

Social Studies of Cognition

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Abstract

This paper discusses some of the ins and outs of sociological and anthropological approaches to cognition, based on a book I co-edited on this topic. Some of the book's results are developed here. This book offers a critical review of various approaches to cognition in sociology and anthropology, which are independent from, alternative to, or compatible with projects carried out in other disciplines, such as neurobiology. It then shows how perception, representation, and knowledge production and transmission may be usefully studied outside of laboratories and experimental situations. This claim is illustrated by a series of case studies concerning: the mechanisms of trust building; the visualization of the dangers of nuclear waste; learning logical skills; beliefs in the apparition of the Virgin Mary; and collective intelligence used to build large equipment, data infrastructures and scientific theories.

Social Studies of Cognition

*Claude Rosental*¹

This paper discusses some of the ins and outs of sociological and anthropological approaches to cognition, based on a book I co-edited on this topic - *Social Studies of Cognition* (SSC)². Some of the book's results are developed here.

SSC starts with the following question: How can sociology and anthropology — in comparison with biology and psychology — contribute to the study of cognition?

First of all, SSC offers a critical review of various approaches to cognition in sociology and anthropology, which are independent from, alternative to, or compatible with projects carried out in other disciplines, such as neurobiology. SSC then shows how perception, representation, and knowledge production and transmission may be usefully studied outside of laboratories and experimental situations. This claim is illustrated by a series of case studies in two targeted domains. The first domain of investigation bears on human abilities to visualize various phenomena in society. The second field of research bears on the cognitive abilities of groups. The case studies concern: the mechanisms of trust building; the visualization of the dangers of nuclear waste; learning logical skills; the apparition of the Virgin Mary to pilgrims; and collective intelligence used to build large equipment, data infrastructures and scientific theories.

In this paper, I will first present and discuss a few convergent and divergent approaches to cognition in the human, social, and natural sciences. I will then show how visualizing in society and the cognitive abilities of groups are usefully studied by the social sciences³.

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² B. Lahire & C. Rosental (eds.), 2008. *La Cognition au Prisme des Sciences Sociales*. Paris: Editions Des Archives Contemporaines. I use the English title *Social Studies of Cognition* (SSC) to refer to this book in this paper.

³ 'Social sciences' refer here mainly to sociology, anthropology and history, although social sciences' approaches are developed and used by other disciplines. See in particular J.C. Passeron, 1991. *Le Raisonnement sociologique. L'espace non-poppérien du raisonnement naturel*. Paris: Nathan.

1. Convergent and Divergent Approaches to Cognition in the Human, Social, and Natural Sciences

1.1 Convergent approaches

There are many collaborative prospects for the interdisciplinary study of cognition, which involve the social sciences, psychology, and biology. These should be clearly illustrated by the following examples.

1.1.1 The Impact of Culture on the Evolution of Human Abilities

The first example concerns the impact of culture on the evolution of human abilities. The idea is to study how certain cultural practices or innovations have brought about alterations to the way brains or even bodies function.

Hence, some authors argue that a cultural evolution in the field of agricultural production has helped humans to better stand lactose. This physiological adaptation would be due in particular to the development of dairy farming. This case would illustrate how cultural changes may modify human genes.

Such a framework of analysis favors various collaborative projects between anthropologists, sociologists, and biologists. Social and natural scientists are invited to gather their data to study the relationship between cultural changes on the one side, physiological and genetic evolution on the other side. They have in particular to explore the impact of culture on evolution⁴.

1.1.2 Challenging the Explanatory Value of the Notion of Culture

Another framework of analysis for interdisciplinary research consists of challenging the explanatory value of the notion of culture. Some anthropologists have argued that most cognitive categories which could be seen as determined by culture are essentially predetermined by the nature of the brain. This includes the notions of cause, of substance, of

⁴ See in particular P. Richerson & R. Boyd, 2005. *Not by Genes Alone: How Culture Transformed Human Evolution*. Chicago: University of Chicago Press.

species, of function, but also of color, of bird, and of norm. Religion itself is depicted as an essentially natural phenomenon. Such claims are based on peculiar interpretations of specific sets of results of experiments conducted in psychology and neurobiology⁵.

In this framework of analysis, psychologists and biologists have to conduct experiments on cognitive abilities. The anthropologists' role may consist of confirming that these abilities are universal by gathering related data around the world.

