Thom Scott-Phillips' contribution consists in further grounding Dan Sperber and Deidre Wilson's Relevance Theory into an evolutionary and cognitive framework for the advent of human language. I take it that the central thesis of Scott-Phillips' book is that language is not an organ. Rather, it is the result of the joint capacity for ostensive-inferential communication—a side product of increased social capabilities for recursive mindreading—in addition to the production and cultural transmission/transformation of conventional codes. Scott-Phillips' project is a difficult one and, to me, the synthetic review he offers in his recent book is an important step forward.

I want to focus on a mechanism that, in my view, is important for Scott-Phillips' project, but not directly discussed in the book: the capacity to produce public displays from private, mental representations. I will see how it relates to some of the conceptual points made in the book — the issue about continuity and discontinuity between natural and conventional codes, and the role of natural codes in the evolution of ostensive-communication.

Making intentions publicly available

Relevance theory is all about communicating (displaying and interpreting) intentions. When ostensive-communicative acts are produced, they need to signal both (1) that they are communicative, and (2) what their informative content is. However, for ostensive communication to work at all, it is not enough that one individual have clear intentions to both communicate and inform, and that the receiver be capable of recognizing these intentions when made manifest. The one communicating must also be capable of producing signals that carry with them the right kind of structure (i.e., information) so that the receiver will contextually understand what the informative content consists of, and that there is information to understand in the first place.

Communicative intentions aside, the capacity to produce public representations that signal some informative content depends on (1) knowing that some signals will be relevant to another person to understand the intended content but also (2) knowing how to produce an arbitrary signal of this kind. Having sufficient knowledge about others' minds and what sorts of signal will manipulate them in the right way is not enough for communication to be ostensive. One needs to know how to produce, from one's private mental representations, the public signals capable of transmitting the right kind of informative content (Sperber 2006). In other words, it is of little value that one knows that some sorts of signal will allow a receiver to identify one's own communicative and informative intentions in the right way if one does not also know how to produce such public displays from the relevant mental representations and intentions. I am pointing here at a transduction problem: how do I know how to produce a public display at all (how am I capable of producing it) from my own private mental representations, and moreover, how do I make sure that the display will appropriately convey the right kind of information so that my interlocutor will be able to infer my communicative and informative intentions?

An evolutionary/neurocognitive framework requires explaining how, between ancestral and contemporary Homo forms, a specific capacity for producing language emerged. We are required to take seriously the problem of producing, with the right structure, public displays from private mental representations, especially in an arbitrary, voluntary, communicative way. Indeed, without such productive capacity, you could do all the recursive mindreading you want, and have all the communicative and informational intentions you want, you would still be unable to produce relevant communicative acts. In other words, you might be an expert at recursive mindreading, but be very poor at speaking your mind. In this sense, it seems that the productive capacity must emerge either before or at the same time as ostensive-inferential communication comes about.

Being able to solve this transduction problem is no small cognitive feat, and I am not prone to believing that the cognitive capacities to produce relevant public displays from private mental

representations come for free with the capacity for recursive mindreading.

Consider the case of expressive aphasia, also known as Broca's aphasia. Expressive aphasia is a form of agrammatism: the inability to produce grammatically correct sentences. There are diverse degrees of severity to this handicap, with the most severe case consisting in only being able to produce a single word for all communication acts, as Paul Broca's well known patient Tan was only capable of. Expressive aphasics usually are capable of comprehending others, so in the context of ostensive-inferential communication, they seem to be able to recognize the communicative and informative intentions of others. What they lack is part of the capacity to produce public signals that convey such intentions: they fail to properly map the sounds they emit on the intended meaning they wish to convey. This does not mean they cannot communicate at all in other ways, but it does show that producing meaningful acts of communication is not a trivial task.

The dysfunctional mechanisms in the expressive aphasia case are likely to have evolved in order to produce more powerful ostensive communication, and thus after ostensive inferential communication was already in place. But this only pushes back the problem as to which productive processes were in place to allow the evolution of ostensive-inferential communication in the first place. Indeed, even an early ostensive-inferential communication system faces the same problem, i.e., individuals must still possess the capacity to produce — in the right way — public signals that reflect their private mental intentions.

Pointing as a natural code

So what would this process look like in an early ostensive-inferential communication system? I suggest here that some natural code, namely pointing, might serve as a key candidate for such early ostensive-inferential productive mechanisms. Moreover, I would suggest that pointing has opened the way for ostensive-inferential communication to evolve through a process of ritualization (Scott-Phillips, 2014, section 2.5; table 2.2).

