

Title: Can Argumentation Help Understand How Scientific Information Reaches the Public?

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STRUCTURED ABSTRACT

Aim of your contribution

Our work aims to make the arguments underlying a scientific controversy more clear and more understandable.

Value of your contribution

The audience will learn about argumentation theory and how it can help analyze scientific controversies. Ultimately our line of research will enable a better understanding of the public dissemination and discussion of scientific and technical information.

Research outline

Research context

In a multi-year project, we are studying the information needs and behaviors of knowledge brokers (e.g., social media influencers, activists, advocates, journalists, librarians, Wikipedia editors, etc.) who help citizens make sense of scientific and technical information. We are conducting interviews with knowledge brokers and analyzing documents from public controversies related to COVID-19. Ultimately our project will co-develop public libraries services for knowledge brokers.

Problem/overall research aims/research question

A long-term goal of our research is to use argumentation theory to help improve science communication, and particularly to help reduce information disorders such as misinformation, disinformation, and malinformation (Wardle, 2018). Argumentation studies how the premises of arguments support the conclusions. Argumentation research often concerns attacks on arguments, argument structures, and the validity and strength of arguments (van Eemeren et al., 2014). Argumentation theories have also been applied to visualize and understand the rationale behind disagreements. For instance, Lewiński & Aakhus (2022) analyzed arguments related to the fracking controversy; their work visualized the players in an argument who hold different positions. Our work aims to make the arguments underlying a scientific controversy more clear and more understandable.

Design/methodology/research approach

We conduct a case study about one public controversy: whether masks can interrupt or reduce the spread of COVID-19. Our case study is centered around a controversial

literature review “Physical interventions to interrupt or reduce the spread of respiratory viruses” (Jefferson et al., 2023), which was published in January 2023 by the top medical review producer Cochrane. The authors concluded “There is uncertainty about the effects of face masks”, which led to public discussion. The review was heavily discussed and as of March 30, 2023 it was in the top 5% of all research outputs scored by Altmetric.com, with an attention score of 21,808, from mentions in social media, traditional media, blogs, and online reference managers. The conversation includes questions about whether advice to wear face masks during the COVID-19 pandemic was scientifically supported as well as critiques of the review. Cochrane announced they would rewrite the plain language summary and abstract to avoid misinterpretation (Soares-Weiser, 2023).

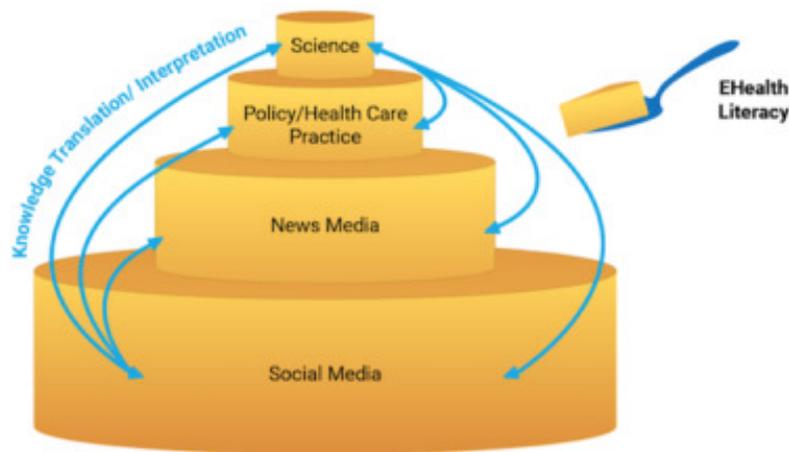


Figure 1 The Information "Cake" Model (Eysenbach, 2020)

We draw on Eysenbach (2020)'s framework for knowledge translation and information management in a crisis. As shown in Figure 1, the model considers four layers: science, policy/health care practice, news media, and social media, and we are choosing materials from each layer. For science, we selected the Cochrane review. For policy/health care practice, we will refer to the guidance on wearing masks during the pandemic provided by the public health agencies in order to compare the recommendations given by agencies with different social, cultural, economic backgrounds. For news media and social media, we are collecting materials from Altmetric.com.

We are mapping this controversy using an argumentation theory called polylogue analysis (Lewiński and Aakhus, 2022). Polylogue analysis analyzes complex controversies by viewing them as discussions among different players defending distinct positions in multiple places. We will diagram the players, positions, and places found in the materials centered on Jefferson et al. (2023). Through this case study, we aim to visualize arguments underlying the disagreement as a step towards our long-term research goal.

Findings or expected findings

The polylogue diagrams resulting from our case study could be used in the future to determine whether argumentation theory can help improve the quality of communication about controversies in science. We are investigating how polylogue diagrams can make a complicated controversy topic clearer by distinguishing its players, positions, and places, showing the landscape of a controversy.

Research limitations/implications

In the future, the landscape of a controversy could be used to determine the alignment of players and positions (for instance to highlight conflicts of interest); to help stimulate people's critical thinking and analytic skills; and to elucidate the subtle positions in controversies. Controversies in science are complex and often involve players with different educational backgrounds and different levels of expertise. A single case study, such as our analysis of the COVID-19 mask controversy, will be only a starting point. Further case studies will be needed to justify the strengths and limitations of our argumentation-based approach.

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