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Mindshaping and Non-Gricean Approaches to Language Evolution

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Abstract
Orthodoxy has it that language evolution requires Gricean communicative intentions and therefore an understanding of nested metarepresentations. The problem with this orthodoxy is that it is hard to see how non-linguistic creatures could have such a sophisticated understanding of mentality. Some philosophers like Bar-On (*The Journal of Philosophy* 110 (6): 293-330, 2013a; *Mind and Language* 28 (3): 342-375, 2013b) have attempted to develop a non-Gricean account of language acquisition building on the information-rich and subtle communicative powers of expressive behaviours. This paper argues that this approach shares a number of instructive similarities with the literature on the cognitive conception of language. It shows how expressive accounts (and others) can learn from insights in that tradition and identifies a problem with the role of intentional actions in expressive accounts that can be solved by understanding expressive behaviours more as cognitive rather than communicative tools.

1 Introduction

Language is one of the defining characteristics of human cognition. Language enables humans to have a form of communication that is vastly more complex and informative than anything non-linguistic. Naturally, therefore, exploring how humans acquired this incredible communicative instrument has been the main focus of most of the literature on language evolution. However, as thinkers like Clark (2006) or Carruthers and Boucher (1998) have pointed out, language is not only an incomparable communicative tool, it also shapes human cognition. It is easy to forget this important fact, because both intuitively and as a research interest, humans have tended to focus on language as the ultimate communicative tool (see Clark 2006).

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In this paper, I follow in the footsteps of the thinkers that advocate the cognitive conception of language and apply their insights to language evolution. In particular, I want to use some of the insights from that tradition and argue that they can help us to better understand expressive accounts of language evolution (Bar-On 2013a, b). Such accounts argue that expressive behaviours are first steps towards the development of a proto language, because expressive behaviours make the mental states of the animal visible.

The idea that making the mind visible is an important function of language is also a key insight in the work on the cognitive conception of language (Clark 2006; Pettit and McGeer 2002). But what is meant by this idea? The point of departure is that the psychological states that carry our belief contents are hidden away behind the skull. Looking at a person we cannot see their psychological states but have to infer them.[1] Language provides a new way for humans to access these belief contents. Because words are external vehicles for the contents of internal belief states, they allow the agent to attend to those contents, which before had been transparent,[2] like a window, for the agent: without words, the mind is invisible, because the agent looks through it into the world, as it were. With words, on the other hand, belief states themselves become visible as objects. This is particularly salient when thinking about written text. In contrast to psychological beliefs, written words are visible, stable and can be manipulated in all kinds of ways. Fittingly, Andy Clark therefore calls them material symbols (Clark 2006). But it is not only written text but also spoken language that has at least some of these features. The content of language is, because of its linguistic vehicle, perceptible and manipulable: Its content is far more precise, easier to remember, to attend to, to rehearse, etc. than non-linguistic content.

It is easy to see the parallel to expressive behaviours. Dorit Bar-On (2013a) argues that expressive behaviours like play bows, angry grimaces or alarm calls make the mind of the animal visible. The playfulness, anger or alarm is no longer hidden away in the skull, but has a visible correspondent in the external world.

But in Bar-On's work in the tradition of work on language evolution, the visibility here is important not because it allows for new cognitive operations of the agent but because of its proto communicative function. For Bar-On, expressive behaviours are a first stepping stone to communicating mental states to others. By making its anger visible, the animal facilitates that relevant others in the environment like potential mates or competitors can use these signals for the coordination of behaviour. However, Bar-On makes one important additional point, which will bring us to the core issue of this paper. Bar-On argues that expressive behaviours are not only special because they make the mind visible but also because they can be brought under

[1] The idea that our folk psychological states like beliefs are unobservable entities that require theoretical observation is both intuitive and has a venerable tradition in the so-called theory theory of mindreading. Obviously, once one looks a bit more closely, things become less straightforward. Is it really true that we use inference to find out about others mental states? Is there not a way in which one could claim that mental states are somehow perceivable? (see e.g. Lavelle 2018 for an excellent introduction to this literature?). These are important points, but they are not critical for us here. It seems uncontroversial at least that access to mental states is much more difficult without language.

