Living Handbook of
Science Communication and
Science Studies

Science Journalism

Holger Wormer

Chair of Science Journalism, TU Dortmund University
holger.wormer@tu-dortmund.de

ABSTRACT **There is a lot of confusion among both scientists and journalists about what exactly is meant by science journalism. This applies in particular to different normative assignments, according to which science journalism is often not seen as a critical observer ("fourth estate") but as a mere explanatory format or even as a campaigner for research. This article gives a short overview of the historical development of the field, discusses possible synergies with and differentiations from other forms of science communication as well as triggers and specific topics for science reporting.**

10.17877/DE290R-26036

Article number: 2/2025

Definitions: Journalism with a scientific flavor?

The meaning of compound terms leaves considerable room for interpretation. For example, a "Schweineschnitzel" in German clearly indicates the meat of which the schnitzel is made (Schwein = pork). However, the expression "Jägerschnitzel" (Jäger = hunter), which is also a commonly used compound term, should not be interpreted as an indication of possible cannibalism: It merely indicates the method of preparation (usually a mushroom sauce is served with this kind of schnitzel).

The compound term "science journalism" often raises similar questions: Is it journalism that essentially consists of science and functions mainly according to scientific rules? Or is it merely a special type of journalism that essentially follows the rules of journalism but only deals with the "flavors" of science?

A definition of the term seems even more necessary as it is becoming increasingly difficult in the digital world to distinguish between journalism and other forms of communication. In the social media timeline, advertising and science, journalism or propaganda initially look very similar. Media brands that were once considered reliable are hardly recognizable as such. But throughout its history science journalism "has had to maintain boundaries with other journalists, with other types of communicators and with scientists" (Mellor 2024, 1). Yet it should be noted that science

journalism is a fairly recent phenomenon: Its roots as a separate journalistic area of specialization in the US and UK are often ascribed to the 1920s (Mellor 2024, 2). In Germany, specialized science sections were still referred to as a "delayed news section" at the end of the 1980s (Hömberg 1989) although they first appeared in leading newspapers such as the *Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung* at the end of the 1950s and 1960s. The term "delayed" refers to the fact that, to a significant extent, science journalism only emerged in the second half of the twentieth century—long after traditional newspaper sections such as politics/news, feuilleton, business and local affairs or sport had been established. This late establishment also explains why "classical" science journalism mainly focuses on topics dealing with medicine, natural sciences and technology (Summ and Volpers 2016): Unlike topics relating to social sciences and humanities, which had, for example, been located in the culture section (see ❊ Scientific Disciplines), for a long time, the natural sciences had no fixed place, especially in the news media. Even though some science editorial offices have slightly broadened their focus and opened up in particular to certain social science topics, the focus on the (natural) sciences and medicine remains.

However, using a "broader" definition, quite a lot of science journalism can be found outside the science pages, too (e.g., Summ and Volpers 2016, 783–784). This is especially true for the (growing) proportion of science journalism where the news that triggers reporting is not a recent publication in a scientific journal or a lecture at a scientific conference but rather an event outside the science system: This could be scientific experts' assessment of a political decision in parliament on euthanasia or phasing out nuclear energy. It could also be a background interview with a psychologist on the shooting at a US school or the question of how to reliably estimate the number of participants at a demonstration. Seasonal occurrences, such as the heatwave that requires explanation, events in art, culture, business or sport also have potential for the kind of science journalism in which scientific expertise is required to evaluate and explain a specific topic. (How realistic is the depiction of the Manhattan Project in the successful Hollywood movie Oppenheimer? Could research explain the success of Taylor Swift? And how long does it take for a top national soccer player to be fit for action again after rupturing his Achilles tendon?). In this respect, many journalists from other sections of the news may even do science journalism without actually being aware of it.

Diverse expectations: Translator, campaigner, critical observer

Beyond the questions of "what?" and "when?" defining the topics and occasions for science reporting, there remains the much more complex question of "how?". A look at the history of journalism in both the United States and Europe shows that science reporting was initially based primarily on the rules of science. In the more favorable cases, science journalists were regarded as translators

DOI: 10.17877/DE290R-26036

or transmission belts of science to society, who however, had to align themselves as far as possible with the relevance and rationality criteria of science itself (e.g., Kohring 2005, 118). In extreme cases, science journalism was also seen as a means of gaining acceptance for scientific research, and its successes were to be celebrated publicly. Consequently, several authors speak of "Gee-Whiz" science journalism (e.g., Rensberger 2009, 1056). A kind of "eureka reporting" that celebrates even minor scientific advances was also intended to emphasize the importance of research and technology in the race with the Soviet Union. In the Western world this was triggered by the Sputnik shock of 1957, to some extent following the example of presenting the Manhattan Project to develop the atomic bomb as an undoubted success of science about 15 years earlier. An assignment of tasks or "purpose programming" ("Zweckprogrammierung"; Kohring 2005, 211) as a normative setting can, moreover, be found until the late 20th century in German-language science communication research on science journalism, which Kohring also criticizes as a "paradigm of science popularization" (Kohring 2005, 63–140, translated by the author).

