Discussing the symmetry principle: towards a realist dialogue inside global STS theory

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1. Introduction

Globally, STS is intrinsically associated with David Bloor’s symmetry principle (1976). As we know, symmetry is a geometry idealization. Applied to linguistic issues, symmetry could mean that when we translate from Spanish to English, we do not lose anything in the translation process. If this is so, why am I writing in English despite the fact that my native language is Spanish? The quick answer to this question is because symmetry is often apparent, but not substantial in the social world – including science – and the stipulation of writing in English in the academic sphere all over the world shows that there are other mechanisms working underneath the translation process. In that way, of course, it means that true and false scientific claims cannot be considered symmetrical at all, except in a trivial sense as beliefs. If this is correct, we can discuss seriously the validity of the symmetry principle in science and technology studies.

To debate this, I consider the contribution of Lin and Law’s types of knowledge and their proposal about STS method, both with flawed arguments due to the confusion between social and epistemic levels of analysis. I will begin by summarizing Bloor’s contribution and then I will refer to Lin and Law’s works to discuss two issues: one related to a classification of East Asian STS practices presented in Lin and Law (2018), and the other related to the proposed method of enlarging the canon, and promoting inter-contextual dialogues (Law and Lin 2017). Regarding the first issue, I will give examples from Latin America in order to discuss problems with the symmetry principle in standard STS approaches. With respect to the second issue, I would like to share a nuance related to the epistemic hypothesis involved in STS theorization. I have to do this succinctly in order to discuss the role of this foundation principle and propose a different scheme for characterizing the STS framework. The aim of this comment is to discuss problems of relying on the symmetry principle to build a new dialogue between STS scholars from different world regions.

2. A brief interpretation of Bloor’s symmetry principle

It is important to contextualize the emergence of the symmetry principle in order to preserve a critical understanding of its problems. The principle was elaborated in the
European intellectual context of the 1970s. It arose from the Strong Programme (SP) in sociology of knowledge (Bloor 1976) as a consequence of Bloor’s interpretation of Mertonian sociology of science.

A brief overview of how scientific knowledge is characterized by the SP includes three methodological principles to formulate a sociological theory of scientific knowledge. The first principle is causality, meaning that explanations of scientific knowledge must include social causes. A second principle is impartiality, which considers that all beliefs (true and false) are just beliefs. And finally, the principle of symmetry, which states that true and false beliefs have the same type of causes (Bloor 1976). As an addition, Collins states that results of scientific research are not decisive as claims of scientific knowledge or as a claim for scientific consensus (1981). Callon adds the assumption of identity between Nature and Society, or principle of generalized symmetry (1986). This theoretical corpus denies the difference between epistemology and methodology and the difference between methodology and knowledge (or theoretical outputs), and produces a new field called STS. The result was the dissolution of both analytical contexts of knowledge, the blurring between the internal justification issues and the external discovery issues. The distinction between epistemology and methodology was replaced by the distinction between official and alternative knowledge, and one vision of research strategies as teleologies that promotes certain scientific narratives (Domenech and Tirado 1998; Ramos 2012; Bycroft 2016).

If we focus on the broader picture, the emergence of STS (SP version) as a hot topic in the social sciences was due to its resonance with intellectual and historical events. These include the renewal of Marxist views (German and Italian schools), the Foucaultian epistemic revolt and the philosophy of science controversies (Popper, Kuhn, Lakatos and Feyerabend). At the same time, decolonization and the 1960s social revolutions captured the imagination of scholars and the students all over the world.

The intellectual effect of all those events was to create the conditions for a break with an older theoretical tradition: the Mertonian approach. The social revolutions of the real world opened the door to the radicalization of theoretical activity. In the 1970s, radicalization was honest and fresh. It was the legitimate answer to the predominance of authority over free thinking in Academia. The radical turn in sociology of science created a new paradigm, the so-called social constructivism, supported by all sorts of justifications distilled from philosophy of science controversies. Indeed, the result of this intellectual move was crucial for the emergence of STS in two senses. It denied the monistic viewpoint of positivism in social science and permitted the very core of the field to include other intellectual approaches, coming from other geographic regions, as valid (at least theoretically). Indeed, historically, the outcome was the Orwellian saying: “All animals are equal, but some animals are more equal than others.”

