

CHAPTER X

THE COGNITIVE FOUNDATIONS OF INSTITUTIONS

BENOÎT DUBREUIL,
FNRS, UNIVERSITÉ LIBRE DE BRUXELLES (BELGIUM)

One of the striking features of human societies is the presence of a formal, institutionalized division of labor. This is not only the case with modern societies, with their huge organizational structures in which thousands of individuals cooperate, but also with stateless societies in which individuals are assigned specific rights and duties within clans, lineages or age sets. It is trivial to say that without their unique capacity to create institutions and to collectively assign roles to individuals, human societies would be much different from what they are, and probably much more similar to non human primates' societies.

My objective in this chapter is to show how this capacity to design institutions and to collectively assign functions is based on domain-general cognitive skills proper to modern humans. The nature of institutions is seldom questioned by social scientists, who often black-box the problem and take for granted that institutions are an irreducible part of humans' access to "symbolic culture". The most commonly accepted starting point in social science is John Searle's social ontology. According to Searle, humans' capacity to build institutions depends on language, which is the first of all human institutions, the one which makes all others possible (Searle 1995, 2001, 2005).

Searle's claim is often considered naive by cognitive scientists because it conflates many distinct phenomena. The popularity of Searle's claim among social scientists, however, is not accidental: it frames the problem from a perspective that makes sense from the social scientists' point of view, whereas cognitive scientists are usually interested in more primitive social cognition (like mind reading, social categorization, pro-social emotions). This article begins with a brief description of Searle's view on institutions and of the problems associated with it. In the rest of the article, I explain how it can be reinforced by a more detailed assessment of how the mind works. More precisely, I stress the importance of domain-general cognitive skills in the development of our specific cultural skills.

1. What is special about human institutions

Searle's basic claim is that humans assign functions to all kind of objects, like hammers and screwdrivers. These assignments depend on the physical structure of the object. Some functions, though, only make sense if they are assigned collectively. Searle calls these "status functions," and they typically take the form *X counts as Y in the context C*. For instance: "That piece of paper counts as a 20\$ bill in the context of the Canadian monetary system". Or: "The leader of the party that has the most MPs counts as the Prime Minister in the context of the British parliamentary system".

Those examples are typical of what Searle calls "constitutive rules", which are rules that allow for the creation of new behaviors. "Constitutive rules" are opposed to "regulative rules", which are based on mere observed regularity. Once a constitutive rule is socially accepted, it can enable a piece of paper to be treated as a 20\$ bill or a man to be treated as a prime minister.

Searle argues that human institutions depend on language because in order to create an institution, the members of a group need to assign status functions and construct constitutive rules. This, in turn, requires that they can represent publicly (that is, linguistically) these rules and functions, by making claims about them. In other words: no language, no claims. No claims, no status functions and constitutive rules. The difference between humans and other species, from Searle's point of view, is that other species have no language complex enough to make claims, and therefore have no institutions.

The association between language and institutions is pretty intuitive, at least for social scientists. Cognitive scientists, however, complain that it merges distinct claims about categorization, mind reading, and pro-social behavior, and that it does not take into consideration what we know about social cognition in (1) apes, (2) early humans, and (3) children.

(1) Let's begin with apes. Searle analyses briefly the structure of dominance hierarchies in apes and contrasts them with institutions in humans. From his point of view, dominance hierarchies are not based on any kind of deontology – that is, rights and duties – as human hierarchies are. Subordinate individuals do not consciously say "I have to recognize Frodo's authority because he is the alpha male". There is no question that this is right. But then Searle goes farther and claims that "these prelinguistic animals cannot recognize deontic powers because, without having some linguistic means of representation, they cannot represent them" (Searle 2005).

This, however, raises the question of how much language is needed to stop being a prelinguistic animal. We know that trained apes can master a good level of sign language, including hundreds of words and basic syntax. It is true that they have difficulty mastering complex syntax with full recursivity, but there is

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no question that they are able to refer symbolically to things (Hauser *et al.* 2002). One could ask, when an ape uses an arbitrary symbol to refer to a banana, why shouldn't we consider this as a constitutive rule in line with Searle's definition? After all, Kanzi, the famous speaking bonobo, practically shows that in the context of his interaction with the research assistant, the arbitrary symbol X counts as a banana. What is the difference with humans? Is it the fact that speaking apes tend to use symbols as tools, to reach instrumental goals, while human childrens tend to use symbols merely for pleasure? Or is it rather the fact that speaking apes are not conscious of the rule they are practically following because they can't explicitly make claims such as "In the context of this experiment, I will consider that this arbitrary symbol conventionally refers to a banana"? To be sure, there is a difference in the way humans and speaking apes use symbols, but this difference needs to be specified. I will come back to this later.