In editorial practice, however, the emancipation of science journalism from science started with the environmental movement and environmental journalism, in the US for example with Rachel Carson's book *Silent Spring* in 1962. In Germany too, criticism of the possible side effects of research and technology on the environment increasingly played a role in science reporting, as the renaming of the first dedicated science page of the German broadsheet *Süddeutsche Zeitung* in 1968 may illustrate: Some years later it was entitled "Environment—Science—Technology" (today simply "Knowledge" ["Wissen"]). In the last third of the 20th century, science journalists increasingly changed from "cheerleaders into watchdogs" (Rensberger 2009, 1055). Their mission thus became more like that of their colleagues in other sections of the newsroom.

Science journalism made by scientific institutions?

On current understanding, science journalism is first and foremost journalism as a cultural practice: It is regarded as part of the fourth estate providing "[c]ritical evaluation and monitoring [of the] three state powers … as well as all other powerful players in society" (Meier 2019, 2), "[t]elling about events, supplying novelty, and discerning factual truth from the process" (Barnhurst and Owens 2012, 1). However, even today, science journalism is still often ascribed a special explanatory (or translating) function for complex (scientific) issues. In extreme cases this has resulted in a separate genre that is sometimes referred to as "knowledge journalism" ("Wissensjournalismus") due to its educational function.

At least with regard to this area of science journalism in particular it is again worth discussing whether certain functions of science journalism (such as a mere explanatory and educational function) could not be performed by other actors, too, especially in the dig-

DOI: 10.17877/DE290R-26036

ital media age: for example, by blogging scientists or even laypersons, state museums or the communication departments of research institutions. It is no coincidence that some scholars have observed a convergence between science journalism and science PR (see ❊ Science PR). More recent definitions of science communication no longer describe science journalism explicitly as separate from science communication as a whole, but only as a sub-area of it (acatech et al. 2017, 21; Wormer 2023, 239).

From a functional perspective, however, there is much to be said for not equating science journalism in general too strongly with other forms of (especially institutional) science communication, as mentioned above, an analogy already criticized by Kohring (2005, 113–119) 30 years ago. This kind of de-differentiation seems particularly paradoxical as in other fields of society, such as politics or business, one would hardly think of equating journalism (committed to critical observation and as independent as possible) with public relations or even marketing, which always serve particular interests or even persuasive communication. In this respect, science journalism as an external observer of science should always be distinguished from the self-observation of the science system.

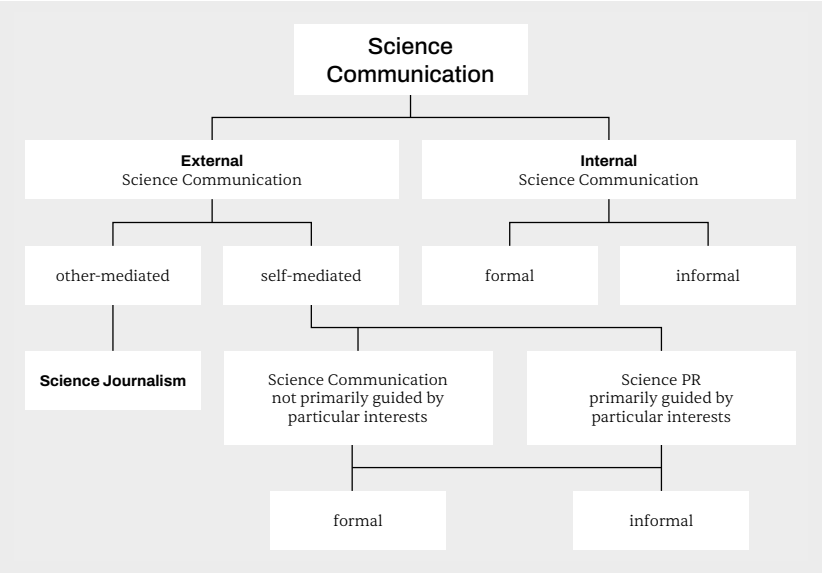

Figure 1: *How well can a system criticise itself? Although there are overlaps with other areas of science communication (for example, regarding an educational function), science journalism ideally takes on a special role: as a largely independent external observer of scientists and their institutions, which functions as a watchdog and puts research into a societal context (figure based on acatech et al. 2017, 21).*

