain trust and legitimacy. They have to demarcate, defend, and expand the borders of their areas of control, which is often referred to as boundary work (Carlson & Lewis, 2015; Hanitzsch & Vos, 2017, pp. 121–122). The “interprofessional competition” (Abbott, 1988, p. 35) forces professions to draw clear boundaries. In this regard, journalism is a “very permeable occupation” with an “inability to monopolize” its competencies, especially in relation to “publicity agents” (p. 225), which represent the interests of powerful actors in politics and the economy.

In summary, sociology of knowledge provides an important complement to epistemology by analyzing the social institutions and power dynamics surrounding the production and distribution of

knowledge. Two aspects are rarely considered in sociology of knowledge, however: the role of *media* in the knowledge process (2013), and the dimension of *historical change*. Both limitations can be addressed by integrating sociology of knowledge with knowledge and media history.

History of knowledge and history of media

Scholars of knowledge history analyze the driving forces behind changes in the knowledge order of a given society (Burke, 2000, 2012, 2016; Renn, 2020). Burke (2016) has considered the knowledge process as “a sequence of practices, different stages in the process of making and using knowledge” (p. 44). According to Meyrowitz (1994), history of knowledge is closely intertwined with history of media because the emergence of a new medium has often marked a turning point in knowledge history. In particular, the invention of the printing press and its consequences have been described as a knowledge revolution (Burke, 2000; Eisenstein, 2005; Pettegree, 2014, 2015). “[T]he multiplicity of books is likely to have made more people more aware of the many discrepancies between different descriptions of the same phenomenon or different accounts of the same event” (Burke, 2000, p. 201). Pluralization and contradictions have led to conflicts (e.g. the Reformation vs. the Catholic Church), criticism of authority, and a crisis of knowledge. As the example of the printing press illustrates, media innovations involve not only new technologies but also new infrastructures (e.g. book trade), new organizations (e.g. publishing houses), and new audiences (e.g. lay publics). Media evolution can thus be understood as the combined and interrelated transformations of these technological, infrastructural, institutional, and audience-related dimension of media. In this process of media evolution, not only knowledge practices are transformed, but also the processes and contexts of knowledge production and distribution, the role inclusion of actors, and the status of epistemic authorities. Digitalization is only the most recent chapter in a long history of media innovations that have affected public communication (Couldry & Hepp, 2017, pp. 34–52).

The advent of a new medium often provides momentum for societal expectations of extended and more equal access to knowledge as well as to a better quality of knowledge, while critical voices have often warned against the potential of new media for abuse and the creation of new inequalities. This is true for the digital revolution as well. Our model does not take sides with either position as a starting point but instead aims to provide an analytical model for analyzing the digital transformation of knowledge order as a basis for an informed evaluation of knowledge practices and their normative implications.

A model of knowledge order

Three premises of our model can be derived from the theoretical insights summarized above. First, consistent with knowledge and media history, we suggest that the *media* have come to occupy an important role as intermediary institutions in the knowledge order of modern societies. The media incorporate knowledge from various social contexts, thus acting as an integrative force (Neuberger, 2017, p. 418; Reich, 2012). One of the goals of our model is to explain the structural preconditions for this integrative function and how it is affected by the digital transformation of knowledge order.

Second, in line with social epistemology, our model proposes that *epistemic practices* of knowledge justification constitute the basic elements of a given knowledge order (Goldman, 1999). As socially recognized forms of action, epistemic practices are stabilized through their iterative enactment (Reich & Barnoy, 2020, p. 967).

Third, drawing on sociology of knowledge, we argue that a society’s knowledge order can be described as a system of interrelated epistemic practices. As explained below, our model specifies a set of four structural dimensions of knowledge order that determine the relationship between epistemic practices (Neuberger et al., 2019): (a) *knowledge processes*, which include specific practices for each phase, (b) several *knowledge contexts* with distinct standards of accepted practices, (c) *knowledge hierarchies* between these contexts, and (d) a set of *knowledge-related roles*, which legitimize

actors to perform certain practices. As we will explain below, all four structural dimensions are profoundly shaped by the use of media as part of epistemic practices.

Knowledge processes

A literature review reveals various suggestions for how the *phases* of knowledge processes can be categorized. Burke (2016) proposed “four main stages in the sequence that runs from acquiring information to using it: gathering, analyzing, disseminating, and employing” (p. 46). According to Goldman (1999), “[f]our stages of testimony-related activity’ are relevant for ‘socially distributed knowledge: (1) discovery, (2) production and transmission of messages, (3) message reception, and (4) message acceptance” (pp. 103–104), to which he later added argumentation as “discursive practice” (p. 131) in public discourse. Renn (2020) referred to “the production, reproduction, transfer, distribution, sharing, and appropriation of knowledge in a given society” (p. 146). According to Foucault (1980), ‘truth’ is to be understood as “a system of ordered procedures for the production, regulation, distribution, circulation and operation of statements” (p. 133). Based on the conceptual overlap of key elements in these conceptualizations of knowledge processes, our model focuses on the phases of *generation, verification, distribution, and appropriation* of knowledge.

