

## Knowledge broker, trust broker, value broker: The roles of the Science Media Center during the COVID-19 pandemic

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### Abstract

In the communicative figuration of science communication (Hepp & Hasebrink, 2017), a variety of actors, practices and orientations contribute to the mediation of scientific knowledge and expertise. By curating scientific content for a journalistic audience, Science Media Centers (SMCs) can take up a powerful intermediary position. In this paper, we apply a figurational framework to understand what roles SMCs can take in science communication. Building on ethnographic material gathered during January and October 2020, we analyze through which practices, communicative relations, mission and normative assumptions SMC Germany has shaped its position in science communication during the COVID-19 pandemic. Doing so, we follow the “cultural turn” in science communication research. Building on the concept of brokerage, we conclude that SMC Germany has taken on roles as a knowledge broker by providing journalists with curated scientific content, a trust broker by facilitating relationships between journalists and scientists, and a value broker by promoting the status of scientific expertise in the social knowledge order.

### Keywords

Science Media Center, COVID-19, expertise, science journalism, science communication, ethnography

## 1 Introduction

The speed with which disciplinary jargon – viral load, infection rate, aerosols – has become part of our everyday language illustrates how abstract scientific concepts can acquire concrete and social meaning. Imagining this process as conversational, as proposed by various science communication researchers (Bauer, 2009, p. 235; Bucchi & Trench, 2021, p. 8), raises questions of participation, practice, and transformation: Which actors are involved in the social conversation on the COVID-19 pandemic, how do they relate to one another, and how do they define what counts as knowledge, expertise and truth?

This paper examines the role of one conversational participant: the Science Media Center (SMC) Germany. SMCs originate in the UK and claim to provide journalists with expertise “when science hits the headlines” (Fox, 2012, p. 257). Over the past decades, SMCs have spread internationally with organizations taking root in

Canada, Australia, New Zealand, and Germany. Though SMCs and their potential impact on science communication have been discussed in the literature (Callaway, 2013; Rödder, 2014, 2015, 2020), their practices have rarely been empirically studied (Broer, 2020; Broer & Pröschel, 2021; Buschow, Suhr, & Serger, 2022; Tanaka, 2015; Williams & Gajevic, 2013).

Below, we present a newsroom ethnography of SMC Germany. The fieldwork coincided with the spread of the novel coronavirus in January 2020, and was repeated in the midst of the COVID-19 pandemic, in October 2020. The ethnographic material consists of interviews with editorial staff, observations of newsroom activities, and SMC media releases. With this, we explore the following question: How did SMC Germany understand and shape its intermediary role in the communication of scientific knowledge and expertise during the COVID-19 pandemic? Our analysis is guided by a theoretical approach that envisions the SMC as part of a



*communicative figuration* (Hepp & Hasebrink, 2017). In order to describe the intangible transactions that SMC Germany facilitates between itself and other actors, we expand the concept of *brokerage* (Nisbet & Fahy, 2017; Pielke, 2007) and argue that the SMC took on the roles of a *knowledge broker*, *trust broker* and *value broker* during the COVID-19 pandemic.

## 2 The refiguration of science communication

Our paper starts from the understanding that the meaning of scientific knowledge depends on the social processes through which that knowledge is produced, evaluated and mediated (Knorr-Cetina, 1981; Latour, Woolgar, & Salk, 1986; Law, 2004). Scientific knowledge comes into being through scholarly negotiations that determine the practices, instruments and linguistic styles permitted for its production (Collins, 2001). In some circumstances, scientific knowledge takes on meaning as expertise – usually when highly specific, socially relevant and time-sensitive questions require conclusive and practicable answers (Peters, 2021, p. 116). As scientific knowledge is recontextualized to fit the questions that arise (Nowotny, Scott, & Gibbons, 2001), it becomes embodied in individual experts, whose authority is negotiated in public communication (Jauho, 2016). Several scholars have mapped out this process for the COVID-19 pandemic, for example, through interconnected knowledge and data sources (Väliveronen, Laaksonen, Jauho, & Jallinoja, 2020) and social media platforms connecting scientific experts, policymakers, journalists, and citizens (van Dijck & Alinejad, 2020). Through these networks, problems are defined, knowledge is shared, and expertise is attributed. At the same time, scientific knowledge becomes intertwined with political, economic and moral aspects, attaching layers of social meaning (Bauer, 2015; Brüggemann, Lörcher, & Walter, 2020; Leach, Scoones, & Wynne, 2005). In this way, we understand science communication not as the transmission of

neutral representations of reality, but as a transformative process in which scientific knowledge and expertise are socially negotiated (Felt & Davies, 2020, p. 3; Horst, Davies, & Irwin, 2017).

The range of actors in science communication is wide, including all those involved in the production, mediation, evaluation and use of scientific knowledge (Schäfer, Kristiansen, & Bonfadelli, 2015, p. 13). Similarly, activities ranging from scholarly communication and science PR to science journalism, scientific policy advice and citizens' science engagement can all be studied as forms of science communication (Bonfadelli et al., 2017; Bubela et al., 2009). In addition to the content of science communication formats (e.g., Summ & Volpers, 2016), many analyses have been interested in the relationship between actors within and outside of science (e.g., Milde, Vogel, & Dern, 2021; Rödder, Franzen, & Weingart, 2012), and increasingly, science-related communication between non-science actors (Felt & Davies, 2020). A recent trend in the scholarship views science communication as a “social conversation around science” in which imaginaries about science, scientific knowledge and expertise are constructed, shared, contested and transformed (Bucchi & Trench, 2021, pp. 6–8; Felt & Davies, 2020, p. 28).

Our paper adds to this and investigates science communication as a communicative figuration. Originating in Norbert Elias' (1978) process sociology, this concept assumes that social relations are communicatively constituted and subject to constant change, for example due to technological or societal transformations (Hepp & Hasebrink, 2017). Each communicative figuration consists of three interwoven dimensions: an *actor constellation* held together through *communicative practices* and guided by a *frame of relevance* that defines the orientation of the figuration. Viewing science communication through a figurational lens gives space to the variety of actors, practices, technologies, and orientations involved in the mediation of scientific knowledge. The assumption of transformation invites

research into how the “blurring of boundaries” between the production, evaluation and dissemination of knowledge takes shape (Neuberger et al., 2019, p. 176).

From this perspective, science communication is currently undergoing a refiguration. Of particular interest is the relation between actors in science and journalism. These fields are mutually beneficial, with journalism providing space for the public legitimization and dissemination of scientists’ work, and science offering journalism resources for news production (Blöbaum, 2017; Schäfer, 2008; Scheufele, 2014; Väliverronen, 2021). While journalism remains an important mediator of scientific knowledge (Newman et al., 2021; Van Aelst et al., 2021), the voices in the social conversation about science are multiplying. In other words, the actor constellation is expanding. On the side of science, there is a tendency for academic organizations, scientific journals and individual scientists to increase their visibility in order to raise funds, improve their standing, or inform the public about research results (Franzen, 2011; Raupp, 2017; Väliverronen, 2021). On the media side, science journalism faces similar economic challenges as other beats, leading to science newsrooms being downsized or eliminated, and full-time journalists being replaced by freelancers (Blöbaum, 2017; Hanitzsch, Hanusch, Ramaprasad, & de Beer, 2019; Schäfer 2017). Developments toward a 24-hour news cycle and the rise of digital technologies have shortened the time available to report on complex issues (Rosenberg & Feldman, 2008). In these circumstances, journalists can become more dependent on press releases of news agencies, scientific journals and institutions (Vogler & Schäfer, 2020), which may foster exaggerations or *hying* of scientific claims (Heyl, Joubert, & Guenther, 2020; Sumner et al., 2016; Weingart, 2017) and raises questions to which extent journalists are able to critically contextualize scientific knowledge (Kohring, 2005).

