

Co-production handout

This handout summarizes key points about the co-production of science and other parts of society. It is derived from the first two chapters of Jasanoff's book *States of Knowledge: The Co-production of Science and the Social Order*. Abingdon, UK: Taylor & Francis, 2004. We focus here on points that are most relevant to our journal club.

The co-production framework is useful for understanding the historical relationship between the rise and transformation of eugenics, genetics, political and technological means for controlling human reproduction.

What is co-production?

Co-production is a conceptual tool used in Science and Technology Studies¹ to understand the “untidy, uneven processes through which the production of science and technology becomes entangled with social norms and hierarchies.” Through the lens of co-production, science and other aspects of society are constantly and reciprocally influencing each other. Jasanoff summarizes co-production as follows:

Co-production is shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it. Knowledge and its material embodiments are at once products of social work and constitutive of forms of social life; society cannot function without knowledge any more than knowledge can exist without appropriate social support. Scientific knowledge, in particular, is not a transcendent mirror of reality. It both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions – in short, in all the building blocks of what we term the social. The same can be said even more forcefully of technology.

Co-production means that the arrow of influence runs both ways between the scientific order and the social order. “The scientific order” refers to all the ways that science is done, the interactions among scientists and their institutions, and the knowledge that science produces. The “social order” refers to all the political and social practices, institutions, interactions, and beliefs that are typically thought of as “outside” of science.

This mutual influence occurs because “the same human capacities for learning, responding to and transmitting knowledge ... are responsible for the creation of natural and social order.” Science influences society, because the actions taken in society and

¹ STS is an interdisciplinary academic field that studies social processes and structures within science and between science and other elements of society. STS incorporates sociology, anthropology, history, philosophy, literary studies, and other disciplines.

the ways in which people interact (including political relationships) reflect what we believe about the nature of human beings and the world around us; science is the authoritative source of those ideas in modern society, so scientific knowledge shapes what we take to be natural, possible, or desirable in the social/political realm.

In turn, the social order affects the scientific order, because scientists and our institutions operate in a social, political and economic context, which shapes the questions that we think are worth asking, the categories we impose on the world when we ask them, the kinds of cause-effect explanations we can imagine, the burdens of proof that we impose on inferences, and who is granted the trust and authority to settle these questions and “transmit” them to the rest of society. Co-production means that the feedback relationship between the scientific order and the social order is constant and inevitable.

One focus of Inquiry using the co-production framework is to identify the ways in which “particular states of knowledge are arrived at and held in place, or abandoned.” The goal is not to evaluate the veracity of scientific claims but to illuminate how societies arrive at a consensus regarding particular types of knowledge claims and how those claims are incorporated into social and political practices and interactions.

Some implications of the co-production framework

Below are some specific key points raised in Jasanoff’s chapters.

- **Co-production does not imply that science is “just a social construct.”** That is, it does not say that social factors are the sole determinants of scientific knowledge. There is a material reality independent of our perceptions and social interactions, and this reality imposes strong constraints on the claims that can emerge from science. But our understanding as individuals or groups of what is “out there” is strongly shaped by social factors, processes, and assumptions. Moreover, the process by which claims become accepted as “true” or “factual” is social to its core, and these facts then serve as the foundation for further perception, discussion, and negotiation of the next claims about nature. There is no way for anyone to step outside of these influences and see an unmediated version of what is “out there.” We therefore have no accurate means to distinguish the social content of scientific knowledge from the influence of “external” reality.
- **Science is inescapably political.** Because science and society underwrite each other’s existence, and everyone within a society is a political actor, all science has political determinants and political effects. “[S]cience and technology are

indispensable to the expression and exercise of power. Science and technology operate, in short, as political agents.” According to Jasanoff, doing science merges into doing politics in three main ways:

- “First, scientific practitioners have created, selected, and maintained a polity within which they operate and make their intellectual product.” This refers to the various relationships within science by which decisions, resources, and authority are distributed. These relationships shape not only scientific institutions but also its practice and therefore its products.
- “Second, the intellectual product made within that polity has become an element in political activity in that state.” Scientific knowledge and techniques are key resources that inform decisions, assumptions, and the distribution of power and resources in the larger society.
- “Third, there is a conditional relationship between the nature of the polity occupied by scientific intellectuals and the nature of the wider polity.” The ways in which relationships and institutions within science are organized depend on those in the larger society (and, to some extent, vice versa). To take an extreme example, science will be done differently in an authoritarian society than in a technocratic liberal democracy or a set of decentralized communities governed by direct democracy. Jasanoff writes:

Conceptions of scientific authority and objectivity are intrinsically related to the political organization of society. “How objectivity is understood and institutionally embedded in a given political system has enormous implications for the sponsorship of science by the state [...] In turn, concepts of objectivity and reliability affect the uptake of science and technology by state institutions.... At times of significant change, such as those we tend to call “scientific revolutions”, it may not be possible to address questions of the facticity and credibility of knowledge claims without, in effect, redrafting the rules of social order pertaining to the trustworthiness and authority of individuals and institutions.