Consider the following, admittedly crude just-so story for the evolution of pointing behaviours by ritualisation. Infants incapable of grasping objects out of their reach will tend to stretch their arm in the direction of the objects they desire, in a proto-pointing manner. Such behavior, which serves first as an attempt to grasp the object, "signals" part of the mental states of the infant: the infant has some intentions about the object it is grasping towards. Later on, parents could come to recognize the intention of the infant by associating the direction of the kids reaching behavior with the desired object, and recognize that the infant desires the object being "pointed" at, and so learn to offer the object to the infant. We do not have ostensive-inferential communication here yet, because the infant is just trying to grasp the object, not making his intentions public to others in any intentional manner. Nevertheless, such behaviors can fixate and serve as a natural code for wanting/asking for some specific object, as long as parents react appropriately.

In this speculative scenario, pointing serves as a natural code as it is based on a pair of associations (one between the desired object and the grasping/pointing behavior, another between the grasping/pointing behavior and the parent's response). The scenario looks a lot like how chimpanzees learn to point. Indeed, Leavens & Hopkins (1998) and Leavens et al. (2005) argue that captive chimpanzees learn to point at desirable food that is out of their reach in order to manipulate a nearby human in bringing the food to them. However, as Scott-Phillips argues (with Tomasello (2008)), chimpanzees do not have sufficient mindreading capabilities to communicate ostensively. Pointing in chimpanzees must thus be a natural code. In contrast, for humans it seems that such processes are ontogenetically well entrenched as little nurturing is required for human infants to actually produce such reaching/pointing behaviors (Kita 2003; Tomasello 2008). Moreover, humans (even infants) use pointing as a conventional code. They do not only request objects, they also use

pointing to inform others cooperatively (Kita 2003; Tomasello 2008).

If the capacity of pointing in our ancestors was first used as a natural code as the scenario above suggests, we would have a story to explain how recursive mindreading might have co-opted pointing as an early productive mechanism. However, that would imply that pointing started as a natural code and became a conventional code once ostensive communication had evolved. This does not mean that language conventions, specifically, evolved from pointing as a natural code. Rather, it means that pointing made ostensive communication possible by serving as an early productive mechanism, and then became a conventional code. How can this be possible?

First, note that pointing behaviors (in chimpanzees for instance) are much more expressive than the set of natural codes that Scott-Phillips considers in his criticism (sections 1.5, 2.7). I agree that there is just so much we can express with sneezing, frowning, etc., even when we use these behaviors in an ostensive way. However, pointing, in contrast to sneezing, frowning, etc., is a much more expressive natural code as it is a natural way to publicly display part of what our mind is privately thinking of (its intentions). Part of the content of your mental states is directly made public as its referent is directly being pointed at. In an early, pre-ostensive context, pointing directly shows what the object of a private mental intention is, and thus can serve as an early form of producing public displays of mental representations in an expressive way. I would suggest that it is this expressive power of pointing, even as a natural code, which makes pointing a plausible productive mechanism that could have served as a platform for the evolutionary acquisition of ostensive communication.

Moreover, from this natural code, and once ostensive-inferential capacities have evolved into the picture, not only the infant can communicate her intention to reach an object (imperative), but with further development of mindreading and cooperation, the pointing act can then play expressive and informative roles (Tomasello 2008, pp. 111-143). In fact, with pointing plus ostensive communication, we have a very expressive form of communication that does not obey the code model anymore. For instance, pointing in one direction can mean many things: we can refer to the chair being pointed at, its color, its shape, its number, or to the person that usually sits on it, etc., the specific intended meaning changing with the context (Wittgenstein, Philosophical Investigations, §33). This certainly is not language, nor is it as expressively powerful as language, but it is much more expressively powerful than sneezing ostensively.

Scaffolding and transformative continuity

Scott-Phillips recognizes pointing as a key mechanism for early ostensive communication (section 5.2). This is in line with Tomasello's work (who also discusses pantomiming as an early form of communication in his 2008) that pointing in addition to words can make an expressive proto-language as it allows for the production combinatorial signals (section 6.1 in Tomasello (2008)). This would also be in line with Scott-Phillips' view that ostensive-inferential communication allows for a more direct route to communication. However, as I have speculated above, pointing might have first evolved as a natural code and only then been co-opted as a conventional code. This puts some stress on Scott-Phillips arguments against the continuity of natural codes with conventional codes, or at least it suggests that there are different kinds of continuity between natural and conventional codes that might fit into Scott-Phillips scenario about the evolution of language.

