Meaning in animal and human communication

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Abstract:

What is meaning? While traditionally the domain of philosophy and linguistics, this question, and others related to it, is critical for cognitive and comparative approaches to communication. This short essay provides a concise and accessible description of how the term meaning can and should be used, how it relates to 'intentional communication', and what would constitute good evidence of meaning in animal communication, in the sense that is relevant for comparisons with human language.

Keywords: communication; meaning; intentionality; language; primates; pragmatics

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Introduction

In any discussion of communication, human, animal, or otherwise, it is hard to avoid the term *meaning*. An intuitive use of the term is to describe the effects that a signal tends to have, and/or the objects that it tends to pick out in the world. It is, for instance, a natural turn of phrase to say that the famous vervet alarm calls mean 'snake', 'eagle', and 'leopard'. At the same time, it is also natural to use meaning to refer to the cognitive aspects of human communication: when we talk about the meaning of words, what we mean to refer to is not just the literal translation of those words, but also the intentions that we have as speakers. For instance, when we say "Can you pass me the sugar?", we (typically) do not simply wish to enquire about whether the audience is able to pass the sugar; we instead mean that we would actually like them to pass us the sugar. Meaning, then, is a ubiquitous term, that appears to have at least two related but different uses.

This potential for ambiguity around meaning can make comparisons between human and animal communication hazardous. Are any animal signals, such as birdsong or the vervet alarm calls, meaningful in the way that words are? If so, how, and to what extent? To answer these questions, we need a concise account of how the term meaning can and/or should be used in comparisons between human and animal communication.

In this short essay, I provide such an account. In the following sections I: (i) provide a brief background, focusing on recent critiques of how meaning and associated terms are used; (ii) describe how meaning is typically used in the philosophical and pragmatics literature; (iii) discuss the relationship between the causal and philosophical uses of meaning; (iv) explain how meaning relates to the way that 'intentional communication' has been operationalised in the animal communication literature; and (v) describe what would need to be shown to demonstrate that any non-human communication system is meaningful in the way that human communication is. In sum, this paper satisfies a pressing need for a concise and accessible description of what

45 constitutes meaning in animal communication, in the sense that is relevant for comparisons with
46 human language.
47
48 **Meaning in animal communication**
49 The language of communication – not just meaning, but other related concepts too, such
50 as information and reference – has historically been used in the animal communication literature
51 often in a loose and largely intuitive way. Researchers often write that a particular animal signals
52 'means', 'refers to', or 'carries information about' some particular feature of the world. However,
53 the degree to which such statements are meant to encourage the thought that the signal in
54 question is similar to or possibly even related to human communication varies between cases. In
55 some instances, such comparisons are very much the point, while in others, this language is used
56 only as shorthand: a convenient way to describe, in a metaphorical way, how a given signal
57 appears to work.
58 Some researchers have critiqued these and associated practices at length, arguing that the
59 use of terms that have been co-opted from linguistics, and other disciplines that study human
60 communication, is wont to lead animal communication research astray (Owings & Morton, 1997;
61 Owren & Rendell, 2001; Owren et al., 2010; Rendall et al., 2009; Wheeler & Fischer, 2012). The
62 nub of the matter is that when it comes to between-species comparisons, we do not want to pre-
63 judge matters, but casual use of terms such as meaning – for which there is a rich philosophical
64 literature – substantially increases the chances that we will inadvertently do so. Such critiques
65 have had significant impact in recent years (see Stegmann, 2013 for a collection of views). This has
66 been especially true in non-human primate communication research, perhaps unsurprisingly,
67 given that comparisons with human communication are one of the primary motivations for such
68 research. This increased care over terminology has encouraged researchers to consider in detail
69 how the existence of human-like 'meaning' (not to mention other, related concepts) could be

tested for in non-human primate communication. However, there is not as yet any consensus on this.

