



Editorial: Theoretical and Practical Issues in the Epistemology of Science Journalism

Carrie Figdor*

Department of Philosophy, Psychological, and Brain Sciences, The University of Iowa, Iowa City, IA, United States

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Editorial on the Research Topic

Theoretical and Practical Issues in the Epistemology of Science Journalism

This Research Topic looks at science journalism's mediating role between the production of scientific knowledge and its public uptake. Its four papers consider science communication and journalism from the perspective of philosophy of science and epistemology. Framing the Research Topic is a conceptual analysis of the multiple aims of science communication and an assessment of empirical evidence to date regarding whether these aims are being met. The other papers consider the practices of science journalism, the public reception of science information, and how the process of science is presented in three major mass media outlets. In their analysis of the science communication literature, Kappel and Holman distinguish two overarching paradigms of science communication and eight aims that fall under these paradigms. The Dissemination paradigm sees science communication as transmitting science information to the lay public, through formal education or the media. The Public Participation paradigm sees it as facilitating communication between the public, policymakers, and scientists. These paradigms differ in their emphases regarding the eight main explicit or implicit aims in science communication. These include improving public beliefs about science, generating public trust in science, collecting citizens' input into worthwhile research aims and applications of science, and enhancing democratic legitimacy of science.

Kappel and Holmen also review the science communication literature to assess empirical evidence on whether these aims are being met. While they note evidence of success and reason for optimism with respect to aims that involve lay participation in the pursuit of science, in general the data are inconclusive or scarce. Their conceptual clarity is likely to promote effective future data-gathering efforts.

Elliott harnesses the philosophical literature on values in science to propose a role for science journalists within the Open Science movement. Noting that lack of consensus in science can be due to reasonable differences in value judgments, Elliott suggests that science journalists adopt the Value Judgment Principle (VJP) as a regulatory ideal, whereby they aim to identify and explain major value judgments in areas of science where there is no strong consensus. Elliott illustrates the VJP by contrasting two articles on the possible dangers of radiofrequency radiation from electronic devices, such as cell phones. While one declares there is no danger, the other follows the VJP by noting mixed results and clarifying how different values might lead to different decisions.

Furman considers how values may enter into public reception of scientific information in laypersons' judgments about what to do. Furman argues that it can be reasonable for members of the public to believe rumors over official pronouncements because rumor can encode information about social values that are important factors in judgments. The value judgments made within

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Tarla Rai Peterson,
The University of Texas at El Paso,
United States

*Correspondence:

Carrie Figdor
carrie-figdor@uiowa.edu

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science are often opaque to the public, and may be counter to their own. She illustrates her position with an analysis of public responses to Ebola epidemics in 2013–2016 in Guinea, Liberia, and Sierra Leone, where there was substantial science communication about the disease. Rumors about medical teams stealing the bodies of Ebola victims to sell their organs reflected a strong social concern with proper burial practices. Burying deceased victims' bodies in secret reflected judgments that weighed scientific information about post-mortem infectiousness against such concerns.

Slater et al. probe the question of how science media provide insight into the scientific enterprise as an ongoing, social process. They performed a content analysis of 163 randomly selected science articles in *The New York Times*, *The Washington Post*, and *USA Today*. They found that articles often reported only scientific outcomes and provided little information about the scientific process. In those articles that did include information on scientific process, a strong majority (81%) framed the process negatively (e.g., emphasizing conflict) while only half framed it positively (e.g., emphasizing self-correction). This suggests room for science journalists to help shift public expectations regarding the ongoing social enterprise of science.

As a group, these articles point to important questions for future science communication research and its translation into the practices of science journalism given the aims of more accurate public beliefs, more public trust in science institutions, and so on. What empirical measures can be developed to obtain data about levels of public trust in science? How might science journalists modify their practices to promote a realistic

understanding of science as inherently self-correcting and value-involving? Coverage of the COVID-19 pandemic has been a real-life experiment relevant to these and other questions due to the well-publicized tentativeness of pandemic-related science data. Analysis of this coverage may show that science communicators are already adjusting to heightened public awareness of the scientific process and its uncertainties in ways recommended by the authors in this Research Topic.

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