

“Why does the world need science?” Science communication in the climate change discourse, between diagnosis and prognosis

This main article deals with a special text offer in external science communication, namely short statements by scientists on science-related, politically relevant issues. Upon request of the science journalism editorial office of the Science Media Center Germany (SMC, Cologne), scientists evaluate, e. g., current environmental developments and the related state of research in order to support journalistic research and science references in media. Using the example of climate change discourse, this article focuses on the temporal perspectivation in these statements and investigates the relationship between scientific diagnosis and prognosis against the background of a self-conception of science that is evident in SMC texts.

Context and text type

An essential component of the SMC offer consists of obtaining statements by other scientists 1) on current issues and 2) on new original scientific studies. These are then made freely available on the internet as 1) “rapid reactions” or as 2) “research in context” in the original wording. Since summer 2020, there has been another type of service 3), the so-called “science response”, the introduction of which can already be considered an expression of discourse dynamics in the exchange between science and the public (or media as the central mediating instance). These texts are not a *reaction to a fact*, but ultimately are intended to include *prognoses* on topics that *could* soon be on the political agenda. These, in turn, are not unproblematic for scientific and experimental disciplines, which in their self-image rely very much on evidence – that is, on ‘what is’. Against the background of these short texts by scientists, which are intended for journalistic use, this article sheds light on the temporal dynamics in the climate change discourse.

Subject of analysis and research questions in the article

The following SMC texts were analysed from a trans- and intertextual perspective:

- (1) On the one hand, the scientific self-image is examined more closely so that discourse contributions related specifically to questions of climate change and global warming can then be analysed against this background. The object of analysis here is a conspicuous collection of statements (text collection “rapid reactions”): the SMC editorial team had asked scientists at the March for Science 2017 how they would answer the question “Why does the world need science?” The answers, published on 07 April 2017, include 69 different statements, most of which are single sentence (fewer than ten authors use more than one sentence).¹
- (2) On the other hand, two “science responses” with different content but parallel questions are analysed in order to test whether and to what extent the responses here attempt to answer the ultimately prognostic questions using longer statements that are more typical for the SMC

¹ <https://www.sciencemediacenter.de/alle-angebote/rapid-reaction/details/news/warum-braucht-die-welt-wissenschaft-zum-march-for-science-germany-am-22042017/> (last access: 14.4.2022).

offer. For this purpose, two parallel text offers from the years 2020 and 2021 are selected that refer to the Arctic (2020)² and the Antarctic (2021)³ respectively.

The concrete research question of the article thus has two parts, because both the transtextual ((1) \diamond (2)) and the intratextual ((2)) level are taken into account: To what extent can transtextual shifts be detected in the contouring of the SMC textual offer with regard to the expectations of scientific statements for the public in the field of tension between diagnosis and prognosis? To what extent do these correspond intratextually with the scientific self-image?

In terms of methodology, the variety of temporal references in different combinations of negation and modality is analysed. This makes it possible to distinguish different concepts of non-knowledge on the epistemic level and different dimensions of reference on the non-epistemic level. Thus, in the case of the scientific statements examined, it is not only necessary to distinguish who knows or believes to know something and how certain they are, but also what the temporal perspectivisation refers to in each case – to the natural phenomena and processes such as the climate or the melting of the ice, to their investigation by science or to the way the phenomena or the scientific findings are dealt with in the media, politics and society.

Findings

Overall, the statements from 2017 on the benefits of science, unsurprisingly show a consensus with regard to scientific self-image: a large number of statements are worded in such a way that they directly interrelate scientific knowledge and its social benefits. Other statements have a stronger normative reference to the necessary framework conditions for science, such as democracy and freedom of research. Temporally, they are not characterised by future tenses, but mostly by a gnomic present. In turn, by coupling it with expressions that describe the scientific (procedural) process of knowledge (e. g. *entdecken/to discover*, *entwickeln/to develop*, *verbessern/to improve* etc.), this gnomic aspect is often ascribed a future-oriented character.

Against the background of this self-image, namely that science is so relevant for the future of society because constant progress and growth in knowledge is taken for granted, the selected “science responses” from 2020 and 2021 on the significance of the melting of the ice in the Arctic and the Antarctic in the context of climate change were examined for their prognostic character. The analysis focused on whether, in questions about prognoses,

- future perspectives are also generalised, here (primarily/only) as a fundamental momentum of science and research;
- tense markers are used in a more differentiated and possibly also more modalised way when referring to such topics, because more concrete knowledge is being sought;
- temporality plays a different role in each case, depending on whether statements are made about research or about the respective part of the world.

² <https://www.sciencemediacenter.de/alle-angebote/science-response/details/news/situation-des-groen-landeises-und-seine-rolle-in-klimaprozess/> (last access: 14.4.2022).

³ <https://www.sciencemediacenter.de/alle-angebote/science-response/details/news/die-antarktis-im-klimawandel/> (last access: 14.4.2022).

Interestingly, explicit temporal markers in the answers are found much more frequently in relation to the environmental developments that are being enquired about and less in relation to possible scientific progress. However, more modal markers can be found in relation to the latter.

- Thus, **references to the past** can be found with regard to previously observable developments, their causes and their dynamics.
- This temporal perspective can be directly linked to the **present perspective** with regard to previously observable effects and a continuing development.
- And finally, the development dynamics with regard to the consequences of climate change and the melting of the ice are substantiated by **future perspectives**.
- The responses to the role of Antarctica are notable because temporal expressions are explicitly used here to represent a **temporal order** of environmental events, namely the natural seasonal fluctuation of the melting of sea ice.

The temporal expressions are accompanied throughout the texts, and in high density, by verbs and verb nominalisations that refer to a process that is already underway and progressing. This alludes both to the dynamics and complexity of the process as well as to the worrying nature of the situation.

As far as prognoses on research are concerned, it is noticeable that a safeguard against triggering too high expectations (afforded in particular by modal expressions) is implemented predominantly in the demand for a better understanding of the contexts through a more contextualising science communication. In other words, a better understanding is formulated as a goal, but not only an understanding of the complex interrelationships by science itself, but also an understanding of the research results and the procedures of scientific knowledge development by the media and the public.

Conclusion

According to Aristotle’s Rhetoric, a scientific speech, as a genuinely argumentative text genre, is of the type judicial speech (*genus iudicale*) – it thus has a fundamental reference to the past, because it deals with ‘what is’ (and how this came to be). By analysing what is, however, an understanding of the how and the why should also emerge – only this understanding enables a view into a future that is, in principle, uncertain.

The analysis has shown that the SMC editorial team’s *meta-discursive* offer to science, which has emerged through discourse dynamics, to participate with greater autonomy in the shaping of public science communication, is actually taken up by the respondents and used constructively in accordance with their own self-image. In this context, understanding current developments on the basis of (constantly expanding) data about the past becomes a prerequisite for any predictions about the future. It is precisely this understanding that makes the uncertainty of the future comprehensible and bearable.