

Navigating the Gray Zones of International Research

Science funders can enable responsible international collaboration by developing global norms for ethical research that appropriately respond to today's geopolitical tensions.

The past two decades have seen rapid global growth in investments in research and development with a concomitant volume of publications. Much of this growth is associated with countries, such as Brazil, Russia, Iran, India, and especially China, that have not historically been considered global leaders in investing in science. China in particular has become a significant part of the global science enterprise. Since 2016, China has been the largest producer of scientific publications in the world, and in 2020 produced nearly 23% of the world total. Moreover, papers from China overall are cited at a higher rate than the average rate for the world total, indicating rising quality.

Accompanying this globally distributed growth, international scientific collaboration is also on the rise. Between 2009 and 2018, for example, the growth in scientific articles in major European research nations was almost entirely due to international coauthored papers, including with countries whose scientific enterprises are growing swiftly. In the last five years, researchers have collaborated internationally to sequence and monitor SARS-CoV2, develop and deliver vaccines, preserve habitat, mitigate climate change, and more. But though global problems have never been more pressing, geopolitical tensions and politicization of research are raising barriers for transnational scientific cooperation. For example, in the United States, the FBI warned in July 2020 that “China pays scientists at American universities to secretly bring our knowledge and innovation back to China,” with interests including crops, energy, and military equipment. With the exception of COVID-related research, China-United States collaborations declined during 2020. Australia, Germany, India, Japan, and the United Kingdom are also reported to be increasing scrutiny of international research relationships.

Meanwhile, there are concerns about the integrity of research coming from emerging countries. From 2011 to 2020, the number of grant applicants to China's main basic research funding agency grew about 9% a year, an unprecedented rate of growth. Yet stringent structures to ensure ethical, rigorous research take time to form and can be thwarted by hypercompetitive environments. The research community, including Chinese funders, has tried to quell a rise of research fraud, including faked peer reviews and fraudulent research articles produced by paper mills. What's more, research performed under an authoritarian government brings other challenges, such as the lack of institutional autonomy for research organizations and academic freedom for researchers. And of course China is not the only country where researchers must deal with autocracy and hypercompetitive pressures to publish.

While more research and inclusion of more countries in global science are needed, the challenges of emerging science systems and the greater institutional differences encountered by researchers today negatively impact research quality and accountability. This makes it difficult to foster high standards of integrity in international collaborations. A deep global dialogue is necessary to set out what is needed to uphold research standards and how to enforce them, but national governments have not initiated such multilateral dialogue. And researchers, while vital to any such discussion, do not themselves have authority to set international norms.

I study international research collaborations amid geopolitical tensions, with a focus on China. In my view, national and global science funders are best positioned to launch dialogue that can harmonize research norms

and build trust. Funding mechanisms offer a way to induce behavioral changes. Moreover, coordination between funding organizations can be done flexibly and iteratively via the development of a common code of conduct that funding recipients must adhere to.

Some dialogue has already begun. For example, a network of international research funders—including the Swedish Foundation for International Cooperation in Research and Higher Education (STINT, to which I am an advisor), Swedish Research Council, Vinnova (the Swedish Innovation Agency), Research Council of Norway, Academy of Finland, Japan Science and Technology Agency, and US National Science Foundation—began discussing responsible practices in international research collaboration amid geopolitical tensions in 2022. Since 2019, the Nordic funders have also held discussions with the National Natural Science Foundation of China (NSFC) on the topic of global research norms.

But more than funder-to-funder discussion is needed to recalibrate codes of conduct. In today's scientific world, no set of international norms will be broadly adopted unless their development includes a broad base of players: advanced as well as emerging science nations, funders, and researchers. Actors in places like the United States, Europe, and Japan need to include China in discussions and dialogues about norms. In China, there must be an increased willingness to take greater responsibility for deteriorating global political conditions, as well as to see research more broadly than as an instrument primarily used for the rejuvenation of the Chinese nation.

Done inclusively, the global research community can support the vital work of forming an open science system that, while not independent of geopolitical frictions, can better withstand them and push on to solutions addressing climate change, epidemics, and other global challenges.

Steering toward responsible collaboration

Older guidelines seeking to harmonize scientific integrity in an international context are often not easy to apply in researchers' current reality. These efforts and the resulting brief statements (e.g., the 2010 Singapore Statement on Research Integrity, the 2013 Global Research Council Statement on Principles for Research Integrity, or the European-focused ALLEA code of conduct in 2017) were formulated primarily based on norms set by Western countries, and they reflect high-level principles rather than concrete practices. Nor do these declarations anticipate how to navigate geopolitical tensions.

To address this need, the European Commission and governments in Japan, Australia, the United Kingdom, and the United States have taken actions to protect national research institutions from foreign interference. The Organisation for Economic Co-operation and Development (OECD) released a report in June 2022 that elaborated ways to strike the proper balance between research security and research integrity on one hand and the need for international research collaboration

to solve global challenges on the other. The report includes recommendations for good practices in research security and research integrity, such as developing clear guidelines for handling specific research security and research integrity issues and developing capabilities across institutions by sharing information, guidelines, or databases.

In conjunction with the OECD report, the Group of Seven intergovernmental forum released a document on common values and principles regarding research security and research integrity. These principles are designed to safeguard the research and innovation ecosystem from risks to open and reciprocal research collaboration, such as foreign interference or unauthorized information transfer. Guidelines by international organizations and forums could be valuable in building global norms, but they will need to be put into practice. Funders are uniquely positioned to translate these principles into practice by creating guidelines for researchers across nations and scientific fields and to ensure that the guidelines foster international collaboration rather than stifle it.