While intermediaries such as the communication department of a university may be able to take on at least some aspects of "knowledge journalism" as described above, it is a much more controversial question to what extent such an institution can also engage in critical self-observation. To do this, a communication department would not only have to primarily report on the success of its own institution, but in accordance with journalistic and scientific rules, also make its negative results, failures and unpleasant developments transparent. Furthermore, it would have to communicate contradictory results achieved by researchers at other institutions as well as the success of competing researchers from elsewhere. If a communication department did actually do that, it could be seen as a critical self-observer of parts of the academic system,

DOI: 10.17877/DE290R-26036

which—theoretically—would be doing the job of an external observer from journalism. At least in principle, this could be justified by the argument that, unlike other PR departments (such as those of an industrial company), the respective department at a research institution may also be obliged to follow the rules of good scientific practice (for an overview: wissenschaftliche-integritaet.de; see ❇ Good Scientific Practice), which explicitly demand transparency as well as critical self-questioning and scrutiny of new research results in the light of the existing literature.

However, from personal conversations with many communicators working in science outreach, the following inferences can be drawn: Although some could imagine directing press departments in a journalistic way, and while the increasing influence of science PR on reporting is generally recognized, current competitive structures in the research landscape as well as the expectations of most university managements hardly allow more transparent and balanced (not to say: more honest) institutional science communication. Against this backdrop, it is to be expected that most (academic) public relations departments will remain committed first of all to reputation communication and—in the best case—educational communication, while critical observation of science and its institutions in the sense of watchdogs will continue to be the privilege of science journalism.

Reporting more processes, not only results

Science journalism itself, however, has also been criticized repeatedly for deviating from the ideal image of a critical observer of science—and thus too often conforming to the "paradigm of science popularization" criticized by Kohring. Indeed, empirical studies point to a tendency towards affirmative science reporting (e.g., Summ and Volpers 2016, 786); there is often a lack of second opinions, and the limitations and uncertainties of study results are rarely discussed, especially in editorial offices outside of the science sections.

Another point of criticism (also expressed by science journalists themselves) is that most science reporting does not explain enough about how scientific results are produced and what good scientific practice means. The *Global Science Journalism Report* (Massarani et al. 2021, 8) puts it like this: "Science journalists agree that too few people are reporting on the process of science – there is too much focus on the results of scientific research." Although there is undoubtedly some truth in this, it would be challenging to depict lengthy and laborious research processes in an attractive way for a wider audience: Unlike a soccer match, in which the course of the game rather than the outcome is the real excitement, in research many users will find the final result more interesting than the often boring way of getting there.

Such in-depth science reporting is made even more difficult as science journalism—after (at least in Germany) a peak phase around the turn of the millennium—is increasingly subject to the media houses' general cost-cutting constraints (Latos et al. 2024, 2441–2442). In the US, the closure of the CNN science and environment

DOI: 10.17877/DE290R-26036

desk in 2008 is seen as a key moment in such developments (Mellor 2024, 4). In Germany, public broadcasting, with formats such as *Quarks & Co* or *Abenteuer Forschung* (overview in: Wormer and Karberg 2019, 115), which have been a guarantor of above-average science reporting for many years (Lehmkuhl 2013), has come under pressure in recent years. And in the digital world the directly measured comparison with the number of clicks on other, even more popular topics is not exactly conducive to in-depth explanations or even the description of scientific methods.

Conclusion: Learning from each other

Even accepting the limitation that most science journalism formats will not be able to trace the previous research process for every item of science news, journalists must be familiar with the way science tries to produce reliable results because only those who are reasonably familiar with the quality assurance processes as well as the nature of science with its uncertainties and its shady sides can investigate properly. Moreover, scientific rigor and scientific methods could also provide a general model for journalistic investigations outside of science journalism, as Walter Lippmann, one of the most renowned political(!) journalists of the 20th century, demanded: "In fact, just because news is complex and slippery, good reporting requires the exercise of the highest of the scientific virtues" (Lippmann 1920, 82). But again, this does not mean that it is sufficient for science journalism to limit itself to the purely scientific content of news from the labs. The journalistic added value is always about contextualization in political, social and economic backgrounds, influences and dependencies. This is becoming even more relevant as AI language models are already able to produce news or even dialogues generated from individual scientific papers with quite surprising results. These developments will obviously also have an influence on future science journalism formats (see ❇ Formats of Science Communication), which—unsurprisingly—are expected to "involve more multimedia content" and "data-driven storytelling," at least according to a conversation about the future of science journalism with ChatGPT (Mellor 2024, 194).

Returning to the initial question of this article, the compound expression "science journalism" is ultimately not comparable to the compound expression "pork schnitzel." Rather, science journalism ideally consists of and follows the rules of journalism, not those of science. However, especially in a post-truth era both are considered "truth professions" (Mellor 2024, 7), and there is no doubt that journalism can learn a lot from scientific virtues and scientific quality assurance processes in its investigations. And not to forget, vice versa: Science could also learn from good journalism, communicating not only "naked" research results but also providing more societal context.