Morover, it is not clear how far language is needed to understand social status. On the one hand, a lot of social categorization in humans is similar to what happens in non-human primates: the capacity to recognize dominance relations, kin groups, or mother-child affiliation is present in both human and non-human primates (Dasser 1988; Bovet et Washburn 2003; Bergman *et al.* 2003). On the other hand, cognitive scientists are increasingly arguing that prelinguistic representations have many of the properties traditionally associated with language, including the capacity to represent type and token, to produce categorical inferences, to combine symbols productively, and to represent abstract concepts (Barsalou 1999; Hardy-Vallée and Poirier *in press*).

(2) The second source of concern is associated with the study of human evolution. A sharp dichotomy between linguistic humans and prelinguistic animals does not leave a lot of space for paleoanthropologists to think of the evolution of human culture. The question then becomes: at what precise moment in their evolution did humans acquire this very specific capacity to make claims, assign status functions and create institutions? As a matter of fact, the first unambiguous symbolic artifacts in human history (such as abstract and figurative engravings and paintings, personal ornaments, etc.) appeared during the Upper Paleolithic in Europe (40 000 BP) and the Middle Stone Age in Africa (75 000 BP) (McBrearty and Brooks 2000; Wadley 2001; Henshilwood and Marean, 2003; Philip G. Chase 2006). Does this mean that earlier humans had no language, no constitutive rules and no deontology? How can this be made consistent with the high cultural complexity and the high level of cooperation that can be found in Neanderthals and archaic humans? I will come back to this later.

(3) The third source of concern comes from child development. How is Searle's argument to account for the way human children gain access to

language and culture? Should we think that there is a one-step development in children that makes it possible for them to make claims, to assign status functions and to create institutions? At what precise moment in their development do children become able to fully understand their social reality? This paper does not aim at rejecting the link between language and institutions in humans, but at clarifying it by using data coming from developmental psychology, primatology, and human evolution.

2. The coevolution of language and theory of mind (ToM)

One good starting point in clarifying this question is the ongoing debate on the development of Theory of Mind (ToM). When Premack and Woodruff (1978) coined the concept of Theory of Mind in connection with chimps, it was understood as basically an all-or-nothing skill; either animals were able to understand their conspecifics' intentions by ascribing psychological states to them, or they simply had a contextual understanding of their behaviors. The creation of the false belief task reinforced the idea that ToM was a specific and well-integrated module in human minds that was subject to its own deficiencies, as was allegedly the case in autism (Wimmer and Perner 1983; Baron-Cohen *et al.* 1985, 1986). This view seems to support Searle's claim, which proposes a strong and unique dichotomy between apes and humans. The story would go like this: sometime during the evolution of a particular species of hominins – say, *Homo sapiens* – a specific cognitive module dedicated to mind reading evolved (Baron-Cohen 1995).

But the main view among researchers on ToM has changed during the last 10 years. For their part, primatologists realized that it was not so obvious that apes understand each others' behavior simply on the basis of contextual cues (Call *et al.* 2004; Tomasello *et al.* 2007). Experiments suggest that chimps, especially in competitive contexts, are able to understand each others' intentions (Hare *et al.* 2000, 2001, 2006). These results remain contested (Povinelli and Vonk 2004), but it has become increasingly difficult to pretend that apes' understanding of action does not include any kind of representation of what is going on in their conspecifics' heads (Tomasello *et al.* 2005).

At the same time, psychologists have come to moderate the idea that ToM emerges in one step with the understanding of false beliefs (Malle 2000, 2005). The consensus today points toward a multistage development of ToM, rather than toward a single module that emerges around the age of four. Although the understanding of false beliefs can be seen as the pinnacle of mind reading, there exist more basic skills in apes, children or early humans, that allow them to track intentional action (Tomasello *et al.* 2005). It has been established that

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children as young as 15 months understand that there is something wrong when someone behaves on the basis of beliefs she should not have, although children below a certain age remain unable to verbalize it (Onishi and Baillargeon 2005). This can be explained by the fact that young preschoolers do not have sufficient executive skills to manage conflicting perspectives (Carlson *et al.* 2002, 2005; Stone and Gerrans, 2006).

Recent attempts have also been made to establish a link between research on ToM and that on the development of language (Miller 2006). To be sure, the connection between understanding the meaning of an utterance and understanding the intentions of a speaker has been known to philosophers for a long time, and theories of pragmatics have developed detailed accounts of how language depends on mind reading (Grice 1957, 1969; Sperber and Wilson 1986). The idea that ToM is essential to language is intuitive. The very act of referring symbolically to an object implies the ability to share the attention of a conspecific (Baldwin 1993). This in turn implies that one is able to follow his gaze, which children learn to do at about 9 months. Gaze detection and shared attention are widely held to be evidence of an early understanding of intentional action in humans (Tomasello 1999).

