Experts and the production of international policy knowledge: do epistemic communities do the job?

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Abstract

Epistemic communities are accepted as an important, if not dominant, purveyor of the professional or scientific expertise that informs international policies. However, expertise has also been frequently noted to be a shared and contested resource pertaining to a range of actors, not the least of international bureaucracies. Policy knowledge, furthermore, appears to form across the conventional boundaries separating these actors and their ways of engaging in international politics. This chapter suggests discussing the notion of epistemic community, and specifically the "community" aspect of it, to assess how well it can reflect this proliferation of expertise.

Expertise, in international relations, is the object of a most paradoxical characterization: it is frequently located within a collective actor called epistemic community, which stands alongside other well-identified actors—from non-governmental organizations (NGOs) to transnational business networks, states and international bureaucracies—as the discrete site in which knowledge claims are articulated, and possible changes in international policy paradigms initiated[1]. Ownership over specialized, authoritative knowledge is what characterizes an epistemic community. At the same time, expertise is found in and among these other actors, and in other forms than strictly scientific ones. International bureaucracies themselves incorporate experts, shape the information, data and science that suppose their programs, and engage with the knowledge that is circulated by other competing actors[2]. Expert knowledge underpinning policy action, in other words, is more diffuse[3] than strictly owned by epistemic communities. This chapter builds on insights from the field of science and technology studies (STS) to show how the formation of policy knowledge takes place across multiple boundaries. It introduces a brief case study, and concludes that an epistemic community is less of a cohesive group with a causal role in policy change, than a label for loose sets of experts that circulate knowledge, control this circulation and successfully claim ownership over this knowledge.

1. The sociology of international expertise: epistemic communities

The application of the concept of epistemic community to the study of international politics and regimes was initiated by a group of scholars including John Ruggie, Emmanuel Adler, Peter Haas under the leadership of Ernst Haas[4].. The concept was first applied by John Ruggie in 1975[5]. The term denoted the fact that international

behavioural rules and collective responses to new situations may originate in collectives sharing a given way of looking at social reality. Soon after, Ernst Haas, Pat Williams and Don Babai interrogated the action of international groupings of scientists on international affairs, outlining the role of networks "who are able to influence the future by virtue of their shared specialized knowledge of certain crucial phenomena".[6] (Haas *et al*. 1977, p. 38). In his book When Knowledge is Power[7], Ernst Haas investigated the topic further, probing the conditions under which epistemic communities provoke cognitive disruptions and learning. Like Ruggie in 1975, he sourced the notion of epistemic community in the work of Holzner and Marx, who defined it as "knowledge-oriented work communities" that are united by "epistemic criteria" of knowledge production and application, and share "frames of reference" and "reality tests[8]". In 1992, Peter Haas offered what will become the authoritative definition of epistemic communities for international relations, as "a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area[9]". Peter Haas also cited Holzner and Marx, as well as Ludwig Fleck (for his notion of thought collectives[10]) and Kuhn (for his argument on the scientific communities that share a paradigm of normal science[11]), as inspirations.

This very brief genealogy shows that the concept pertains to sociology in general, and to the (constructivist) sociology of knowledge in particular, where the notion has historically been much more developed and used. In sociological terms, a community is a collective made of peers with respect to a shared characteristic, that isconscious of sharing it, which means that the shared characteristic constitutes the identity of the collective and of its members[12]. Epistemic communities, as Haas suggests[13], are distinct

from professions, disciplines or research communities. They are a deepening and concentration of professions or disciplines. Communities are also distinct from other modes of social organization such as markets (communities are not instrumental) or hierarchies or networks (they are not purposive). Communities are not coordinated to serve a given purpose, though the attribute which they share partly explains the behavior of the members of the community[14]. Identifying the "shared attribute" is a critical step for the use of the term to be relevant.