In light of these transformations, we can witness the rise of individuals, platforms and organizations in the gray zones of science communication (Görke &

Rhomberg, 2017, p. 54). As Gerber and colleagues note: “these ‘disintermediated’ communication contexts bring about not only new means and tactics but even entirely new actors in communication such as journalistic media platforms which are not ‘journalistically independent’ in a classic sense” (Gerber et al., 2020, p. 50). Some examples are the international platform *The Conversation* (Bruns, 2017; Guenther & Joubert, 2021), the media outlet *SciDev.Net* (Trench, 2007), and *Science Media Centers (SMCs)* – the focus of this paper. The figurational perspective gives way to empirical questions about the impact of these new actors on the power balance, communicative practices and attribution of social meaning in the process of science communication.

### 3 Science Media Centers

SMCs are editorial organizations that curate scientific content for a journalistic audience. The first SMC was founded in the UK in 2002, in response to public debates in the 1990s surrounding controversial topics like stem cell research and animal experiments (Rödder, 2014). One of the proposed solutions from actors in science and politics was an independent organization that would foster trust in science through journalism (Rödder, 2014, p. 371). The newly founded SMC UK understood itself as science’s advocate and provided elite journalists with easily accessible scientific expertise (Fox, 2012). Its main activities became summarizing new studies, maintaining a database of scientific experts, and organizing press conferences when “science hits the headlines” (Fox, 2012, p. 257). The SMC concept took on internationally, as independent organizations were founded in Australia (2005), New Zealand (2008), Canada (2010) and Germany (2016).

SMC Germany was initiated by the German professional association of science journalists “Wissenschafts-Pressekonferenz” (Hettwer, Rödder, & Zotta, 2013). Rather than explicitly promoting science, it claims to support science jour-

nalists in reporting about complex scientific topics (Rödder, 2015). At the time of our fieldwork, SMC Germany consisted of an editorial board (“Redaktion”) of eight editors working in three thematic departments (medicine & health; climate & environment; energy, technology, mobility & AI), and the SMC’ Lab that develops software for the editorial board. The Klaus Tschira Foundation funds the majority of the organization. SMC Germany’s activities are similar to those of SMC UK, and reach just under 1700 accredited journalists at the time of writing.

Research on SMCs is limited, which is surprising considering their potential impact on science journalism. One empirical study was able to show considerable influence of SMC UK on the media portrayal of the controversial issue of animal-human hybrid embryos (Williams & Gajevic, 2013). An account by an editorial lead of the now inactive SMC Japan describes the difficulties of finding a balanced pool of experts after the Great East Japan Earthquake in 2011 (Tanaka, 2015). Other literature describes SMCs in terms of their potential benefit for health communication (Rödder, 2014), the foundation of SMC Germany (Rödder, 2015), the theoretical identification of SMCs as boundary organizations (Rödder, 2020), and innovators that work to repair and enhance the field of journalism (Buschow et al., 2022).

#### 4 Research interests

Employing a figurational perspective, we focus on how scientific knowledge and expertise are mediated across actors, practices and orientations. In doing so, we follow calls for science communication to be explored as conversation rather than transmission, i.e., as cultural practices that shape meaning (Blue, 2019; Bucchi & Trench, 2021; Davies, Halpern, Horst, Kirby, & Lewenstein, 2019; Horst & Davies, 2021). Organizations like the SMC provide an opportunity to witness this up close, while the COVID-19 pandemic forms the background as a “post-normal situation” characterized by uncertainties, value

questions and an urgency to take action (Brüggemann et al., 2020, p. 2). With this in mind, our research question aims to understand SMC Germany’s role in the figuration of science communication, as analyzed along four categories:

- › RQ: How did SMC Germany understand and shape its intermediary role in the communication of scientific knowledge and expertise during the COVID-19 pandemic?
- › With which *editorial practices* did the SMC engage in science communication?
- › How did the SMC shape its *communicative relationships* with other actors?
- › How did the SMC understand its *mission*, aims and goals?
- › Which *normative assumptions* guided the SMC’s activities?

The four sub-categories have been adapted from the original three dimensions of communicative figurations. Communicative practices are operationalized as SMC Germany’s *editorial practices*, divided into gatewatching, topic selection, content production and broadcasting routines. The actor constellation is reflected by *communicative relations* with other actors, e.g., in journalism, science and the public. Frame of relevance is divided into the SMC’s *mission* with regard to the organization itself, practical journalism, the public debate and the social knowledge order, and *normative assumptions* in the SMC newsroom about how actors in science, journalism and society should act and interact.

#### 5 Research design and methods

The ethnography central to this paper was designed to gain first-ever empirical insights into how SMC Germany curates scientific expertise for dissemination into journalism. It thereby follows a longstanding tradition of newsroom ethnographies in journalism research (e.g., Fishman, 1980; Paterson & Domingo, 2008, 2011; Schudson, 1989; Tuchmann, 1978). The initial field phase, with the first author pres-

ent at SMC Germany, took place from January 6 to 31 2020. After receiving the same introduction as interns, the researcher was able to attend editorial and management meetings, talk with staff during coffee and lunch breaks, and experience the day-to-day work first-hand. Furthermore, she gained access to the SMCs collaboration software Slack. Full participation in content writing was not possible due to language limitations. As fieldwork coincided with the first COVID-19 cases in Europe, the response of the SMC to this situation unexpectedly became a focal point in the research.

The second field phase took place from October 5 to 30 2020 and was intended as a follow-up to uncover how the editorial practices, organizational setup, and the editors' understandings of their role had developed since the start of the COVID-19 pandemic. As the editorial team was partially working from home at that time, fieldwork took place in physical presence for one and in virtual presence for three weeks. The first author had access to all online editorial and management meetings, the collaborative platform Slack, as well as SMC publications and live broadcasts. Interviews took place either in presence or via video conferencing. The shift toward digital research methods brought forth several challenges and advantages that are reflected in more detail elsewhere (Broer & Schmidt, 2022).

The ethnographic material totals 28 interviews with all editorial staff, 42 field notes, 168 SMC publications, and 62 chat logs. Throughout both phases, the semi-structured interviews focused on SMC editors' professional backgrounds, role understandings, and perspectives on the work of the SMC. As fieldwork progressed, they became more reactive to observed practices and discussions, and the editors' experiences in the previous months. The field notes contain written impressions of editorial research and production practices, as well as meeting transcripts of all days the first author was present. The chat logs contain messages sent in 27 "channels" used for sharing news articles and scientific publications, and

discussing editorial decisions. The SMC publications include all media releases transmitted to journalists during and between both fieldwork phases.

Following constructive grounded theory, data gathering and analysis happened reiteratively (Charmaz, 2006, p. 23) and remained open to new developments (Breuer, Muckel, & Dieris, 2019, p. 55; Charmaz, 2006, p. 46). While the ethnography initially set out to uncover SMC Germany's editorial processes, these research interests were expanded to include its response to the COVID-19 pandemic. The first author increasingly focused on changing practices and imaginaries – common understandings and ideals that create a shared sense of legitimacy for engaging in practices that work toward a particular version of the social world (Taylor, 2004) – underlying the editorial work. In this case, we mean SMC editors' beliefs about the meaning of scientific knowledge and expertise (e.g., "sociotechnical imaginaries," Jasanoff & Kim, 2015), the value of journalism in society (e.g., "democratic imaginaries," Ezrahi, 2012) – and about the role of the SMC regarding these.

After anonymization, both authors coded the ethnographic material using the software MAXQDA. Starting out with open line-by-line coding and focused coding (Charmaz, 2006, p. 46) we identified initial topics, before consolidating the emerging theoretical framework. Some of the codes derived from the data gathered in January, mainly those related to the SMC's organizational structure and editorial process, were included in the coding process after October in order to capture changes. After intercoder comparison, we proceeded with axial coding by which codes were connected and abstract codes formed. We then related these codes to four figurational categories, editorial practices, communicative relations, mission, and normative assumptions, as explained in Chapter 4.