For the individual phases in knowledge processes, specific *practices* apply. Carrying out these collectively shared practices is intended to guarantee the rationality of the process. As collectively shared regularities (Reckwitz, 2002), practices are institutionalized and also often set as professional norms, for example, in science (e.g. Hepburn & Andersen, 2021) and journalism (e.g. Kovach & Rosenstiel, 2007), or as legal norms (Garton Ash, 2017).

Contexts of knowledge

Contexts of knowledge can be differentiated according to the degrees of specialization, accessibility, and elaboration, among others. Berger and Luckmann (1966/1991, pp. 97–104) distinguished between a general, life-world-oriented stock of knowledge available to everyone and specialized bodies of knowledge only accessible through certain roles. These exclusive “socially segregated sub-universes of meaning” (Berger & Luckmann, 1966/1991, p. 102) include science and other professions like law and medicine (Abbott, 1988; Oreskes, 2019), in which high normative standards are placed on the degree of elaboration for knowledge generation and verification in order to legitimize knowledge claims. In contrast, the forms of information processing in everyday life are rather heuristic and informal (Esser, 1993).

The segmentation of the institutional order and the concomitant distribution of knowledge lead to the need for integrative meanings that provide an overall context of objective sense for the individual’s fragmented social experience and knowledge (Berger & Luckmann, 1966/1991, p. 102). An important function of journalism is to integrate these fragmented knowledge areas and to intermediate and translate between them (Neuberger, 2017, p. 418; Reich, 2012).

Hierarchies of knowledge

Because we “necessarily learn most truths from other people,” we need “trust in authorities at a distance, unknown to us except by reputation, institutional affiliation, or some other form of external validation” (Rosenfeld, 2019, p. 16). In the ‘knowledge society,’ there is a hierarchy in which science is considered the highest epistemic authority. In some contexts, exceeding deference to scientific authority can take the form of ‘expertocracy,’ which is related to antidemocratic views (Howell et al., 2020). At the same time, however, the scientification of society means that science loses its privileged status and its “monopoly on producing valid knowledge” (Weingart, 1998, p. 870). As a consequence, citizens increasingly question science as an epistemic authority and

tend to lean toward more critical viewpoints (e.g. Funk et al., 2019). Journalism is another contested epistemic authority (Carlson, 2017, pp. 174–178), as we will discuss later.

Knowledge-related roles

The access to contexts and phases of knowledge processes is partly restricted to actors in professional roles such as ‘scientist’ and ‘journalist.’ In particular, production and verification of knowledge are tied to special competencies and normative orientations that require professional education and experience (Hanitzsch & Vos, 2017, pp. 123–126). While scientists must obtain academic qualifications, journalism is a relatively open field without standardized entry requirements. In societal subsystems such as politics, economy, and journalism, two main roles can be distinguished: the professional role of service providers (e.g. politicians, producers, journalists) and the role of service recipients (e.g. citizens, consumers, media users; Stichweh, 1988). Digitalization, however, can lead to the dissolution of such role separation.

Two types of knowledge order – an exemplary analysis

After having laid out the premises and analytical dimensions of our model of knowledge order, we will now use this model to analyze two different types of knowledge order: a linear type of knowledge order that can mainly be observed under the conditions of traditional mass media, and a circular type of knowledge order which gained particular relevance in the context of the digital transformation of the public sphere. We use the term ‘ideal type’ according to Max Weber, by which he meant an analytical category rather than a description of real existing cases (Swedberg, 2018). It is important to note that our following account of these two types of knowledge order is a theoretical simplification and that both can coexist or blend into hybrid forms, as we will discuss further below. In practice, neither the linear nor the circular type of knowledge order have ever existed in pure form. Nevertheless, as we will argue based on insights from social epistemology and knowledge history, media technologies can shape and stabilize specific types of knowledge order (Burke, 2000; Goldman, 1999, pp. 161–173).

A linear type of knowledge order associated with traditional mass media

Our first analysis zooms in on a predominantly linear type of knowledge order which is characterized by a clear link between roles and phases of the knowledge process, and a clear distinction of contexts and positions in the hierarchy (see Figure 1). This linear type of knowledge order will be

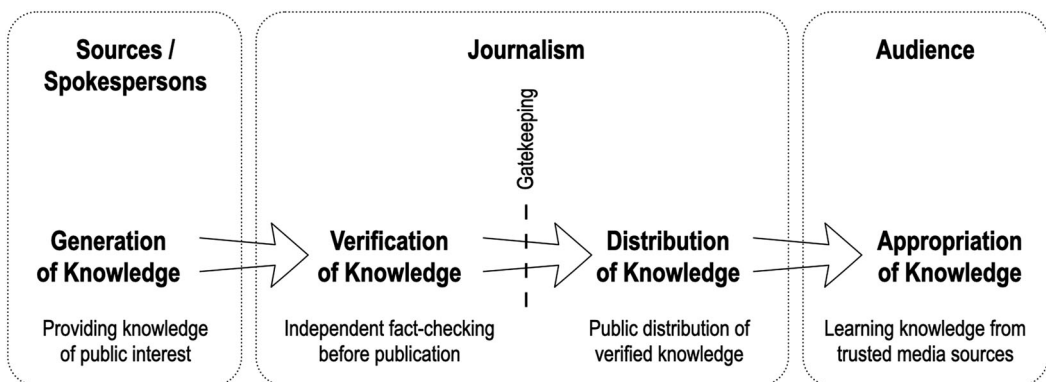


Figure 1. A linear type of knowledge order associated with traditional mass media.

explained on the example of professional news journalism. News journalism used to occupy a hierarchical position as gatekeeper and intermediary of epistemic trust between sources and audiences in the knowledge order of the pre-digital era. The standards of news reporting ('objectivity') were initially developed in newspaper journalism (Schudson, 2001) and were adopted later on by other mass media such as radio and television.