The innovation of international relations scholars was to put a sociological-epistemological notion to use in the study of international politics, to be able to analyze iconic cases of transnational policy convergence in such issues as environmental matters, energy policy or economic and trade problems. In this move, the notion of epistemic community became less of a sociological tool to study what binds together a given collective, or the prevalence of a communal mode of social relations in contemporary societies, but a concept to analyze the phenomenon of expertise. Expertise not only denotes the fact that some scientists or professionals detain codified and authoritative knowledge – something that, in turn, sustains their discipline or professionalism. In political science, what is of interest is the fact that, by virtue of owning such knowledge and knowledge credentials, these very knowledge-holders gather some influence over the course of international policies and decisions. In other words, the main question international relations scholars have in mind when they study communities of scholars, scientists or professionals, is the politics of expertise, or expertise as a pattern of influence on policies, rooted in knowledge.

The problem with which epistemic community scholars have grappled revolves around the translation of these sociological attributes to a political question: how far is this influence over policies explainable by the characteristic that the members of a community have in common – shared claims and notions or procedures of knowledge validity, in Haas's case? It is obvious, from the literature on epistemic communities, that scientists' or professionals' influence over international policies can not solely be linked to the cognitions they share. To be sure, knowledge sharing and cohesion is the starting point. Both Ernst and Peter Haas define procedural and substantive notions of scientific validity as the shared characteristic of the community. There are variations between the two authors[15], but these are in any case central, "non-negotiable"[16] elements of the conceptualization. What Ernst Haas stresses is that scientific communities are constituted by shared scientific beliefs, as well as by the sharing of a common philosophy of action—a scientific idealism of some sort: the belief that applying scientific knowledge will result in human welfare, coupled with the (more politically naïve) conviction that knowledge, truth and ideas move the world[17]. That philosophy explains that scientists are collectively active in international policy-making and politics, in their own way (neither like interest groups nor like activists). Peter Haas did emphasize the importance of what makes the community a community. Without shared claims and shared notions of validity, the epistemic community loses its authority, and the knowledge-to-policy transmission is more likely to break down[18]. In the terms of Cross, "the more internally cohesive an epistemic community, the more likely it will achieve a high degree of influence on policy outcomes"[19].

But although this is necessary, this is not sufficient. One needs to go beyond the community motif to be able to explain influence over the course of policies and norm

negotiation. Several factors are decisive, and have progressively been folded in the definition of epistemic communities. In summary, “While epistemic communities are the principal agents responsible for articulating such principles, norms, and rules, the extent to which they become more deeply diffused and embedded internationally has to do with the political influence of epistemic community members; their ability to persuade others, their ability to consolidate bureaucratic influence in important institutional venues, and their ability to retain influence over time”[20]. The literature has highlighted several concrete conditions for this political influence to materialize.

One of the conditions is that decision-makers or policy-makers are in an environment in which they are led to search for information and learn. What is decisive is the extent to which a relation ties up between decision-makers and potential knowledge providers. Decision-makers must be in search for validated knowledge, and turn to experts for advice, for the influence of the latter to materialize[21]. Members of an epistemic community may also act as advisers to these policy-makers, or be associated to national delegations to intergovernmental negotiations. In a different way, later work has tied epistemic communities to the process of policy transfer[22]. In so far as policy-makers agree to enter such cognitive processes and to depend on the social formations that allow policy tools, recipes or frameworks to circulate, they do create opportunities for the influence of epistemic communities—one such formation through which policy knowledge circulates—to materialize.

Another decisive aspect is the organizational ties between the epistemic community and international organizations, assuming that organized communities can “come to dominate standing expert advisory bodies or consistently serve as executors of

programmatic decisions."[23] Diana Crane documented how invisible colleges, as the active minority of larger academic or professional groups, influence international organizations by consistently sitting in (or indeed setting up) expert committees or by framing and participating in expert consultations[24]. The penetration of advisory committees by experts points to the possibility that members of the community slowly come to populate the bureaucracies or secretariats themselves[25], a confirmation of the fact that transnational communities generally do not stand alone in the world, but "are embedded in other types of collectives, and especially in formal organizations."[26]

The rest of the literature has dwelled on a third mechanism of policy influence. What is critical, many authors have noted, is that relations get established between the members of an epistemic community and what Haas called the "dominant political coalition" in the organization[27]. This has been broadly confirmed and illustrated in the subsequent literature[28]. It has been documented particularly well by scholars in European studies who wedded the study of epistemic communities to policy advocacy coalitions[29].

