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## **A Discussion of *Speaking Our Minds* by Thom Scott-Phillips**

**Abstract.** This discussion aims to investigate some claims proposed by Scott-Phillips in *Speaking our minds*. The main thesis by this book is that ostensive-inferential communication is the prerogative of human beings. In fact, despite admitting a continuity between human beings and other animals at the level of cognitive architectures, Scott-Phillips places a discontinuity at the communicative level. In his view, human communication requires high-order mental metarepresentations, guaranteed by a sophisticated mindreading system that, in his opinion, is not present in nonhuman primates. Recently, this idea has been challenged by some scholars. The aim of the present discussion is to take into account this debate.

**Keywords:** human communication; ostension; great apes; metarepresentation; comparative psychology; evolutionary plausibility.

Reflecting on language means investigating the nature of the human species. Language has long been considered a mystery: human communication appears unique in the animal world, with no other species seemingly able to express itself with such freedom.

Analysing human language concerns two essential elements: first, the study of functioning – namely, exploring the properties that govern communication exchanges and the cognitive systems that define those

properties (“what” and “how it works”) – second, the study of origin, which includes analysis of the minimal conditions without which language would not have the form it has today (“because” a phenomenon is done in a certain way).

Cognitive science has transformed these two elements into constraints on contemporary reflection about language: the constraint of “cognitive plausibility” as well as “evolutionary plausibility”. Without these two conditions, there can be no naturalistic theory of language that conforms to the dictates of Darwinian evolution (Ferretti, 2015).

An effective tool for those wanting to study a phenomenon following the theory of evolution is the *comparative method* (Harvey & Pagel, 1991). This method can be traced back to Darwin, whose work *On the origin of species* (1859) introduced the analysis of the phylogenetic tree. This analysis compares the genealogical trees of various animal species: One observes a certain trait in each species and identifies its constituent parts. The presence of differences or similarities among different species allows us to generate or validate hypotheses on how and why that particular trait evolved (Scott-Phillips, 2015a).

In recent decades, investigations into the origin of human language have often resorted to the comparative method to explain whether (and to what extent) human language has features shared with communication systems of nonhuman animals. Such investigations can be framed with at least two strands: discontinuistic and continuist. The discontinuistic strand, the greatest proponent of which is linguist and cognitive scientist Noam Chomsky, carries the Cartesian idea that language makes *Homo sapiens* qualitatively different from all other animal species (Chomsky, 1966). From this point of view, language is conceived as a specific faculty domain that is independent from other cognitive systems. It is an all-or-nothing phenomenon belonging exclusively to the human species; in other words, it has no precursors in the communication systems of nonhuman animals. It follows, then, that discontinuists do not interpret language in reference to natural selection and, from their point of view, comparative analysis with other forms of communication in the animal world is totally inconsistent (Chomsky, 1988, 1996; Hauser et al., 2014).

On the contrary, the continuist view reconciles the origin of language with the theory of evolution. From this perspective, language is related to other nonlinguistic cognitive systems that guarantee its functioning and constitute the prerequisite for its development. It is clear that continuism’s proponents consider animal world as a fundamental starting point in the language investigation.

According to the continuist perspective, in his book *Speaking Our Minds* (2015a), Thom Scott-Phillips examines the cognitive and communicative abilities that led to the evolution of language as we know it today. He devotes much of his work to the discussion of evolutionary scenarios in which such skills may have evolved. In particular, he applies the Relevance Theory of Sperber and Wilson (1986) to the origin of language. Human communication is unique for its ostensive character, articulated in the exchange of clues and intentions among the speakers. To guarantee this process, there is social cognition, in particular, the *mindreading device*, developed for functions different from those communicative ones and later co-opted for language.

Here, we will examine the debate proposed by Scott-Phillips in his book that ostensive communication is the prerogative of human beings and, consequently, it is not possible to identify this property in the communication systems of nonhuman animals in general and of the great monkeys particularly. This idea is strongly related to another important debate: the existence of mindreading skills in nonhuman primates. Specifically, Scott-Phillips (2015a, 2015b) has declared that ostensive communication requires a sophisticated theory of mind, implying higher degrees of recursive reading. In his view, the great apes do not possess the cognitive mechanisms indispensable for ostensive communication. It follows that the ostensive character marks a qualitative difference between human and animal communications. Before introducing the main arguments and the corresponding supporters in this dispute, it is necessary to fully understand the characteristics of ostensive communication.