This linear type of knowledge order of the pre-digital era evolved in tandem with the emergence of mass media, specifically print news, as a result of technological innovations, commercialization and professionalization of fact-centered journalism (Chalaby, 1996; Schudson, 2001). This professionalization of journalism in the late nineteenth century and early twentieth century was part of a broader development, which also gave rise to other "truth-seeking professions" (Benkler et al., 2018, p. 5), or "information professions" (Abbott, 1988, pp. 215–279). Science became an ideal for journalism, and objectivity journalism's central norm (Schudson, 2001). Thus, professional journalism has played a crucial role in liberal democracies and has become an epistemic authority alongside science.

This hierarchical position of journalism in the linear type of knowledge order is not only grounded in professional ideals, but also in the specific structure of knowledge order shaped by traditional mass media. Specifically, the linear type of knowledge order is characterized by a strong link between roles and phases of the knowledge process, which grants journalism an exclusive position as intermediary of epistemic trust between audiences and sources, based on its dual role as gatekeeper between the phases of knowledge verification and distribution.

The phase of knowledge *generation* is mostly performed by actors in the roles of *sources and spokespersons* who transfer their knowledge to professional journalists, often in the form of research interviews (sources) or press releases (spokespersons). Many of these actors pursue particular interests through strategic-persuasive communication, constructing "desirable realities" in the process (Merten, 2004, p. 51). However, these spokespersons, who represent interests generated in other social subsystems (e.g. politics, economy), are dependent on journalistic gatekeeping and intermediation. According to the objectivity norm, the role of journalists in knowledge verification is strictly separated from the role of spokespersons and sources who are limited to knowledge generation.

Journalism takes on an almost exclusive dual role in the phases of knowledge *verification* and knowledge *distribution*, which enables its gatekeeping function and thus its hierarchical position in the knowledge order (Carlson, 2017, pp. 16–19). Only knowledge that has been verified by journalists is (or should be) published (Waisbord, 2013, pp. 121–148). "The essence of journalism is a discipline of verification" (Kovach & Rosenstiel, 2007, p. 79). Objectivity as a central norm is operationalized by several professional practices (Barney & Reich, 2019, p. 2313), such as cross-verification, source transparency, and the separation of news and opinion (Godler & Reich, 2017; Kovach & Rosenstiel, 2007). Another important aspect of the journalistic role is to transfer and translate knowledge between the separated contexts of sources from different societal subsystems (such as politics and the economy), and the live-world context of audiences (Neuberger, 2017, p. 418; Reich, 2012). Thus, in addition to its role as an intermediary of epistemic trust, journalism also serves as an intermediary of knowledge and meaning making, which further contributes to its hierarchical position in the knowledge order.

The corresponding role of *audiences* in the phase of knowledge *appropriation* is rather passive and relies on the complementary role of journalism as an intermediary of epistemic trust. Audiences typically expect a verified supply of knowledge and process news with little effort, that is, heuristically (Esser, 1993), meaning that trust shortcuts their knowledge verification process. Such delegation of knowledge verification may be efficient, but it is also linked to the risk of accepting false information (Kohring & Matthes, 2007, p. 238). Given that audience members are largely excluded from the verification phase, they can only criticize knowledge claims after publication via letters to the editor (Bruns, 2008, pp. 70–73), a viable but relatively rarely enacted participatory practice.

To summarize, the linear type of knowledge order as outlined here reflects a well-structured connection of roles, phases, contexts, and hierarchy that has never existed in pure form but has been stabilized as dominant knowledge order by the technological structure of mass media (one-to-

many communication) and professional institutions. It is based on a strong hierarchy (journalism's monopoly of gatekeeping) and a clear separation of roles (journalist, source/spokesperson, audience member) and contexts (journalism, other social subsystems represented by spokespersons, audiences' life-world contexts). Minor deviations have always existed (e.g. those who straddle the line between journalism and PR or writers of letters to the editor). However, such phenomena pointing to greater flexibility of roles, phases, contexts, and hierarchies in knowledge processes have only gained transformative momentum since the digital transformation has created new technological and institutional affordances that have greatly increased the relative frequency and prevalence of flexible roles, phases, contexts and hierarchies of knowledge in public discourse.