2. Expertise: producing knowledge across boundaries

This is where an ambiguity arises, though. How instrumental is the sharing of cognitions and criteria of truth, and the form of the community, for scientists or other professional experts to forge the demands and needs of decision-makers, to penetrate multiple organizations and to ally with policy coalitions? Can all of these critical mechanisms be collapsed in the concept of epistemic community, or is policy entrepreneurship and influence another shared attribute of those communities? There may be a gap between an epistemic community sociologically understood as a

collective made of peers with respect to the sharing of cognitions, and the kinds of systematic crossing of boundaries that defines expertise.

The first kind of boundary-crossing inherent in expertise is that between science and policy. The research performed in the field of STS over the years is helpful here[30]. It is useful to appreciate how the uncertainty and complexity of policy issues force scientists and experts to produce a kind of knowledge that will exceed scientific standards, and enter a field where criteria of facticity, validity and objectivity are much more contested or instable. Several terms have been invented since the 1970s by observers and social scientists, from trans-science to post-normal science, or yet regulatory science[31], which emphasize the fact that the body of scientific knowledge in question incorporates more than the products of experimental investigation, and attached theories, because the terms of the discussion are fundamentally politicized, controversial, or because they are technically unanswerable with the existing body of validated knowledge. STS has also demonstrated the extent to which science becomes politicized, and politics scientized, beyond and above the separatist discourse stressing their respective autonomy. Much of what has happened in the relations between science and policy in the last decades can be understood as a spiraling logic of politicization of science responding to a scientification of politics[32].

If this complex interplay between science and politics is observable in international politics, then more research is warranted on this phenomenon. If, on the contrary, science and politics are not intertwined in international affairs, this would still be an interesting phenomenon to study in its own right. It may mean that compliance with norms of transparency, accountability and responsibility are more effective there,

leading scientists and bureaucrats or state representatives to stay much more strictly within the boundaries of their legitimate role. Another possibility is that the inter-mingling of science and policy, which has been observed mainly in national public spaces, does not happen in international politics. This is doubtful because, as the literature on international epistemic communities shows, international knowledge is permeated and affected by uncertainty, and uncertainty, in so far as it leads all political actors to gather expertise and opens games of mutual deconstruction of knowledge claims, often prompts knowledge politicization. The politicization of expert knowledge, the emergence of controversies, and the termination of these controversies would thus all be relevant objects to study. One insight that may be imported from STS in international relations is that controversies are limited in cases of mutual construction of science and policy: "rather than being based solely on science, 'closure' is sometimes achieved by pragmatic regulatory decisions, which are often presented as purely scientific."[33] From such a perspective, influential expertise is the one that is produced at the junction of policy and science, within the social fabric that connects the two and its respective actors. The epistemic coalition among experts and policy-makers—or in the terms that prevail in STS, the "coproduction" of knowledge and forms of governance[34]—protects the experts' authority and their image of objectivity.

Second, experts cross boundaries because they span roles and kinds of behaviours. When scientists, scholars or professionals engage in policy enterprises and coalition building, they may continue to benefit from a kind of aura and reputation, linked to the fact that they belong to and represent an epistemic community. However, their behavior, in this instance, is not determined by adherence to epistemic standards, and the knowledge that they defend does not necessarily correspond to the standards of

their discipline. The people that are typically active in these spaces of interaction between science and international policies are multi-professionals, who have accumulated roles and positions along their career, and who often continue to circulate between various affiliations. They are experts in the sense of having trespassed or extended the boundaries of their legitimate professional activity, and of engaging in a more diversified portfolio of activities (including some for which they employ competences that would qualify as political much more than technical[35]) or of collaborating with a diversity of organizations, from national governments to multinational firms, for which their qualifications would vary. In certain cases, the involvement with the "expert" hat is a true political or ethical engagement in disguise. There too, the literature applying the notion of epistemic community is ambiguous. There are variations at the level of who is included in these communities: people with a strict academic or scientific role, or people that act from and for heterogeneous organizations (such as firms, governments, or NGOs)