## 6 Ethnographic insights on SMC Germany's intermediary roles

Over the course of the COVID-19 pandemic, the way that SMC Germany has related to the figurational categories has not been static – neither has its role as an intermediary. Initially, the SMC took on the role of a “service provider” transmitting knowledge content for journalists; later it focused more on mediating science-journalism relations and became an explicit proponent of science-informed journalism. We expand the concept of brokerage to explain this shift. Actors that facilitate the flow of knowledge, goods or opportunities between otherwise separated parties within a network (Simmel, 1950) have been identified as *brokers* in various academic disciplines, including sociology, anthropology and communication science. Being familiar with each party, brokers are able to bridge gaps in social structures and “translate” between distinct groups (Nisbet & Fahy, 2017; Pielke, 2007; Stovel & Shaw, 2012). Considering SMC Germany's position in between science and journalism, the concept of brokerage accurately captures how the organization facilitated intangible transactions between itself and other actors in its figuration. The following paragraphs show how the SMC has taken on roles as a knowledge broker by providing journalists with curated scientific content, a trust broker by facilitating relationships between journalists and scientists, and a value broker by promoting the status of scientific expertise in the social knowledge order.

### 6.1 Knowledge broker

Knowledge brokers mediate professional, technical or scientific knowledge between different fields (Meyer, 2010; Sverrisson, 2001). In models of knowledge-based journalism, science journalists are often described as knowledge brokers between science and their audience (Donsbach, 2014; Gesualdo, Weber, & Yanovitzky, 2020; Nisbet & Fahy, 2015). SMC Germany generally fits this model, but occupies an unusual intermediary position between science and journalism: It assesses jour-

nalists' knowledge needs, locates knowledge within science, and transforms it into expertise for journalistic consumption (Broer, 2020). As we can see in Table 1, the SMC carries out this role through many of its daily editorial practices. One of these is gatewatching (Bruns, 2005) i. e., the continuous monitoring of scientific, journalistic, political, and societal sources. The SMC aims to anticipate which topics will become relevant by compiling background knowledge and locating experts. In this way, the SMC was able to provide knowledge content before the COVID-19 outbreak reached Europe, as it had previously established contact with virologists, epidemiologists and emergency health specialists:

We are like guides through the jungle where every tree is its own discipline with many branches and leaves. We are good at saying: tree number seven, fourth branch to the left, there is the expert on coronaviruses. [...] We know these experts and we fetch their expertise when science is making headlines, or when it should be. (Interview, SMC editor, January 14 2020)<sup>1</sup>

Gatewatching also provides SMC editors with a way to estimate and act upon journalists' knowledge needs. This was the case when statistics became relevant in news of the COVID-19 outbreak. The SMC instigated a new format named “corona report” to bring “statistical enlightenment” (“statistische Aufklärung”) into journalism. It provided regularly updated numbers, visual charts and explanations of statistical terms.

The basic idea is that you give the colleagues out there a repetitive part [statistics] that is always interesting. And they like that because they then develop confidence in the product and say, yes, there's the daily report, then I have all the important data, then I don't have to search around. Instead, I get it there, and I always get it on the same day, and then I'm

<sup>1</sup> The interviews were held in German; the quotes in this article were translated by the authors.

informed again. (Interview, SMC editor, October 9 2020)

In terms of production routines, the SMC normally mediates scientific expertise through static publication formats, e.g., “fact sheets” summing up relatively secured scientific claims. The rapidly evolving research on COVID-19 meant that SMC editors had to find new ways to display scientific knowledge. An “annotated publication list” was established to provide journalists with an overview of the latest COVID-19 findings. In this regularly updated Google Document, SMC editors selected, summarized and ordered scientific content using a self-designed system that rated its scientific novelty, public relevance and reliability. Journalists could see at one glance which recent scientific findings the SMC had approved as relevant and reliable.

These products have developed their own life, they create a demand. You could say, my God, all these academic papers, there are not so many that I find interesting. But there are always new ones and the colleagues [journalists] now say ok, I trust you when you make this selection. In this respect, we have become a *service provider*, which is what we want to be. (Interview, SMC editor, October 9 2020)

SMC Germany depends on a range of communicative relations. For example, its access to scientific knowledge relies on the goodwill of around 40 academic publishers to share studies before their official publication date, when they are under “embargo” (Franzen, 2011, p. 126). Embargos give SMC editors a time advantage to summarize, contextualize, and gather expert statements. This advantage was lost during COVID-19, when research often appeared on preprint servers first (Fleerackers, Riedlinger, Moorhead, Ahmed, & Alperin, 2022; Fraser et al., 2021).

We don't really stand a chance if there's no embargo. And the corona studies were always released for direct publication. That is, they were sent out via the press offices and were of course immediately available to journal-

ists, who wrote about them directly. So we just didn't have that lead time anymore. (Interview, SMC editor, October 14 2020)

To cope with this, the SMC shifted its focus from academic journals to preprint servers, and developed a program that flags preprints with above average download and sharing counts. This was an adaptation of the SMC's selection criteria for scientific resources, which previously excluded non-reviewed findings. In addition, SMC Germany maintains close relationships with journalists as both a source of feedback and its main recipient audience, and with international SMCs, which can provide topics, contacts with scientists and expert statements.

The SMC's mission in the knowledge brokering process is multifaceted. Its organizational goal is to gain standing as a central resource for scientific knowledge in journalism. It aims to aid practical journalism by adapting to journalists' needs and rhythms, highlighting relevant topics, curating scientific sources, and providing free knowledge content. This is reflected in the “service mentality” we encountered in our interviews with SMC editors.

This is the difference: we're not an agency or press office for science. We are a science newsroom that wants to share information with others, so that they can share it again in their work. It is a service from journalists to journalists [...] We convey expertise. Doing that in this crisis situation is exactly what we're there for [...] *This is our mission*. (Interview, SMC editor, January 19 2020, highlight by the authors)

Doing so, the SMC hopes to inform the public through journalism, and ultimately impact the social knowledge order by strengthening the scientific knowledge base in society. We can point out three normative assumptions guiding the SMC in this role: Firstly, it acts from the belief that the quality of science journalism is under strain due to budget cuts, accelerating production rhythms, and increased PR efforts from scientific actors. Secondly, the SMC works under the assumption that

Table 1: The SMCs knowledge broker role structured along figurational categories

Editorial practices	Communicative relations	Mission	Normative assumptions
<b>Gatewatching</b> –Continuous observation of science, media and politics –Sharing resources amongst editors <b>Topic selection</b> –Assessing scientific and journalistic relevance –Assessing strategic and organizational compatibility <b>Content production</b> –Formulating an angle (relevance statement and open questions) –Gathering expert assessments –Compiling scientific knowledge, relevance statement and expert assessments <b>Broadcasting</b> –Developing new publication formats –Adapting to journalistic rhythm –Publishing / updating content	<b>Journalism</b> –Emailing content to accredited journalists –Gathering questions and feedback from journalists <b>Science</b> –Selecting scientists for expert databank –Gathering commentary from experts –Gaining access to scientific journals <b>General public</b> –Publish content on website –Announce publication over Twitter <b>SMCs</b> –Exchanging topics and expert statements	<b>Organizational</b> –Becoming a central knowledge resource for journalists <b>Practical journalism</b> –Fulfill knowledge needs –Provide “services” to improve the quality of science journalism <b>Public debate</b> –Informing the public through journalism <b>Social knowledge order</b> –Strengthening knowledge base for public and political decision-making and opinion building	<b>Journalism</b> –The quality of science journalism suffers from digitalization and medialization –Science journalism needs independent gatekeeper to provide access to curated scientific expertise <b>Science</b> –Scientific actors are not equipped to judge public relevance

scientific actors – institutes, publishers, researchers – are not equipped to judge the public relevance of scientific research. Lastly, an independent gatekeeper providing access to high-quality scientific experts and relevant scientific research is considered a necessary intervention to combat these pressures.

