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Graham K., Hobaiter, C., (2023) «Towards a great ape dictionary: Inexperienced humans understand common nonhuman ape gestures», in *PLoS Biology*, n. 21(1), pp. 1-7.

An evolutionary puzzle that still stands

Graham and Hobaiter's paper begins with a statement that makes explicit what is at stake: «the apparent discontinuity between human language and nonhuman communication has been argued to present an evolutionary puzzle» (Graham, Hobaiter 2023: 1). The first point to discuss is such supposed "evolutionary puzzle". The unthought hidden premise that transform «the apparent discontinuity between human language and nonhuman communication» into a "puzzle" seems to be that for the AA any evolutionary explanation should be more or less continuous, whereas the huge difference between non-human and human communication makes it very difficult to imagine how it can be passed continuously from the first to the second. It seems that, according to the AA, if some cognitive human competence is not found in nonhuman animals, at least the presumed roots of it, then such a discontinuity poses a major threat to evolutionary theory. That is, it seems that according to the AA, the appearance of a genuine behavioral and cognitive novelty in an animal species is incompatible with evolutionary theory. However, according to the AA, «more and more research has begun to reveal the deep phylogenetic roots of language: from the way other species combine signals to change the meaning [...] of an utterance» (*Ibidem*). Since such a point is central to their argument, the first point to discuss is what their proposed notion of "meaning" is.

The AA refer to a precedent paper properly titled *The meanings of chimpanzee gestures*, so the first point of the present commentary is an analysis of the critical notion of meaning that they use. According to them «chimpanzees use their gestures in purposeful communication with other chimpanzees; as such, they can be considered meaningful» (*Ivi*: 1597). According to such a definition, the "meaningfulness" of a semiotic gesture coincides with its own "purposefulness": that is, semantics is the same thing of pragmatics. Take the following example of the gesture that the AA indicate as STOP THAT whose meaning according to the AA is: «either cease behavior previously directed toward the signaler or change behavior to direct it toward another». The supposed meaning of this gesture is divided into two parts, "primary" and "secondary" outcome of the gesture; in this case the primary outcome is «grab; hand on; jump; push; side roulade; slap other; somersault; stomp two feet; tap other», while the secondary would be «arm swing; bite; foot present; hand fling; punch other; shake hands; slap object» (*Ivi*: 1598). According to the AA chimpanzee «individual gestures have specific meanings, independently of signaler identity, and we provide a partial lexicon; [moreover] flexibility is predominantly in the use of multiple gestures for a specific meaning» (*Ivi*: 1596). However, such presumed semantic flexibility seems more like semantic indeterminacy, since the very large variety of their supposed meanings and contexts in which the gestures are used.

When the same AA define the putative meanings of chimpanzee gestures as «real-world meanings», it becomes clear that we are not really in the presence of meanings, at least if we use the notion of

meaning consistently: in fact, according to them «*real-world* meanings are defined and listed with the gestures with which they are associated, as either a primary or a secondary outcome» (*Ivi*: 1597). This means, properly speaking, that we are not in the presence of meanings as the semantic (internal) side of the significant (external) side of the gesture as a bifacial semiotic entity. What is a "real-world meaning" if it is not an actual behavior that is in a direct relation with the preceding gesture? A more sober description of what the chimps are actually doing– one that does not violate the so-called Morgan's canon[1]– is that we are not in the presence of a real semiotic action, but rather of a complex unified pattern of behavior that includes a gesture followed – on the part of another chimp – by some sort of action (not strictly defined, as we have just seen). The point is that meaning does not coincide with the effect on the receiver of the message, such as a particular action he actually performs, at least as we use the notion of meaning as it is used in human semantic communication. Take the case of someone who, upon hearing the linguistic expression "beer", immediately begins to pray to God for help against the temptation to drink alcohol. It would be completely wrong to consider such a prayer as the meaning of the linguistic expression "beer".

When the AA write that since «chimpanzees use their gestures in purposeful communication with other chimpanzees», therefore, «they can be considered to have meaning», such a conclusion does not follow from the premise. That chimpanzees use gestures "purposefully" is not at all sufficient to consider those gestures to be endowed with meanings. The meaning of a gesture is not meaningful because it is used with some (even if communicative) purpose; it is meaningful because a community of semiotic subjects (in a larger unconscious way) considers such a sign to be meaningful, and this means that in such a community there is a semiotic code that establishes that there is a correspondence between signs and meanings. Such a code is somewhat independent of the actual use of the sign. Contrary to the perspective held by the AA, semantics, even if obviously connected to pragmatics, is semiotically independent of pragmatics.