A circular type of knowledge order associated with digital media

Like the linear type of knowledge order described above, the circular type of knowledge order has never existed in pure form, nor has it abruptly replaced the predominantly linear knowledge order shaped by traditional mass media. However, as we will argue, the current diagnoses of an epistemic crisis discussed in the introduction can to a large part be understood as a response to the marked shift in the salience of a circular knowledge order in public discourse. Compared to the clear structure of phases, roles, contexts and hierarchies of the linear type, the circular type of knowledge order may appear, at first sight, like chaos or disorder (hence the perception of epistemic crisis). However, a systematic analysis of the structural dimensions of our model of knowledge order still reveals a substantial amount of order in the apparent chaos. Given that the salience of the circular type of knowledge order has greatly increased in the context of digital transformation, we will illustrate it below on the example of digital media platforms such as Google, Facebook and Twitter. Such platforms do not produce their own content but allow third parties to publish without rigorous quality control (Zuboff, 2019, pp. 504–512), using algorithms for the selection, validation, and aggregation of knowledge (Just & Latzer, 2017, p. 240)

Figure 2 provides a visualization of the circular type of knowledge order. We first give an overview of this type of knowledge order before describing in detail why its salience increased under the conditions of digital media platforms. Compared to the linear type of knowledge order, the clear coupling

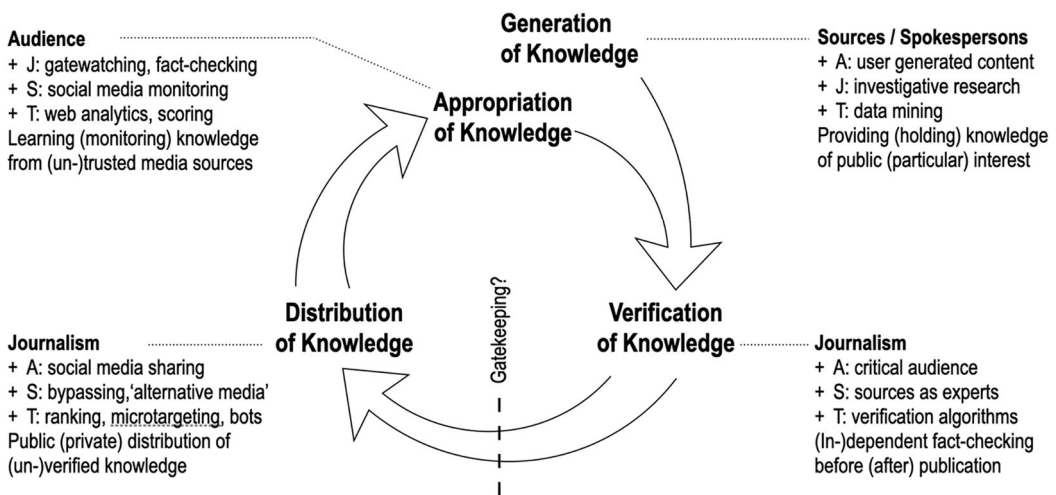


Figure 2. A circular type of knowledge order associated with digital media.

Notes: + = Roles of nontraditional actors or quasi-actors in the respective phase of the knowledge process.

S = Sources / Spokespersons; J = Journalism; A = Audience; T = Technologies / Algorithms.

() = Brackets are used to indicate context-dependent variations in characteristics of a circular knowledge process associated with digital media, compared to a linear knowledge process as displayed Figure 1.

of roles and phases in the knowledge process is dissolving. Journalism, sources and spokespersons, audience members, and technical tools (algorithms) can perform tasks in all phases of the knowledge process. The knowledge process exhibits a circular structure in which knowledge conveyed by the media as news is no longer the final and unalterable product. Instead, knowledge is part of continual (re-)verification, (re-)distribution, and (re-)appropriation processes by various actors whose knowledge processes take place simultaneously and without a fixed end. In the knowledge *generation* phase, the importance of user-generated content and investigative journalism grows, as well as algorithmic knowledge generation such as data mining. In the knowledge *verification* phase, increasing demands are placed on audiences' critical media literacy, because they need to evaluate the accuracy and sincerity of communicators and find reliable sources. In addition, algorithmic verification and sources as providers of expertise (e.g. think tanks) become involved in the verification process. In the phase of knowledge *distribution*, journalistic intermediaries can be easily bypassed by spokespersons, social media users as well as by algorithms such as microtargeting and social bots. In the knowledge *appropriation* phase, professional journalists increasingly engage in activities such as gatewatching (Bruns, 2018) and fact-checking, whereby they observe knowledge that has already been published. In addition, knowledge is appropriated for particular interests by spokespersons who use social media monitoring, web analytics, tracking, and scoring algorithms. To visualize the taking on of alternative roles by additional groups of actors and technologies involved as quasi-actors in the knowledge process, these additional (and often competing actors) are marked with a '+' sign in Figure 2. Brackets are used to indicate context-dependent variation in characteristics of a circular knowledge process associated with digital media, as compared to a linear knowledge process illustrated in Figure 1. A more detailed analysis of this circular type of knowledge order along our analytical dimensions of process phases, roles, contexts and hierarchies follows below.

Knowledge process

In the context of digital media platforms such as Google, Facebook and Twitter, a circular structure of knowledge processes is more likely to emerge. On these platforms, news is often published without journalistic review. Spokespersons and lay communicators can reach audiences directly, especially via social media. In addition, formerly professionalized phases of the knowledge process such as knowledge verification can become public. As a consequence, the formerly periodic, linear, and closed process of news production tends to be replaced at least partly by an open-ended, often non-linear, interactive, and transparent process (Bruns, 2008, pp. 24–28; Robinson, 2011; Russell, 2016, p. 151). This process can be described as a cycle between editors and their audience (e.g. Bowman & Willis, 2003, p. 12; Messner & DiStaso, 2008, p. 459), which occurs when audience feedback on digital media platforms after publication is then used as a source or idea for further journalistic coverage. As a consequence, the editorial process lacks "stopping points" (Lynch, 2016, p. 126), such as the editorial 'deadline' in traditional mass media.