## 6.2 Trust broker

As the pandemic progressed, SMC editors became concerned about “pseudo experts” in the public debate, especially after receiving reports of journalists having difficulties reaching scientists for comment (e.g., Schneider, Ruby, Kuhrt, Reuning, & Hackenbroch, 2020). Against this background, SMC Germany began to adopt an additional role as a trust broker. While continuing most of its knowledge broker activities, its practices became angled toward improving the reciprocal relationship between science and journalism. In Table 2, we can see this reflected in editorial practices such as the frequent hosting of virtual press briefings, in which a panel of scientific experts answered questions about, for example, immunity levels, vaccination strategies and the limitations of German emergency care.

So that’s why we’ve also ramped up these press briefings, because then we simply create a space where journalists can get their questions out, and they don’t all have to call Prof. Drosten or anyone else individually. [...] *That was a point where we could really help the experts.* At the same time, journalists especially from smaller news media may fall behind [getting answers] from press offices, but we were able to offer them a platform to deliver their questions to the experts. (Interview, SMC editor, October 8 2020, highlight by the authors)

SMC Germany also began broadcasting what the editors called “meta-expertise.” This entailed, for example, content on how to recognize scientists’ academic standing, how to understand the academic publishing process, and how to deal with preprints. According to SMC editors, this proved especially important with regard to the organizations’ growing audience of non-specialized journalists covering COVID-19.

And then it came to this phase in April, where [also] political journalists called us here. And then [...] media inquiries also came: can’t you do an interview about the question of me-



ta-expertise, that is, who is actually an expert [on coronaviruses] and why is he one? And the political journalists then called [and asked], well we can't distinguish between A and B, aren't they both okay and how can I even say that Scientist X is more competent than Scientist Y, how do you determine that? (Interview, SMC editor, October 9 2020, scientists' names anonymized)

In terms of communicative relationships, SMC editors' contact with scientists became focused on maintaining a balance between convincing them to share their expertise as a duty to the public, while avoiding to overburden them. Their relation with journalists became marked by more direct exchanges, as SMC editors increasingly responded to direct inquiries and follow-up questions. Interestingly, we also observed that SMC Germany intensified its vetting process for both scientists speaking as experts, and journalists gaining access to the expertise. As several SMC experts started to gain public prominence, e.g., by appearing alongside politicians, in interviews, or partaking in controversial debates, the SMC sharpened its criteria to exclude scientists who had, in the eyes of SMC editors "lost their authenticity."

To me, Scientist Y is part of the German health ministry club. Scientist Y is advocating for the 15 % of people that don't see COVID-19 as a threat. But I say, Scientist Y is no longer behaving as a part of the scientific community. If you read Scientist Y's statements, you notice that Scientist Y tries not to say anything wrong, but still tries again and again to please the public. Scientist Y says, what Scientist X and Merkel are saying is not true at all, it's unscientific, it's like the flu. But that's just not true. It is simply not true. (Interview, SMC editor, October 9 2020, scientists' names anonymized)

At the same time, the SMC began monitoring the journalists attending its virtual press briefings. Though in principle, these were meant for accredited journalists, access could be obtained by anyone with a link. This on the one hand risked experts being confronted with questions from what the SMC leadership considered

"non-serious" media, such as blogs, niche magazines and political publications, and on the other, meant that accredited journalists would lose their exclusive first access to SMC content. In the editorial meeting following a press briefing with many unfamiliar attendees, the SMC editor-in-chief raised the issue of exclusivity with staff:

[Yesterday] there was the problem that many non-journalists were able to sign up because the invitation was forwarded by Journalist Y. A warning for the future. [...] *This is a service just for our journalists.* (Field note, SMC editorial conference, 20 Oct 2020, journalist's name anonymized, highlight by the authors)

The SMC's mission in this role shifted toward establishing the organization more overtly as an independent center of expertise for journalists on matters of scientific literacy, and for scientists on matters of communication. On an organizational level, SMC Germany saw its audience grow from around 800 to 1400 accredited journalists between January and October 2020.

Yes, that's really a huge difference when you compare January to now. A lot of accreditations have come in the entire time. Because I think people have simply perceived us *as a contact point* that on the one hand can provide experts for interviews, but on the other hand we're experts in the topic ourselves. (Interview, SMC editor, October 8 2020)

On the level of practical journalism, the SMC aimed to improve scientific literacy among journalists, while giving high-quality scientific experts a platform in the public debate on COVID-19 and its countermeasures. In establishing itself as a trusted intermediary, the SMC aimed to strengthen the relations between science and journalism.

But we were also accepted as a hub because everyone trusted us and said: They don't make any nonsense, they don't provide any strange experts, they are right on the beat of what needs to be discussed, they are just on top of things. There we were simply, yes, already

**Table 2: The SMCs trust broker role structured along figurational categories**

Editorial practices	Communicative relations	Mission	Normative assumptions
<b>Gatewatching</b> –Observing public and political debates –Observing experts’ appearances <b>Topic selection</b> –Redefining quality criteria for scientific experts –Introducing scientific literacy topics <b>Content production</b> –Continuous and repetitive products –Quality & relevance markers for scientific publications (including preprints) <b>Broadcasting</b> –Broadcasting virtual press briefings –Vetting journalists attending virtual press briefings –Sorting journalists’ questions for relevance	<b>Journalism</b> –Directly answering questions –Receiving praise (awards, tweets) <b>Science</b> –Convincing scientists of social responsibility –Offering scientists a platform to mass media –Avoiding overburdening scientists –Removing scientists from expert database <b>General public</b> –Promote “Together for Fact News” on website and Twitter <b>SMCs</b> –Setting apart identity vis-a-vis other SMCs as independent and autonomous.	<b>Organizational</b> –Protect organizational independence –Becoming a trusted expert in “meta-expertise” <b>Practical journalism</b> –Improving scientific literacy in journalism <b>Public debate</b> –Giving “quality” scientific experts a platform <b>Social knowledge order</b> –Strengthening trust between science and journalism –Improving public trust in science and journalism	<b>Journalism</b> –Journalism should have a close relationship with science <b>Science</b> –Scientists have a duty to inform the public when their topic is relevant –Scientists must communicate authentically and without self-interest

kind of a *trust broker*. So I think we have matured there. (Interview, SMC editor, October 9 2020, highlight by the authors)

In its role as a trust broker, the SMC relies on three normative assumptions. Firstly, the belief that journalism benefits from having a close relationship with scientific actors; secondly, that scientists have a social duty to inform the public with relevant expertise; and lastly, that scientists should only communicate expertise for the benefit of the greater good, rather than self-interest.

**6.3 Value broker**

In addition to brokering knowledge and trust, SMC Germany also exercises a role as a value broker trying to amplify specific values through journalism. In Table 3, we see this reflected in editorial practices like topic selection, for which the SMC editors take into account the direction of debates on scientific topics played out in the news, social media and the political stage, as well as the intended impact of SMC media releases. Topics characterized by ambiguity and polarization on the one hand, and an urgency in decision-making on the other, are particularly relevant. The extent to

which topics are expected to gain media attention, could lead to misconceptions, and whether scientific expertise could steer the debate, furthermore guide the SMC’s editorial practices.

This was illustrated by the SMC’s response to debates about COVID-19 countermeasures. One example is the publication of the “Great Barrington Declaration” in October 2020: a statement in which a number of scientists advocate for fewer public restrictions and more protection of vulnerable citizens (Bhattacharya, Gupta, & Kulldorff, 2020). SMC editors considered the statement “unscientific” due to its practical and moral implications, as the health of millions could be at risk. Anticipating a media attention surge, the SMC decided to copy expert statements as published by the SMC UK, rather than contacting German experts, in an effort to provide journalists with a critical assessment as soon as possible.