When one reads with more attention the proposed definition of the meanings of chimpanzee gestures, one cannot help feeling a great superposition of these supposed meanings, as the same AA admit: «gestures can be used for two or three similar outcomes: for example, *push* is used for both 'move away' and 'stop that'» (*Ivi*: 1597). In what sense can one continue to think that such a gesture has a definite meaning? In the majority of cases, the meaning – that is, the primary and secondary outcomes of the gestures – is nothing more than the promotion of more or less close contact between the nonhuman animals. The AA insist on emphasizing the flexibility of the meanings of the chimpanzees, but it seems that more than flexibility, we are actually in the presence of an expressive continuum with no clear boundaries between one gestural movement and the next. In such a context, attempting to individuate a particular meaning for each gesture seems to respond more to the (perhaps unconscious) desires of the AA than to what the chimpanzees are actually doing. At the same time, also the distinction between primary and secondary outcomes seems rather

[1] «In no case is an animal activity to be interpreted in terms of higher psychological processes if it can be fairly interpreted in terms of processes which stand lower in the scale of psychological evolution and development». Stripping away the somewhat old-fashioned jargon of the 19th-century British psychologist Lloyd Morgan, what he is saying is simple and still understandable: to explain animal behavior, it is not the case that we should use complex explanatory terms – such as the semantic term "meaning"– when we can describe it effectively with simpler, in particular nor semantic or semiotic, notions.

arbitrary. Even more doubts arise when the AA define the gestures STOP THAT and MOVE AWAY as forms of «negation» (*Ivi*: 1597). One should not confuse a gesture that is used to stop someone else's behavior with the logical function of negation. One does not negate anything, let alone the opening of the door when one closes it. Such closing is an action, just as opening a door is another action; these actions are not logically connected. On the contrary, every negation implies an implicit assertion. For example, if someone says, «There is no cat on the mat», such a "not" is inseparable from the unuttered assertion, «There is a cat on the mat». Such an implicit assertion is completely absent in the case of the chimpanzee gesture STOP.

Notwithstanding all these unresolved theoretical and empirical problems, the paper we are commenting on uses such an approximate notion of meaning for the goal, as the AA put it, to envision «an online experiment to crowdsource whether adult human subjects understand the meaning of gestures produced by nonhuman apes. [...] We selected the 10 most common gesture types for which we were previously able to confirm 'meaning' in both chimpanzees and bonobos, determined by recipient responses that consistently satisfy the signaller» (Graham, Hobaiter 2023: 2). Again, as in the previous paper, the implicit, unquestioned assumption is that the recognition – or, more accurately, the assumption – on the part of the recipient (in this case, a human animal) is sufficient to ascribe a certain meaning to a particular animal behaviour. The main conclusion of the experiment is as follows: «Participants were significantly better than chance at assigning the 'correct' meanings to chimpanzee and bonobo gestures across types, suggesting that humans may have retained their understanding of the core features of a gestural system that was present in our last common ancestor with the genus Pan 6 to 7 million years ago» (*Ivi*: 3). In fact, what the experiment actually shows is that human animals, whose bodies are quite similar to those of chimpanzees and bonobos, are able to attribute certain behavioral meanings to a given video of one of these two animals performing a certain behavior. Even though the human body is quite different from a cat's body, for example, it is not difficult to imagine what a cat "wants" when it sits in front of a closed door: it wants to get out. Such an "understanding" of the cat's behavior has nothing to do with any meaning of the gesture. We are both animals that react similarly in a similar situation, regardless of the behavioral differences that distinguish us.