Scott-Phillips makes a good point that it is ostension and inference augmented with conventional codes that makes language possible, not natural codes augmented with ostension and inference (section 2.7). Pointing behaviors have not evolved into words, I agree. Nevertheless, pointing plausibly has served as a preliminary step in the evolution of ostensive communication by solving the basic productive problem discussed above. Moreover, pointing might have served as the early platform for the evolution of combinatorial communication with conventional codes (see Tomasello,

2008, for arguments supporting this last point). What these two roles points at is the usefulness of pointing as a simple productive mechanism for communication. So there seems to be a form of continuity here between natural codes and language, assuming we read continuity as how we got from A to B, i.e., how a natural code (pointing) helped scaffolding the evolution of ostensive communication (of which language is a special case) by serving as an early productive mechanism.

In contrast to the scaffolding understanding of continuity suggested here, Scott-Phillips understands continuity as how A transformed into B, where B is a modified version of A. More specifically, Scott-Phillips argues that natural codes did not (and could not) evolve into languages along some gradient of expressivity (p. 48; see also Origgi & Sperber 2000). He convincingly argues that a transformative understanding of continuity is wrong, showing that conventional codes are not natural codes plus pragmatics, and that this argues against the code model. I agree. However, where I would disagree with Scott-Phillips is when he appears to infer from this rejection of the transformative view of continuity that natural codes should be removed from the evolutionary picture of the advent of language. I admit, this conclusion is not stated explicitly. However, it is suggested by the way natural codes are dealt with throughout the book. For instance, there are no more references to natural codes in Scott-Phillips' book once chimpanzees are shown to be unable of ostensive-inferential communication and only capable of using natural codes. This suggests that natural codes were last useful in our closest common ancestors, but not afterwards, thus being a key difference-maker in the evolution of the human lineage's capacity for language.

Continuity understood as a process of evolutionary scaffolding does not entail the transformative view. When I say that pointing might have evolved from a natural code to a conventional code, I do not mean that language as such is just pointing plus pragmatics (see above). What I am suggesting is that pointing was originally a natural code, serving first as a pre-ostensive mechanism of expressing private mental representations in the form of public signals. When ostensive communication came along, pointing was co-opted as a conventional code, retaining its role as a productive mechanism along the way, but then served the additional role of a conventional code.

Perhaps I am over-reading Scott-Phillips here. This "implicit dismissal" of natural codes as relevant to the evolution of language — e.g., as relevant/important evolutionary steps in the origins of language in Modern Humans — seems to me to be founded on a false dichotomy, i.e., that either you are a transformative continuist (what Scott-Phillips blames the code model to be), or you are a discontinuist (Scott-Phillips). I believe that the scenario elaborated above, a form of scaffolded continuism, offers a third alternative. Ostensive communication (of which language is a special case) might have evolved from natural codes, not as a transformation of natural codes, but by co-opting natural codes (i.e., pointing) as a productive mechanism for expressing informative intentions. The scaffolding reading of continuity offered here in fact would agree that "linguistic communication is made possible by the existence of [natural] codes", at least phylogenetically. However, it would not agree that because natural codes are part of the evolutionary story of ostensive communication — and thus language —, it means that language functions according to the code model. Rather, it means that natural codes — specifically pointing — might have served as the necessary productive mechanism required for the capacity of ostensive communication to evolve in the first place.

If the arguments presented here are anywhere close to being sound, then they put stress on some aspects of Scott-Phillips arguments. First, I have argued that an important condition for ostensive communication is the evolutionary acquisition of a capacity for producing public displays from private mental representations. An evolutionary and cognitive account of ostensive communication (and thus language) depends on explaining how such productive mechanisms have evolved. Scott-Phillips does not explicitly discuss the evolution of such productive mechanisms. I hope I have offered reasons convincing enough to see that we should take the evolution of productive mechanisms seriously for a complete theory of the evolution of ostensive communication, and thus

language. Second, I have argued that even when pointing serves as a natural code (e.g., as in chimpanzees), it directly expresses part of the mental states of the pointer, and that pointing is a much more expressive and flexible natural code than what Scott-Phillips suggests natural codes can be, even without ostensive communication. This makes pointing a plausible candidate for an early productive mechanisms scaffolding – with the addition of recursive mindreading – the evolution of ostensive communication. Moreover, I have suggested that a natural code serving a productive role can be co-opted by ostensive communication and become a conventional code. This does not mean that language works according to the code model. Rather, it means that natural codes can have a role to play in the evolution of ostensive communication, and thus that there can be a form of continuity between natural codes and conventional codes.

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