If we want to compare traditional sociology of knowledge (and science) with the SP framework, we must admit that the former is richer than the latter. The reason is quite simple: scientific reasoning is enriched through analytical distinctions. If we mix things (entities with properties, ontologically speaking), it is hard to think clearly. It is the same problem as when we mistake causal factors with contextual social factors. In contrast,

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1An interesting selection of papers written by those authors from that period can be found in Delanty and Strydom (2003).

2The major argument for this is the fact that discoveries or formulas were many times independently elaborated geographically as well as historically, as the history of science shows (e.g. Leibniz and Newton).
historically speaking, we may say that the SP permits the emergence of new and important topics, and new and relevant explanations and research orientations. Maybe the most important one was the emphasis on “practices” or the “doing science” problems.

Unfortunately, this new research agenda was distorted. The problem was not the aim of the SP, but the method. Indeed, the method may be characterized as ideologically based with no evidence as support, and with a research strategy much more equivalent to a lawyer’s litigation strategy (the theory of the case) than to the logic of scientific research. Even so, the SP results are remarkable and will last. Basically, these are two. On one side, we cannot assume that all knowledge is scientific, as well as that science is not limited to monism (or positivism or abstract empiricism). On the other, we cannot assume that knowledge can be reduced to the Western intellectual tradition, nor that science can be limited to a Eurocentric point of view.

Here, we agree with Chakrabarty (2000) in that “provincializing Europe is not a project of rejecting or discarding European thought” (16). But we also think that neither is it a project of forgetting scientific realism and science in general as the most important legacy of European thought. And despite the fact that Latour, dialoguing with De Vrieze (2017) about “Science wars,” recognized that “I certainly was not anti-science” and therefore lowered the profile to his theoretical claims saying “there was some juvenile enthusiasm in my style” (159), I think that, for many defenders of the symmetry principle and of constructivism, criticism about the work of scientists transmutes into an endless questioning of scientific results regardless of the evidence that supports them. This behavioral pattern seems to be opportunistic. The purpose is to arrive at time to any intellectual controversy by means of ad hoc performative arguments in order to take advantage of the scientific or political reputation that can be obtained. It is not a coincidence that popular topics in social media such as gender, neocolonialism, transgenics and other left popular topics are the center of STS studies. As Michael Lynch argues “the popularity of social constructivism … waned not because it was heretical, but because, in the sectors of academy where it was tolerated, it was not heretical enough to suit proponents of a more thorough and relentless politicization of scientific knowledge” (2016, 111). That is a possible explanation for the victory of the SP over other versions of sociology of scientific knowledge. Sadly, in a strong sense, the SP can seem to imply that science cannot be taken seriously because it depends on the issue at stake. But here, we have no criteria for supporting knowledge produced by social science because even the most solid evidence-based statement can be diminished or ignored depending on particular political or economic interests. If the symmetry principle affirms that the same types of cause would explain true and false beliefs, there is nothing valuable internally in scientific claims. There is no objectivity or truth possible (even approximately). If the choice is to be on the scientist’s side or closer to a political position, I think social science is at the scientist’s side. Of course, that implies that social science can be critical. But critical does not mean interested in following a political (or editorial) agenda: it does not mean that scientists can follow whatever agenda they want to. Someone could argue that the symmetry principle is only one of the four basic statements that characterize the SP. However, it is the genesis and the support milestone of the whole perspective.³

³For a hard rejection of the symmetry principle, see Jerkert (2006).
3. Can we reduce Lin and Law’s (2018) classification to an asymmetry principle?

It is obvious that Lin and Law’s paper (2018) provides us with a very powerful classification in order to discuss the hegemony of Eurocentric STS perspectives. The “types” of East Asian STS practices that emerge from their paper are useful. The examples are very well documented and rigorously argued. No doubt, we can see these types as globally valid, and even as provincializing Europe. Unfortunately, all of these types and their dynamics hide the “Eurocentric funnel” which takes only European–U.S. knowledge as a desirable model, almost exclusively the kind of scientific knowledge and technology provided by the Russell Group and the Ivy League institutions. Let us see how this works.

Lin and Law elaborated six ways or modes of knowing: diffusion, distortion, circulation, localizing, translation and softening. Surprisingly, they do not include appropriation and dependency or, in Kreimer’s words (2006), the dependence integration mechanisms. These show that peripheral scientific works only have a chance of being integrated into the stock of scientific knowledge in a secondary position, usually through data collection but never through theory building. Nevertheless, the general assumption of the six ways consists in the old idea that the world-system, conceived as any kind of ontological sets (e.g., geographically or politically), is an asymmetric reality. Here we must ask where symmetry is located. It is a strong claim to say that different knowledge practices are something else than a performative difference. The implication of this is unclear: does the generation of different objects or realities depend on the clarity and rigorousness of knowledge practices? One hypothesis is that when scientific (or even metaphorical) knowledge practices come from the Global North, acceptance is probable; but whatever the knowledge practices, if they come from the non-Western world, the possibility for them to get included in the stock of universal and valid knowledge is minimal.