The transition from a linear to a circular structure of the knowledge order can be further explained using a platform logic, which is prevalent in broad parts of the Internet. Parker et al. (2016, pp. 6–12) have described platform logic as a transition from the traditional pipeline model of the linear, closed value chain to interactive, open platforms. The platforms' openness makes it easier for providers and users to interact in feedback loops enabled by user comments and user data. A network model that makes the mutual relationships clear is therefore more suitable than the traditional gatekeeper model: "*Network journalism* [...] stands for a model of changing connectivity modes and interaction patterns in today's global journalism sphere" (Heinrich, 2011, p. 61; emphasis in original).

Editorial knowledge processes that involve digital media platforms can also be opened for algorithms and audience members, which means for automation and participation. Algorithms are increasingly being used in every phase of the knowledge process (Diakopoulos, 2019): starting with news monitoring (data mining), followed by algorithmic verification, news production (robot journalism), and distribution (personalization), right up to audience research (web analytics).

Datafied knowledge production has failed expectations that it would lead to “perfect information, real-time insights and smarter decision-making” (Thylstrup et al., 2019, p. 1), or even to “complete control over human societies” (Renn, 2020, p. 401). Nevertheless, it increasingly permeates the epistemic practices employed in the knowledge process (Godler et al., 2020), and “very little attention has been devoted to the epistemological standards of journalists who use these new technological innovations” (p. 223). Therefore, the structuring or distortion of the knowledge order through algorithms needs to be considered an important factor (Just & Latzer, 2017), especially in the case of digital media platforms (Helberger, 2020) and data journalism (Appelgren et al., 2019; Diakopoulos, 2019).

In addition, the ‘people formerly known as the audience’ (Rosen, 2006) are involved in the investigating, selecting, verifying, writing, editing, distributing, and commenting of journalistic content (Engelke, 2019, pp. 32–33). On digital media platforms, news is often published without first being reviewed and is then subjected to audience review, the results of which can vary widely with regard to veracity (Keen, 2007). This even happens in professional journalism, for example, “[s]ome magazines appear willing to place some of the responsibility for digital content’s accuracy onto their audiences through crowd-sourced verification and post-publication corrections” (Sivek & Bloyd-Peshkin, 2018, p. 417). Serious doubts have been raised as to whether citizen journalism can be a functional equivalent to professional journalism (Bruns, 2018, pp. 32–61) or whether Wikipedia has the same quality of content as a printed encyclopedia (Frost-Arnold, 2019). However, regardless of the quality of outcomes, the process of knowledge generation, verification, distribution, and appropriation has changed as a result of audience participation.

Journalistic practices of verification have also been adjusted to the new conditions of digital media platforms (Brandtzaeg et al., 2016; Henkel et al., 2020). Immediacy of reporting presents a tall challenge for online verification (Rom & Reich, 2020). Moreover, in response to the unhindered distribution of content on social media, professional journalism has incorporated fact-checking as an additional task, that is, retroactively reviewing what other outlets have published (Graves & Cherubini, 2016). Thus, overall, digitalization has changed the knowledge process not only with regard to the linear succession of its phases (knowledge production, verification, distribution, and appropriation), but also concerning the epistemic practices, technologies, and actors involved.

Contexts of knowledge

Contexts, which can be differentiated according to the expected degree of accuracy and sincerity of knowledge claims, are converging on digital media platforms. In this hybrid public (Chadwick, 2013), lay rationalities and journalistic, scientific, and other professional rationalities are no longer clearly separated or necessarily bridged by journalism. A consequence of such collapse of contexts (Davis & Jurgenson, 2014) and blurring of boundaries (Carlson & Lewis, 2015) is collective disorientation regarding the credibility of knowledge claims. Boundaries have to be defended, and the paradigm has to be discursively repaired by the profession (Hermida, 2015; Ruggiero, 2004).

However, there is also an opposite trend towards ideologically-based boundary demarcation. Like-minded communities with shared perceptions of reality immunize themselves against critical scrutiny and tend to construct knowledge in a closed fashion (through motivated reasoning). This is why attempts to correct false statements (debunking) often fail on digital media platforms (Zollo et al., 2015). Roberts (2017) has related these developments to the emergence of a new ‘tribal epistemology.’ ‘Good for our side’ and ‘true’ begin to blur into one (Lynch, 2016, pp. 43–45; Lynch, 2019, p. 6; Rosenfeld, 2019, p. 9). Without joint epistemic principles, however, participants in public discourse have no “common currency to exchange reasons” (Lynch, 2016, p. 50).

Hierarchies of knowledge

On digital media platforms, epistemic authorities such as journalism and science are being challenged in several ways, for example, by so-called ‘alternative media’ and ‘quasi-journalistic actors.’