Scott-Phillips (2015a) presents the ostensive-inferential model starting from the criticism to an idea of communication strongly rooted in common sense: the code model (Shannon & Weaver, 1949). It is a highly intuitive system: communication is nothing more than the product of the transfer of information from the sender to the receiver, through a process of coding and decoding. According to this model, speaker and listener are in the same mental state, and what the speaker says (that is, the literal meaning of his utterance) is sufficient for the other to understand it and to communicate successfully. This type of communication is based purely on associative mechanisms that constitute the qualifying element: for the sender, the state of the world is associated with production of a given signal; for the receiver, reception of those signals is associated with a certain behaviour (Shannon & Weaver, 1949). In line with Scott-Phillips (except in some cases of attributable human communication, such as involuntary laughter or chemical signals of the areola), the association scheme can explain most

forms of animal communication, from bacterial to recall signals of the vervet, up to the gestural communication of great apes. Despite the fact that in some circumstances the literal meaning of an expression is sufficient for its understanding, in most cases human beings use language figuratively. Consider the case of irony: interpret the phrase “It’s really hot today!” when said on a chilly day, is attributed to the fact that, as listeners, we are able to switch from what was *actually* said to what the speaker *meant* to communicate in that given context. What is said rarely coincides with what one actually intends to say: communication, in fact, requires an effort from the listener to reconstruct the speaker’s intention to be understood.

Scott-Phillips (2015a) provides some clarifications. First of all, communication systems that work according to processes of coding and decoding must not be associated with cognitively limited tasks. Although automatic, there is the possibility that these systems can be used intentionally and may require sophisticated social cognition. Secondly, the processes of production and understanding within the code model should not be interpreted in necessarily deterministic terms. In fact, coding and decoding can be used in a probabilistic way. This makes these communication exchanges extremely flexible. That said, these characteristics are insufficient to consider the code model an exemplary framework of human communication. To explain the functioning of human communication, it is necessary to refer to a different theoretical model: the one proposed by the philosopher Paul Grice.

Grice (1957, 1975) proposes the *Theory of conversational implications*. The basis of this model is the idea that expression and recognition of intentions are essential to human communication, both verbal and nonverbal. Grice indeed makes the important distinction between *meaning of the expression* and *meaning of the speaker*. While the former is nothing more than the linguistically encoded meaning, the latter corresponds to what the speaker actually intends to communicate to his interlocutor. For example, when we ask to a friend “Could you please open the window?” we do not expect an answer such as, “Yes, of course”; the expected reaction is that response followed by an appropriate behaviour: getting up to open the window. Such behaviour highlights the fact that our interlocutor didn’t stop only at the linguistic decoding of the expression but *grasped* the speaker’s communicative intention. In fact, with verbal utterances, the interlocutors communicate much more than the literal meaning of what he says (Adornetti, 2013).

For Scott-Phillips (2015a), this phenomenon can be defined as *semantic underdetermination* (Carston, 2002; Atlas, 2005), that constitutes proper

human ostensive communication. It is exactly the ostensive character that has allowed the beginning of language. According to Grice’s ostensive-inferential model – elaborated upon by Sperber and Wilson (1986) – the speaker gives the listener a *clue* about his intention to communicate a certain meaning, and the listener understands it by carrying out a series of inferences. In this process, we can identify two types of intention (Scott-Phillips, 2015a): (1) *informative intention*, wherein information is provided to the interlocutor by the sender, in order to induce a change in the receiver’s mental representations; and (2) *communicative intention*, aimed at producing in the interlocutor a representation of the informative intention. To better clarify this distinction, consider the following example from Scott-Phillips (2015a): “I am in a coffee shop, catch the eye of the waiter, and I tilt my coffee cup in a particular, somewhat stylized way. The waiter then comes over and refills my cup” (p. 8).

Informative intention corresponds to an intention the interlocutor recognizes as what he is trying to communicate (for example, “I would like some more coffee”). Communicative intention is the intention that the interlocutor recognizes I am trying to communicate and, as such, I have an informative intention. The content of the communicative intention corresponds to the informative intention. Signals that express communicative intentions are called “ostensive signs”; usually, both intentions are expressed through a single behaviour, such as the tilting of the cup (Phillips, 2015a). According to Sperber and Wilson (1986), communication is not successful when the listener recognizes only the literal meaning of the sentence, but when he succeeds in reconstructing the speaker’s communicative intention through the clue provided. The ostensive signal must therefore attract the attention of the recipient. A specific principle governs the success of this process: *relevance*.