The third kind of boundary that experts cross is the boundary between knowledge communities. From the perspective of the sociology of production of scientific knowledge, the very existence of communities of knowledge is in doubt. The new sociology of knowledge that emerged after Robert Merton (whom Ernst Haas cites) has cast doubt on the value of that notion to account for how scientific knowledge is formed and ascertained in practice. The succession of concepts for describing the social structure of knowledge production shows greater reluctance, over time, to speak of delimited scientific communities like Kuhn did, or also Fleck with his idea of thought

collective. Sociologists of the production of scientific knowledge do not think it possible to a priori identify demarcated groups of knowledge producers and holders, with defined "members".[36] Producing knowledge takes place through tacit exchanges in open collaborative networks[37], through informal contacts[38] or through institutional migrations motivated by conflict and controversies[39]. STS scholars have advanced alternative concepts over the years, which denote the porous and instable nature of knowledge communities, speaking of "research networks[40]", or "trans-epistemic arenas[41]", even taking distance with the loose and informal "invisible colleges" of Diana Crane [42]. From the perspective of arenas and other trans-scientific fields, communities have no material existence. The only tangible reality for the sociology of knowledge are not the delimited groups that carry it, but circulating ways of knowing things, points of references, epistemic practices or standards of proof.

In many of the cases that are studied in the literature on epistemic communities, more than one discipline as well as knowledge role (such as that of producer, publisher, standardizer, diffuser, or operator) is involved. As mentioned above, being an expert is in and of itself often a transgressive position. A set of people playing a diversity of roles generally does not form a community, at best a network—and in fact, epistemic communities have as frequently been defined as "networks" as as communities strictly speaking[43]—or a core-set[44]. If there is talk of a community, this is either the analyst imposing a category on the observed reality or the result (not the cause) of a political enterprise by concerned experts, to reinforce the image of unity of a group and the authoritativeness of the knowledge that is being advanced[45].

The notion of epistemic community continues to have great appeal and many virtues. It can be adjusted to reveal its full potential in possibly more complex cases where there is competition between knowledge claims in international politics, and where a diversity of sciences and types of knowledge are involved[46]. It is also a convenient box in which to put academics and experts, to simplify the role they play in international politics, alongside "IGOs", "NGOs", "states" and "firms" and other "interest groups". It is a concept for sociographical mapping of international politics. But there is a mismatch between the attributes that define what it is to be an expert in international politics, and the sociological assumptions embedded in the concept of epistemic community. The community motif is misleading. In sociological terms, it does not seem realistic enough, and conveys a false sense of collective and cohesive action on behalf of people strictly defined as knowledge-carriers—possibly explaining why "epistemic-like communities" are observed as often as epistemic communities tout court[47]. The notion of a community does not seem appropriate when the inquiry of how knowledge for or in international policy-making is actually formed, as it covers up the concrete mechanisms of formation of international policy knowledge under scientists' own "legitimizing veneer of scientific practices and successes"[48].

3. Trans-organizational spaces of policy knowledge

What would a sociological approach of collectives of knowledge production in international politics look like then? Instead of assuming a separation of knowledge-carriers and of policy-making, one possibility is to start from the hypothesis of a kind of knowledge that would be common to bureaucrats, state negotiators and "experts", something that may be termed policy knowledge. By international policy knowledge, I

do not mean technical knowledge that supports the formation of policies and decisions, but the causal relationships established between a given state of the world, a policy intervention and the effects attributed to this intervention on the original problem. The literature on policy framing and policy paradigms has given attention to such a thing under the notion of policy scripts or theories: naturalized causal narratives according to which action A produces outcome(s) B[49]. Policy theories are not necessarily always explicit, but where they play a role it is because they constitute a common knowledge of some sort. In my previous work, I have identified such policy theories in international regulatory areas, and have called them regulatory concepts, or ideas about the benefits of extending, standardizing a practice to address a given risk[50].

