

## STS as a Lens to Study Disciplines and Interdisciplinarity: A Comment on Sharon Traweek's "I Prefer the Map"

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### Abstract

In the 2020 Prague Virtual Conference of the Society for Social Studies of Science (4S), Sharon Traweek was awarded the society's John D. Bernal Prize jointly with Langdon Winner. The Bernal Prize is awarded annually to individuals who have made distinguished contributions to the field of STS. Prize recipients include founders of the field of STS, along with outstanding scholars who have devoted their careers to the understanding of the social dimensions of science and technology. In this essay responding to Traweek's Bernal lecture, Sørensen draws on her critical understanding of academic disciplines to discuss how STS may develop the field's understanding of disciplines, interdisciplinarity, and itself.

### Keywords

Bernal prize; faultlines; epistemic authority; epistemic politics; disciplines; interdisciplinarity; Sharon Traweek

### Introduction

I feel honored and grateful for the invitation from the editors of ESTS to comment upon Sharon Traweek's speech on receiving the Bernal award of 4S. I believe this award was a timely recognition of an important scholarly effort that has helped us in understanding how scientific cultures are intersected by transnational political economies as well as local articulations of gender, class and ethnicity, and of an impressive amount of academic service work to the benefit of the broader STS community. Sharon's article, based on her speech when receiving the Bernal award, is rich and stimulating. It offers important challenges to widespread scholarly approaches to the understanding of science and technology, drawing on her longstanding intellectual concerns. One of these is the regime of academic disciplines, which she sees not only as a conservative force that limits inquiry, but also as a machinery of power that bestows epistemic authority in ways that limits the making and exchange of knowledge.

This comment pursues these ideas by addressing some aspects of the epistemic politics of the dominant discipline-based regime of production of knowledge and the growing set of interdisciplinary practices. My concern is to understand these practices when the norm is membership in a discipline, which increasingly is challenged, and relating this to features of STS. How has STS navigated the issues of disciplines and

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interdisciplinarity and the related epistemic politics? As I will discuss below, there are paradoxical aspects of STS that may illuminate the doing of disciplines and interdisciplinarity but also serve as a resource to reflect upon STS as a knowledge formation and community.

Mainly, I share Sharon's critical views of disciplines and the making of epistemic authority and believe that STS scholars should reflect more frequently about how the regime of disciplines shapes the field's own practices: how it orders the making of, assessment of, and traffic in knowledge. What faultlines have provided spaces for STS to grow? Are academic disciplines policed to the same degree and how does academic policing influence STS? Arguably, STS scholars have tended to study science with an empirical focus on the particular; the problem area or the site that is researched, often focusing on a single laboratory. Consequently, disciplines have mainly appeared as backstage phenomena. Their role has often been conceptualized using cartographic metaphors concerned with boundaries and the traffic of knowledge taking place across them, analyzing how the mobility of knowledge is affected by the boundaries and asking about barriers, transformations, and related boundary practices.

This has resulted in a host of concepts widely employed in STS, such as boundary work, boundary objects, trading zones, boundary walking, boundary crossing, borderlands, etc. They provide an understanding of how disciplines are upheld but also about how they may be transgressed in pursuit of interdisciplinary or transdisciplinary making and flowing of knowledge. However, I see a need to discuss the performativity of such cartographic metaphors and their usefulness when we study how disciplines and interdisciplinary communities make knowledge and shape the flows of knowledge.

### **Are Academic Disciplines "Silos"?**

STS scholars do not unambiguously share a critical understanding of the disciplinary regime of knowledge making, which contrasts to the distinctly negative descriptions often articulated by research policy communities. They tend to see disciplines as unable to effectively address the complex problems that are facing today's societies; academic disciplines are even seen as barriers to such problem-solving. A recent OECD report argues the need for more what they call transdisciplinary research that integrates academics from several scientific fields with non-academic participants to co-create new knowledge ([OECD 2020, 15](#)). It invokes the metaphor of "silos" to emphasize the problems with the specialized, fragmented and self-contained features of disciplines, which is seen to hinder much-needed combinations of knowledge across and beyond disciplinary boundaries ([ibid., 29](#)). The report claims that this inability to contribute to the integration of knowledges is due to currently dominant research practices, with their standards for collecting and managing data and their narrow evaluation criteria. Furthermore, it outlines a series of policy interventions to push for more integrative research, such as economic incentives and dedicated research programs.