But the connection between ToM and language is perhaps not so straightforward. If it is obvious that children need some understanding of intentional action to learn their first words, it is also clear that the understanding of false beliefs comes much later, when children acquire a more elaborated language. On this point, it has been established that the understanding of false beliefs in children is closely connected with the development of recursive syntax (de Villiers and Pyers 2002). It makes sense, since recursivity allows children to use mental state verbs with embedded clauses, as they do in constructions like “Pierre thinks that p” or “Pierre thinks that Marie knows that p...” (de Villiers 2000, 2005).

Language and ToM are clearly not an all-or-nothing matter. It is possible that apes and human children share the same basic capacity for mind reading and the use of symbols, although in apes this is not accompanied by a spontaneous desire to share attention, emotions and intentions with others (Tomasello *et al.* 2005). The interesting question is how children move from these basic social and cognitive skills to complex language and ToM.

Providing a more detailed account of language and ToM also gives us more room to think of the evolution of culture in early humans. There is scant evidence of symbolic status markers in human prehistory before the Upper Paleolithic (40 000 BP), although humans were clearly already living in culturally complex societies with cumulative culture based on imitation (Chase and Dibble 1987; Mellars 1996; Klein 2000; Davidson 2003; Richerson and Boyd 2005; Chase 2006). How can we explain the sudden emergence of

symbolic status markers in the archeological record, if we consider that modern and archaic humans were cognitively very close to each other? In the rest of this chapter, I argue that the development of the executive functions of the brain has led to the understanding of false beliefs and recursive syntax which, in turn, was responsible for the emergence of a new form of social categorization. To understand how this is possible, however, we first have to go back to Searle.

3. Status ascription and the executive functions of the brain

As we saw earlier, one of Searle's major contributions to epistemology has been to understand the centrality of "status functions" to the emergence of properly human language and culture. Humans not only categorize things and people, but also ascribe statuses on the basis of collective categorization. While chimpanzees recognize "mother/child" or "dominant/subordinate" relationships on the basis of their conspecifics' social behavior, humans ascribe statuses that depend on the very attitude of their conspecifics toward the ascription. In other words, chimpanzees can ascribe "mother" or "child" statuses without having any idea about what their conspecifics think about mothers or children. On the other hand, humans can hardly understand how someone can be a "president", a "priest" or a "chief", if she has no opinion about what others think about presidents, priests or chiefs. The institutionalization of such statuses depends on the capacity to publicly metarepresent people's attitude toward the categorization itself.

This, according to Searle, is made possible because language is a practice governed by constitutive rules, one that allows language users to publicly articulate metarepresentations. But at what point does language switch from a practice governed by regulative rules to a practice governed by constitutive rules? This is a pretty tough question. Searle's formula, *X counts as Y in C*, is clearly insufficient. When the bonobo Kanzi or the 12 months old baby uses an arbitrary symbol X to refer to an object Y, is he following a constitutive rule? Or is it insufficient for him to follow such a rule in practice? Does he still need to state explicitly the rule he is following?

To understand the emergence of institutions in humans, one has to move beyond the dichotomy between regulative and constitutive rules. An experiment conducted by Rakoczy and colleagues (in Press) may help us to understand how this is possible. In this experiment, children between 2 and 3 years old are shown how to play a simple game (called "daxing"). Once the children master the game, a puppet comes, asks to join the game and performs an action that violates the rules of the game. The experimenters found that children's normative response to the puppet's performance (like protest or critique) shows

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they understand the “constitutive” nature of the rules of game. They do not simply associate rules with behavioral regularities, but are able to refer symbolically to the context or the frame of reference (“daxing”) in which an action is authorized or prohibited (Nichols 2004; Sripada and Stich 2005).

We can better understand how this is possible by going back to considerations related to the development of the ToM and language. Although they have not yet mastered recursive syntax and full-fledged ToM, 2 and 3 year old children usually know hundreds of words and are able to make simple sentences. Moreover, 2 or 3 year olds can engage in pretend play and act as if they were driving cars, talking on the phone, etc. This shows that the children’s incapacity to understand false beliefs or recursive syntax is not simply due to a failure to engage in counterfactual thinking. But what else can it be?

One interesting account suggests that there is a gap between the capacity to understand the rules of the game within one context, and the capacity to keep track online of inferences going on simultaneously in different contexts. Many authors argue convincingly in favor of such a scenario (Proust 2002; Perner *et al.* 2002), which is also supported by neurological evidence (Aichhorn *et al.* 2006). From that point of view, it is not properly young preschoolers’ inability to simulate other minds that is responsible for their failure in the false-belief task, but rather their inability to keep track online of what is going on in different minds at the same time. This claim is also supported by the fact that children before the age of 4 have no problem with naming objects, but have a problem understanding that objects can have alternative names (Doherty and Perner 1998). The problem can be seen as a difficulty to represent different perspectives on one object (Mounoud 1996; Perner *et al.*, 2002).