The main benefit of starting from such a notion of policy knowledge is that it takes down the supposed boundary between science and policy, or knowledge and policy, as well as the more or less explicit "two communities" vision that persist in the study of the use of knowledge in policy[51]. Policy knowledge is inseparably bureaucratic or political (embedded and expressed via bureaucratic experience and rules, as well as politicians' discourses) and professional. It may even be backed by data, facts and experiments, as well as validated theories – and hence appear scientific. In other words, it is an assemblage of different forms of knowledge, which does not need to be analyzed in terms of its uses or impacts: it is there. It reflects the knowledge forms and contents of a variety of actors in a field and, as such, it already "does" a number of things, such as making policy solutions exist and getting people to act towards these. While rarely applied to international policies, there is no real reason not to envisage the existence of transnational policy theories, and to try to find mechanisms by which they crystallize.

What this question of policy knowledge requires to do is analyze the relations between transnational collectives of experts and international organizations, to be able to understand how a seamless space of knowledge formation appears that cuts across potential boundaries. The very production of policy knowledge, including by experts, is not necessarily detached from international organizations, even though they pertain to policy, as opposed to science. So, beyond characterizing what knowledge the expert collectives carry and convey to international organizations for these to "use", we may ask what kind of knowledge is produced or articulated within this relational structure, and how.What are the actual practices of knowledge production that are enabled in the set of relationships that tie experts to international organizations, and what form of knowledge and objectivity does it produce?

One example can be found in the international food safety policy deployed by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) through Codex Alimentarius standards. One such standard establishes that food businesses, of whatever sort, must have a food safety assurance plan in place of the "Hazard Analysis Critical Control Point" kind (HACCP; a method that is inspired by reliability engineering). The generalization of this measure is believed to solve the problem of the prevalence of foodborne diseases worldwide. The standard is defined in a guideline of the Codex Alimentarius, a standard-setting body supervised by the WHO and the FAO, and a reference body in the framework of the World Trade Organization (WTO). The preamble of that guideline reads like an explicit policy theory: "Any HACCP system is capable of accommodating change. HACCP can be applied throughout the food chain from the primary producer to final consumer. As well as enhanced food safety, benefits include better use of resources and more timely response

to problems. In addition, the application of HACCP systems can aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety[52]". That theory was articulated over a long period of time (approximately 1969 to 1993), across various organizations: Pillsbury and Nestlé, as companies where the practice was experimented and established as an internal standard; the International Commission for the Microbiological Safety of Foods and the International Life Science Institute, as scientific think-tanks which modelled the practice and quantified its benefits for controlling food contaminations; various national regulatory organizations, which recommended the use of the emerging method in food industries; international organizations, namely the European Commission, the WHO, FAO and the Codex Alimentarius, through expert meetings, reports and organizing state negotiations. The theory progressed in this rather delimited circuit of actors Itfound its proponents, a self-styled "HACCP mafia" comprised of veterinarians and food microbiologists who consistently worked on the topic in these various settings, and liaised among themselves more and more as the consensus on the theory was taking shape.

In previous work[53], I have built on the concept of "invisible college" to capture the attributes of this loose collective of mobile and polyvalent scientists that contribute to the transnational formation of a regulatory concept. The first attribute is elitism, to be understood as the capacity of some scientists to appear to work as experts or advisers simultaneously or successively in a number of organizations of one regulatory area. The second is circulation, to be understood as the mobility and polyvalence of people who navigate between various sites of policy experimentation, but also between regulatory and regulated organizations. The third is a particular relational pattern, namely the fact that these collectives are loosely coupled. They are typically made of

weak links. The interactions between the people that form part of the collectives are intermittent. The group rarely meets in one place as a whole, but socializes in small clusters. The circulation of these experts in the transnational environment can be individual most of the time, and in group only rarely. Most importantly, they meet in "interstitial" organizations—places that are not affiliated with any vested interest, or only ambiguously so[54]. The invisible college connected the various sites in which HACCP-like practices were innovated (multinational food companies), and other sites of formal or informal standardization of the practice (such as industry think-tanks, US and European regulatory agencies, expert committees of the WHO or of the Codex Alimentarius), such that the HACCP has grown increasingly codified, commodified and abstracted. It became a portable and generic model of food hygiene practices. The fact of being able to replicate experience across various settings, to sell that generified experience in various policy environments, to articulate an objective "view from nowhere[55]", are signs of the capacity of the set of scientists to articulate a shared policy concept. What seems important to note is that the set of scientists that contributed to this transnational concept formation became conscious of its own existence and potential impact on the standardization as it was happening—they were not a community upfront.

