

Key Findings: The (Very Limited) Evidence Base for Basic-Science-Specific Science Communication in Key Communication Journals

John C. Besley, Karen Peterman, Allison Black-Maier, Jane Robertson Evia

We used a combination of keyword- and human-coding-based strategies to identify and characterize the degree to which four key science communication journals have included research articles focused on the communication of basic science (N = 2,386). These journals included *Public Understanding of Science*, *Science Communication*, the *Journal of Science Communication*, and the *International Journal of Science Education, Part B: Communication and Public Engagement*. Our intention is to give those interested in basic-science-related communication the ability to speak to the degree to which an evidence-based ‘basic science communication research literature’ exists within core science communication journals.

Our tentative conclusion is that less than 5% of the available research provides substantive quantitative or qualitative evidence that specifically speaks to communication in the context of basic science. An additional qualitative review of the basic science-focused articles that included quantitative or qualitative data further suggests that there is little evidence of a shared focus within the available work. Further, the focus of the available articles was typically on a narrow range of potential communication outcomes such as others’ science knowledge, risk/benefit beliefs, and emotions. There was also only limited connection made between these types of outcomes and potential longer-term goals such as increasing support or acceptance for funding/policy or building long-term, positive relationships between scientific communities and others. We also saw no attention to ‘basic science’ as a key organizing concept in the research.

Two additional case studies—reported separately—explore astronomy- and neuroscience-focused communication research in more depth. The case studies’ conclusions are consistent with the overall findings reported in this summary but also highlight how researchers in specific areas may focus additional attention on issues of special relevance to their topic. For example, neuroscience-focused research appears to put substantial attention on the potential misuse of imagery as a tool of persuasion, whereas the ability of astronomy communication to evoke positive emotions about science and serve as a tool for increasing youth attention to scientific careers seemed especially important to astronomy-focused communication researchers.

The conclusion we draw is that there is a substantial opportunity for research and discussion related to basic science but that such discussions should recognize the value of looking beyond basic-science-focused scholarship. One path forward would be for organizations or groups to explicitly identify shared questions that they would like answered.

In the language of strategic communication, this path forward would involve people in the basic science community identifying the long-term goals they hope to achieve through communication (e.g., ensure funding support, increase the diversity of youth choosing science careers, identify promising research paths) and then building research programs aimed at better understanding the nearer-term objectives (e.g., factual knowledge, risk/benefit beliefs, normative beliefs, self-efficacy beliefs, trustworthiness-related beliefs, specific framing and emotions) and tactics (e.g., changes in behavior, message, style/tone, channel, and sources) that might help the basic science community achieve its goals. Clear identification of goals and objectives would also help with identifying existing theories and theoretical gaps around which to build new research. This perspective is further explored in a companion essay on the topic.