1.2 Divergent Approaches

There are also many divergent approaches to cognition within and between disciplines. These include apparently complementary approaches that are in fact divergent.

One main source of divergence corresponds to major differences of scale of analysis and of conceptualization of cognitive phenomena within and between disciplines. These differences lead authors to define very different objects for the study of cognition, even though they use the same keywords. The terms "logic," "social," and "trust" constitute three examples of such keywords as I will explain.

1.2.1 Language Confusions

In fact, the fields of investigation on cognition and many results are strongly predetermined by various presuppositions. They are especially predetermined by various representations of science that both cognitive scientists and social scientists have.

For example, some representations of logic used by a number of psychologists to analyze cognitive experiments' results correspond to ancient and nineteenth-century philosophers' conceptions of logic. Some of these representations are structured around the notion of syllogism. Logicians have developed very different views of logic during the twentieth century. One may therefore ask the following questions: What does it mean to refer to

⁵ See B. Lahire, "La nature du cognitif en questions" in Lahire & Rosental (2008), pp. 55-105.

sylogisms to assess the ability of individuals to think logically? And how do different views of logic between analysts allow comparing results regarding logical abilities?⁶

Similar questions may be asked for the definition of the term “social.” For a certain number of psychologists, being “social” refers primarily to a behavior linked to a cost-benefit analysis of actions, or to a deontic logic focused on concepts of obligation and permission. By comparison, social scientists use many different definitions of the term “social.” What is the impact of such diverging views on possible collaborations and comparisons of results regarding social cognition?⁷

Asking such questions is very helpful to identify possible language confusions and diverging approaches to cognition. It helps to unveil both false oppositions and false agreements between analysts. It helps to assess the relevance of various interdisciplinary collaborations and the necessity of independent approaches when the conditions for interdisciplinary research are not gathered. I will now illustrate this claim by reviewing a few approaches of mechanisms of trust building.

1.2.2 Divergent Approaches of Trust Building

In the writings of certain economists, trust is primarily conceived in terms of cooperation and reciprocity⁸. People trust each other if and only if they choose to cooperate, and more precisely if they choose to lend and borrow money to one another in the framework of various experimental games. In such games, actors are generally interchangeable subjects having no history and social features. They are essentially agents likely to freely make investment decisions. The main element that guides their actions is their temporary interaction during the game. Choosing to lend one’s money is fed by an expectation of gain based for example on subjective probability estimates. Analysts both observe and define trust through actual transactions.

⁶ See in particular C. Rosental, “Apprendre à voir apparaître des formes, des structures et des symboles. Le cas de l’enseignement de la logique à l’Université”, in Lahire & Rosental (2008), pp. 161-189.

⁷ *Ibid.*

⁸ This section is based on L. Quéré, “Les neurosciences fournissent-elles une explication “plus” scientifique des phénomènes socio-culturels?”, in Lahire & Rosental (2008), pp. 23-54.

According to some biologists, trust may be grasped by observing changes in the state of a subject, and especially in the state of the brain. This state is given a causal power. For example, some experiments consist of observing the effects of an injection of a substance called oxytocin administered to human subjects. Experiments have been conducted to see in particular if the introduction of oxytocin caused subjects to favor money transactions in games such as those previously mentioned.

It has been indeed observed that certain female animals, such as female rats that are indifferent to their babies, start to take care of them when given oxytocin. The role of this hormone has then been studied in relation to various behaviors. These include situations that biologists have associated with various notions, such as social recognition, pair bonding, love, maternal behaviors, and trust.

In the aforementioned cases, two mechanisms allow defining trust as an essentially material phenomenon. The first one consists of focusing on instant-based phenomena. This relates to granting a privilege to the moment of decision-making. The second mechanism consists of focusing on event-based phenomena. This relates more particularly to focusing on an internal event.

By comparison, social sciences have proposed different conceptualizations of trust and underlined different dynamics of trust building. Some studies highlight how trust may be established only progressively, in a diffuse way, and in the long run. Many types of beings, such as individuals and institutions, may be involved. As a result, the dynamics of trust building can't generally be grasped in moments of decision at the origin of specific actions.

According to the sociologist Louis Quéré, trusting somebody does not mean counting on a well-defined behavior with a certain confidence. It means accepting that one is vulnerable and abandoning oneself to the good care of a person, without knowing the exact outcome. Trusting somebody or acting in a trustful way implies a personal involvement and an active attitude. This phenomenon can't be reduced to overcoming an aversion for treason, to overcoming social avoidance, or to being attached to someone.