International bureaucracies, in this case the WHO, have played a key role at several points to shape the circuit of standardization of food safety policy. There were several key interactions between these organizations and the emerging college of experts. First, the WHO selected and instituted a set of microbiologists as those who were to be consulted on the issue of food safety. The WHO called the same slowly rotating set of scientists, as participants in ad hoc meetings, members of permanent advisory

committee or as respondents to call for research projects. Second, the WHO did this in coherence with an internal shift in the framing of the issue of food safety: declaring that the problem of transmissible and foodborne diseases should be prioritized over the issue of chemical contaminations (hence the weight given to biological expertise over toxicological and chemical expertise). This shift is also sensible in the selection of staff for the offices of WHO headquarters, where more veterinarians (including some that were friends with or recommended by the external experts that the WHO preferred to consult) were recruited. A more epistemological note is that there was an affinity between the way of seeing and knowing things that prevailed at the WHO headquarters and the perspective that the invisible college of experts articulated (food safety understood as a question of reliability in food production, mostly shared among microbiologists and veterinary people). Third, the WHO placed pressure on other actors of this international field, i.e. national governments, to consult those very experts that were advocating the emerging regulatory concept. In all three ways, the action of the international bureaucracy concurred with that of the invisible college, to consolidate emerging policy knowledge *and* what eventually appeared to be an epistemic community in food safety. The history of the HACCP concept thus illustrates how a community appears to form as policy knowledge is taking shape.

Conclusion

Knowledge in international relations, or in international policy studies, is often approached as if it was produced in one place, then transferred and finally used in another, as if knowledge was there to be carried and conveyed by experts, already black-boxed and packaged, for international bureaucracies and states to act on it. The

"community" motif accentuates the idea of cohesiveness and solidarity among experts and over-emphasizes the existence of an ontological boundary between them and policy-makers, between producers and users of knowledge. The historical focus on scientific expertise in the literature on epistemic communities has also contributed to this emphasis, at the expense of investigating how this boundary is managed, as knowledge that is relevant for international policy making is being articulated. The example that is given here provides an illustration of how the relations between experts and international bureaucracies can be revisited if we consider that what is happening in between them is a production of common policy knowledge. Among other things, it forces us to consider that the actors of international politics are not ontologically given at the outset, but that both the international organizations in question and the collectives of experts are strengthened in their identity, as the representation of an international policy solidifies. In a nutshell, it is the concept that makes the community, as much as the opposite.