This can be connected with what I said earlier about syntax and ToM. Recursivity is precisely what allows us to articulate linguistically different frames of reference. This is clearly the case for constructions using mental state verbs (“ Pierre wants Marie to know that... “), but it is also true of constructions using negations and “if-then” structures (de Villiers 2000, 2005). In these cases, one has to keep track of two frames of reference simultaneously (e.g. if and then), and see how the embedded clause fits within the whole claim.

Most authors recognize that recursivity is a fundamental property of modern human language (Chomsky 1995; Jackendoff 1999; Bickerton 2000). There is, however, no consensus concerning its cognitive foundations. Some authors hold that recursivity is based on a specific computational mechanism (Hauser *et al.* 2002), while others see it as the result of natural constraints on symbolic representation itself (Deacon 2003, Bouchard 2005). There is no question, however, that recursivity is useful in a social species like ours, since it allows individuals to share information about each others’ mental states (Byrne and Whiten 1988; Zuberbühler and Byrne 2006). There is no question, though, that

recursivity is somewhat independent of full-fledged ToM, since some children with autism develop complex language, but still fail the false-belief task (Andrews 2002). This suggests that recursivity is necessary to understand false beliefs, though perhaps not sufficient.

Interestingly, the linguistic capacity to articulate inferences in different frames of reference is essential to assigning status functions in Searle's sense. Indeed, this skill allows us to make the distinction between what someone does as the holder of different statuses. I can specify what one does as a man or a husband, and what he does as the holder of another status, let's say president, priest, or chief. It renders it possible to look simultaneously at an object as a tool and as a ritual object. In a social context, this is absolutely necessary to disambiguate the different rights and duties or the different deontic statuses that a person or an object can hold.

If this connexion between ToM, language, and status functions is correct, then in order to understand the foundation of social institutions in humans, the real scientific question is, what makes it possible to draw inferences across frames of reference and, consequently, to succeed in the false-belief task. I propose that we turn our attention to the domain-general cognitive skills associated with the executive functions of the brain.

It has been shown that performance in theory of mind tasks decays with ageing and under conditions of divided attention, just as is predicted for cognitive tasks that rely heavily on domain-general resources (McKinnon and Moscovitch, 2007). More precisely, domain-general cognitive skills like working memory and inhibitory control seem to play a key role in the development of full-fledged ToM (Stone and Gerrans 2006). The reason is rather intuitive: understanding false beliefs implies that one is able to hold in mind different frames of reference (working memory) and to suppress at will salient though irrelevant representations (inhibitory control) (Carlson *et al.* 2002, 2005).

The idea that properly human institutions result from an increase in domain-general cognitive skills is also firmly grounded in data concerning human evolution. Brain growth in hominins' evolution is mainly located in the prefrontal cortex (Deacon 1997; Donald 1998), an area associated with the executive functions of the brain (Baddeley 2001, Repovš and Baddeley 2006). Moreover, the behavioral gap between *Homo sapiens* and Neanderthals can be advantageously explained by a difference in working memory (Coolidge and Wynn 2004; Wynn and Coolidge 2004). The most parsimonious hypothesis about the emergence of institutions in humans is that at one point in the evolution of hominins, the working memory and/or inhibitory control became sufficient to hold in mind and to draw inferences across different frames of

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reference. A continuous increase in domain-general cognitive skills led to a new social ability: the collective ascription of status functions.

Conclusion

The argument presented in the paper does not imply that social learning stops with the development of full-fledged ToM around the age of 4 or 5. Although 4 or 5 year old children appreciate the psychological motives underlying social norms, they still don't fully understand their conventional nature. This is one of the points that we should remember in Lawrence Kohlberg's (1981) theory of moral development. Children until the age of 7 or 8 don't really grasp the conventional nature of norms. In other words, they have a problem appreciating that "things could have been otherwise" (Kalish 2005). In the case of language, for instance, children fail to recognize that "cows" could have been called "horses" before the age of 7 or 8 (Homer *et al.* 2001). The understanding of false beliefs paves the way for a long cognitive and cultural development during which children learn to appreciate subtle forms of counterfactual thinking.

At the level of human evolution, the fact that rich symbolic cultures appear only with *Homo sapiens* does not imply that cognition in Neanderthals or archaic humans can be equated with that in three-year-old modern humans. It means, rather, that a modest difference in working memory and/or inhibitory control could have thrown *Homo sapiens*, archaic humans, and Neanderthals on very different cognitive and cultural trajectories. Because they became able to articulate attitudes toward social categorization, *Homo sapiens* also became able to ascribe new kinds of statuses and functions: ones that depend on people's attitude toward the ascription.

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