- **Conceptions of science and scientists are constructed and shaped by social processes, both within science and with the rest of society.** Science and the rest of society are in a constant and reciprocal process of reinterpretation as new societal needs or dynamics arise and new scientific knowledge is produced. Changes in society often prompt changes in scientific questions, approaches, and institutions; changes in scientific knowledge point to new problems for society to solve and new ways to solve them. According to Jasanoff, both kinds of change alter the accepted “boundary between the social and the natural, the world created by us and the world we imagine to exist beyond our control”.

Four activities in the co-production framework

Jasanoff highlights four key aspects of the co-production relationship between science and the rest of society. We will refer to these elements during our journal club discussions. The first three – making representations, identities, and languages – involve the “emergence and stabilization of new objects or phenomena: how people recognize them, name them, investigate them, and assign meaning to them; and how they mark them off from other existing entities, creating new languages in which to speak of them and new ways of visually representing them.” The fourth involves the making, reinforcement, and unmaking of institutional arrangements and their effect on the construction and use of scientific knowledge.

- **Making representations.** A key knowledge-making aspect of science is identifying the categories of things that exist in the world and the causal connections between them. What scientists establish and use as meaningful entities/categories influences the things that are used as reference points for ideas and action outside science. The reverse is true, too: the things that are taken to exist by a society in general influence the things that scientists assume are real in any time or place. Representations also include models that describe the causal relationships between entities in the world. Models and representations summarize entire systems of ideas and knowledge into intelligible, concrete, self-containing entities, which can then be integrated into language, institutions, and identities to deliver and reinforce messages and ideas in society. Jasanoff writes, “Representation plays a key role in holding the networks together. Scientific representations, in particular, are products of multiple translations of form and meaning between the observer, the observed, and the means of observation across the network.” Examples might include “IQ,” “the gene pool,” “the human genome.”
- **Making identities.** Among the categories of things that science influences society to take as natural (or dissolve as natural) are categories of people. These dimensions of identity shape the behavior of individuals who associate themselves with these categories and the reactions of other individuals and institutions to those individuals, including the approved social roles and treatment of individuals with those identities. Some examples include “scientist,” “geneticist,” “physician-scientist,” “cognitive scientist,” “pseudo-scientist,” “Asian,” “White person,” “Indigenous person,” “genius,” “imbecile,” etc.
- **Making discourses** → “Solving problems of order frequently takes the form of producing new languages or modifying old ones so as to find words for novel phenomena, give accounts of experiments, persuade skeptical audiences, link

knowledge to practice or action, provide reassurances to various publics, etc... Such strategies often involve the appropriation of existing discourses (legal, medical and ethical languages, for example) and their selective retailoring to suit new needs. In the process, scientific language often takes on board the tacit models of nature, society, culture or humanity that are current at any time within a given social order.... Discursive choices also form an important element in most institutional efforts to shore up new structures of scientific authority.” Examples might include the theory of adaptation by natural selection, the global “population explosion,” etc.

- **Making institutions.** “As stable repositories of knowledge and power, institutions offer ready-made instruments for putting things in their places at times of uncertainty and disorder [...] successful institutions classify, confer identity, act as repositories of memory and forgetting, and make life-and-death decisions for society”. Scientific knowledge and its applications are produced and used in institutional settings – universities, corporations, government agencies and laboratories, private research institutes, national academies and professional scientific societies. These institutions disburse resources, confer authority on certain groups of individuals, organize scientific activity along coherent disciplinary lines, reward accomplishments, and sanction misbehavior, thereby shaping the processes and products of science. They also reflect and are shaped by the institutional arrangements, politics, and culture of the larger societies. Scientific knowledge, in turn, can lend support to the creation, maintenance, or decay of institutions outside of science, such as particular kinds of regulatory agencies, intergovernmental bodies, nongovernmental organizations, and citizens’ movements. Examples include the Eugenics Records Office, the Galton Research Laboratory, the World Congress on Eugenics, Ancestry.com LLC, etc.