Sperber and Wilson (1986) argue that it is exactly the relevance of the stimulus that determines which particular information will receive the participant’s attention to the conversation at a given moment. Relevance is defined through the two notions of cognitive effect and processing effort: (1) the greater the cognitive effect obtained from the processing of information, the greater will be the relevance of that information for individual; (2) the greater the processing effort required, smaller will be the relevance of information for individual. The *cognitive principle of relevance* explains the general tendency of cognitive systems to improve their performance by optimising the relationship between cognitive effort and cognitive effect. Therefore, cognitive processes tend to optimise the relevance, thus decreasing the processing effort. This theory, applied to the communication

field, comprise the *communicative principle of relevance*. In this perspective, the communicator's purpose is to be understood and, to this end, he must produce a sufficiently relevant ostensive stimulus for his interlocutor, who will have to grasp his communicative intent through an effort of elaboration. Sperber and Wilson's Relevance Theory has solid cognitive bases. In fact, to distinguish it from Grice's model (1975), strong attention is given to the analysis of cognitive systems involved in the processing of linguistic information. From this point of view, the theory of relevance is a model of communication that respects the cognitive plausibility that (as we saw earlier in this paper) is one of the two necessary steps for a naturalistic model of human language.

The question at this point is: which cognitive device can guide a communicative scheme like the one outlined above? Since the theory of relevance model is in a stark contrast with the hypothesis of the code model, there is a difference between the cognitive capacities required by ostensive-inferential communication and those involved in the code model (i.e. the ability to form associations in an intentional way). According to the relevance theory, ostensive communication is made possible by the system of *mindreading*, namely, the ability to attribute mental states (such as desires or beliefs) to understand and predict others' and oneself's behaviours (Baron-Cohen, 1995; Leslie, 1987, 1994). According to Scott-Phillips, what makes ostensive communication possible in principle is what makes language possible. He maintains that the ostensive act (both in production and in understanding) is nothing more than an exercise of mindreading. Scott-Phillips explains (2015a):

In particular, we shall see that the very act of ostensive communication, in both production and comprehension, is exercise in reading others' minds. Moreover, it involves not just mental representation of others' mental states, but the mental representation of others' mental representation of one's own mental states, and indeed several further levels of representation beyond these. I call the ability to entertain and process these multiply embedded levels *recursive mindreading*, or *mental metarepresentation* [...]. We shall see that only once we have added several levels of mindreading does proper ostensive-inferential communication actually occur. (pp. 64–65)

The ability to attribute mental states has been the focus of numerous theories in the philosophy of mind and cognitive science. Leslie (1994) links this ability to the existence of an innate module identified with the

*Theory of Mind Mechanism* (TOMM), which consists of two components: first, agents and action provide an interpretation of the actions of a purpose-oriented agent; second, agents and attitude allow the attribution of mental states to others (beliefs, desires, fictions). The latter allows inferences that rest on meta-representational structures of the type: agent 1 believes that X thinks Y (Adornetti, 2013). According to Scott-Phillips, ostensive communication emerges only thanks to meta-representational structures; that is to say, thanks to the elaboration of multiple levels of mindreading. This point is particularly important. As we will see, this argument will then be used by the same author to assert that nonhuman primates are unable to communicate ostensively.

As mentioned, Scott-Phillips incorporated the relevance theory into an evolutionary framework to explain how human language originated. In other words, he supplied the relevance theory with an evolutionistic plausibility. It is a fundamental step in the work of the author. In clarifying how language evolved, it is completely impossible to presuppose the existence of a combinatorial linguistic ability: this would imply admission of what one is actually trying to explain. For this reason (and in stark contrast to the Chomskian vision), according to Scott-Phillips, emerging first is a form of ostensive communication, made possible by the meta-representational capacity of human beings. The linguistic code was created later to enhance ostensive communication. Let's analyse the question in detail.

In cognitive sciences, many models of language evolution have proposed the origin of human communication bringing into play cognitive systems at the basis of social behaviour (Origg & Sperber, 2000; Sperber, 2000; Tomasello, 2008; Scott-Phillips, 2015a, 2015b). The fact that language has a social character is certainly not in question; indeed, the function of communication is exactly to exchange information in order to change the beliefs of others, to cooperate, and to share experiences. From this point of view, the essential characteristics of human communication emerge thanks to the so-called social brain. In line with some notable authors, the social brain has allowed our ancestors to survive and prosper, distinguishing themselves from all other animal species (Frith & Frith, 2010). According to the *social brain hypothesis*, Dunbar (1998, 2009) posits that the management of social relationships has allowed human beings to develop a unique nervous system in the animal world. Richard Byrne and Andrew Whiten (1988) coined the term “*Machiavellian intelligence*” to refer to a most important evolutionary challenge for our ancestors, namely, having to anticipate and predict others' behaviour and use that information for their own purposes. From a biological point of view, the social brain would allow us to grasp the intentions of the