What, then, would constitute good evidence of animal signals having human-like meaning? One recent study, explicitly motivated by comparisons with human language, and aware of the fact that we cannot simply ascribe word-like meaning to signals willy-nilly, claimed to have identified the 'meaning' of chimpanzee gestures based on documentation of gestures that were intentionally produced, and which consistently led to apparently satisfactory outcomes (Hobaiter & Byrne, 2014). Are these criteria – intentional production and persistent, satisfactory outcomes – appropriate? If not, what would be? To answer these questions, we must turn to philosophy and pragmatics, and discuss the meaning of meaning itself.

Meaning in human communication

In a famous essay, entitled simply 'Meaning', the philosopher Paul Grice distinguished between *natural meaning* and *non-natural meaning* (1957). Natural meaning describes stable relationships between two things in the world, where one reliably predicts the other. Those spots 'mean' measles; that noise 'means' trouble. Non-natural meaning, in contrast, is the meaning that a speaker intends to communicate when they use language and some other forms of human communication.

Grice stated three criteria for something to qualify as having non-natural meaning. The first is that the signaller must intend to achieve in the audience a particular response.Second, the audience must recognise that the speaker has this intention. Suppose that we are in a bar. It is your turn to buy the drinks, and I would like another. I intend for you to believe this (the first of Grice's criteria, above), and I therefore make sure that my empty glass is visible to you. However, suppose that I do not do anything to explicitly bring attention to it. With regards such cases, Grice argued that there is not enough going on here to say that I *meant* that I would like another drink.

All I have done is provided evidence that might or might not indicate as much. Grice thus added the following, third criterion to address this: that the listener should recognise the speaker's intention, and the listener should grasp the intended meaning at least in part because he recognises the speaker's intention. This criterion is satisfied if, rather than simply ensuring that my empty glass is visible, I make eye contact with my friend and simultaneously tilt my wine glass, or express my intentions in some other conspicuous way. Here, not only do I intend that my friend believes that I would like another drink, but my friend believes this in part because she recognises that this is my very intention. Now we can say that I *mean* that I would like another drink. The Stanford Encyclopedia of Philosophy summarises these three criteria using an example of a driver who flashes her car lights at another driver, with the intention that the other driver will realise that he does not have his own lights on. Here, the driver who flashes her lights intends that: (i) the other driver should come to believe that his lights are not on; (ii) the other driver recognises that this change in belief is the first driver's intention; and (iii) this recognition is part of his reason for believing that his lights are not on.

This Gricean analysis dominates contemporary discussion of meaning. Many modifications and reformulations have been proposed (e.g. Strawson, 1964; Schiffer, 1972; Neale, 1992; Sperber & Wilson, 1995; Recanati, 2004). Animal communication researchers should not expect that the philosophy of language will speak with a single voice on the matter of meaning any time soon. Nevertheless, it is fair to say that Grice's key insight remains central to most discussion. That key insight is that meaning is auto-deictic: stimuli that have non-natural meaning point to the very intentions that triggered their production in the first place.

Another way to make this point is to say that meaningful communication is not only intentional, it is also *overtly* intentional – it brings attention to the intentions that are being expressed. When, for instance, I tilt my coffee cup to request a refill, I do so in a way that brings attention not only to the fact that my cup is empty, but also to the fact that the tilt is

communicative i.e. to the very fact that I am trying to communicate in the first place. Similarly, when I speak, I provide evidence not only for what I wish to communicate, but also for the very fact that I am trying to communicate something. My behaviour is overtly intentional.

Meaning and levels of analysis

Clearly, not all animal signals are meaningful in this way. Many animal communication researchers, when they say that a particular signal 'means' something, do not actually wish to say that something as cognitively rich as the notion described above is being used. For instance, birdsong can be said to 'mean' something like 'come mate with me', but I doubt that researchers that use such language wish to commit themselves to the view that birdsong involves the expression and recognition of intentions, in the way described above. In general, the term meaning tends to be used in the animal literature more simply, as a way to describe the effect that a signal has, and/or the object that it picks out in the world. This raises the question of how the Gricean notion of meaning, described above, relates to the more intuitive use that is common in the animal communication literature.