One related point which is generally difficult to grasp is that economists, biologists, psychologists, and sociologists do not propose in fact complementary views of the same

phenomenon in such a case. Division of scientific labor would work perfectly if it were the case. Each author and discipline would work on different aspects of the same phenomenon, namely ‘trust,’ and a dialogue or synthesis would suffice to gain a complete picture of the same complex object.

But it doesn’t work this way in a case like trust building because the objects under study are fundamentally different. According to Louis Quéré, trust represents a dense lived experience. In particular, this phenomenon cannot be separated from the intentional vocabulary used by the actors themselves to describe their experience. It can’t therefore be simply described as a simple material process. In other words, the understanding that the actors have of trust and the motives they may express are constitutive of this phenomenon. This phenomenon can certainly be taken as an object by the social sciences. Social scientists may study how trust emerges, develops, and gets structured. But this “trust” is incommensurable with the trust of the laboratory experiments and game theory approaches previously mentioned.

Since Durkheim, with his emphasis on the primacy of collective representations and with his theory of the origins of the fundamental categories of thinking⁹, we know that sociologists, psychologists, and biologists may build very different objects although they use similar words. The enthusiasm generated by recent studies of cognition should not make us forget this reality. Otherwise, the price to pay would be the emergence of cheap interdisciplinary projects based on misleading keywords, which would in turn lead to disappointment and distrust.

We also know that sociologists have been interested in studying cognitive phenomena since more than a century. But then, what specific results can they obtain now, starting from their own methods and theoretical issues? What are the distinctive features of their independent studies compared to those of current psychological and biological studies?

I will address these issues by presenting two case studies developed in SSC. These studies illustrate how social sciences can usefully contribute to the study of cognition outside of laboratories and experimental settings.

⁹ See E. Durkheim, 2008. *The Elementary Forms of Religious Life*. New York: Oxford University Press.

2. Visualizing in Society

As I mentioned, the first set of case studies in SSC bears on human abilities to visualize various phenomena in society. One of these studies shows how the dangers of nuclear waste processed by a specialized plant located in La Hague in France have been progressively visualized by epidemiologists, doctors, journalists, and the public¹⁰. The scale of the phenomenon is such that it couldn't be observed in a laboratory. Gaining the ability to visualize the dangers of nuclear waste in La Hague has been the outcome of fundamentally collective dynamics taking place over a long period of time. The large causal chain that explains the emergence of this visualization ability couldn't be grasped in particular thanks to a physiological analysis. It involved among other things a specific organization of the social world, series of actions, trials of strength, and devices that existed on a large scale.

In particular, various actors have been led to visualize the dangers of nuclear waste in La Hague because a scientist has produced innovative charts representing various kinds of epidemiological data and has succeeded in having some journalists publish those results with his interpretations. Journalists were instrumentalized, that is, used as devices of visibility partly comparable to a microscope. The scientist indeed knew some of the basic working rules of journalists. He played for example on the journalists' tendency to publish news stories that have been or are about to be presented by other media.

In other words, the visualization of the dangers of nuclear waste in La Hague was the result of a militant work of collection, treatment, representation and circulation of data, which was necessary for the "apparition" of a new object – namely the dangers of nuclear waste. This object was not previously hidden *per se*. It was just unavailable. The visualization phenomenon was not only the cause of collective mobilizations – of a researcher, and then of journalists, of doctors, and of the public. It was also the consequence of such mobilizations. The latter consisted of a series of continuous practical achievements. They were realized by individuals and groups who were equipped to direct the attention of third parties.

Mobilizations could themselves be taken as an object by the sociologist. Collective mobilizations played in the sociological analysis of this visualization process the role that

¹⁰ See C. Lemieux, "Rendre visibles les dangers du nucléaire. Une contribution à la sociologie de la mobilisation", in Lahire & Rosental (2008), pp. 131-159.

individual intentionality plays in certain psychological and philosophical analyses of visualization abilities. According to certain studies in cognitive science, the subject's intention is indeed essential to explain visualization phenomena.

The case study in La Hague illustrates how sociology can gain access to ways in which visualization abilities may develop in society, whereas these same ways can't be explored in the framework of laboratory experiments. In this sense, sociologists may contribute to the study of cognition in specific ways that are unique to sociology, ways that differ from approaches taken by various human and natural sciences.