Crucially, funders can also help to build appropriately nuanced frameworks for future collaboration. Although much of the debate on international research has focused on red lines and extreme examples such as espionage, direct dual use, or human rights violations, such flagrant threats will not be germane to what many scientists may face in their research collaborations. A study of the STINT-NSFC Joint China-Sweden Mobility Program (for 2015–2021) found that “the percentage of considerable ethical challenges identified by the evaluators in the program applications received was in the low single digits.”

Of course, research collaborations that encroach on human and individual rights, violate laws, or directly help develop weapons must be handled in a resolute and clear manner by both government authorities and research organizations. But responses crafted to control rare, extreme, and even hypothetical risks could set restrictions that limit international cooperation, including cooperation that would ensure research integrity. That's especially true for funders and researchers in a repressive setting.

Funders should work on what's really important for maintaining integrity in international scientific collaborations, which includes helping researchers navigate the gray zones they are more likely to encounter as their colleagues become increasingly international. For most researchers, for example, conversations about guest authorship and informed consent are more relevant than safeguarding military secrets.

Research collaborations can fall into gray zones because of differences in national laws or varying levels of implementation of ethical codes. And when scientists or scientific organizations exploit gray zones, it can lead to what is referred to as “ethics dumping”: conducting unethical research in another country because of lower requirements, or testing technologies that are not approved or certified for use in the inventor's country in places with less rigorous oversight. Ethics dumping can

be a particular problem for clinical trials in developing countries, with populations vulnerable to exploitation. While not necessarily illegal, ethics dumping practices are highly inappropriate, and funders are often well positioned to identify, recognize, and regulate such practices.

Identifying gray zones and developing ways to deal with them will help pinpoint where responsibilities lie for scientists and their communities and organizations. Discussions around specific gray zones, such as conducting clinical trials in developing countries or performing research with nonhuman primates, can illuminate how to view reciprocal exchanges of data, financial resources, or personnel; pinpoint shared boundaries for transnational exchanges; and identify opportunities for training and education. Discussion of reciprocity can also help clarify the reasons why specific projects should be undertaken in an international context.

Better collaborations, stronger science

In addition, deliberately discussing gray zones may strengthen scientific collaborations more broadly: researchers can develop more nuanced skills in balancing due diligence with relationship-building. Currently, researchers based in Europe, Australia, and the United States are asked to be vigilant of foreign interference when collaborating with researchers in authoritarian countries by conducting due diligence to avoid transgressing legal requirements. This could occur, for example, if a researcher accepts a secondary position through one of China's talent plans, which seek to incentivize scientists to bring their work to China. But starting relationships with due diligence is a challenge. Collecting information about individuals and institutions in foreign countries can be difficult. For instance, the Australian Strategic Policy Institute's China Defence Universities Tracker identifies universities in China with military ties, but the categories are so blunt that they might cause researchers to refrain from undertaking what may be fruitful, low-risk collaborations.

For productivity and longevity, collaborations require reciprocity and mutual benefits. Establishing such reciprocity is challenging in the current research landscape due to unequal conditions and systemic differences. This is not only because of variances between the Global North and Global South or among national government policies, but also due to mobility differences. Creating more equity in the relationships within and between research groups requires mobility, so that people can get to know each other in person and become familiar with each other's research cultures. Western researchers and students seldom seek opportunities in new or emerging science countries compared to the reverse. For instance, recent data show that in 2018–2019, just prior to the COVID-19 pandemic, the United States hosted more than 136,000 international scholars, of which around 80,000 (59%) came from Asia. That same year, the United States hosted more than 1 million international students, of which around 768,000 (70%) came

from Asia. While data on international scholar mobility globally is limited, the United States had around 347,000 study abroad students in 2018–2019, of which only around 40,000 (12%) went to Asian countries.

Funders can improve equity by encouraging North Americans and Europeans to travel and, within collaborations, incentivizing frequent meetings between research teams. Granted, it will be an uphill battle in the current environment to incentivize Western researchers or students to conduct research or study in countries such as China or India. Increased suspicion by institutions and governments does not help. Nevertheless, exchange is important, be it through online video conferencing, at international branch campuses, or in international conferences. A more equal exchange with the West could help build relationships and co-develop norms in nations that are still developing scientifically.

Finally, any effort by funders to establish new norms for international research collaborations must include a component of educating and socializing these norms within the research community. An example is an educational initiative launched by STINT and developed with three Swedish research universities—Karolinska Institutet, KTH Royal Institute of Technology, and Lund University—to address responsibility in international research collaborations. Working together, these institutions provide a forum to manage gray zones, highlight opportunities in international research, and better understand trade-offs like the conflicts between individual and institutional goals or the risks and benefits of openness versus securitization. The target groups for the initiative have been university leadership, department chairs, and other administrators. But it is at least as important that active researchers receive this education and training. STINT has also since 2020 asked applicants to reflect on responsible internationalization in their applications. Applicants must describe the benefits of their research in a transnational context as well as detailing potential challenges or risks. For example, studying women's rights in a setting where they are severely encroached upon might pose risks to the study population as well as the researchers. By working with the universities where funded researchers work, STINT hopes to target the broader research community.

Research funders have a leadership role to play in developing a more inclusive global dialogue to first spell out who has the responsibility and authority to uphold academic principles and then to implement necessary changes. But the norms must focus on the gray zones collaborators are more likely to encounter, and emphasize the balance between due diligence and reciprocity. Such norms, properly developed and socialized, can enhance relationship-building and global scientific collaboration at a time when it is more needed than ever.

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