ED1: I saw there was a broadcast from us last night after all on this “Barrington Declaration” from these three scientists who advocate protecting the elderly population in particular from Corona. How did that come about?

ED2: [...] Yes, yesterday I wrote back and forth with [editor-in-chief], whether we should do something about this Declaration. I had already pre-formulated a few questions, in case we still wanted to write to experts. [...] Then I remembered that the SMC UK had already done something about it, with some really clear expert statements. We were then able to simply pass these on, with a teaser [...].

ED1: [...] When I saw the broadcast, I actually thought it was exactly the right solution. The statements of the UK experts are good and exactly portray our thoughts about it. I think the broadcast can function as a “showstopper” – that’s why I think it was solved so well. (Field note, SMC editorial conference, October 7 2020)

SMC Germany’s communicative relations in this role are marked by explicit appeals, for example through the initiative “Together for Fact News” that was launched at the end of 2020. The SMC appealed to well-known personalities, such as virologist Christian Drosten, science journalist Mai Thi Nguyen-Kim and talk show host Eckart von Hirschhausen, to pledge a “knowledge

testimonial” (“Wissensbekenntnis”) in favor of science-based journalism, public engagement of scientists, and a stronger collaboration between journalism and science.

This goes a bit in the direction of showing attitude. The SMC does not appear that clearly in the campaign, but simply tries to put actors from science and journalism in front [to create] testimonials that stand up for the idea of independent journalism and independent science and a fact-based society. So likewise, these core values that are also behind the vision of SMC. (Interview, SMC editor, October 8 2020)

The SMC’s mission as a value broker can be understood in several ways. The shift from providing knowledge services in the background to explicitly communicating value positions was, on an organization level, motivated by the aim to increase its visibility, attract funders and expand its journalistic audience and expert base. Characteristic of the SMC’s value broker role is also the aim to steer the public debate, for example by timing its publica-

Table 3: The SMCs value broker role structured along figurational categories

Editorial practices	Communicative relations	Mission	Normative assumptions
<b>Gatewatching</b> –Monitoring the direction of public and political debates on scientific topics <b>Topic selection</b> –Adapting relevance criteria, selecting controversial topics –Discussing impact of coverage on public debate <b>Content production</b> –Selecting suitable expert statements –Timing broadcasts in order to achieve biggest impact <b>Broadcasting</b> –Launching “Together For Fact News” initiative	<b>Journalism</b> –Recruiting journalists to pledge “Wissensbekenntnis” for “Together for Fact News” <b>Science</b> –Recruiting scientists to pledge “Wissensbekenntnis” for “Together for Fact News” <b>General public</b> –Showing standpoints (“Haltung zeigen”) on website “Together for Fact News”	<b>Organizational</b> –Increasing visibility of the organization and its mission –Gaining the interest of new funders <b>Practical journalism</b> –Widening scope of qualified experts to quote –Providing access to scientific arguments <b>Public debate</b> –Pushing relevant science topics (agenda setting) –Preventing misunderstandings and exaggerations (agenda blocking) –Presenting particular scientific arguments (framing) –Increasing outreach of qualified experts <b>Social knowledge order</b> –Amplifying scientific voices and arguments –Raising authority of journalism and science	<b>Journalism</b> –Critical and independent journalism is crucial for democracy –Journalism should be informed by scientific rationale <b>Science</b> –Scientific knowledge is a mostly neutral and suitable basis for decision-making and opinion building

tions to set the journalistic agenda, sharing critical assessments of questionable scientific claims, giving voice to particular scientists, and presenting scientific arguments in response to controversial topics.

In doing so, the SMC acts according to specific normative assumptions. At the core is the belief that science, especially when following positivist methods, is the most neutral source of knowledge, and that journalism, when it is critical, independent and informed by scientific knowledge, has an essential function in the democratic process. In its efforts, SMC Germany therefore supports an epistemic order in which knowledge that is produced, evaluated and mediated according to scientific and journalistic norms provides the basis for individual opinion building and political decision-making.

## 7 Conclusion

Our aim was to analyze how SMC Germany understood and shaped its intermediary role in science communication during the COVID-19 pandemic. Although the circumstances were unique, they showed a highly accelerated version of the “social conversation on science” (Bucchi & Trench, 2021, p. 8) in which the boundaries and meanings of scientific knowledge and expertise were negotiated.

The figurational approach employed here has proven helpful for understanding how this transformative process is performed and understood in one particular organization. For SMC Germany, the pandemic was a “critical moment” (Quandt & Wahl-Jorgensen, 2021, p. 1201) in response to which new editorial practices were initiated, relationships with surrounding actors revisited, and its own role reconsidered. The post-normality of the situation made evident that in times of high uncertainty and urgency, scientific knowledge and expertise easily become entangled in value questions and moral positions (Hirschi, 2018). In such volatile circumstances, it is important to critically examine who takes part in the definition of relevant, credible and legitimate scientific

knowledge and expertise (Peters, 2021, p. 120). To gain a deeper understanding of the SMC’s role in this, we investigated its *editorial practices, communicative relations* with other actors, its *mission* as well as the *normative assumptions* guiding its activities.

We conclude that SMC Germany has taken on multiple brokerage roles during the COVID-19 pandemic. First and foremost, it positions itself as a knowledge broker by centering its practices around curating scientific knowledge to fulfill knowledge needs in journalism (Donsbach, 2014; Gesualdo et al., 2020; Nisbet & Fahy, 2015). Expanding the brokerage terminology, we argue that the SMC also took on the role of a trust broker. Through gaining trust from both scientists and journalists, the SMC aimed to improve the relationship between actors in both fields beyond its own boundaries (see also scholarship on networked trust, e.g., Castelfranchi, Falcone, & Marzo, 2006). Finally, we argue that the SMC promotes distinct normative positions in the role of a value broker. Scientific knowledge, especially when produced according to the standards of natural sciences, is considered the preferred basis for opinion building and decision-making. Journalism ideally represents a range of arguments based on scientific rationale so that it can fulfill its functions of critical observation and public orientation. In all its practices, the SMC ultimately aims to strengthen the epistemic authority of both science and journalism.

SMC Germany thereby orchestrates scientific expertise by curating scientific knowledge for recontextualization in journalism (Peters, 2021, p. 116) – with several implications. With regard to science, the SMC provides an attractive platform for individual scientists, academic institutions and scientific journals to gain visibility. Joining the SMC’s expert database allows scientists to simultaneously conform to expectations of societal engagement, and gain public expert status (Marcinkowski, Kohring, Fürst, & Friedrichsmeier, 2014; Peters, 2021). At the same time, the SMC may exacerbate publishers’ efforts to

promote research expected to draw journalistic attention (Franzen, 2011), feeding into medialization processes in science and research (Peters, Heinrichs, Jung, Kallfass, & Petersen, 2008). Regarding science journalism, evidently, the SMC is in a powerful position to set the agenda and frame public debates on scientific topics. Its efforts to summarize and arrange scientific arguments and expert statements could provide practical support to journalists working on complex topics under time pressure. They could also contribute to a “weight of evidence” model (Kohl et al., 2016) in which journalists present a range of scientific arguments without creating a false balance. Some SMC practices are, however, reminiscent of those in regular science newsrooms, e.g., its dependence on embargo material and press releases from academic journals and institutions, its focus on natural sciences and applicable research, and its orientation toward news cycles (Blöbaum, 2017). In an effort to distance itself from “science PR” tendencies, SMC Germany has developed criteria for determining relevance, credibility and authority, but by ascribing these, the organization takes on implicit and explicit value positions despite its branding as a mediator of neutral knowledge.