DOI: 10.17877/DE290R-26036

References

ACATECH – NATIONAL ACADEMY OF SCIENCE AND ENGINEERING, GERMAN NATIONAL ACADEMY OF SCIENCES LEOPOLDINA, AND UNION OF THE GERMAN ACADEMIES OF SCIENCES AND HUMANITIES (EDS.). 2017. *Social Media and Digital Science Communication: Analysis and Recommendations for Dealing with Risks and Opportunities in a Democracy*, August 2017. Munich. URL: https://www.acatech.de/wp-content/uploads/2018/03/WOM2_EN_web_final.pdf (date accessed: March 1, 2025).

BARNHURST, KEVIN G., AND JAMES OWENS. 2012. "Journalism." In *The International Encyclopedia of Communication*, edited by Wolfgang Donsbach. Wiley. URL: https://doi.org/10.1002/9781405186407.wbiecj002.pub2 (date accessed: October 1, 2025).

HÖMBERG, WALTER. 1989. *Das verspätete Ressort: Die Situation des Wissenschaftsjournalismus*. Konstanz: Universitätsverlag Konstanz.

KOHRING, MATTHIAS. 2005. *Wissenschaftsjournalismus: Forschungsüberblick und Theorieentwurf*. Konstanz: UVK Verlagsgesellschaft.

LATOS, MARIA, FRANK LOBIGS, AND HOLGER WORMER. 2024. "Peer-based research funding as a model for journalism funding." *Journalism* 25 (11), 2440–2459. doi: 10.1177/14648849231215662.

LEHMKUHL, MARKUS. 2013. "Wissenschaftsformate des deutschen Fernsehens im internationalen Vergleich: Zum Einfluss der Segmentierung des Marktes auf das Angebot." *Publizistik* 58 (4), 409–426. doi: 10.1007/s11616-013-0187-8.

LIPPMANN, WALTER. 1920. *Liberty and the News*. New York: Harcourt, Brace and Howe.

MASSARANI, LUISA ET AL. 2021. *Global Science Journalism Report 2021: Working conditions and practices, professional ethos and future expectations*, October 2021. URL: https://www.scidev.net/wp-content/uploads/Global-Science-Journalism-Report-2021.pdf (date accessed: March 1, 2025).

MEIER, KLAUS. 2019. "Quality in Journalism." In *The International Encyclopedia of Journalism Studies*, edited by Tim P. Vos and Folker Hanusch. Wiley. URL: https://doi.org/10.1002/9781118841570.iejs0041 (date accessed: October 1, 2025).

MELLOR, FELICITY (ED.). 2024. *Insights on Science Journalism*. London, New York: Routledge. doi: 10.4324/9781003326724.

RENSBERGER, BOYCE. 2009. "Science journalism: Too close for comfort." *Nature* 459 (7250), 1055–1056. doi: 10.1038/4591055a.

SUMM, ANNIKA, AND ANNA-MARIA VOLPERS. 2016. "What's science? Where's science? Science journalism in German print media." *Public Understanding of Science* 25 (7), 775–790. doi: 10.1177/0963662515583419.

WORMER, HOLGER. 2023. "Öffentliche Forschung: Von der Wissenschaftskommunikation zur evidenzbasierten Information." In *Wissenschaftsforschung*, edited by David Kaldewey. Berlin, Boston: De Gruyter Oldenbourg, 237–256. doi: 10.1515/9783110713800-012.

WORMER, HOLGER, AND SASCHA KARBERG. 2019. *Wissen: Basiswissen für die Medienpraxis*. Köln: Herbert von Halem Verlag. doi: 10.1453/2019_9783869620244.

Further Reading

Further reading is a section where each author makes recommendations for interesting publications that widen the scope of the respective topic or are particularly valuable for deeper research.

MELLOR, FELICITY (ED.). 2024. *Insights on Science Journalism*. London, New York: Routledge. doi: 10.4324/9781003326724.

DUNWOODY, SHARON. 2020. "Science Journalism." In *Science Communication*, edited by Annette Leßmöllmann, Marcelo Dascal, and Thomas Gloning. Berlin, Boston: De Gruyter Mouton, 417–438. doi: 10.1515/9783110255522-020.

WORMER, HOLGER, AND SASCHA KARBERG. 2019. *Wissen: Basiswissen für die Medienpraxis*. Köln: Herbert von Halem Verlag. doi: 10.1453/2019_9783869620244.

How to cite:

Wormer, Holger. 2025. “Science Journalism.” In *The Living Handbook of Science Communication and Science Studies*, 2/2025. DOI: 10.17877/DE290R-26036.