

NSF 21-059

Dear Colleague Letter: A Broader Impacts Framework for Proposals Submitted to NSF's Social, Behavioral, and Economic Sciences Directorate

March 18, 2021

Dear Colleagues:

The National Science Foundation (NSF) supports fundamental research in the social, behavioral, and economic (SBE) sciences. This research empowers our Nation to address great challenges and seize transformative opportunities. Through scientific advances and subsequent applications of these advances, SBE-supported research strengthens security and preparedness, creates jobs, spurs innovation, and improves quality of life for people across the country and around the world.

Every year, NSF's SBE Directorate receives many more proposals than it can support. To ensure that funded research is of the highest quality and provides the greatest value to the nation, SBE, like all of NSF, uses two criteria to evaluate incoming proposals:

Intellectual Merit: This criterion encompasses the potential to advance scientific knowledge.

Broader Impacts: This criterion encompasses the potential to benefit society.

The intellectual merit that we see in NSF-supported SBE's research is substantial. It manifests as increasing rigor, new data and methodologies, and irreplaceable ways to understand questions of great importance. For broader impacts, the [National Science Foundation, universities, and other organizations offer resources that help researchers](#) understand what the concept means. Yet, some SBE proposal writers have asked for additional guidance on how to articulate the broader impacts for their research.

This Dear Colleague Letter (DCL) responds to these requests by offering a framework that SBE researchers can use to develop and communicate their projects' broader impacts more effectively. This "broader impacts framework" in *no way* alters NSF's existing criteria – rather, it offers guidance on how to consider and convey broader impacts in ways that are easier for others to understand.

One commonly asked question about broader impacts is how to think about them, given that fundamental research often entails substantial uncertainty – and can take many years to produce transformative results. Indeed, for many types of fundamental research the probability of achieving any specific outcome is often difficult or impossible to know in advance. As a result, for most types of fundamental research, descriptions of broader impacts *should focus on a reasonable and honest assessment of possible and likely outcomes rather than on the probability of specific outcomes*.

The "*Broader Impacts (BI) Framework*" offers a way for researchers to hone and articulate this focus. In other words, it offers a framework for connecting fundamental research outcomes to quality of life improvements for others. To use the *BI Framework*, a researcher begins with the basic elements of Broader Impacts and then considers three questions about these elements potential to offer credible improvements.

Basic Elements of Broader Impacts in the SBE Sciences: Scientific Opportunities and Communicative Products

Research often creates broader impacts by generating *new scientific opportunities*. These opportunities for exploration, learning, and broadening participation can take the form of holding a summer workshop for high school students, creating a new course (based on the project), bringing in industry or nonprofit partners, broadening participation in scientific activities for previously underrepresented communities, helping school districts make better use of newly-available data, conducting a citizen-science project, and many more. They can also include development of innovative new learning tools, new laboratories, new scientific infrastructure, new training for students, and any other activities that can stimulate further exploration and learning.

Research also produces communicative products. The most common communicative products from fundamental research include conference papers, presentations, posters, journal articles, books, white papers, syllabi and related educational materials, lectures, videos, podcasts, and, in many cases, research data and materials. These communicative products are the vehicles by which researchers share their findings (including null results) with other researchers, policymakers, and the public. We encourage investigators who are interested in broader impacts to consider the full range of scientific opportunities and communicative products that fundamental research can create.

Descriptions of scientific opportunities and communicative products are common elements of many existing Broader Impacts and we encourage their continued inclusion. In many cases, however, these elements do not connect the work to critical problems -- or to means by which scientific knowledge, technical capacities, and associated practices can empower people to address these problems. We encourage principal investigators (PIs) to consider each of the BI Framework's three questions as they are designed to help researchers more clearly articulate the broader impacts that their work can have.

(1) Who Can the Scientific Opportunities and Communicative Products Empower?	(2) Whose Quality of Life Can the Empowerment Improve?	(3) What Actions Make These Broader Impacts More Likely?
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- 1. Who Can the Scientific Opportunities and Communicative Products Empower?** For research to have a broader impact, it should empower people to accomplish a goal tomorrow that they were unable to accomplish in the past. So, we ask researchers to consider "Who can your research empower?" In some cases, the beneficiaries will include students, early career investigators, and other academics. In other cases, it is possible to go further and consider other people who, and organizations that, can use the proposed research to advance science or improve others' quality of life. This consideration can include communities, public-service organizations and entrepreneurs who can use the research to innovate.
- 2. Whose Quality of Life Can the Empowerment Improve?** Where Question 1 asks about who is empowered, this question asks about who benefits from that empowerment. To answer this question, researchers can consider specific communities, organizations, or populations whose quality of life can be improved by new research. Consistent with the term "broader," we encourage researchers to think expansively about how their work can benefit others. Even when a project's immediate societal benefits are not apparent, and the probabilities of particular outcomes are difficult to calculate, researchers can help others understand the potential public value of their work by articulating *broadly beneficial outcomes that become possible as a result of their proposed course of action*.
- 3. What Actions Make These Broader Impacts More Likely?** Additionally, we ask researchers to consider concrete steps that they can take to make these effects more likely. Here, researchers have an opportunity to offer forthright, feasible, and (where possible) verifiable plans for converting their work's intellectual merit into outcomes that are broadly beneficial.

Having offered this *BI Framework*, we reemphasize that fundamental research often involves significant uncertainty. The exact nature and timeline for breakthroughs can be difficult to anticipate. SBE seeks to support research that has these qualities, particularly when the research can deliver transformative knowledge of great public value.

By thoughtfully describing a project's potential broader impacts more effectively, researchers can help more citizens and stakeholders see the relevance of the research to their lives. As more SBE researchers do this, even with grants that were funded long ago, more people will be able to understand and articulate the tremendous and irreplaceable public value of fundamental research in the social, behavioral and economic sciences.

Sincerely,
Arthur Lupia, Assistant Director
Directorate for Social, Behavioral and Economic Sciences



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