[2] See famously Moran (2012) or (Metzinger 2004) for a similar notion of transparency.

intentional control, which allows the animal to learn to actively modulate those behaviours to make them more effective.

Interestingly, this is again reminiscent of a move that is made in the literature on the cognitive conception of language. In their fascinating paper *The self-regulating mind*, Pettit and McGeer (2002) argue that the crucial function of language is to allow intentional self-regulation. Pettit and McGeer are very much in line with the visible mind point raised by Clark and others, but in addition they focus specifically on the point that visible minds in the form of words can be targeted by the agent as intentional objects. Once the agent has written down what they want to say, they can then start to manipulate the linguistic vehicles in order to aid cognitive progress. The agent can use them to remind themselves, attend to them, rearrange them, etc.[3] Importantly, as I have argued in earlier work, this is possible, even if the agent does not understand psychological concepts (Vierkant 2012). A child can manipulate words, even if they have not yet mastered the false belief task.

This ability to intentionally manipulate the visible mind in agents that have no psychological state concepts is a central parallel between the material symbols of language and Bar-On's account of the role of expressive behaviours in language evolution. It is also motivated by a shared scepticism about the importance of high-level mindreading in the respective domains. McGeer is one of the most important proponents of the so-called mindshaping movement, i.e. a group of philosophers who argue that the traditional debate on the nature of mindreading neglects the regulative dimension of folk psychological state ascriptions. Humans don't just or even mainly ascribe beliefs to others to predict them, but to regulate social interaction. This regulation function is already operative before children are able to engage in high level mindreading.

Bar-On's account is also developed as an alternative to mainstream and mindreading-focussed approaches to language evolution. The mainstream takes its inspiration from Grice (1982) who argues that the non-natural meaning of human language requires complex nested communicative intentions that are at least 4th level metarepresentational. Bar-On is very sceptical on whether it is possible that such complex representational structures could have existed in our non-linguistic animal ancestors. Instead, Bar-On argues that it is possible to make progress using language as a communicative tool, without complex metarepresentations. The trick that is supposed to allow this is, as in the mindshaping tradition for language more general, the idea that expressive behaviours make the mind both visible and manipulable. Where Pettit and McGeer have the material symbols of language as their external vehicles of the mental for intentional mind regulation, Bar-On uses the intentional control of expressive behaviours.

However, there is an important problem with using this move in the language evolution context that Bar-On does not seem to pay enough attention to. As Bar-On's

[3] Importantly, while the point is most striking when made regarding written language, the same point also applies for the spoken word. Inner speech provides the agent with a tool to remind themselves, or to focus easily on highly complex contents by means of a very simple and constantly reproducible acoustic marker.

explicitly eschews Gricean metarepresentations, the intentional actions that animals use to manipulate their expressive behaviours cannot be based on intentions that are metarepresentational. This means that the intentional actions used to hone expressive behaviours that she refers to cannot be intentional communications. The animal that intentionally controls its angry grimacing does this per her non-Gricean assumption, not because it has the intention to communicate its anger.

Yet, it seems puzzling that intentional actions that are not performed with the intention to communicate should be a crucial stepping stone in developing the ultimate communicative tool. One way to make this less puzzling is advocated in this paper. It consists in the idea that the intentional control of expressive behaviours is important for the animal in the first place not because it allows communication, but because it enables the animal to finetune cognitive behavioural loops that allow it to achieve its non-communicative goals more effectively. Intentional control of expressive behaviour might then initially not be primarily for communication, but a first tender shoot of a mindshaping ability.

Importantly however, while I do want to argue that the manipulation of the visible mind is an often-overlooked powerful aspect of language evolution, this paper does not set out to argue that the cognitive aspects of language only become developed in non-communicative contexts. Communication clearly is a powerful tool in the development of human language and reasoning (see e.g. Mercier and Sperber 2017, or O'Madagain and Tomasello 2021). The critical point is it is very likely not the only tool, and it might well not be the main driver initially. This seems likely, because as this paper points out, true communication requires communicative intentions, but mindshaping can take place before the metarepresentational capacities for true Gricean communication are in place.