other and understand causes and consequences of actions before the other can actually perform them (Frith & Frith, 2010). This framework perfectly embraces with the relevance theory describing communication as a process of production and reading of informative and communicative intentions thanks to the mindreading device (Sperber & Wilson, 2002). This assumption has important implications for the origin of human language: As Sperber claims, if communication requires a recursive reading of others' minds, then mindreading must be considered the prerequisite for the birth of language. Sperber and Wilson (1995) claim that

Human communication is a by-product of human meta-representational capacities. The ability to perform sophisticated inferences about each other's states of mind evolved in our ancestors as a means of understanding and predicting each other's behavior. (...) Language made inferential communication immensely more effective. It did not change its character. All human communication, linguistic or non-linguistic, is essentially inferential. (p. 199)

To test this idea, it is necessary to prove that mindreading is independent from language. To do this, we refer to studies of comparative psychology. Premack and Woodruff's most famous article *Does the chimpanzee have a Theory of Mind?* (1978) started a series of comparative psychology studies focusing on the meta-representational ability. They claimed that great apes possess mindreading ability. Ten years later, Premack (1988) examined in depth and reformulated this thesis. Specifically, he recognized that great apes actually have weak mindreading abilities. They are able to attribute to others perceptive or volitional states but not epistemic states, such as desires and beliefs. In *Primate Cognition* (1997), Josep Call and Michael Tomasello reviewed a series of studies on nonhuman primates and concluded that while nonhuman primates are able to understand the others' behaviour, they cannot infer psychological states. Povinelli and colleagues (2000, 2001) confirmed the same result. However, a few years later, Tomasello, Call and Hare (2003) modified their initial hypothesis: nonhuman primates (most research has been done with chimpanzees) are able to understand some limited classes of mental states. In fact, a series of behavioural observations suggests that chimpanzees are able to understand part of the visual perception of others and, following their gaze, perform some significant behaviours (Tomasello et al., 1999; Call et al., 1998; Call et al., 2001). In the 2003 study, Tomasello and colleagues designed an experiment to confirm these hypotheses. In the first part

of the test, experimenters put a head chimpanzee and a subordinate one in competition for food. In the experimental condition, the sub-chimpanzee has access to the position of food, while the vision of the predominant chimpanzee is obstructed by a barrier between him and the meal. In general, the subordinate chimpanzee takes advantage of the situation in an extremely flexible manner, reaching for food only when the ape monkey cannot see it. In the second part of the study, the subordinate chimpanzee observes the experimenter while he places food beyond the barrier and can deduce if the predominant chimpanzee has access to the same information. In this case, the chimpanzee is able to modify its behaviour based on the visual information that its competitor possesses, allowing it to anticipate the other's move. Although some authors propose a different reading (Povinelli & Giambrone, 2001), these studies seem to show that chimpanzees can follow the gaze of others, understand the content of others' visual perception, and adapt their behaviour on the basis of this information. Moreover, these types of behaviours are more evident in familiar situations for chimpanzees, namely competitive circumstances (Tomasello et al., 2003).

Another extremely important line of research concerns the ability of nonhuman primates to understand intentional actions. Call and Tomasello (2008) and Tomasello et al. (2003) argue that chimpanzees are able to understand the aims and intentions of others, as well as their perception and knowledge. In a famous study, the experimenter has some food to leave for the chimpanzee, but he decides not to, for one of the following reasons: He is unable to do it or is unwilling to do it. Such behaviours are similar but elicit different reactions in the chimpanzee: anger when the experimenter doesn't deliver the food voluntarily; patience in the condition in which the experimenter is impeded for some reason (Call et al., 2004). Children behave in the same way (Behne, Carpenter, & Tomasello, 2005). This means that nonhuman primates understand the intentions behind certain behaviours. So, the answer to Premack and Woodruff's (1978) question raised many years ago should be interpreted with the idea of mindreading as a spectrum, ranging from a limited capacity to a more complete one. In this perspective, nonhuman primates possess a rather limited mind-reading capacity: They understand others' intentions and purposes but not the desires nor the beliefs about their mental representations of the world. Chimpanzees, in effect, fail the false belief test (Call & Tomasello, 2008).