The key difference between Gricean (non-natural) meaning and meaning in this more intuitive sense is that they describe different levels of analysis. Specifically, whereas the philosophical notion of meaning describes how a particular set of proximate mechanisms (namely intentions) can work to make communication possible, the more colloquial usage describes the ultimate level function(s) that a signal has, and/or the effects it reliably has on receivers (Krebs & Dawkins, 1984). (This ultimate/proximate distinction is central to evolutionary approaches to behaviour. Put briefly, ultimate level explanations are concerned with *why* a trait exists, while proximate level explanations are concerned with *how* it works (see Davies et al., 2012; Scott-Phillips et al., 2011).) For example, the function of mating calls is to cause in others a willingness to mate, and the function of alarm calls is to alert other animals to potential predators. Under this

usage, the word 'meaning' describes what would trigger these effects, *as if* a signal were an instance of Gricean communication. Knowledge of the ultimate function of a call can be then used to guide research into the specific proximate mechanisms involved. Indeed, given that proximate mechanisms are often the main focus for many comparative psychologists, this is often the very point of identifying the 'meaning' of the signal in the first place. After all, comparisons between different proximate mechanisms are relevant for many questions in animal cognition, not just those associated with communication.

Another way to describe the intuitive use of the term 'meaning' is to say that it describes a type of natural meaning. In other words, birdsong 'means' 'come mate with me' in the same way that clouds 'mean' rain: there is a reliable association between one thing in the world and another (clouds and rain in one case, song and sexual receptivity in the other). This is not to suggest that clouds are signals. Rather, I am pointing out that animal signals, like clouds, have natural meaning. A useful term is to describe such signals is natural codes: sets of reliable associations that makes communication possible (Wharton, 2003; 2009; Scott-Phillips, 2014; 2015). Natural codes have natural meaning.

Human languages are *not* natural codes. They do not make communication possible (Sperber, 1995). Instead, languages are sets of conventional codes. The difference is that whereas natural codes make communication *possible*, what languages do is make an existing communication system – one based on Gricean, non-natural meaning – expressively *powerful* (Wharton, 2009; Scott-Phillips, 2014). Framed this way, the key question for comparisons with human language is whether the meaning observed in any given case is natural meaning (which is a product of communication that is made possible by reliable associations between phenomena in the world) or non-natural meaning (which is a product of communication that is made possible by the expression and recognition of intentions).

169 This difference between these two approaches to meaning has obvious potential for
170 confusion and misunderstanding. This is not simply because the two accounts are different, but
171 also because cross-species comparison of communication, especially when one of those species is
172 humans, is a topic of inter- and multidisciplinary interest, where audiences with different
173 backgrounds may come with quite different sets of assumptions and knowledge. In particular,
174 philosophers and others familiar with the Gricean account of meaning may not be familiar with
175 the ultimate/proximate distinction. Similarly, students of animal communication may not be
176 wholly familiar with the details of the Gricean approach. Consequently, it is often not clear exactly
177 what a researcher who claims that, say, a monkey call 'means' 'eagle!', actually has in mind: they
178 could, quite plausibly, be referring either to proximate intentions, or to the signal's effects and
179 ultimate functionality. Greater clarity about the intended meaning of such claims is desirable.
180 These two different approaches to meaning do however share one important feature in
181 common: they are both about how signals *do* things to others (Scott-Phillips, 2010). In one case,
182 what signals do is change behaviour, and the design comes by virtue of natural selection, which
183 produces organisms that behave in goal-directed ways (Gardner, 2009). In the other case, what
184 signals do is change mental states, and the design comes by virtue of human intentions
185 (notwithstanding the fact that the capacity for this is of course itself a product of natural
186 selection). This quality – that signals *do* things – is what unites different ways of using the term
187 meaning.
188 Clearly many animal communication systems only have meaning in the intuitive, ultimate
189 level sense. It is equally clear that human communication has meaning in the Gricean sense
190 described in the previous section. Consequently, a key question in comparative cognition is
191 whether any other species do too.
192
193 **Meaning and intentionality**

One prominent concept in the study of animal communication is that of 'intentional communication' (see Liebal et al., 2014 for a review). In part motivated by comparisons with language and some other forms of human communication, many studies investigate whether animal signals are used intentionally, or not. The criteria used to identify intentional communication vary somewhat across studies (in part due to methodological limitations), but some general practices have been established, including in particular the appropriate use of persistence and elaboration (i.e. continued use of a behaviour until its objectives have been met, and the use of alternative or modified signals in case of failure). Several natural communication systems have been shown to satisfy these criteria. The most widely attested case is that of great ape gestural communication (Tomasello, 2008), but there are others, including some in non-mammalian species, such as the head shakes of grouper fish (Vail et al., 2013).