2 Bar-On's Argument

Bar-On (2013a, b) starts from the premise that it is implausible that our non-linguistic ancestors could have the nested metarepresentations necessary for Gricean communicative intentions. Instead, she argues that there are interesting behaviours that can at least explain some steps on the road of language evolution without communicative intentions. Bar-On claims that expressive behaviours have the right characteristics to fulfil that function. The growl, facial expression and typical behaviour of an angry dog are a visible sign of the inner state that the dog is in – they express the anger of the dog. Expressive states like these have been discounted as the potential beginnings of language, because even though they signify the presence of an inner state, they seem to do so in the same way as the much broader category of natural signs. As such, they signify the presence of anger in the same way that smoke signifies the presence of fire: they do not have aboutness, but remain firmly in the realm of the causal.

Bar-On argues that this dismissal is too hasty, however and contends that expressive behaviours are special in that they contain an incredibly rich and specific amount of information: The dog's expressive anger behaviour tells the

suitably attuned observer not only of the dog's anger, but also of the target of its anger and the behaviours that one can expect of the animal. Bar-On argues that this "Janus faced" characteristic of expressive behaviours is special and distinguishes them from mere natural signs.

In this way, expressive behaviours are different from what Bar-On (2013b), following Tomasello, refers to as informational displays. The latter include mere physical symptoms caused by an internal state, as well as fully reactive or instinctive behaviours that carry information about the animal's psychology. Examples of physical symptoms would be things like the display of a peacock or the horns of a cow, while the raising of the hair on an angry dog would be an example of a behavioural informational display. Both have evolved to inform the environment about some internal feature of the animal (like e.g. its strength or its anger). While both do tell the observer something about an inner state of the animal, Bar-On seems to agree that they do so in a way that can be compared to other natural signs like smoke for fire.

In contrast, expressive behaviours like play bows or growls of dogs do not just inform the environment about some internal state of the signaller. According to Bar-On (2013b), they also have some rudimentary form of aboutness. They are often directed at some external object, they inform the behaviour about the strength of feeling that the sender has with regard to that external object, and finally and most importantly, they can be brought under intentional control. A behaviour that is under intentional control can be modulated by the animal in order to make the information conveyed more specific. An alarm call, for example, could be produced more loudly if the predator is closer, and so on.

If expressive behaviours really do have proto aboutness as Bar-On argues, then it seems that she has uncovered a non-Gricean ability that foreshadows true linguistic capacities and which is not reducible to mere natural signs without taking a Gricean stance.

In what follows, I will agree with Bar-On that there are proto-referential elements in language evolution, that expressive behaviours are one important example of this, and that the ability to bring behaviour under intentional control is also a key element in this process. However, I will also argue that Bar-On's strongest justification for the specialness of expressive behaviours – i.e. the ability to bring them under intentional control – does not work as straightforwardly in her account as she seems to assume. I do not disagree that intentional control is one very plausible ingredient in language evolution. However in this paper, I do contend on the one hand that the role of intentional control is slightly more complex than Bar-On seems to assume, and on the other, that intentional control might be useful in more ways than Bar-On considers, because intentional control is not only crucial for the development of the communicative functions of language, but also for the development of language as a cognitive tool.

Before we can look at Bar-On's argument in detail, it is first necessary to have a closer look at the concept of intentional action employed in this paper.

3 What is Intentional Action?

Tim Bayne (2013) has suggested that the easiest way to get a grip on the notion of 'intentional action' is to distinguish between hard-wired and inflexible instinctive responses, and more flexible and goal directed-behaviour. The flexible behaviour can then be attributed to the agent as a whole and be understood as "intentional action" (p.164 2013). The differences between simple reflexes on the one hand and the complex behaviours of animals (think e.g. of the coordinated behaviour of hunting lionesses) and pre-linguistic human children on the other are clearly enormous, which justifies using cognitive flexibility and integration as our heuristic.

