Research Statement

Samantha Wakil

My research attempts to answer methodological questions about philosophy and science. I'll begin by describing my research in the methodology of philosophy, since my research in the methodology of science is largely an application of it.

Philosophy aims to achieve a clear and coherent view of ourselves and our place in the world. But how can such clarity and coherence be achieved, given that our ordinary concepts are usually vague and not generally designed to meet those aims? Philosophers have recognized the need to refine our ordinary concepts in order to achieve a high degree of clarity and coherence. This project of refinement is what contemporary philosophers call "conceptual engineering". Of course, we can engineer concepts—like any other tools—to serve many different purposes. But if our purposes are philosophical, then how should our conceptual engineering efforts proceed?

Rudolf Carnap proposed an answer to this question 70 years ago with a method he called *Explication*. As Carnap describes it, "The task of explication consists in transforming a given more or less in-exact concept into an exact one or, rather, in replacing the first by the second." (1950, 2) The transformation—or replacement—must satisfy four conditions of adequacy: similarity, precision, fruitfulness, and simplicity. Curiously, despite Carnap's (1950, 2) assertion that Explication is of "very general importance for the construction of concepts", there is consensus today that Explication is not generally a good methodology for conceptual engineering, because it only works for the concepts used in the mathematical or natural sciences.

My research defends Carnapian Explication by showing that it can be used much more widely. In particular, I develop a modified version of Explication (according to which precision and fruitfulness are especially important), create a road map for the process of Explication of any concept, and then follow this road map to engineer several concepts in the philosophy of science and political philosophy.

I demonstrate the utility of the road map by applying it to the concept *gender*. I support developing least three different and non-equivalent concepts of gender to serve several distinct philosophical and practical goals. I also apply my road map to the concept *parsimony*, as employed in the philosophy of science. I show that the concept of parsimony needn't mark a theoretical virtue distinct from evidential confirmation, since our judgments of parsimony affect our belief in a theory or explanation only insofar as they affect our judgment of

the evidential support which that explanation enjoys. This conclusion is supported by original experimental studies I conducted on how parsimony framing affects judgments of explanation quality.

Part of the value of my approach is that it can help correct some of the mistaken empirical assumptions made by some philosophical accounts, while also helping to correct some of the mistaken philosophical assumptions that guide some empirical research programs. Let me give an example of each. Philosophers of science typically assume that parsimony is a causally efficacious theoretical virtue — in other words, that simplicity considerations really do affect theory or explanation choice. But recent evidence suggests that (absent explicit parsimony framing) individuals prefer complexity and a preference for parsimonious explanations is actually mediated by the perceived complexity of the event or phenomena being explained. Similarly, biologists typically do not define and often conflate various concepts of parsimony. This leaves any debate that hangs on parsimony considerations at a standstill and renders its supposed argumentative force impotent. Finally, engineering concepts of gender that will help explain and combat gender-based discrimination requires data about how laypeople typically use the concept. By combining research from other fields (empirical disciplines in particular) with modified versions of the precision and fruitfulness criteria, my research has shown how Explication is the methodology conceptual engineers have been asking for.

I've also begun a new research project called "Disciplinary Differences in Scientific Integrity". Characterizing natural sciences (e.g. physics, biology, chemistry) as *hard* and social sciences (e.g. psychology, sociology, political science) as *soft* is commonplace in the general public and certain academic circles. Right or wrong, the distinction reflects perceived differences in methodological rigor and objectivity across scientific fields. (Cole 1983; Smith et al. 2000) Similar supposed contrasts between so-called *pure* and *applied* sciences also feature prominently in accounts of scientific progress. (Bird 2007; Douglas 2014; Niiniluoto 2014) Critically, these entrenched distinctions introduce a new and socially significant potential problem.

The public strongly endorses financially supporting sciences with explicitly ethical agendas such as improving human health, increasing economic well-being, combating climate change, and conserving biodiversity. (Pew Research Center 2015) Relatedly, public involvement in these sciences, like epidemiology and conservation biology, has increased. In what has been dubbed 'citizen science', community members are trained to assist with scientific research in their local area. As Elliott and Rosenberg (2019, 2) explain, citizen scientists "collect data about the presence of particular species in specific locations at particular points of time [or] collect information about the environmental quality of the air or water near them [or] they might monitor local temperatures or precipitation." But there is a perplexing discrepancy. Despite the public's professed support of the sciences, public trust in the scientists themselves is lacking. This is especially true for researchers in sciences with objectives society deems ethically valuable. (Funk, 2020) Whether performed by citizens and professional scientists, their level of scientific integrity has been challenged. The criticism

is that ethically-driven sciences are not sufficiently disinterested to ensure good scientific standards are reliably met; they are value-laden, socio-politically motivated, and tainted by advocacy. **But is this empirical assumption correct? Compared to "pure" research in "hard" sciences, do researchers in ethically-driven sciences exhibit less scientific honesty?**

Answering this question is important because misjudging the quality of scientific research has ethical and practical consequences. As Elliott and Rosenberg (2019, 2) caution, "when low-quality research is inappropriately treated with too much respect, one result can be poor-quality decision making and a waste of scarce resources that could have been used to support better studies. On the other hand, when high quality research is inappropriately dismissed or prevented from taking place, decision makers can be deprived of valuable information that could benefit society." This project has two interrelated parts. The first empirically-focused stage attempts to answer the critical question. The second stage explores the philosophical ramifications of the empirical results. In particular, the first stage closely examines three questions:

1 Do researchers in "pure" sciences display higher levels of scientific honesty than those in ethically-driven sciences?

2 Are there general and significant differences in the research standards employed in ethically-driven sciences compared to descriptive sciences?

3 Does the public judge the results of ethically-driven sciences, and the scientists themselves, as less trustworthy?

Two experimental studies and one corpus analysis will be conducted to investigate the aforementioned questions. The results of these studies will provide new empirical evidence crucial to evaluating philosophical accounts of scientific progress and objectivity. Of particular focus will be the distinction between pure and applied science, the distinction between epistemic versus contextual values, and issues regarding pluralism and evidential standards as they relate to scientific judgment, consensus, and knowledge production. Additionally, these philosophical concerns connect to significant worries about trust within the scientific community and about the proper relationship between science and society: such as competition and collaboration between researchers, the cognitive division of labor, the replication crisis in many social sciences, p-hacking and HARKing, and the problem of inductive risk and legitimate function of non-epistemic values in science.