As a consequence, Vos and Thomas (2018) diagnosed a ‘crisis of journalistic authority’ (p. 2001). ‘Alternative media’ discredit legacy media as biased, partisan, deceitful, and distanced from ordinary people. Legacy media are framed as part of a powerful elite and a conspiracy against ‘the people’ (Figenschou & Ihlebæk, 2019, pp. 1228–1229). Generalized skepticism and conspiracy allegations against epistemic authorities such as journalism and science (Harambam & Aupers, 2015) are often motivated by political polarization and tribal epistemology, by an esoteric understanding of the self as the highest epistemic authority (Houtman & Aupers, 2005), and by epistemic populism (Mede & Schäfer, 2020, pp. 478–480).

At the same time, journalistic authority has come under pressure from competition with “quasi-journalistic actors” (Vos & Thomas, 2018, p. 2004), that is, corporate or political actors who mimic journalistic services and cover the same topics without abiding by the same truth-seeking norms and practices (Krebs et al., 2021). On digital media platforms, strategic-persuasive communication can easily bypass journalistic media and reach the audience unfiltered, thus granting quasi-journalistic actors more agency to marginalize epistemic authorities such as journalism and science in an attempt to gain greater power and authority themselves. This situation contributes to the development of a ‘promotional culture’ and ‘commercial democracy’ (Cronin, 2018).

Both of the challenges above are not unique to the context of digitalization but are clearly exacerbated by structural developments that have eroded the monopoly of journalism as gatekeeper and intermediary between different knowledge contexts (Bruns, 2018). New types of intermediaries have emerged in the form of digital media platforms such as social media and search engines, which enable participation and use algorithms for the selection, validation, and aggregation of news without rigorous quality control. The role of digital media platforms as news intermediaries has been increasing (Newman et al., 2021), and they also outperform journalistic media in the advertising market.

Collaborative knowledge projects such as Wikipedia (Frost-Arnold, 2019) are another form of new intermediaries in which volunteers generate, collect, verify, and disseminate knowledge. Entman and Usher (2018) illustrate the redistribution of power in a model with five “new digital ‘pump-valves’ in the flow of political information and frames” (p. 299). Power shifts from legacy media to digital media platforms, analytics, algorithms, ideological media, and ‘rogue actors.’

Despite the destabilization of epistemic hierarchy through bypassing and new intermediaries, it is important to note that an essential indicator of epistemic authority has remained remarkably stable: the attribution of trust. Contrary to common belief, digitalization has not necessarily led to a crisis of trust in science (e.g. Funk et al., 2019) and legacy media (e.g. Hanitzsch et al., 2018). This was confirmed during the Covid-19 pandemic, during which experts and the media had relatively high levels of trust (Newman et al., 2020, p. 12). Given the normative desirability of trust-based (vs. power-based) epistemic hierarchy, the maintenance and rebuilding of trust in public discourse can hardly be overstated.

Knowledge-related roles

Access to the roles exercised so far by professionals in journalism, science, and other domains has become wider on digital media platforms. In contrast to the situation in traditional one-way mass communication, audience members can now participate more profoundly in the knowledge process. The same applies to spokespersons as representatives of political or economic interests who can now bypass the editorial review process and spread their messages and worldviews (Vos & Thomas, 2018, p. 2004). As a result of this openness, new hybrid roles emerge, blending roles of producers and users (‘producers’; Bruns, 2008). Citizen journalists (Engelke, 2019) and citizen scientists (Hecker et al., 2018) are integrated in the professional process of generating, verifying, and distributing knowledge. Amateurs can also create independent knowledge platforms outside the professional framework and can compete with professional knowledge providers (as in the case of Wikipedia). Contrary to what is often expected, however, this opening-up of the whole knowledge

process does not necessarily lead to equal participation of various population groups (Lynch, 2016, p. 143), for example, in the case of Wikipedia (Shaw & Hargittai, 2018).

Taken together, our model of knowledge order allows an in-depth analysis of similarities and differences between the linear and circular types of knowledge order. Through the lens of this model, what may appear like a collapse of knowledge order can be understood as a process of change characterized by: (1) a dissolution of boundaries between knowledge *contexts*, (2) a flattening of epistemic *hierarchy*, (3) a more flexible order of phases in the knowledge *process*, and (4) an opening of professional *roles* to new actors. Although these trends are clearly observable, our model does not predict the beginning of a 'post-factual' age. Rather, our analysis suggests that key epistemic practices of knowledge *generation*, *verification*, *distribution*, and *appropriation* have remained intact, while new (but not necessarily better) epistemic practices are being added, and practices are applied in new contexts by new actors who occupy hybrid roles and positions in the epistemic hierarchy.

Hybrid forms of knowledge order

As noted above, our analysis of linear and circular types of knowledge order is not meant to imply that these types of knowledge order ever existed in pure form, or that one has abruptly replaced the other. Rather, what we can observe is a coexistence and hybridization of these types of knowledge order in public discourse. Therefore, we will complement our analysis with examples of hybrid forms of knowledge order where elements of both types are mixed.

