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National Communication Association (NCA)

Response to Dear Colleague Letter for SBE 2020: Future Research in the Social, Behavioral and Economic Sciences

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Overview

In this response we outline our proposal for future research in the Social, Behavioral and Economic Sciences Division of NSF. We begin with an introduction to *communicating science*, our identified strategy for discussion, provide a context for this strategy, and show that it is both foundational and transformative. We provide several examples of disciplines that could contribute to this imitative, and note implications for research within and across disciplines.

Introduction

Communicating science is the ability to communicate results of scientific research to the public, coupled with the ability to engage the public with science and scientific findings. This activity is crucial to public welfare. Scientific results must be translated into clear and unambiguous messages so that the public understands, for example, the immediate risk involved if they intend to "ride out" an impending hurricane, or the long-term danger to their families if city officials discover toxic waste in the local aquifer. Formulating and exploring research questions regarding the ways in which all forms of science can be communicated to the public to both inform and persuade is more important than ever as the pace and complexity of scientific inquiry, and the interconnectedness of the global community, all increase.

Why is this important? Public confidence in scientific information is at an all-time low. An AP-National Constitution Center poll released on September 16, 2010 noted that only 30% of the American public surveyed trust information from the scientific community.

Members of the scientific community have recognized the importance of communicating science since the mid-1990s, and much of the early work in this area involved collaboration between scientists and journalists to train scientists to craft messages for the mass media. Unfortunately, in a recent American Academy of Arts and

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Sciences Publication (Mooney, 2010) it is argued that science journalism, at least within traditional media institutions, is in a decline, putting pressure on scientists to improve their communication and outreach abilities because there are fewer journalists available to translate their findings for them.

The increased complexity of scientific inquiry in the 21st century, coupled with the increased public pressure to hold scientists accountable for their responses to public issues, requires scientists to improve their abilities to communicate. This improvement must begin with greater understanding of the methods used to communicate science. We propose that to inform future research, the communication of science is best accomplished when it is understood to occur in two phases: one *private*, during which science is conceptualized and created; and one *public*, where the results of creating science are both adapted and communicated to lay audiences. Although communicating scientific results with the media is an obvious dimension of communicating science, the communication processes involved with creating the science are an integral part of the effort, and require much more investigation.

Our scientific strategy is thus to advocate for the study of communication processes that contribute to both the *creation* and *dissemination* of science. Our central question is this: How can the communication practices that contribute to the creation of science best be facilitated in both private (behind-the-scenes) and public (communicating with consumers of science) phases?

Context

The communication of science is perhaps best studied with an interdisciplinary group of researchers, with communication research at the core. Communication research includes inquiry by social scientists, humanists, and critical and cultural studies scholars. Its focus is on improving the content and methods of communication teaching/training, and on the cultivation of communication practices that constitute family, education, healthcare, community, workplace, and public life. The following premises are foundational to communication research:

- To understand (dis)valued institutional, societal, or personal outcomes, it is crucial to study the communication *process* through which outcomes are

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generated.

- The key features of a communication process will depend on whether the process is mediated or face-to face; personal or part of an intuitional frame, largely language-based or highly visual, addressing politically contested or consensually shared values.
- To understand communication problems requires recognition that they are usually the result of multiple, competing legitimate aims.
- Design of messages and campaigns, and interactional scenes and communicative practices related to them (e.g., an appeals process, a deliberation occasion), must take account of the likelihood of interpretive differences and resulting dissent between speakers/planners and the recipients/audience.
- Communication contexts evolve historically and socially and reflect beliefs about persons and meaningful actions that participants will hold.

Two phases. Based on these premises, we propose to investigate both the private and public phases of communicating science in ways informed by both the process and complexity of communication, coupled with a focus on messages and the context in which they are communicated and interpreted. Researchers in our field have spent decades studying communication dynamics in organizations and, as such, we are well equipped to offer the expertise needed to facilitate communication, collaboration, and complex problem solving (Thompson, 2009) in organizational contexts.

The public and private phases of communicating science are not mutually exclusive. Rather, they are overlapping, ongoing, and continuously impact each other.

The private phase: Creation. The private phase involves the creation of science, which is inherently a communication process. Science is shaped through the creation of shared meaning that occurs by way of communication between and among scientists, often trained in quite different methodologies and research traditions, working together. Research teams must be able to collaborate to frame research questions, carry out investigations, and discuss findings with each other, despite their different backgrounds. Scientists must be able to engage in discourse that allows them to work within different research philosophies, so that the research team reaches some degree of coherence and clarity. This is often referred to as *team science*.