Bayne's rule of thumb also fits well with the literature on language evolution. It is often claimed that gesture must be at the beginning of human language because it is under intentional control, while vocalisations are not (Corballis 2003). In line with Bayne's rule, the evidence that gestures are intentional is typically that gesturing is more flexible and less stereotyped.[4]

Given that the Bayne heuristic makes excellent sense not only of our intuitions in general, but also of the specific literature, and given that it is clear that we very much need a distinction between inflexible instinctive behaviour which is purely stimulus driven and flexibly controlled intentional behaviour to adequately describe the phenomena, it is Bayne's heuristic that we will employ from here onwards.

Importantly, however, if we understand intentional control in this way, it is not an on/off distinction. As Bayne points out, few of our actions are purely intentional or purely stimulus driven. Most actions require a complex interplay between internal goals and the demands of the environment (2013, p.163). Very fittingly, he uses language as an example, where it is very clear that a conversation consists of the interplay between communicative intentions and the environment.

4 Grice, Intentional Actions and Functional Communication

Having established a rough heuristic of what intentional control is, we can now return to the question: Why is the intentional control of expressive behaviours important for language evolution? At first, this might seem a very odd question. Intuitively, it seems obvious that intentional control over the expression of mental states matters. Think e.g. of deception: Deception could be plausibly defined as the the intentional production of a behaviour that normally expresses a mental state, despite the fact that the agent is not actually in that mental state with the intention to produce a false representation about the mental states of the sender in the receiver. Obviously, therefore, the ability to deceive, so understood, seems to indicate an

[4] In the next sections, we will discuss Bar-On's claim that vocalisations might be brought under intentional control. Just to be clear: for the purposes of this paper, it does not matter which expressive behaviours were the first ones that were brought under intentional control. All we are interested in is what the effects of bringing any expressive behaviours under intentional control are for language evolution, especially in the absence of Gricean communicative intentions. As a result, we can remain neutral on this debate. Thanks to an anonymous reviewer for pressing me on this point.

understanding of representation, because the definition demands of the deceiver an intention to produce a false representation in the receiver.

The problem with the intuitive plausibility of this claim is that it depends on a Gricean framework. In a Gricean framework, it is trivial that intentional control is crucial for communicative behaviour. The Gricean framework understands communicative actions as a subclass of intentional actions. Communicative actions are actions that are guided by communicative intentions.

But in Bar-On's expressivist story, there is no equivalent to this logical connection between intentional action and communication. The plausibility of the importance of intentional actions relies heavily on the natural thought that if you have a goal (like communicating), being able to pursue it intentionally is a powerful tool to have. On the other hand, on the expressivist story, the animal does not have communication as a goal, but rather only fully world-directed intentions. This is not to say that the behaviour (e.g. alarm calls) cannot serve a communicative function on this account (see the following section). What is excluded by definition is that the animal has a communicative (i.e. Gricean) intention.[5] The intentional behaviours the animal produces do carry a lot of information about the mind of the sender that a suitably attuned observer can pick up on, but this is not what they aim to do.[6] These behaviours are not about telling. What is more, given the aim of the theory to not invoke metarepresentational abilities, this is not just a contingent problem, but excluded by definition from the approach. There cannot be any intentional mind-directed action if the animal cannot understand any form of metarepresentation. It simply does not have the cognitive resources for any form of mind-directed intentions.

5 The Functional Communication Argument

The expressivist has one obvious way of countering this argument. So far we have been interested in animal communication that might have the potential to be a stepping-stone for the evolution of human language. However, animal communication is also used in a different sense. It is not contentious that animals behave in ways that allow them to coordinate their behaviour. These behaviours may give the impression that animals are communicating with each other in the richer Gricean sense. However, this is deceptive. These behaviours are only functionally communicative. This means that they have evolved to fulfil one of the functions that human communication also fulfils, i.e. coordination, but obviously, this does not mean that these

[5] Thanks to Joelle Proust for pressing this point.