However, the report does not resolve the seeming contradiction between its overall, optimistic call for more integrative research and its highlighting of the barriers towards such research offered by the system of academic disciplines. Maybe this is due to the implicit belief that with time inter- and transdisciplinary research somehow will prove superior to that provided by the traditional disciplines. At least, assumptions

about such superiority are common in policy communities ([Frickel, Albert, and Prainsack 2017](#)). Perhaps research that transgresses the disciplines is more common than usually assumed? This is difficult to assess because the concept of interdisciplinarity is notoriously unclear. Thus, such activities have proved difficult to map or measure. Disciplines may still engage with their ability to bestow epistemic authority but also concerned that their authority may erode.

The cartographic metaphors offered by STS scholars suggest that interdisciplinarity mainly is about transgression, about how knowledge may flow across disciplinary borders. Thus, these metaphors arguably sidestep many of the concerns raised by the OECD report because they put less emphasis on how disciplinary knowledges may be synthesized, integrated, or superseded. The focus on exchange is clearly expressed in the way that the two largest STS societies describe their membership. In 4S, membership “is open to anyone interested in the interaction of science, technology, or medicine and society” (see: <https://www.4sonline.org/what-is-4s/>). “Anyone” currently includes “scholars in traditional academic disciplines, . . . scholars in areas of study outside traditional academic disciplines, . . . physical and life scientists and engineers interested in the social aspects of their fields” and interested members of the public. EASST similarly explains that the society “brings together a variety of disciplines and many of its members have qualifications in both natural science/engineering and social sciences” (see: <https://easst.net/about-easst/>).

This inclusiveness suggests a commitment to interdisciplinarity, but mainly as a practice of exchanging knowledge and ideas and building networks. A shared interest in STS topics is assumed to be the girder of the academic interaction, but it is unclear what this means. The practices of the two societies have not provided for “integrative research” as called for by the OECD report or emphasized stable forms of interdisciplinary collaboration. The main activity of the two societies revolves around organizing large bi/annual meetings, which at best are transient scholarly encounters. Admittedly, EASST has instituted two publication prizes, the Amsterdamska award and the Freeman award, which rewards collective efforts and where interdisciplinarity is valued. 4S has four publication prizes: the Ludwik Fleck prize, the Rachel Carson prize, the David Edge prize, and the Nicholas C. Mullins prize. They are predominantly awarded to individuals. The David Edge prize for best article has sometimes been given to co-authored papers but never to more than two co-authors. It is tempting to see the award practice of 4S as reflecting an understanding of interdisciplinarity as a quality of individuals who have acquired knowledge from several disciplines, casting them as encyclopedic scholars. This resonates with widespread ideas in the education of professionals such as engineers, medical doctors, and lawyers who are expected to acquire knowledge also from fields outside their specialty. With respect to engineers, their training was historically shaped by the so-called polytechnical ideal that could mean the inclusion of some social science and humanities input, in addition to mathematics, science, and supporting engineering areas ([Sørensen 2009](#)). Given the epistemic authority of these professions, such individual interdisciplinarity seems not to be a disadvantage.

4S and EASST offer arenas for interdisciplinary exchanges, but if we want to consider the daily practice of STS, we need to look at the many departments, centers and programs that offer degrees in STS and conduct STS research and thus appear to be relatively stable communities. Engagement with teaching requires the

construction of STS curricula, ideas about core STS skills, and thus some intellectual stability that goes beyond what is needed for research. This stability should be considered an achievement since the faculty employed by STS institutions often have a heterogeneous background; some with degrees in STS but many coming from disciplines such as sociology, anthropology, political science, history, and philosophy. Some also have been trained in engineering and science. Arguably, teaching STS from such diverse backgrounds requires some form of integration practices, but these practices are seldom made transparent. Thus, it is unclear how integration is performed and the extent to which epistemic authority is attributed to STS. If we use a trait approach to disciplines, STS may check many boxes. However, having a degree in STS does not seem to provide much epistemic privilege. This is demonstrated by the membership and election practices of 4S and EASST but also in the governance of STS departments, centers, and programs. What integration practices may be observed?