To work collaboratively, scientists must demonstrate interpersonal communication competence, teamwork (which includes problem-solving and decision making), manage conflict, and often communicate across cultural and language differences. They must deal with the reality that *how* a message is communicated is as

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important as the message *content*. Being able to communicate effectively in a team is the foundation for successfully communicating results to the public. As noted in a recent National Academies of Science publication, "at the heart of Interdisciplinarity is communication—the conversations, connections, and combinations that bring new insights to virtually every kind of scientist," (NAS, 2005, p. 19).

Thompson's (2009) investigation of collective communication competence in interdisciplinary work teams reinforces the importance of what occurs in the private phase. As scientific problems become more complex, scientists have formed interdisciplinary teams comprised of people with different areas of scientific expertise. These interdisciplinary teams often make communication and collaboration more difficult. Thompson identifies four specific communication processes essential to building collective communication competence: spending time together, practicing trust, discussing language differences and engaging in team tasks. She also specifies communication processes that cause deterioration of collective communication competence such as sarcastic humor and jockeying for power.

However, the creation of science is not just about collaborative teamwork. It involves communication and collaboration with other constituencies such as funding agencies, project managers, and subcontractors, on which continued progress and success of the project depend.

The public phase: Dissemination. The public phase is comprised of events that allow for scientists to engage in communication with public stakeholders about their results. They must present research results clearly and understandably, leading discussion and managing public debate, each of which requires adapting messages to varied audiences. Communication researchers have examined public discussion and deliberation, risk and crisis communication, and analyzing and adapting messages to various audiences and publics for decades. Communicating science to the public increasingly requires explaining complex findings to translating research into lay language, and perhaps overcoming resistance from opinion leaders and organized opposition.

Range of Contributing Disciplines

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Communication is ubiquitous, and so the ideas proposed here are at once relevant and adaptable to many scientific disciplines. Two recent examples of collaboration between the National Communication Association (NCA) and scientific initiatives of other associations are noteworthy. The first of these was an NSF/PASI funded grant on the communication of risk, hazard and climate change in the Americas and involved NCA and the Association of American Geographers. Forty early career scholars from across the Americas met in Panama City in June 2010 to develop (among other things) a collaborative research and educational agenda on risk, hazard and climate change. This project involved not only the practice of communicating in interdisciplinary and intercultural teams, but developing a research agenda that would increase understanding of how risk, hazard, and climate change could best be communicated to the public. Participants developed the following research questions:

1. How can scientists frame messages and communicate with diverse stakeholders without compromising scientific meaning?
   - 1a. How can the scientific community best communicate with policy makers?
   - 1b. How can scientific uncertainty be communicated meaningfully to citizens and decision-makers?

2. How can researchers best communicate the risk of long-term, slow-developing, climate-related hazards as a way to facilitate community-led structured change?
   - 2a. How are competing messages of uncertainty and competence best communicated regarding climate change and hazards so that people feel empowered to take action?
   - 2b. Conversely, how do we get scientific experts to listen to, and understand, people?

Second, NCA has recently partnered with the American Meteorological Society (AMS) to co-sponsor their 2011 annual meeting, “Communicating Weather and Climate.” The goal of this partnership is to lend communication expertise to how meteorologists might better forecast, and subsequently communicate, uncertainty and risk. One focus is in the AMS Division on Policy and Socio-Economic Research where we will collaborate with television/radio meteorologists and researchers studying uncertainty and risk in weather forecasting to develop a shared research agenda. AMS is funding 15 communication scholars with accepted abstracts to attend the conference. Plans are in progress for a workshop involving scholars in both disciplines to outline a plan for the improved communication of crucial meteorological information to the public.

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Implications for Future Research Within and Across Disciplines

The implications for studying the communication of science in the private and public phases are profound and far-reaching. Achievements realized during the public dissemination phase are largely dependent upon the successful creation of science in the private phase. Conversely, the clear communication and public understanding of scientific findings will also have an impact on the private creation phase. Positive or negative feedback from the public, and actions taken on the basis of the findings, will determine how (and indeed whether) the teams continue to work together in the private phases of science creation. The public and private phases as well as the mutual influences between them all warrant further investigation. Such investigation can help to train science researchers to realize the impact of their private behavior in the creation of science. It will also shape the impact of scientific messages on the public.

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