Scott-Phillips used the results of these studies to his advantage. Since ostensive communication requires epistemic states (intentions and beliefs) and not just states of knowledge, and since great apes are unable

to attribute complex mental states, he concluded that nonhuman primates do not possess the necessary and sufficient prerequisites to develop a communication system like our human one. The author reclaimed a series of criteria that must be used to understand when it is possible to talk about intentional communication: alteration of the gaze, social use, awareness of other's attentive state, use of behaviours to attract attention, persistence to achieve objective, flexibility and expectation of an answer (Liebel et al., 2014). When all these criteria are observed, it's plausible to say that we are dealing with intentional communication (Scott-Phillips, 2015a). Although intentional communication is closely related to the ostensive one, for Scott-Phillips, it is two different phenomena: It is possible, in fact, that a signal is intentional but not ostensive since it does not openly express a communicative intention. Specifically, to talk about ostensive communication, one must give the expression and recognition of the informative intention, and the expression and recognition of the communicative intention. These tasks require meta-representational skills that are articulated in multiple levels. A series of studies shows that infants are able to carry out these operations (Grosse et al., 2010; Tomasello, Call, & Gluckman, 1997; Behne, Carpenter, & Tomasello, 2005; Moore, Liebal, & Tomasello, 2013; Tomasello, Carpenter, & Liszkowski, 2007; Cibra, 2010).

In particular, in the case of recognition of communicative intention, studies show a difference in the performance of infants and in those of nonhuman primates. In fact, while the former recognizes an experimenter's intention to indicate the position of a hidden object and responds differently when the experimenter simply turns his gaze in the direction of it, chimpanzees have difficulty understanding deictic gestures (i.e. Tomasello, Call, & Gluckman, 1997; Hermann & Tomasello, 2006). According to Scott-Phillips (2015a), failure in tasks that include pointing highlights serious doubts about nonhuman primates' ability to communicate ostensively. From his perspective, in addition to methodological problems, a general scepticism has produced significant absence of empirical investigations on apes about skills required by ostensive-inferential communication. Indeed, ostensive communication

As mentioned, Gricean communication is not only intentional, it is overtly intentional. In other words, not only are signals used in a voluntary (i.e. intentional) way, but this fact is made explicit (overt) to the audience, and this explicitness contributes to successful comprehension. Consequently, demonstration

of intentionality in animal communication is not sufficient to demonstrate meaning in the sense that is relevant to comparisons with human communication. (Scott-Phillips, 2015c, p. 804)

Therefore, nonhuman primates possess limited mindreading skills: They know how to grasp what others know and understand (Call & Tomasello, 2008). This makes gestural communication of the great apes extremely flexible and intentional – but not ostensive. It is a natural code enhanced by metapsychological abilities or, rather, the opposite of human language. Since the idea of Scott-Phillips is that nonhuman primates do not communicate ostensively, that ostensive character marks a qualitative gap between human language and communication of the great apes. However, although the ostensive communication is not in continuity with the communication of nonhuman primates, human social cognition is in continuity with social cognition of nonhuman primates. In other words, human meta-representational skills are the evolutionary product of the great apes' mindreading skills. The adoption of the comparative method allowed Scott-Phillips to assert a discontinuity between human beings and great apes on the level of communication systems but continuity on the level of cognition. End of the story?

The publication of *Speaking Our Minds* (2015a) has started a vigorous debate on this last question: namely, the possibility that the continuity between human beings and great apes concerns only cognition – or is it instead possible to extend it in terms of communication? The main protagonist of this debate, along with Scott-Phillips, is Richard Moore.

Moore's discussion follows the path identified by Scott-Phillips in his book. Scott-Phillips (2015a) argued that if we want to extend continuity to the communication level (that is to say, if we want to criticize the idea that nonhuman primates' communication is not ostensive), we have two options: demonstrate that ostensive communication doesn't require recursive mindreading or show that great apes have such ability. Richard Moore built his own criticism of the Scott-Phillips theory from the first point. The hypothesis of Moore (2014) is that the proponents of the inferential-ostensive model of communication have overestimated the cognitive abilities that this requires (Grice, 1989; Sperber & Wilson, 1995; Tomasello, 2008; Scott-Phillips, 2015a). According to Scott-Phillips (2015a), expressing an informative intention, which is part of the communicative one, means manipulating the mental states of others, specifically their beliefs. As we've seen, nonhuman primates are unable to infer information about others' beliefs. However, Moore shows some

examples of utterances that do not presuppose the concept of belief: One can say “stop hitting me” with the intention to modify the action of the other but not his mental state (Moore, 2014). Moreover, even when informative intention is aimed at manipulating others’ mental states, this can be explained in less mentalistic terms. In Moore’s phrase: “For example, in addition to pointing to get you to *believe that there is a snake* (richly mentalistic), I might also point to get you to *look at the snake* (less mentalistic)” (2014, p. 646). In this perspective, given that nonhuman primates are able to understand intentions underlying the actions of others and what is within the visual field of others, they are able to communicate ostensively. Eye contact represents a helpful tool for recognize the ostensive capacity of nonhuman animals. In fact,