However, the very existence of these supposed meanings is not at all a genuine discovery made by the human subjects who participated in the online experiments. In fact, the experimental apparatus has explicitly and beforehand determined that these meanings do exist: the human participant only has to choose which should be the "correct" meaning – the choice is between four – to assign to the video. That is, it is the same experimental apparatus that has explicitly told them that these meanings exist. In fact, what human subjects recognize is not that these gestures are endowed with determinate meanings; rather, they simply have to accept the experimental set that has already decided that these meanings must be in place. Note that in order to explicitly guide the human subjects to the desired experimental goal (to recognize the presumed meanings of the chimpanzee's gestures), each actual gesture shown was accompanied by a simplified diagram of that same gesture; but in this way, what does the human subject actually recognize, what the AA believe (or unconsciously wants to believe) that the chimpanzee is doing, or what the chimpanzee is actually doing? This is apparent in the experimental instructions given to the subjects (see at https://app.gorilla.sc/task/8263279):

> **Instructions**
> When chimpanzees and bonobos gesture, they move their body in a way that communicates something to another ape. **All of these videos contain a gesture**. [...] <<<< Next to each video you will see a cartoon [...] to help you to find the gesture you are looking for. Underneath the video you will be given information about what they were doing before they gestured. After this video, select which of the four options you think the gesture meant. These are the different meanings you can choose from:
> **"Climb on my back"**
> **"Follow me"**
> **"Let's have sex"**
> **"Move closer to me"**
> **"Stop doing that"**
> **"Groom me"**
> **"Let's be friendly"**
> **"Carry me"**
> **"Give me that food"**
> **"Move away from me"**
> **"Move into a new position"**.

In this case, it is the experimental apparatus that decides (without making explicit that such a decision has already been made) that a) the behaviours of the non-human animals are communicative gestures and b) that these "signs" have certain meanings. The human participants were left only with the "free" choice of assigning a particular presumed meaning – one of four possible ones – to the gesture seen in a video. In fact, all the human participants in the experiment had to do was accept the prior (hidden) decision of those who prepared the whole experiment that these presumed meanings actually exist. But the question is whether these meanings really exist, not what they are. The AA end the paper with these general evolutionary conclusions:

> The underlying mechanism that makes gestural communication comprehensible across great ape species, now including humans, remains unresolved. Humans use of gesture as intertwined with language in diverse ways makes detecting gesture types from the ape repertoire difficult. It remains unknown whether the great ape repertoire itself is biologically inherited, or whether apes—now including humans—share an underlying ability to produce and interpret naturally meaningful signals that are mutually understandable because of general intelligence and shared body plans and social goals, or the resemblance of gestures to the actions that they aim to elicit. These are not the only possible explanations, for example, gestures could be biologically inherited in nonhuman apes but understood by humans through other cognitive mechanisms, and we need to continue to develop innovative methods such as these video playbacks to address remaining unknowns (Graham, Hobaiter 2023: 3).

As the previous critical analysis has shown, the assumption of the existence of a "great ape repertoire" is not at all relevant, since such a repertoire is based on the existence of gesture meanings, the existence of which there is no proof at all. As a direct consequence, the main conclusion of the paper is completely unjustified: «our findings add a substantial new thread of evidence to the continuity of communication throughout our hominid lineage» (*Ivi*: 4). What the paper clearly shows is that humans – when appropriately trained by an experimental apparatus that guides them to choose what that same apparatus considers the "correct" answer – are quite capable of making plausible conjectures about the possible goals of chimpanzee and bonobo behavior, rather than a «continuity of communication throughout our hominid lineage». It is

important to note that the AA's use of the technical term "correctness" is very vague. When they say that a particular meaning is the correct meaning of a chimpanzee gesture, what are they really saying? That such a meaning is correct from the point of view of their reconstruction of the chimpanzee semantic system or from the point of view of the chimpanzee? In the latter case, there is no report of any instance of incorrect use of this gesture. It is well known that if there is no way of distinguishing between correct and incorrect use of a sign, there can be no talk of correctness in general. The consistent and repeated use of quotation marks when using technical terms of linguistic philosophy and semiotics shows that this is a problem for the AA. However, this kind of notation only serves to hide the theoretical problems associated with their allusive use of these terms.

These conjectures are not based on the presumed sharing of the same meanings for at least some basic gestures; we do not share a similar ancestral communication system, but a somewhat similar body, sometimes facing similar ecological problems, which is limited by similar material constraints. It is superfluous and unnecessary to assume the existence of meanings for the (presumably communicative) behaviors of chimpanzees and bonobos. Finally, «the apparent discontinuity between human language and nonhuman communication» seems still destined to remain an "evolutionary puzzle".

References

Graham K., Hobaiter, C., (2023) «Towards a great ape dictionary: Inexperienced humans understand common nonhuman ape gestures», in *PLoS Biology*, n. 21(1), pp. 1-7.

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