### **Interdisciplinary Practices in/of STS**

The integration practices related to the teaching of STS seem opaque. It is not given much attention, which we also may observe in the STS handbooks and the few available textbooks. This is different with respect to research, where STS stands out as a knowledge making formation with scholars who have an affinity towards interdisciplinarity, maybe even see the pursuit of such modes of research as virtuous, in particular when interacting with science and engineering. The result is a diversity of practices. Sheila Jasanoff (2016) provides one view of this diversity when she distinguishes between two modes of STS; Science, Technology, and Society that focuses on critical investigations into how science and engineering impact society, employed to invite reflection on such impacts and how they may be moderated, and Science and Technology Studies that analyses the epistemic work and cultures of science and engineering to make visible the social aspects of the efforts involved in the construction of such knowledges. Both these modes involve interdisciplinary interaction with science and engineering, but in diverse ways.

The critical mode is based on inquiries into the aspirations for social change and thus on an ability to translate scientific and engineering discourses into social science and vice versa. This mode has also evolved into more constructive engagement with engineering and, to a lesser extent, scientific communities.<sup>1</sup> Such engagements require cooperation with engineers and scientists to provide reciprocal translations between science and engineering on the one hand and social science and humanities scholarship on the other, in order to facilitate integration of these different forms of knowledge. Integration may be achieved, for example, by exploring and utilizing insights into the contexts of and conditions for beneficial applications of the scientific and/or engineering knowledge available in a project. STS scholars may develop insights about potential users and their requirements; insights that are co-produced with engineering or scientific problem

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<sup>1</sup> Constructive technology assessment is an example (Rip et al. 1995). The more recent policy concerns such as Ethical, Legal and Social Aspects of research (ELSA/ELSI) and Responsible Research and Innovation (RRI) are other examples (e.g., Stilgoe and Guston 2017).

solving. Thus, interdisciplinarity becomes a collective achievement even if the research does not result in co-authored publications.

The resulting integration practices seem to offer limited epistemic authority. Pragmatism often rules in the sense that new knowledge is accepted when it is seen to be useful. Epistemic authority may also emanate from the rhetoric quality of the arguments, possibly also from charismatic features of (some) participants. From my experience, for STS scholars it may help to have a degree in science and engineering, to be recognized as a kind of insider.

Jasanoff's second mode involves a different form of interdisciplinary integration, described by Harry Collins and Robert Evans as interactive expertise: the ability to "walk the talk" of a given expert community in science or engineering ([2007](#)). This is mainly an individual achievement that is vital to be able to analyze and publish insights about features of the epistemic culture(s) under scrutiny. Practitioners of this mode of STS tend to have higher status in the field, but if they have epistemic authority, it is a result of scholarly recognition rather than emanating from membership in the STS community.

However, both modes as Jasanoff describes them, focus singularly on research in intersections between STS and science, engineering, or medicine. Interactions with social science and humanities disciplines like those we may encounter at 4S and EASST meetings and at STS centers and departments seems to be left out of the equation. When STS scholars reflect on the challenges of interdisciplinary collaboration, they are mainly concerned with science and engineering. Does that mean that exchanges with social science and humanities disciplines are unproblematic? Sharon's article definitely suggests otherwise. Problematic exercise of epistemic authority is not restricted to science disciplines.