Asymmetry implies that truths from the South do not have the political force to express themselves but through the mediation of Northern voices, even if the mediator has nothing to add. The symmetry principle’s inconvenience is that it is a political statement but not an epistemic one. If, as I said above, knowledge is about data/evidence, the symmetry principle is a relativist chitchat, epistemologically speaking. True and false scientific claims are not just beliefs. True beliefs, as evolution theory, are not the same than false beliefs, as creationism. Flat earth, climate change, and moon landing are other topics explored by fake-science. Today’s asymmetry is basically between knowledge and fake-science.

However, one might presume that, when knowledge creation and acquisition are evidence-based and with theoretical foundations well established, good science from the South should be incorporated without objections. Nevertheless, in contrast to standard STS approaches, we can verify an asymmetry principle in action. I will mention four examples.

First, looking at Latin American history, there is no linear and progressive connection between a Western and a non-Western theory set, in contrast to the conventional diffusion theory of knowledge assumption. For example, Prebisch’s (1998) exchange

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4I do not include in my list “Steal, adapt and copy,” because that multiple strategy works vertically and horizontally inside countries across the globe.
theory, also called the Prebisch-Singer hypothesis, argues that, in the long term, the price of agricultural and mining commodities declines relative to the price of manufactured goods. This idea, to which empirical evidence has given solid statistical support since the 1950s, benefits not only Latin American government elites, but also world-wide governance. This is because it promoted import substitution industrialization (ISI) policies all over the world during the post World War II period. The importance of such a contribution was circumscribed to the Latin American context, and unfairly ignored within global mainstream economics.

A second historical example concerns the Argentinian physicist and technologist Jorge Sábato and Botana (1968), this time with respect to Lin and Law’s classification of distortion and translation. In the 1960s, he championed the idea of the three vertices of national development: the linkages between government, industry, and academia. The formulation was further developed and turned into a hot topic by Etzkowitz and Leydesdorff (1995) and Etzkowitz (2011), as the so-called triple helix of the innovation approach. It can be assumed that there is a chance that the idea was formulated independently by Etzkowitz and Leydesdorff. However, the possibility that the original theoretical structure was retrieved by the European team, 30 years later, is also possible.5

There are two other examples from astrophysics, one concerning the Argentinian team Giambiagi and Bollini6 and the other about the Chilean team Maza and Hamuy.7 In the first case, the dynamics of asymmetry between South and North were verified through the role of Northern researchers within journals involved, in contrast to the researchers’ role from the South’s science in those journals. In the second case, the appropriation of knowledge was done without recognizing the contribution of the Chilean team in the authorship of the paper that finally led Adam Riss to win the Nobel Prize. In both cases, a lively controversy was generated about which is the correct interpretation of these historical events. In the four examples, the South’s truth did not have the political force to be integrated into a large stock of global knowledge. Here, there is a trivial asymmetry. So now, what can we do?

I think that we can continue doing studies of “postcolonial forms of domination.” That implies that we agree with this theme, and we legitimize it as an important one for social science. It is an area of historical and sociological knowledge, as well economically, politically, and culturally relevant.

It must be asserted that to really be a global thinker, intellectuals ought to provincialize their own knowledge. It must be done especially when they belong to a Eurocentric geopolitical environment. In that sense, Lin and Law’s proposal is associated with other propositions like those relating to the concept of multiple modernities (Eisenstadt 2000; Seth 2014; Domingues 2015; Kerner 2018). The last one is extremely interesting because Kerner identifies different strategies to challenge a Eurocentric viewpoint that can be

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5Of course, there is an enormous merit to the triple helix developments, especially in methodological terms. It is a mandatory reference in regional sciences discussions, and constitutes a field in itself in current socio-economic literature.

6Martinus Veltman and Gerardus ’t Hooft won the Nobel Prize in physics in 1999 for a contribution received by the journal Nuclear Physics on 21 February 1972, while a very similar paper by Juan Giambiagi and Carlos Bollini was received by the journal Il Nuovo Cimento on October 1971.