Consensus is that—at least in humans—where eye contact is used to address an utterance to its intended audience, this suffices to make communicative behaviors ostensive [...] It is sufficient for acting with communicative intent that one produce (sincerely and in conjunction with one another) a sign in order to elicit some behavioral response or action *r* from an interlocutor and an act of address, with which one directs one’s performance of that sign to the attention of one’s interlocutor. (Moore, 2016a, pp. 225–226)

The fact that great apes fail to understand pointing could be that pointing is a more difficult act to interpret because it is less rich in information. Indeed, pointing requires greater inferences than a wider class of expressive behaviours, such as altering the gaze, expression of emotions, and posture. These behaviours provide direct, non-inferential information about the mental states of others, making certain manifestations of communicative intentions more easily interpretable than others (Moore, 2016b).

Scott-Phillips (2015a) also argued that ostensive communication requires a recursive mindreading ability. However, as Moore points out, there is no empirical evidence to support the idea that pre-verbal children, as well as great apes, possess such a sophisticated meta-representational capacity (Moore et al., 2013; Moore, 2016b). The classic test used to evaluate mindreading skills is the “false belief” test (Wimmer & Perner, 1983). At the base of this experimental paradigm, there is the idea that the demonstration of mindreading ability emerges when the content of others’ mental states is different from the beliefs that the subject has with respect to them (Dennett, 1978). Before the age of 4, children fail this test (Wellman, Cross, & Watson, 2001). Although the test revisited

in the implicit form is overtaken by children as early as 18 months (Baillergeon, Scott, & He, 2010). Moore (2014) argues that such success is liable to a less heavy explanation of the cognitive mechanisms involved in ostensive communication. It is possible to communicate ostensively even if you have more limited metarepresentations skills. Therefore, in the alternative perspective proposed by Moore (2016a), the ability to attract the other's attention would be sufficient to direct a communicative act (in other words, to express a communicative intention) and to recognize when a signal is addressed to themselves (recognizing a communicative intention). However, with reference to informative intentions, production requires only the ability to model one's own signal according to the goal pursued, while comprehension requires the ability to grasp the purpose underlying the action of others. There is empirical evidence that nonhuman primates are able to perform all these operations (Povinelli et al., 2003; Liebal et al., 2004; Hermann & Tomasello, 2006; Yamamoto et al., 2009). If we accept the proposal of a functional and less costly reinterpretation of the Scott-Phillips model, then there is no doubt that nonhuman primates can communicate ostensively.

To conclude, it is certainly possible to say that in *Speaking Our Minds* (2015a), Scott-Phillips fulfils a very important aim, that of reconciling the relevance theory with a Darwinian point of view. As we saw at the beginning of this work, respecting evolutionary plausibility is the only way to build a naturalistic framework for the explanation of the origin of human language. Once the Cartesian discontinuity approaches have been overcome, it is necessary to confront an investigation into the unique traits of human communication harmonize with the investigations concerning the elements of continuity that qualify the phylogeny of our species. Although Scott-Phillips supports a continuity between humans and great apes compared to cognitive architecture, he admits the existence of a qualitative difference at the communicative level. However, in light of a new reading of the ostensive-inferential model, there are currently no arguments strong enough to support a thesis of this kind: Nonhuman primates are not able to communicate ostensively, and therefore the ostensive character is a prerogative of human beings.

The commitment to provide a complete theory – taking into account evolutionary and cognitive plausibility – is still a very deep matter. In fact, it requires the reconstruction of the numerous small steps that gradually led from the communicative abilities of our closely related animals to the complexity of human language.