Eventually, we need to stress the ethnographic nature of our study: Our insights stem from observed practices and perspectives from within SMC Germany as it engages with actors outside of it. This does not allow us to draw conclusions on SMC Germany’s impact on science journalism, or about other SMCs. Our role conceptions provide a lens for understanding how practices, intentions and normative imaginaries can interplay in the mediation of scientific knowledge and expertise. The limitations above are interesting points for further research, however, and we encourage comparisons between SMCs or other intermediary platforms in science communication, as well as quantitative investigations that examine the impact of SMC content on German science reporting. Lastly, we believe a large-scale ethnographic project that looks at a variety of actors, practices and orientations

simultaneously could lead to important insights about the construction of science and expertise in the figuration of science communication.

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### Conflict of interests

The authors declare no conflict of interests.

### References

- Bauer, M. W. (2009). The evolution of public understanding of science – Discourse and comparative evidence. *Science, Technology and Society*, 14(2), 221–240. <https://doi.org/10.1177/097172180901400202>
- Bauer, M. W. (2015). Science literacy and beyond. *Public Understanding of Science*, 24(3), 258–259.
- Bhattacharya, J., Gupta, S., & Kulldorff, M. (2020). *The Great Barrington Declaration*. Retrieved from <https://gbdeclaration.org/>
- Blöbaum, B. (2017). Wissenschaftsjournalismus [Science journalism]. In H. Bonfadelli, B. Fähnrich, C. Lühje, J. Milde, M. Rhomberg, & M. S. Schäfer (Eds.), *Forschungsfeld Wissenschaftskommunikation* (pp. 221–238). Wiesbaden, Germany: Springer VS. [https://doi.org/10.1007/978-3-658-12898-2\\_12](https://doi.org/10.1007/978-3-658-12898-2_12)
- Blue, G. (2019). Science communication is culture: Foregrounding ritual in the public communication of science. *Science Communication*, 41(2), 243–253. <https://doi.org/10.1177/1075547018816456>
- Bonfadelli, H., Fähnrich, B., Lühje, C., Milde, J., Rhomberg, M., & Schäfer, M. S. (Eds.). (2017). *Forschungsfeld Wissenschaftskommunikation* [Research field science communication]. Wiesbaden, Germany:

- Springer. [https://doi.org/10.1007/978-3-658-12898-2\\_1](https://doi.org/10.1007/978-3-658-12898-2_1)
- Breuer, F., Muckel, P., & Dieris, B. (2019). *Reflexive Grounded Theory. Eine Einführung für die Forschungspraxis* [Reflexive Grounded Theory. An introduction for the research practice] (4th ed.). Wiesbaden, Germany: Springer Fachmedien.
- Broer, I. (2020). Rapid reaction: Ethnographic insights into the Science Media Center and its response to the COVID-19 outbreak. *Journal of Science Communication*, 19(5), 1–19. <https://doi.org/10.22323/2.19050208>
- Broer, I., & Pröschel, L. (2021). Das Science Media Center Germany: Ethnographische Einblicke in die Arbeitsweisen und Rollen eines Intermediärs zwischen Wissenschaft und Journalismus [The Science Media Center Germany: Ethnographic insights into the working practices and roles of an intermediary between science and journalism]. *Arbeitspapiere des Hans-Bredow-Instituts*. Hamburg, Germany. <https://doi.org/10.21241/SSOAR.73542>
- Broer, I., & Schmidt, J.-H. (2022). “Dasein”: Die Integration kulturanthropologischer Konzepte in die Journalismusforschung [“Being there”: Integrating cultural anthropological concepts into journalism research]. *Medien & Kommunikationswissenschaft*, 70(1–2), 79–96. <https://doi.org/10.5771/1615-634X-2022-1-2-79>
- Brüggemann, M., Lörcher, I., & Walter, S. (2020). Post-normal science communication. Exploring the blurring boundaries of science and journalism. *Journal of Science Communication*, 19(3), 1–22. <https://doi.org/10.22323/2.19030202>
- Bruns, A. (2005). *Gatewatching: Collaborative online news production*. New York, NY: Peter Lang.
- Bruns, A. (2017). Das Modell The Conversation: ‘Academic Rigour, Journalistic Flair’ [The model of The Conversation: ‘Academic Rigour, Journalistic Flair’]. In R. F. Huttel, H. Wormer, P. Weingart, & A. Wenninger (Eds.), *Perspektiven der Wissenschaftskommunikation im digitalen Zeitalter* (pp. 78–79). Weilerswist, Germany: Velbruck Wissenschaft.
- Bubela, T., Nisbet, M. C., Borchelt, R., Brunger, F., Critchley, C., Einsiedel, E., ... Caulfield, T. (2009). Science communication reconsidered. *Nature Biotechnology*, 27(6), 514–518. <https://doi.org/10.1038/nbt0609-514>
- Bucchi, M., & Trench, B. (2021). Introduction: Science communication as the social conversation around science. In M. Bucchi & B. Trench (Eds.), *Routledge handbook of public communication of science and technology* (3rd ed., pp. 1–13). London, UK: Routledge.
- Buschow, C., Suhr, M., & Serger, H. (2022). Media work as field advancement: The case of Science Media Center Germany. *Media and Communication*, 10(1), 99–109. <https://doi.org/10.17645/mac.v10i1.4454>
- Callaway, E. (2013). Science media: Centre of attention. *Nature*, 499(7457), 142–144. <https://doi.org/10.1038/499142a>
- Castelfranchi, C., Falcone, R., & Marzo, F. (2006). Being trusted in a social network: Trust as relational capital. In K. Stølen, W. H. Winsborough, F. Martinelli, & F. Mascacci (Eds.), *Trust management. iTrust 2006. Lecture notes in computer science* (pp. 19–32). Berlin, Germany: Springer. [https://doi.org/10.1007/11755593\\_3](https://doi.org/10.1007/11755593_3)
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London, UK: Sage Publications.
- Collins, H. M. (2001). What is tacit knowledge? In K. Knorr Cetina, T. R. Schatzki, & E. von Savigny (Eds.), *The practice turn in contemporary theory* (pp. 107–119). London, UK: Routledge.
- Davies, S., Halpern, M., Horst, M., Kirby, D., & Lewenstein, B. (2019). Science stories as culture: Experience, identity, narrative and emotion in public communication of science. *Journal of Science Communication*, 18(5), 1–17. <https://doi.org/10.22323/2.18050201>
- Donsbach, W. (2014). Journalism as the new knowledge profession and consequences for journalism education. *Journalism*, 15(6), 661–677. <https://doi.org/10.1177/1464884913491347>
- Elias, N. (1978). *What is sociology?* New York, NY: Columbia University Press.
- Ezrahi, Y. (2012). *Imagined democracies: Necessary political fictions*. Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/CBO9781139198769>
- Felt, U., & Davies, S. (2020). *Exploring science communication. A science and technology*