Intentional communication is *not* the same thing as communication that is meaningful in the Gricean sense. 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. What must also be shown is that the signaller intended to make this intention explicit, and that this overtness contributes to comprehension.

How can these criteria be operationalised for empirical research? One way might be via a distinction between behaviours where the intentionality is overt, and those where the intentionality is partially covert. Here is a human example (adapted from Grice, 1989; and Wharton, 2003):

(a) Mary intends that her mother sees that she is unwell. Mary thus greets her mother with an exaggeratedly sad face, and overtly points to her forehead, which is pale.

(b) Mary intends that her mother sees that she is unwell. However, she doesn't want this intention to be noticed (it might decrease her chances of getting a day off school). So Mary pretends to be asleep, but ensures that her pale forehead is fully visible.

In (a), Mary has an overtly expressed intention that her mother believes she is unwell, whereas in (b), the same intention is expressed only covertly. By the appropriate use of these two different behaviours, Mary shows us that she has command over the difference between overtly and covertly expressed intentions, and hence of (Gricean, non-natural) meaning.

We presently have no evidence that any non-human species (primate or otherwise) is able to make the same distinction. Thus, we have no good evidence that the communication of any non-human species is meaningful in the way that words and other forms of human communication are. For a signal to be meaningful in the Gricean sense, it must be overtly intentional, and we do not have good evidence of overt intentionality in any non-human species. I mentioned earlier one recent analysis, which claims to report the 'meanings' of chimpanzee gestures based on documentation of intentionally produced gestures that consistently led to apparently satisfactory outcomes (Hobaiter & Byrne, 2014). This is not enough to demonstrate meaning in the sense relevant for comparisons with human language. Overt intentionality has not been shown, and without this, we do not have grounds to claim that these behaviours have meaning in the way that human words do.

Summary and conclusion

How should the term meaning be used? Above I described two ways in which it has been used – one casual and intuitive, and widely used in animal communication research; the other philosophical and more precise – and I do not intend to insist that the term be used in the latter sense alone. This approach is contrary to other critiques, which recommend avoidance of the term meaning altogether (unless researchers really do mean to refer to Gricean, non-natural meaning).

Instead, these critiques suggest alternative terminology, based on the language of influence and effects, rather than of information, meaning, and associated concepts (Rendall et al., 2009; Owren et al., 2010). While I certainly agree that meaning is too often used too casually, there are benefits to the use of intuitive language, in particular plain convenience. Behavioural ecology has long used the language of intentions and other mental states as shorthand to describe behaviour at the ultimate level. An expression like "offspring are selected to demand more food than the parent *wants* to give" is far more easy to use than alternatives that do not use the language of intentions: "During the course of evolution selection acting on genetic differences in the begging behaviour of offspring will have favoured an increase in the intensity of begging, and this will have been favoured to the extent that the level of begging by any individual offspring exceeds the optimum level for the parent" (example from Krebs & Davies, 1993, p.3). Such practice is not problematic so long as researchers keep in mind that these are ultimate level descriptions, and use them accordingly.

It is at the proximate level that more explicitness is needed. Researchers that do wish to discuss whether any particular instance of animal communication is meaningful in the same way that human words are should make explicit reference to Gricean, non-natural meaning. I am personally skeptical that any non-human species uses non-natural meaning (Scott-Phillips, 2014; 2015). However, this is ultimately an empirical issue, and the key criterion is that signals should be overtly intentional. This has to date not been shown in any non-human species.

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