## References

- Adornetti, I. (2013). *Il farsi e il disfarsi del discorso. Pragmatica del linguaggio e processi cognitivi*. Firenze: Le Lettere.
- Atlas, J. D. (2000). *Logic, meaning and conversation: Semantic undeterminacy, implicature, and their interface*. Oxford: Oxford University Press.
- Baillargeon, R., Scott, R. M., & He, Z. (2010). False-belief understanding in infants. *Trends in Cognitive Sciences*, 14(3), 110–118.
- Baron-Cohen, S. (1997). *Mindblindness: An essay on autism and theory of mind*. Cambridge: The MIT Press.
- Behne, T., Carpenter, M., & Tomasello, M. (2005). One year olds comprehend the communicative intentions behind gestures in a hiding game. *Developmental Science*, 8(6), 492–499.
- Byrne, R., & Whiten, A. (Eds.). (1988). *Machiavellian intelligence: Social expertise and the evolution of intellect in monkeys, apes, and humans*. New York, NY: Clarendon Press.
- Call, J., Hare, B. A., & Tomasello, M. (1998). Chimpanzee gaze following in an object-choice task. *Animal Cognition*, 1(2), 89–99.
- Call, J., & Carpenter, M. (2001). Do apes and children know what they have seen? *Animal Cognition*, 3(4), 207–220.
- Call, J., Hare, B., Carpenter, M., & Tomasello, M. (2004). ‘Unwilling’ versus ‘unable’: Chimpanzees’ understanding of human intentional action. *Developmental Science*, 7(4), 488–498.
- Call, J., & Tomasello, M. (2008). Does the chimpanzee have a theory of mind? 30 years later. *Trends in Cognitive Sciences*, 12(5), 187–192.
- Carston, R. (2002). Linguistic meaning, communicated meaning and cognitive pragmatics. *Mind & Language*, 17(1–2), 127–148.
- Chomsky, N. (1966). *Cartesian linguistics: A chapter in the history of rationalist thought*. New York, NY: Harper and Row.
- Chomsky, N. (1988). *Language and problems of knowledge: The Managua lectures*. Cambridge: The MIT Press.
- Chomsky, N. (1995.) *The minimalist program*. Cambridge: The MIT Press.
- Csibra, G. (2010). Recognizing communicative intentions in infancy. *Mind & Language*, 25(2), 141–168.
- Darwin, C. (1859). *On the origin of species by means of natural selection, or preservation of favoured races in the struggle for life*. London: John Murray.
- Dennett, D. C. (1978). Beliefs about beliefs [P&W, SR&B]. *Behavioral and Brain Sciences*, 1(4), 568–570.
- Dunbar, R. I. (1998). The social brain hypothesis. *Evolutionary Anthropology: Issues, News, and Reviews*, 6(5), 178–190.
- Dunbar, R. I. (2009). The social brain hypothesis and its implications for social evolution. *Annals of Human Biology*, 36(5), 562–572.

- Ferretti, F. (2015). *La facoltà di linguaggio. Determinanti biologiche e variabilità culturale*. Roma: Carocci.
- Frith, U., & Frith, C. (2010). The social brain: Allowing humans to boldly go where no other species has been. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 365(1537), 165–176.
- Grice, H. P. (1957). Meaning. *The Philosophical Review*, 66(3), 377–388.
- Grice, P. (1989). *Studies in the way of words*. Cambridge-London: Harvard University Press.
- Grosse, G., Behne, T., Carpenter, M., & Tomasello, M. (2010). Infants communicate in order to be understood. *Developmental Psychology*, 46(6), 1710–1722.
- Harvey, P. H., & Pagel, M. D. (1991). *The comparative method in evolutionary biology*. Oxford: Oxford University Press.
- Hauser, M. D., Yang, C., Berwick, R. C., Tattersall, I., Ryan, M. J., Watumull, J., [...] Lewontin, R. C. (2014). The mystery of language evolution. *Frontiers in Psychology*, 7(5), 401.
- Herrmann, E., & Tomasello, M. (2006). Apes' and children's understanding of cooperative and competitive motives in a communicative situation. *Developmental Science*, 9(5), 518–529.
- Leslie, A. M. (1987). Pretense and representation: The origins of "theory of mind". *Psychological Review*, 94(4), 412–426.
- Leslie, A. M. (1994). ToMM, ToBY, and Agency: Core architecture and domain specificity. In L. A. Hirschfeld & S. A. Gelman (Eds.), *Mapping the mind: Domain specificity in cognition and culture* (pp. 119–148). Cambridge: Cambridge University Press.
- Liebal, K., Call, J., & Tomasello, M. (2004). Use of gesture sequences in chimpanzees. *American Journal of Primatology: Official Journal of the American Society of Primatologists*, 64(4), 377–396.
- Liebal, K., Waller, B. M., Slocombe, K. E., & Burrows, A. M. (2013). *Primate communication: A multimodal approach*. Cambridge: Cambridge University Press.
- Moore, R., Liebal, K., & Tomasello, M. (2013). Three-year-olds understand communicative intentions without language, gestures, or gaze. *Interaction Studies*, 14(1), 62–80.
- Moore, R. (2014). Ape gestures: Interpreting chimpanzee and bonobo minds. *Current Biology*, 24(14), R645–R647.
- Moore, R. (2015). A common intentional framework for ape and human communication. *Current Anthropology*, 56(1), 71–72.
- Moore, R. (2016a). Meaning and ostension in great ape gestural communication. *Animal Cognition*, 19(1), 223–231.
- Moore, R. (2016b). Gricean communication and cognitive development. *The Philosophical Quarterly*, 67(267), 303–326.
- Origg, G., & Sperber, D. (2000). Evolution, communication and the proper function of language. In P. Carruthers & A. Chamberlain (Eds.), *Evolution and the*