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[40] Mulkay, M. J., G. N. Gilbert, and S. Woolgar. “Problem Areas and Research Networks in Science.” Sociology 9, no. 2 (1975): 187–204.
[41] Knorr-Cetina, Karin D. “Scientific Communities or Trans-epistemic Arenas of Research? A Critique of Quasi-Economic Models of Science.” Social Studies of Science 12, no. 1 (1982): 101–30.
[42] Crane, Diana. Invisible Colleges. Diffusion of Knowledge in Scientific Communities. Chicago & London: The University of Chicago Press, 1979. Quite surprisingly, Peter Haas argues that the sociologist of science Karin Knorr-Cetina must be credited to coining the term “epistemic community” (Haas 2001, ibid., p. 11580). The expression, however, can neither be found in her 1981 book on “the manufacture of knowledge” nor in her 1999 opus on “epistemic cultures” (Knorr-Cetina, Karin. Epistemic Cultures: How the Sciences Make Knowledge. Harvard University Press, 1999). This attribution is all the more puzzling as Knorr-Cetina on the contrary develops a rather explicit and extended critique of the concept of scientific community, to which she prefers the notion of trans-scientific fields or trans-epistemic arenas (see Knorr-Cetina, K. D. The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science. Elsevier, 1981 (Chapter 4) and Knorr-Cetina 1982, ibid.).
[43] Haas et al. 1977, ibid; Haas 1992, ibid.
[44] Jasanoff, S. “Breaking the Waves in Science Studies: Comment on H.M. Collins and Robert Evans, ‘The Third Wave of Science Studies.’” Social Studies of Science 33, no. 3 (2003): 389–400.
[45] Gieryn, Thomas. Boundaries of science. In Handbook of science and technology studies, ed. Jasanoff, Sheila. SAGE, Thousand Oaks, 393–443; Jasanoff 2003, ibid; Hoppe 2005, ibid.
[46] Cross 2013, ibid; Morin 2015, ibid.
[47] Haas 1992, ibid; Higgott, Richard. “Pacific Economic Cooperation and Australia: Some Questions about the Role of Knowledge and Learning” 46, no. 2 (1992): 182–97; Stone, Diane. Knowledge networks and global policy’, in Global Knowledge Networks and International Development: Bridges across Boundaries, eds. D. Stone and S. Maxwell. London: Routledge, 89–195; Pianta, Mario. “Slowing Trade: Global Activism Against Trade Liberalization.” Global Policy 5, no. 2 (2014): 214–21; Zimmerman, Erin. Think Tanks and Non-Traditional Security: Governance Entrepreneurs in Asia. Palgrave Macmillan, 2015.
[48] Hoppe, Robert. “Rethinking the Science-Policy Nexus: From Knowledge Utilization and Science Technology Studies to Types of Boundary Arrangements.” Poiesis & Praxis 3, no. 3 (May 12, 2005): 199–215.
[49] E.g. Sabatier, P. A. and Hunter, S. (1989), ‘The incorporation of causal perceptions into models of elite belief systems’, Political Research Quarterly, 42(3), 229–261; Hofmann, J. (1995), ‘Implicit theories in policy discourse: An inquiry into the interpretations of reality in German technology policy’, Policy Sciences, 28(2), 127–148.
[50] Demortain, David. Scientists and the Regulation of Risk: Standardising Control. Cheltenham, United Kingdom and Northampton, MA, United States: Edward Elgar Publishing, 2011. Many other examples could be thought of here to illustrate this phenomenon of international policy knowledge – market based scripts being a case in point. Goldman documented the progression of a policy motto of universal access to water services in the World Bank, and the associated theorization that privatization is the appropriate

instrument to reach this outcome, as testified by economic calculations of the superiority of private arrangements (Goldman, Michael. "How 'Water for All!' Policy Became Hegemonic: The Power of the World Bank and Its Transnational Policy Networks." Geoforum 38, no. 5 (2007): 786–800). Ongoing work on global food security point to the same co-construction of international policies with econometric models (Cornilleau, Lise, and Pierre-Benoit Joly. "La Révolution Verte : Un instrument de gouvernement de la 'faim dans le monde'. Une histoire de la recherche agronomique internationale." In Le gouvernement des technosciences. Gouverner le progrès et ses dégâts Depuis 1945, ed. Pestre Dominique. Recherches. La Découverte, 2014).

[51] Freeman, Richard, and Steve Sturdy, eds. Knowledge in Policy: Embodied, Inscribed, Enacted. London & New York: Palgrave Macmillan.

[52] Codex Alimentarius Commission (2003), Recommended International Code of Practice General Principles of Food Hygiene, Cac/Rcp 1- 1969, Rev. 4- 20031, Geneva: FAO/WHO.

[53] Demortain 2011, ibid.

[54] The phrase that de Solla Price uses to speak of invisible colleges of scientists seem to be applicable here. The organization of science into colleges 'is not perfect': all important people are not always in the same place at the same time, some who would qualify to be in the group indeed never come. These people also 'meet piece- meal'. A college is above all a 'commuting circuit', 'so that over an interval of a few years everybody who is anybody has worked with everybody else in the same category' (Solla Price (de), Derek. Little Science, Big Science. New York: Columbia University Press, 1963, 84–85).

[55] Daston, Lorraine, and Peter Galison. "The Image of Objectivity." Representations, no. 40 (1992): 81–128.