- studies approach*. Los Angeles, CA: Sage Publications.
- Fishman, M. (1980). *Manufacturing the news*. Austin, TX: University of Texas Press.
- Fleerackers, A., Riedlinger, M., Moorhead, L., Ahmed, R., & Alperin, J. P. (2022). Communicating scientific uncertainty in an age of COVID-19: An investigation into the use of preprints by digital media outlets. *Health Communication, 37*(6), 726–738. <https://doi.org/10.1080/10410236.2020.1864892>
- Fox, F. (2012). Practitioner's perspective: The role and function of the Science Media Centre. In S. Rödder, M. Franzen, & P. Weingart (Eds.), *The sciences' media connection – Public communication and its repercussions* (pp. 257–270). Dordrecht, The Netherlands: Springer Science + Business Media B.V.
- Franzen, M. (2011). *Breaking News: Wissenschaftliche Zeitschriften im Kampf um Aufmerksamkeit* [Breaking news: Scientific journals in the battle for attention]. Baden-Baden, Germany: Nomos. <https://doi.org/10.5771/9783845231501>
- Fraser, N., Brierley L., Dey, G., Polka, J. K., Pálffy, M., Nanni, F., & Coates, J. A. (2021). The evolving role of preprints in the dissemination of COVID-19 research and their impact on the science communication landscape. *PLoS Biology, 19*(4), 1–28. <https://doi.org/10.1371/journal.pbio.3000959>
- Gerber, A., Broks, P., Gabriel, M., Lorenz, L., Lorke, J., Merten, W. ... Warthun, N. (2020). *Science communication research: An empirical field analysis*. Berlin, Germany: Edition innovare. Retrieved from [https://sciencecomm.science/app/uploads/2020/05/Research\\_Field\\_Analysis\\_Science\\_Communication\\_2020\\_public.pdf](https://sciencecomm.science/app/uploads/2020/05/Research_Field_Analysis_Science_Communication_2020_public.pdf)
- Gesualdo, N., Weber, M. S., & Yanovitzky, I. (2020). Journalists as knowledge brokers. *Journalism Studies, 21*(1), 127–143. <https://doi.org/10.1080/1461670X.2019.1632734>
- Görke, A., & Rhombert, M. (2017). Gesellschaftstheorien in der Wissenschaftskommunikation [Social theories in science communication]. In H. Bonfadelli, B. Fähnrich, C. Lüthje, J. Milde, M. Rhombert, & M. S. Schäfer (Eds.), *Forschungsfeld Wissenschaftskommunikation* (pp. 41–62). Wiesbaden, Germany: Springer VS.
- Guenther, L., & Joubert, M. (2021). Novel interfaces in science communication: Comparing journalistic and social media uptake of articles published by *The Conversation Africa*. *Public Understanding of Science, 30*(8), 1041–1057. <https://doi.org/10.1177/09636625211019312>
- Hanitzsch, T., Hanusch, F., Ramaprasad, J., & de Beer, A. S. (2019). *Worlds of journalism: Journalistic cultures around the globe*. New York, NY: Columbia University Press.
- Hepp, A., & Hasebrink, U. (2017). Kommunikative Figurationen. Ein konzeptioneller Rahmen zur Erforschung kommunikativer Konstruktionsprozesse in Zeiten tiefgreifender Mediatisierung [Communicative figurations. A conceptual framework for researching communicative construction processes in times of deep mediatization]. *Medien & Kommunikationswissenschaft, 65*(2), 330–347. <https://doi.org/10.5771/1615-634X-2017-2-330>
- Hettwer, H., Rödder, S., & Zotta, F. (2013). Das britische Science Media Centre – und was wir davon lernen können [The British Science Media Centre – and what we can learn from it]. *WPK Quarterly 6*(1), 16–18.
- Heyl, A., Joubert, M., & Guenther, L. (2020). Churnalism and hype in science communication: Comparing university press releases and journalistic articles in South Africa. *Communicatio. South African Journal for Communication Theory and Research, 46*(2), 126–145. <https://doi.org/10.1080/02500167.2020.1789184>
- Hirschi, C. (2018). *Skandalexperten, Experten-skandale – Zur Geschichte eines Gegenwartsproblems* [Potent eunuchs. A history of experts and their scandals]. Berlin, Germany: Matthes & Seitz.
- Horst, M., & Davies, S. (2021). Science communication as culture: A framework for analysis. In M. Bucchi & B. Trench (Eds.), *Routledge handbook of public communication of science and technology* (3rd ed., pp. 182–197). London, UK: Routledge.
- Horst, M., Davies, S., & Irwin, A. (2017). Reframing science communication. In U. Felt, R. Fouché, C. A. Miller, & L. Smith-Doerr (Eds.), *Handbook of science and technology studies* (pp. 881–907). Cambridge, MA: MIT Press.

- Jauho, M. (2016). The social construction of competence: Conceptions of science and expertise among proponents of the low-carbohydrate high-fat diet in Finland. *Public Understanding of Science*, 25(3), 332–345. <https://doi.org/10.1177/0963662514558167>
- Jasanoff, S., & Kim, S.-H. (Eds.). (2015). *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. Chicago, IL: University of Chicago Press.
- Knorr-Cetina, K. D. (1981). *The manufacture of knowledge. An essay on the constructivist and contextual nature of science*. Oxford, UK: Pergamon Press. <https://doi.org/10.1016/C2009-0-09537-3>
- Kohl, P. A., Kim, S. Y., Peng, Y., Akin, H., Koh, E. J., Howell, A., & Dunwoody, S. (2016). The influence of weight-of-evidence strategies on audience perceptions of (un)certainly when media cover contested science. *Public Understanding of Science*, 25(8), 976–991. <https://doi.org/10.1177/0963662515615087>
- Kohring, M. (2005). *Wissenschaftsjournalismus. Forschungsüberblick und Theorieentwurf* [Science journalism: Research overview and theoretical concept]. Konstanz, Germany: UVK.
- Latour, B., Woolgar, S., & Salk, J. (1986). *Laboratory life. The construction of scientific facts* (2nd ed.). Princeton, NJ: Princeton University Press.
- Law, J. (2004). *After method. Mess in social science research*. London, UK: Routledge.
- Leach, M., Scoones, I., & Wynne, B. (2005). *Science and citizens. Globalization and the challenge of engagement*. London, UK: Zed Books.
- Marcinkowski, F., Kohring, M., Fürst, S., & Friedrichsmeier, A. (2014). Organizational influence on scientists' efforts to go public: An empirical investigation. *Science Communication*, 36(1), 56–80. <https://doi.org/10.1177/1075547013494022>
- Meyer, M. (2010). The rise of the knowledge broker. *Science Communication*, 32(1), 118–127. <https://doi.org/10.1177/1075547009359797>
- Milde, J., Vogel, I., & Dern, M. (2021). *Intention und Rezeption von Wissenschaftskommunikation* [Intention and reception of science communication]. Köln, Germany: Herbert von Halem.
- Neuberger, C., Bartsch, A., Reinemann, C., Fröhlich, R., Hanitzsch, T., & Schindler, J. (2019). Der digitale Wandel der Wissensordnung. Theorierahmen für die Analyse von Wahrheit, Wissen und Rationalität in der öffentlichen Kommunikation [The digital transformation of the knowledge order. Theoretical framework for the analysis of truth, knowledge and rationality in public communication]. *Medien & Kommunikationswissenschaft*, 67(2), 167–186. <https://doi.org/10.5771/1615-634X-2019-2-167>
- Newman, N., Fletcher, R., Schulz, A., Andi, S., Robertson, C. T., & Nielsen, R. K. (2021). *Reuters Institute digital news report 2021*. Oxford, UK: Reuters Institute for the Study of Journalism.
- Nisbet, M. C., & Fahy, D. (2015). The need for knowledge-based journalism in politicized science debates. *The ANNALS of the American Academy of Political and Social Science*, 658(1), 223–234. <https://doi.org/10.1177/0002716214559887>
- Nisbet, M. C., & Fahy, D. (2017). Models of knowledge-based journalism. In K. H. Jamieson, D. A. Scheufele, & D. Kahan (Eds.), *The Oxford handbook of the science of science communication* (pp. 273–282). New York, NY: Oxford University Press.
- Nowotny, H., Scott, P., & Gibbons, M. (2001). *Re-thinking science: Knowledge and the public in an age of uncertainty*. Cambridge, UK: Polity Press.
- Paterson, C., & Domingo, D. (2008). *Making online news. The ethnography of new media production*. New York, NY: Peter Lang.
- Paterson, C., & Domingo, D. (2011). *Making online news. Newsroom ethnographies in the second decade of Internet journalism*. New York, NY: Peter Lang.
- Peters, H. P. (2021). Scientists as public experts. Expectations and responsibilities. In M. Bucchi & B. Trench (Eds.), *Routledge handbook of public communication of science and technology* (3rd ed., pp. 114–128). London, UK: Routledge.
- Peters, H. P., Heinrichs, H., Jung, A., Kallfass, M., & Petersen, I. (2008). Medialization of science as a prerequisite of its legitimization and political relevance. In D. Cheng,