Influencers on social media such as YouTube, Instagram, or TikTok are exemplars of a hybrid knowledge process, the linear aspects of which run counter to the generally circular dynamic of digital media platforms. The role of influencers results from the popularity of user-generated content and trust relationships established in peer-to-peer communication. However, with increasing popularity, influencers can develop a privileged hierarchical position as gatekeepers and opinion leaders in their respective areas of knowledge – a role largely comparable with the role of journalism in the predominantly linear knowledge order of traditional mass media. Elite blogs constitute an early example of hierarchy formation (Hindman, 2009, pp. 102–142; Van Dijck and Poell 2013, p. 7) have argued that the emergence of "superusers" is inherent to datafication and commodification tendencies, specifically with regard to connectivity and popularity ratings. "Mass media logic and social media logic get incrementally entangled in defining the popularity of issues and the influence of people" (van Dijck and Poell, 2013, p. 8). Thus, the general circular structure of knowledge processes on digital media platforms does not seem to preclude the emergence of new linear and hierarchical forms of knowledge order.

Social media influencers often receive information from corporate sources, for example about games, music, travel, gadgets, fashion, or styling products and present themselves as trusted gatekeepers and intermediaries who verify and distribute this knowledge to their followers. It may seem like a relatively apolitical and unimportant form of communication as long as consumer products and lifestyles are concerned. One of the most interesting aspects of influencer communication, however, is how easily the currency of epistemic trust can be converted, for example, from fashion and lifestyle trends to social and political issues such as social distancing during the Covid-19 pandemic, or endorsement of political candidates (Moldrem, 2021; Suuronen et al., 2021). While influencers approximate the linear order, professional journalists seek to transfer their epistemic norms and gatekeeping role to social media through 'hybrid normalization' (Bentivegna & Marchetti, 2018).

In this context, it is also important to note that professional journalism has always involved elements of a hybrid knowledge order, even in the pre-digital era. For reasons of analytic clarity, we put these hybrid elements aside in our description of news journalism as an example of a predominantly linear knowledge order described above. As mentioned, hybrid roles in the knowledge order of professional journalism include writers of letters to the editor (Wahl-Jorgensen, 2007) and those who straddle the line between journalism and PR (Carlson & Lewis, 2015). News journalism as

the core of the profession has traditionally defended its boundaries and standards of objective reporting against such hybrid phenomena (Schudson, 2001). However, other forms of journalism such as public journalism, advocacy journalism, tabloid journalism and special interest journalism have been more permeable to audience participation, user generated content, political activism, and commercial influence (2019; Min, 2020; Örnebring & Jönsson, 2004). A comprehensive analysis of journalistic practices needs to account for such elements of hybrid knowledge order that are present to various degrees in different sub-fields of journalism as well as potential tensions between professional ideals and lived practices in the newsroom.

Outlook and research agenda: after the 'epistemic crisis'

In this paper, we set out to provide a better understanding of current debates on the epistemic crisis caused by digitalization. Our analysis leads to the conclusion that the predominance of a linear type of knowledge order associated with traditional mass media is (knowledge) history. But what is next? At this point, we can only speculate about developments that may lead to a re-stabilization of knowledge order in the digital age. As we have argued, the linear knowledge order shaped by traditional mass media will not be simply displaced; rather, a hybrid order with multiple logics will emerge, one which must and can be molded and regulated as in the case of previous 'new' media. Our model of knowledge order provides analytical tools for a precise description of differentiated and context-dependent types of knowledge order with their respective challenges and potentials.

We will end this paper with an outlook on trends that we think are important to keep on the research agenda. While the consequences of the developments summarized above are often paradoxical and ambivalent, our research outlook will focus on possible areas of scientific interest where research evidence and theoretical argument may spur developments desirable from a democracy perspective.

Towards a new epistemic division of labor?

A first area of ambivalent development comes to mind as epistemic authorities such as journalism and science are partly losing grip over normative standards of knowledge order. They need to defend themselves against critics and protect their boundaries against competitors. A negative consequence is that audiences are often confused about the trustworthiness of sources. On the positive side, however, epistemic authorities are forced to be more transparent and open to participation, which offers opportunities for a renewal of knowledge order and further emancipation of citizens.

Both scenarios – confusion and uncertainty among audiences as well as their emancipation – create a situation where individuals are increasingly responsible for verifying knowledge, which places growing demands on their media literacy. Media literacy is no longer limited to the appropriation of knowledge but also needs to include epistemic practices of other phases, like media literacy skills for producing, verifying, and distributing knowledge. This does not mean that audience members are qualified or required to enact these epistemic practices all by themselves. Rather, they become part of what has been described as “a system of divided labor, in which many epistemic tasks are outsourced to other individuals or institutions” (Herzog, 2020, p. 273).

A supportive epistemic infrastructure can be created through several means, such as building informed trust in media brands through transparency about the production, verification, and correction process (Karlsson, 2010), or by journalistic fact-checking (Graves & Cherubini, 2016; Mena, 2019), which can be supported by specialized software (Berendt et al., 2021). Scientists and research organizations also contribute to this epistemic division of labor, enabled by direct access to the public on the Internet (Taddicken & Krämer, 2021, pp. 9–10). Laypersons can contribute to both knowledge professions through citizen journalism (Engelke, 2019) and citizen science (Hecker et al., 2018).