7Adam Riess won the Nobel Prize in physics in 2011 for the discovery of acceleration in the expansion dynamics of the universe. This contribution was based on the data and model by Mario Hamuy and José Maza. https://www.nobelprize.org/uploads/2018/06/advanced-physicsprize2011-1.pdf.
seen as equivalent to those expressed by Lin and Law (2018). Here I want to mention two: enlarging the canon, and promoting inter-contextual dialogue.

From the Global South, maybe symmetry is a political desire but not an analytical claim, because descriptions show the asymmetric relations between North and South. The theories, concepts, and methods do not have the same value in the global knowledge market. Of course, the validity of knowledge is connected to its context of production. Northern scientific networks have better and powerful mechanisms than Southern science to impact the field of STS. The asymmetry is political due to the difference between the human and the financial resources between South and North. Also, it is a geographical asymmetry. However, contemporary knowledge is generated both in the South and the North, although usually the emergence of fake-science comes from the North.

4. A nuance about method and epistemology in Law and Lin (2017)

Epistemologically, the discussion of the symmetry principle is a little bit complex. We can interpret those studies in a Western and in a non-Western perspective. But, there are two senses to understand epistemology: one soft interpretation, and another technical or strong one. In a soft sense, a non-Western perspective can be built by just mentioning the asymmetry of power relations between Southern and Northern knowledge production (and the invisibility of that domination form).

One solution to this problem is to get back to the handmade science, in contrast to the present-day machinery of science. Indeed, science has become a machinery to publish papers that increment H index to people who are the heads of laboratories or research centers in Northern countries (López 2013). In this global context, researchers from the South do not have any chance to make their scientific work visible, because there is a huge gap between the budgets and the human resources used in the North and in the South. However, scientific originality and novelty often arise from the craft science done by individuals everywhere. This work is not mainstream in these days. Actor–Network Theory (ANT) and its diffusion in STS provide an example of how the Northern scientific networks work. ANT is a theoretical construction that implies the assumption of animism, meaning that certain entities as given objects have the attribute of agency. In a nutshell, the contemporary situation implies that contentious science can be successful if it comes from the North. According to it, universal and pure knowledge only comes from Northern scientific results.

However, there is a second possibility which I called the technical interpretation, semantic turns relevant and extremely precise. I think that today’s STS problem is a matter of distinction between knowledge and fake-science. I am not alone on this (Collins, Evans, and Weinel 2017). It is the reloaded ancient controversy between science and pseudoscience that took place in the middle of the twentieth century. In the last decades, the brutal fight between individual genius and the machinery of science (López 2013). In other words, the technical interpretation is epistemological and, stricto sensu, comes from scientific semantics.

I am absolutely in agreement with the Law and Lin exploration program “What would happen if we were to reverse the STS trade of analytical terms. What would happen if we used a Chinese term to make sense of a European case?” (2017, 220). But I am not satisfied with the diplomacy involved. I think that a good theory is intrinsically a good
one if it is coherent and evidence-based, meaning that there is a correspondence between facts and theoretical sentences. It does not matter if that theory explains something very important or less important. In that sense, the geographical origins of the terms are an irrelevant issue. The terms can be used if they enlighten the case in a reasonable manner. The theoretical terms in social science always have (local) cultural interpretations. This is unavoidable. However, as science, understood in a broad sense, social theory has the aspiration to have terms mostly unattached from every-day-life. The social sciences’ goal is to have theoretical terms that can be used with high degrees of autonomy and, to some extent, impartiality. The abstraction, as a feature of the language of network theory and social statistics, was spread within social science in the twentieth century because it was progressive for them. In this way, social science got differentiated from literature as an intellectual field. Theories are universal in principle, although referenced locally. Law and Lin mix social validity of knowledge with epistemic validity of knowledge. For that reason, it seems a competition between the popularity of some terms or analytical frameworks, but not an epistemic confrontation. The real questions are about concepts and their abstraction. Put differently, this problem points to the old one about reference, representation, meaning, truth, objectivity and other issues related to concepts. It is about science’s semantics as the study of the triangle between the symbol, the construct, and the fact. The symmetry problem is the mix between knowledge and fake-science. Nevertheless, knowledge in social science must include certain social considerations embedded in its object–subject of study. Therefore, we must basically include human values, because the whole scientific activity includes them.