I will provide another illustration of this reality by presenting one example of studies developed in the last part of SSC. This study bears on the cognitive abilities of groups.

3. The Cognitive Abilities of Groups

But first, what does “cognitive abilities of groups” mean? This expression refers to cognitive abilities which may be distinct from cognitive abilities of individuals. Groups may know things and accomplish tasks that individuals alone are unable to master. Being able to accomplish all of the practical operations required to maneuver a large warship represents one example¹¹. Certain groups' abilities are not of the same nature as individual abilities. The gathering, organization, and equipment of individuals produce new accomplishments and abilities in the world, which can be attributed to groups alone.

In certain cases, the scale and nature of the corresponding phenomena is such that psychology and biology are in a difficult position to study them, contrary to sociology. Hence, some studies have shown that a collective intelligence may be the result of elements and dynamics as diverse as a set of routines, not well-thought-out acts, antagonisms, and long-term historical processes¹². Sociologists can directly explore how groups develop cognitive properties without even having to make assumptions regarding individual abilities – although they can also contribute to articulate these various levels of analysis. They can then contribute to the study of cognition in a specific manner.

¹¹ See in particular E. Hutchins, 1995. *Cognition in the Wild*. Cambridge (MA): MIT Press.

¹² See in particular C. Mukerji, “Sociologie et cognition collective”, in Lahire & Rosental (2008), pp. 213-231.

The history of the Museum of Vertebrate Zoology at the University of California Berkeley presents a case that clearly illustrates this claim. Some elements of this history may be usefully evoked here.

As Susan Leigh Star and James Griesemer have shown it¹³, the zoologist Joseph Grinnell created and developed this Museum from 1907 on with the support of actors stemming from different social worlds. These include university administrators, professors, research scientists, curators, members of scientific clubs, amateur collectors, trappers, occasional field hands, private sponsors and patrons, government officials, and trapped animals. The collective orchestration of the work of all these actors led to a collective intelligence that allowed the development of both the Museum and an original theory of evolution. This theory of evolution incorporated evolution of the environment as part of an explanation for natural selection. This theory was supported by the unveiling of correlations between the evolution of animal species in California on the one side, and the evolution of the environment on the other side. Such correlations could be observed thanks to specific ways of collecting and analyzing data.

More precisely, the success of this project relied on the cooperation of diverse actors around standardized methods, “repositories,” and “ideal types”. According to Star and Griesemer, repositories are “ordered piles of objects which are indexed in a standardized fashion” — for example, a Museum or a Library¹⁴. An ideal type is an object that does not depict the exact content of a given thing or space. This object may be an atlas, a diagram or a species for example. Such an object provides abstract information, and leaves in the dark certain features of the thing or space it depicts. As it is vague enough, the ideal type may serve as a least common denominator and allow various types of actors to communicate and cooperate.

Such devices and others made it possible to link and coordinate actors equipped with unequal skills, having diverse interests and variable representations of the common object to their contributions. For example, some amateurs thought they just contributed to the preservation of California; trappers were just interested in killing animals for money; and Grinnell was mostly interested in building a new theory of evolution. The cooperation tools that were built

¹³ See S. L. Star & J. Griesemer, “Ecologie institutionnelle, ‘traductions’ et objets frontières : des amateurs et des professionnels au musée de zoologie vertébrée de Berkeley, 1907-1939”, in Lahire & Rosental (2008), pp. 233-276.

¹⁴ *Ibid.*, p. 267.

enabled all actors to keep some autonomy, to act according to their own interests, and to make transactions with their partners, while taking part in a collective work and forming a collective intelligence.

This case illustrates how the capacity to produce knowledge collectively may not simply rely on the aggregation of individual abilities. Here, it depended also on dynamics and elements which were external to the brains and bodies of individuals. These included concrete things, a specific organization of exchanges and conciliations of interests.

This case illustrates how the development of an ability to know the world may crucially depend on socio-technical dynamics and distributed resources, including devices that allow cooperation or orchestration. The building of the required modes of organization and devices required several years in this case. They depended on their conditions of emergence. Consequently, this type of phenomenon can't be observed in the framework of laboratory experiments. It is an appropriate object for a fully fledged historical sociology.

This case study, like the analyses and other case studies that I have previously evoked represents of course only a small part of the set of issues raised by the study of cognition by various disciplines. But I hope that this paper will help clarify the debates proper to diverse approaches to cognitive phenomena.