- M. Claessens, T. Gascoigne, J. Metcalfe, B. Schiele, & S. Shi (Eds.), *Communicating science in social contexts* (pp. 71–92). Dordrecht, The Netherlands: Springer. [https://doi.org/10.1007/978-1-4020-8598-7\\_5](https://doi.org/10.1007/978-1-4020-8598-7_5)
- Pielke, R. A. (2007). *The honest broker*. Cambridge, UK: Cambridge University Press.
- Quandt, T., & Wahl-Jorgensen, K. (2021). The coronavirus pandemic as a critical moment for digital journalism. *Digital Journalism*, 9(9), 1199–1207. <https://doi.org/10.1080/21670811.2021.1996253>
- Raupp, J. (2017). Strategische Wissenschaftskommunikation [Strategic science communication]. In H. Bonfadelli, B. Fähnrich, C. Lüthje, J. Milde, M. Rhomberg, & M. S. Schäfer (Eds.), *Forschungsfeld Wissenschaftskommunikation* (pp. 143–163). Wiesbaden, Germany: Springer VS. [https://doi.org/10.1007/978-3-658-12898-2\\_8](https://doi.org/10.1007/978-3-658-12898-2_8)
- Rödder, S. (2014). Qualität im Gesundheitsjournalismus – welche Rolle kann ein Science Media Centre spielen? [Quality in health journalism – which role can a Science Media Centre play?] In V. Lilienthal, D. Reineck, & T. Schnedler (Eds.), *Qualität im Gesundheitsjournalismus. Perspektiven aus Wissenschaft und Praxis* (pp. 399–412). Wiesbaden, Germany: Springer VS.
- Rödder, S. (2015). Science Media Centres and public policy. *Science and Public Policy*, 42(3), 387–400. <https://doi.org/10.1093/scipol/scu057>
- Rödder, S. (2020). Organisation matters: Towards an organisational sociology of science communication. *Journal of Communication Management*, 24(3), 169–188. <https://doi.org/10.1108/JCOM-06-2019-0093>
- Rödder, S., Franzen, M., & Weingart, P. (Eds.). (2012). *The sciences' media connection – Public communication and its repercussions*. Dordrecht, The Netherlands: Springer.
- Rosenberg, H., & Feldman, C. S. (Eds.). (2008). *No time to think. The menace of media speed and the 24-hour news cycle*. New York, NY: Continuum.
- Schäfer, M. S. (2008). Medialisierung der Wissenschaft? Empirische Untersuchung eines wissenschaftssoziologischen Konzepts [“Medialization” of science? Empirical assessment of a sociological concept]. *Zeitschrift für Soziologie*, 37(3), 206–225. <https://doi.org/10.1515/zfsoz-2008-0302>
- Schäfer, M. S. (2017). How changing media structures are affecting science news coverage. In K. Hall Jamieson, D. Kahan, & D. A. Scheufele (Eds.), *Oxford handbook on the science of science communication* (pp. 51–59). New York, NY: Oxford University Press.
- Schäfer, M. S., Kristiansen, S., & Bonfadelli, H. (2015). *Wissenschaftskommunikation im Wandel* [Science communication in transition]. Köln, Germany: Herbert von Halem.
- Scheufele, D. A. (2014). Science communication as political communication. *Proceedings of the National Academy of Sciences of the United States of America*, 111(4), 13585–13592. <https://doi.org/10.1073/pnas.1317516111>
- Schneider, M., Ruby, C., Kuhrt, N., Reuning, A., & Hackenbroch, V. (2020, April 6). Offener Brief: Journalisten müssen recherchieren können. WPK fordert besseren Zugang zu Informationen [Open letter: Journalists must be able to investigate. WPK demands better access to information]. WPK. Retrieved from <https://www.wpk.org/aktuelles/details/offener-brief-journalisten-muessen-recherchieren-koennen-wpk-fordert-besseren-zugang-zu-informationen.html>
- Schudson, M. (1989). The sociology of news production. *Media, Culture & Society*, 11(3), 263–282. <https://doi.org/10.1177/016344389011003002>
- Simmel, G. (1950). The triad. In K. H. Wolff (Trans., Ed.), *The sociology of Georg Simmel* (pp. 145–169). New York, NY: Free Press.
- Stovel, K., & Shaw, L. (2012). Brokerage. *Annual Review of Sociology*, 38, 139–158. <https://doi.org/10.1146/annurev-soc-081309-150054>
- Summ, A., & Volpers, A.-M. (2016). What's science? Where's science? Science journalism in German print media. *Public Understanding of Science*, 25(7), 775–790. <https://doi.org/10.1177/0963662515583419>
- Sumner, P., Vivian-Griffiths, S., Boivin, J., Williams, A., Bott, L., Adams, R., ... Chambers, C. D. (2016). Exaggerations and

- caveats in press releases and health-related science news. *PLOS ONE*, 11(12), 1–15. <https://doi.org/10.1371/journal.pone.0168217>
- Sverrisson, Á. (2001). Translation networks, knowledge brokers and novelty construction: Pragmatic environmentalism in Sweden. *Acta Sociologica*, 44(4), 313–327. <https://doi.org/10.1177/000169930104400403>
- Tanaka, M. (2015). Agenda building intervention of socio-scientific issues: A science media centre of Japan perspective. In Y. Fujigaki (Ed.), *Lessons from Fukushima* (pp. 27–55). Cham, Switzerland: Springer. [https://doi.org/10.1007/978-3-319-15353-7\\_3](https://doi.org/10.1007/978-3-319-15353-7_3)
- Taylor, C. (2004). *Modern social imaginaries*. Durham, NC: Duke University Press. <https://doi.org/10.1215/9780822385806>
- Trench, B. (2007). How the Internet changed science journalism. In M. W. Bauer & M. Bucchi (Eds.), *Journalism, science and society* (pp. 133–142). New York, NY: Routledge.
- Tuchmann, G. (1978). *Making news: A study in the construction of reality*. New York, NY: The Free Press.
- Väliveronnen, E. (2021). Mediatisation of science and the rise of promotional culture. In M. Bucchi & B. Trench (Eds.), *Routledge handbook of public communication of science and technology* (3rd ed., pp. 129–142). London, UK: Routledge.
- Väliveronnen, E., Laaksonen, S.-M., Jauho, M., & Jallinoja, P. (2020). Liberalists and data-solutionists: Redefining expertise in Twitter debates on coronavirus in Finland. *Journal of Science Communication*, 19(5), 1–21. <https://doi.org/10.22323/2.19050210>
- Van Aelst, P., Toth, F., Castro, L., Štětka, V., Vreese, C. de, Aalberg, T., ... Theocharis, Y. (2021). Does a crisis change news habits? A comparative study of the effects of COVID-19 on news media use in 17 European countries. *Digital Journalism*, 9(9), 1208–1238. <https://doi.org/10.1080/21670811.2021.1943481>
- van Dijck, J., & Alinejad, D. (2020). Social media and trust in scientific expertise: Debating the Covid-19 pandemic in the Netherlands. *Social Media + Society*, 6(4), 1–11. <https://doi.org/10.1177/2056305120981057>
- Vogler, D., & Schäfer, M. S. (2020). Growing influence of university PR on science news coverage? A longitudinal automated content analysis of university media releases and newspaper coverage in Switzerland, 2003–2017. *International Journal of Communication*, 14, 3143–3164. Retrieved from <https://ijoc.org/index.php/ijoc/article/view/13498/3113>
- Weingart, P. (2017). Is there a hype problem in science? If so, how is it addressed? In K. Jamieson, D. Kahan, & D. A. Scheufele (Eds.), *The Oxford handbook of the science of science communication* (pp. 111–118). Oxford, UK: Oxford University Press.
- Williams, A., & Gajevic, S. (2013). Selling science? Source struggles, public relations and UK press coverage of animal human hybrid embryos. *Journalism Studies*, 14(4), 507–522. <https://doi.org/10.1080/1461670x.2012.718576>