So, a second solution is to put on the scientific stage the values involved in the research practices. The most famous example is the notion of nature. Nature can be conceived as a resource or as Pachamama (scientifically speaking, a living being), depending on cultural values. Making values transparent can help to connect in reasonable ways the internal and external issues (justification and discovery contexts) that the SP does not distinguish, but without separating them as traditional sociology of scientific knowledge does. This is the proposal: a better solution to the epistemological dilemma of STS is making explicit the values involved, instead of the dissolution of the dimensions of knowledge generation in the SP version. Table 1 shows our proposal to view STS frameworks in this fresh way.

Knowledge claims are always seeking the scientific ideal of truth. But as we know, such claims change temporarily as scientific observations are made with better technological

| Support tools for research | Axiological bridge | Statements of knowledge |
|---------------------------|-------------------|-------------------------|
| Epistemology              | Methodology       | Research and theoretical attitudes and behaviors based on values and values themselves | Sociology of science and knowledge economy | History of science and natural sciences controversies |
| Epistemology ↔ Methodology|                   |                         | Science and Technology Studies |

Table 1. A modest, moderate and realist STS approach.

Questions related to partiality and objectivity

| Questions related to changing realities | Partiality: no theory is impartial but one could be objective. Autonomy: we can do research without political or economic restrictions, but free research can never be taken for granted. Neutrality: Scientists can be neutral with respect to future ethical uses of their results, but it is not easy. | Questions related to autonomy and neutrality Questions related to changing realities |

Source: Berger and Luckmann (1966), Delanty (1997), Lacey (2005), Gibert (2008, and 2015), and Lynch (2016).
instruments. That is extraordinarily clear in the natural sciences, such as astrophysics and microbiology. Also, it is clear enough in social sciences. Let me explain the previous scheme with an example: the wealth of nations. This topic is at the foundations of economics and sociology. However, depending on the values, it can be defined in different ways, most of them correctly. Therefore, the gross domestic product (GDP), the human development index (HDI) and many other constructs are related with the reality “out there” of the welfare of nations – including the subjectivity of human beings (Gibert 2008) – but validly interpreted in different ways.

While knowledge claims refer ultimately to matters of facts, scientific understanding refers to a wide comprehension of science’s usefulness in humankind history. It may suggest the normative ideal that we can accumulate knowledge of almost everything in a respectful way, and it can be used in a fruitful manner. This may accomplish the economic and technological goals of nations and corporate firms in order to establish a humanistic civilization or, at least, to generate a political behavior with beneficial consequences for humankind.

In terms of Giere (2006), that is an intellectual position of scientific pluralism. On the one hand, we know that we can observe things in different ways and with different instruments (speaking methodologically and technically). One the other, we can theorize phenomena in different ways as well, because theorizing consists in the construction of models. The decision of what instrument or what theoretical perspective we are going to use depends on one’s values. That works even in the natural sciences, when we adopt experimentation as a method, or the mere observation of phenomena in their ecological environment. The first implies a conception of domination of nature while the second one implies a conception of nature understanding (Lacey 2005). Nevertheless, the simple intellectual operation that allows the interpenetration of science and values does not confirm any kind of constructivist relativism. This stance is different and equidistant from metaphysical realism and constructivist relativism. It rejects metaphysical realism, in the ultimate sense, because even when we think there is a reality out there, we do not have to think in terms of monism, which means that we cannot believe that there are universal laws, which rule everything, particularly in social phenomena. On the other hand, we reject constructivist relativism because we do not believe that scientific claims are merely social conventions. In short, we defend a modest pluralism and a naturalistic point of view. This is so in the double sense that social science may believe in real limitations to agency, bio-psychological human determinism, and in agency itself, that is the artificial human conditions of living that we construct historically. Neuroscience and evolutionary psychology have given many arguments in favor of the first sense (Lizón 2016), and social cognitive theory and sociology have supported the second one (Bandura 2001; Archer 2000).

In summary, STS’s symmetry may be a political desire but it is epistemologically worthless. Following the insights of the dependency theory, we may claim the prevalence of an asymmetry principle as an input to STS global dialogue. That asymmetry has two components: (a) trivial, as a difference between scientific capabilities between Northern and Southern regions (including propaganda), and (b) epistemological, between knowledge and fake-science. Finally, the SP, as sociology of knowledge, may evolve towards a new scheme that, including human values, could overcome the confusion between social and epistemological levels of analysis. Human values are the bridge to overpass this mix.
It might be a good idea to renovate the promises that the social science founders made for the foundations of a modest scientific realism. These were the amelioration of social evils, and the rational reconstruction of society. If we do not, maybe Cambridge Analytica and Facebook will do it for us but without humanity.

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**Notes on contributor**

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