- human mind: Language, modularity and social cognition* (pp. 140–169). Cambridge: Cambridge University Press.
- Povinelli, D. J., Bering, J. M., & Giambrone, S. (2000). Toward a science of other minds: Escaping the argument by analogy. *Cognitive Science*, 24(3), 509–541.
- Povinelli, D. J., & Giambrone, S. (2001). Reasoning about beliefs: A human specialization? *Child Development*, 72(3), 691–695.
- Povinelli, D. J., & Vonk, J. (2003). Chimpanzee minds: Suspiciously human? *Trends in Cognitive Sciences*, 7(4), 157–160.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, 1(4), 515–526.
- Premack, D. (1988). “Does the chimpanzee have a theory of mind?” revisited. In R. Byrne & A. Whiten (Eds.), *Machiavellian intelligence: Social expertise and the evolution of intellect in monkeys, apes, and humans* (pp.160–179). New York: Oxford University Press.
- Scott-Phillips, T. (2015a). *Speaking our minds: Why human communication is different, and how language evolved to make it special*. New York: Palgrave Macmillan.
- Scott-Phillips, T. C. (2015b). Nonhuman primate communication, pragmatics, and the origins of language. *Current Anthropology*, 56(1), 56–80.
- Scott-Phillips, T. C. (2015c). Meaning in animal and human communication. *Animal Cognition*, 18(3), 801–805.
- Shannon, C. E., & Weaver, W. (1963). *The mathematical theory of communication*. Urbana: The University of Illinois Press.
- Sperber, D., & Wilson, D. (1995). *Relevance: Communication and cognition*. Cambridge, MA: Harvard University Press. (Original work published 1986)
- Sperber, D. (2000). Metarepresentations in an evolutionary perspective. In D. Sperber (Ed.), *Metarepresentations: An interdisciplinary perspective* (pp. 117–137). Oxford: Oxford University Press.
- Sperber, D., & Wilson, D. (2002). Pragmatics, modularity and mind reading. *Mind & Language*, 17(1–2), 3–23.
- Tomasello, M., & Call, J. (1997). *Primate cognition*. Oxford: Oxford University Press.
- Tomasello, M., Call, J., & Gluckman, A. (1997). Comprehension of novel communicative signs by apes and human children. *Child Development*, 68(6), 1067–1080.
- Tomasello, M., Hare, B., & Agnetta, B. (1999). Chimpanzees, Pan troglodytes, follow gaze direction geometrically. *Animal Behaviour*, 58(4), 769–777.
- Tomasello, M., Call, J., & Hare, B. (2003). Chimpanzees understand psychological states—The question is which ones and to what extent. *Trends in Cognitive Sciences*, 7(4), 153–156.
- Tomasello, M. (2006). Why don’t apes point? In N. J. Enfield & S. C. Levinson (Eds.), *Roots of human sociality: Culture, cognition and interaction* (pp. 506–524). Oxford-New York: Berg.

- Tomasello, M., Carpenter, M., & Liszkowski, U. (2007). A new look at infant pointing. *Child Development*, 78(3), 705–722.
- Tomasello, M. (2008). Why don't apes point? *Trends in Linguistics Studies and Monographs*, 197, 375.
- Tomasello, M. (2008). *Origins of human communication*. Cambridge, MA: The MIT press.
- Wellman, H. M., Cross, D., & Watson, J. (2001). Meta analysis of theory of mind development: The truth about false belief. *Child Development*, 72(3), 655–684.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, 13(1), 103–128.