Interdisciplinary exchanges of knowledge involving STS and social science and humanities disciplines take place mainly in the context of universities. Universities are the home of disciplines, offering them partly protected epistemic spaces emerging from particular co-productions of teaching and research, loosely related to the Humboldtian idea of a unity of research and teaching. So-called research-based teaching is usually seen as a defining feature of universities ([Sørensen and Traweek 2022](#); available Open Access). It emphasizes their dual role as institutions of both research and higher education. The co-production of research and teaching is vital to the reproduction of disciplines. Teaching is intended as a process of socialization into a discipline, as efforts to train students to acquire its predominant worldview, values, and standards and thus learn them to emulate accepted ways of conducting research and writing. In my experience, the boundary work of disciplines tends to focus more on students than outsiders.

This does not imply that boundary work and the accompanying socialization efforts are effective. For example, the disciplinary background of STS scholars is diverse, but this diversity has unclear effects regarding STS research and teaching. Arguably, the epistemic spaces that universities offer academic disciplines are not silos as much as crossroads. The disciplines are not fully autonomous and bounded entities even if efforts are made to produce such an impression. The impression is misleading because there is considerable traffic in knowledges between the disciplines, for example with respect to theories, concepts,

and methods. Moreover, most students take subjects not just from a single discipline but also courses from other fields; some even change their major at a quite late stage.

Many universities offer epistemic space to STS and similar fields, such as gender studies and environmental studies, even allowing them to have teaching programs of their own. This is not always popular with the established disciplines, but this kind of dissatisfaction does not seriously restrict the comprehensive traffic in knowledge that involves both disciplines and non-disciplines. Andrew Abbot (2002) argues that this “chaos of disciplines” affects all social sciences, to the extent that the disciplines shift and interact. They leak knowledges in ways that paves the way for what Abbot calls “proto interdisciplinarity”; a practice that simplifies knowledge exchange across disciplines. This dynamic reflects pragmatic and opportunistic features of research. Researchers use the resources available to them to appear inventive and original (Knorr 1979). Such goals are considered more important than adhering to disciplinary standards.

This obviously facilitates the interaction between STS and social science disciplines, probably also with the humanities that have a long history of proto-interdisciplinarity. Still, we should ask about what happens through such interaction. Is STS merely a crossroads of streams of input from established disciplines, an interdiscipline without coherence? Are the disciplines unaffected by interaction with STS? We may pursue these issues by drawing on John Holmwood’s (2010) distinction between “importer” and “exporter” disciplines as a way of describing interdisciplinary traffic in knowledge. He suggests that fields such as STS are importers, while social science disciplines such as sociology are exporters. This would confirm the idea that STS mainly is an interdiscipline and that the optimistic perception among STS scholars of practicing interdisciplinarity with social science and humanities disciplines is due to the field’s developed practices of appropriating their theories, concepts, models, methods, and findings rather than providing radically new insights.

However, Holmwood’s distinction seems like a traditional defense of the disciplines and a way of invoking a hierarchy between them and interdisciplinary work. At my university in Trondheim (NTNU) a report was published in 2021 about future developments regarding studies in the humanities and social sciences (see: <https://www.ntnu.no/fremtidenshumsam>). It states that the ambitions are “to educate students who with a strong disciplinary identity and skills with respect to interdisciplinary interaction contribute to create a better world” (Børresen et al. 2021, 10). The disciplines are supposed to provide foundational knowledge, they are exporters, while interdisciplinary work is a matter of skills; it is an epiphenomenon to the disciplines from which they import knowledge.

Nevertheless, there is little doubt that STS is also an exporter of theories and concepts. For example, Arie Rip argues that a core STS approach that he designates “pragmatic constructivism” has stabilized and been mainstreamed to social science and humanities disciplines (Calvert and Rip 2018, 190). Moreover, some STS scholars are widely cited in many disciplines. Many of us publish in disciplinary journals and may have multiple professional identities. This complicates the principled distinctions between scholarly areas and suggests that such binaries as the one between “exporting” and “importing” field are misleading.

Still, we need empirical inquiries into and more reflections about how the relationship between scholarship in STS and social science and humanities disciplines is enacted. Why has the institutionalization of STS not made STS into a discipline but rather into a knowledge formation based on what we could call disciplined interdisciplinarity, a particular practice of navigating and domesticating flows of academic knowledges ([Sørensen 2012](#))?