Besides journalism and science, numerous participatory formats have emerged for collecting, verifying, and presenting knowledge on the Internet. Collaborative fact-checking and debunking was

examined in communication studies under the labels ‘citizen curation’ (Pedersen & Burnett, 2018), ‘collective civic moderation’ (Friess et al., 2021), ‘corrective action’ (Wintterlin et al., 2021), ‘civic intervention’ (Porten-Che   et al., 2020), and ‘peer-to-peer counter propaganda’ (Haigh et al., 2018). Platforms engage in this realm by attaching warnings to false news (Pennycook et al., 2020) and by crowdsourcing judgments of news source quality (Pennycook & Rand, 2019). Wikipedia is a prominent (and controversial) example for collaboratively collecting, verifying, and distributing knowledge (Frost-Arnold, 2019), but epistemic division of labor does not end here. For instance, the epistemic infrastructure is also relatively advanced in many domains of practical knowledge that provide guidance for self-help (like do-it-yourself videos, maker spaces, communities of practice), or educational knowledge. During the Covid-19 pandemic, digital education on social media platforms such as YouTube and Wikipedia gained further importance (Rathgeb, 2020). These parts of the epistemic infrastructure, which organize and guide audience participation, should be given more attention in future research, for example, in comparative studies of epistemic infrastructures and epistemic division of labor in different knowledge contexts like science, journalism, self-help, and education.

Generally, our model highlights the need for a comparative and integrative research agenda of studying knowledge practices across the divides of professionals, laypersons, and platform technologies involved in the generation, verification, distribution, and appropriation of knowledge. Such traditional roles no longer sufficiently explain the broad spectrum of individuals’ motivation and ability for epistemic action – from those who uncritically appropriate and distribute knowledge from biased media sources to those involved in advanced forms of epistemic division of labor, including quasi-professional practices of knowledge generation and verification.

Second-order reflection on truth and knowledge – blessing or curse?

A second area of ambivalent development concerns the public reflection on truth and knowledge that has been stimulated by the epistemic crisis. On the negative side, this meta-discourse may aggravate public perceptions of crisis by drawing attention to the socially constructed and disputed nature of truth and knowledge. On the positive side, however, this meta-discourse can be understood as one of the regenerative forces that can contribute to a renewal and re-stabilization of the knowledge order. Knowledge about epistemic practices and the knowledge order is “second-order knowledge” (Renn, 2020, p. 152), which “rarely becomes the subject of conscious reflection by its participants” (see also Berger & Luckmann, 1966/1991, pp. 110–115). In times of crisis, this tacit background knowledge is thrust into the spotlight: Pluralism encourages both skepticism and innovation and is thus inherently subversive of the taken-for-granted reality of the traditional *status quo* (Berger & Luckmann, 1966/1991, p. 143).

Thus, public debates on truth and knowledge are not just a panicky response to a reality perception that has become fragile. The epistemic crisis can also be seen as a chance to intentionally reshape epistemic practices. The expanded potentials of digital media lead to greater complexity in the networked public sphere (Benkler, 2006), with consequences that are often non-intentional and difficult to predict. What is needed in this situation is a more experimental approach, following Dewey (1927/2016) and his concept of ‘experimental democracy,’ or Popper (1966/2002) and his idea of ‘piecemeal technology.’ Both have recommended small steps to test new paths in liberal democracy. Wikipedia is – for all its weaknesses – a good example of how new practices can be collectively discussed, tried out, evaluated, and improved (2015; Frost-Arnold, 2019; Loveland & Reagle, 2013; Messner & DiStaso, 2013). This is primarily a practical and empirical task – or, as Owen (2006) famously put it: “The problem with Wikipedia is that it only works in practice. In theory, it’s a total disaster.” Communication research can make an important contribution by stimulating the meta-discourse that primes, shapes, and evaluates the formation of new epistemic practices, and by providing empirical evidence as a counterweight against oversimplified narratives and unfair criticism.

We hope that our model of knowledge order can provide a clearer understanding of how and why knowledge practices change in the context of a fast-evolving digital media landscape, with its

profound impact on knowledge processes, contexts, hierarchy, and roles. One of the key takeaways is that, with the questioning of epistemic hierarchy, knowledge order is being stripped to what social epistemology has identified as its very core: the social consensus about ‘good’ knowledge practices as a basis of epistemic authority and mutual trust. As we have argued, broader participation in the epistemic division of labor and meta-discourse both tend to destabilize this social consensus about epistemic practices, thus creating a situation of deepened epistemic divergence. At the same time, however, participation and meta-discourse are indispensable for re-negotiating a sustainable and democratically legitimate knowledge order in the digital age – a knowledge order that is not necessarily built on trust in specific actors and authorities, but first and foremost on trust in knowledge practices, the proper and transparent application of which can make anyone a legitimate epistemic authority in public discourse. The research agenda we have outlined to illustrate how communication research can elucidate and support this re-structuring and re-negotiation process is far from exhaustive. Nevertheless, we hope that it will stimulate further research and theorizing on the digital transformation of knowledge order.

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ORCID

Christoph Neuberger  <http://orcid.org/0000-0003-0892-610X>

Anne Bartsch  <http://orcid.org/0000-0002-3387-7226>

Thomas Hanitzsch  <http://orcid.org/0000-0002-7104-6300>

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