### **Beyond Cartography**

Sharon's speech may be read as a narrative about the formation of one STS subject, emphasizing the importance of the hybrid, the diverse, the critical, the inquisitive, and the transformative. These values are widely shared in STS and sources of the dynamism of the field. They are also counter-disciplinary in the sense that they encourage scholarly openness and, as Sharon stresses, critical reflection regarding the epistemic assumptions of all involved knowledge makers that we relate to in interdisciplinary work, including our own.

If we use STS as a lens to understand the dynamics of knowledge exchanges, the role of disciplines and the potential for interdisciplinarity, one important observation is the multitude of practices. STS scholars study disciplines and professions, above all science, engineering, and medicine, we collaborate with scientists, and we have complex interactions and exchanges with social science and humanities disciplines. As I mentioned previously, this diversity should serve as a warning against efforts to provide all-encompassing definitions, criteria, or indicators to identify what interdisciplinarity is or is not. We must recognize a changing ecology of knowledge-making that complicates assessments and epistemic authority as suggested by concepts like Mode 2 and post-normal science.

When we try to make sense of the changes and understand what may be involved in interdisciplinary work, I believe as already suggested that we need to be more careful with invoking the frequently used cartographic metaphors. Some of those who engage in the traffic of theories, concepts, models, research findings, etc. are boundary walkers or employ boundary objects but are such characteristics always the best? Sharon situates herself in a borderland, using this concept productively as a sense-making device, but I think that to see STS as a borderland confines the understanding of the multiplicity of ongoing making of and traffic in knowledge. We need to consider the performativity of cartographic metaphors, for example how they may provide an image of disciplines as relatively homogeneous and well-ordered, in contrast to the proto interdisciplinarity that Abbot ([2002](#)) observes. Moreover, in my experiences, disciplines and professions differ considerably in their boundary work and their policing efforts to create or retain epistemic authority. We should be cautious not to discuss in general terms how the regime of disciplines may inhibit interdisciplinarity or to think about integration of knowledge primarily as an issue of transgressing disciplinary boundaries.

Rather, if we consider universities as complex spaces of epistemic sub-spaces of disciplines and other forms of knowledge formations, we could try other kinds of metaphors. For example, we may think of universities as sets of folded epistemic spaces, in turn consisting of folded epistemic sub-spaces. This may facilitate the observation of multidimensional, heterogeneous flows between folds, complex interactions between a

multitude of disciplinary specialties and academic positions that supersede or challenge ordering and hierarchies. We may notice the degree of polyvalence of the inhabitants of epistemic sub-spaces, using a metaphor based on chemistry to describe their varying ability to and interest in bonding with people and knowledges from other sub-spaces. Some disciplines may be more strictly disciplined than others, with epistemic spaces folded inwards to form silos, thus inhibiting academic polyvalence, but optimistically I think they are in retreat.

In line with this argument, I propose to characterize STS as a community with a capacity and mentality that cultivates academic polyvalence to engage in the forming of a multitude of knowledge attachments. At least this is what I believe STS should be; to be in the forefront of participating in the changing ecology of knowledge making. Faultlines may appear to curb this process, but they are not necessarily emanating from efforts to reproduce disciplines and uphold disciplinary boundaries. Rather, I see them as produced by bureaucratic measures to impose order and homogeneity to facilitate academic governance of universities and continued implementation of the still dominant neo-liberal policies (Sørensen and Traweek 2022). To draw new maps of academic activities by considering complex multidimensional processes of folding will require much more work, but it should be worthwhile to pursue, to provide for more nuanced understandings of interdisciplinarity as well as of STS.

### Author Biography

Knut H. Sørensen is Professor emeritus (Science and Technology Studies), affiliated with the Department of Interdisciplinary Studies of Culture, NTNU. Currently, his research interests focus on university governance and culture, including gender balance issues, interdisciplinarity, quantification, and sustainability transitions.

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