[6] Another nice example of the difference between intentional communication and behaviour that is intentional but might not be intentional communication comes from the debate on indicative pointing. In their excellent paper Leavens et al. (2005) point out that indicative pointing might well not be proof of intentional communication, because there is an alternative, cognitively cheaper interpretation. Babies might point because they have learnt that these behaviours elicit appealing behaviours from their social partners. The babies have intentions and their behaviour is interpreted as communicative by the adult receivers, but this does not guarantee that they communicate intentionally. Rather, they intend to manipulate their social partners because they enjoy their reactions.

behaviours also provide us with a good reason to assume that the animals communicate in the richer sense. Functional communication merely mimics human intentional communication. Nonetheless, functional communication might provide us with an argument for the importance of intentional action in using expressive behaviours for communication.

If animals coordinate behaviour and thereby functionally mimic real Gricean communication, then it might seem likely that this mimicry works better if the behaviour is intentional. The reasoning here might be as follows: Gricean communication is always intentional behaviour, so behaviour that is supposed to mimic Gricean communication will be more successful if it also is intentional, even if the intentions guiding the behaviour are non-Gricean.[7] Growls, for example, might well have evolved to enable dogs to functionally communicate to other dogs that it is better not to interfere with this dog at the moment. Once the dog has intentional control over its growl, it can now modulate its behaviour to achieve its aims better.

However, while these modulation effects provide some reason for the importance of intentional control, it is important to clearly mark the limits of this argument, because it is very easy to slide into illegitimate Gricean talk here.

For example, it is intuitively very hard not to understand the alarm calls as precursors of a primitive language.[8] It is therefore not surprising that alarm calls do indeed play a large role in Bar-On's expressive account and that Bar-On discusses e.g. the intentional modulation of alarm calls described by Manser et al. (2002). Initially, these findings seem puzzling without a Gricean story: It appears that the animal modulates its call because it intends to communicate. If the animal has communicative intentions, then these alarm calls obviously would be clear evidence of real communication, but they would also be clearly Gricean, because the presence of communicative intentions are the hallmark of the Gricean story.

Bar-On, however, wants to use these alarm calls as support for a non-Gricean expressivist story in which intentional control matters. In her text it is not absolutely clear how this is supposed to work, but perhaps she wants to use the same argument here as discussed above with the growling dog: Alarm calls evolved with a communicative function, but once the animal learns to bring them under intentional control, it can now learn to modulate them and thereby communicate much more effectively.

There is a worry with this argument, however: The dog modulated its growling in order to generate the ideal fit between the growl and its intention, which was to protect its food. The alarm call, however, might have a communicative function, but that function is not in line with the intention of the animal. Per non-Gricean assumption, the animal simply expresses its alarm and does not intend to communicate. As

[7] Thanks to Richard Moore for emphasising this point to me.

[8] As already mentioned in the section on the nature of intentional action, despite its intuitive plausibility, the claim that alarm calls are precursors to language is highly contentious. Many like Corballis (2003) doubt that alarm calls are voluntary. For our purposes, we can remain neutral between gesture and vocalisations as the most important expressive behaviours in language evolution. It does not matter for our argument which expressive behaviour is brought under intentional control, but just that it is possible to do so. In fact, as we will see shortly with informational displays, it is not even the intentional production of the behaviour at all that matters for our purposes, but the intentional control of the behaviour.

long as there is no other plausible goal of the animal that gives it a reason to modulate it becomes difficult to see why it would modulate its behaviour. So functional communication does not provide a fully satisfying answer to the worry. To some extent, this is not surprising, because functional communication is an evolutionary phenomenon. As such, it does not engage directly with the understanding and learning of the individual agent (see e.g. Dretske 1991), whereas intentional control is all about individual learning. As our aim in this this paper is to understand how intentional control over expressive behaviours could be important for the learning of the individual, animal functional communication does not quite do the trick.

Fortunately, this is not quite the end of the story, because intentions to modulate behaviour in the absence of metarepresentation are available.[9] While it is obviously true that the animal – per non-Gricean assumption – cannot have a communicative intention, it could well have the first half of such an intention, i.e. it could intend to bring about a specific reaction by the hearer through its signalling behaviour, even though it does not intend that the other animal recognises that it has the intention to do so. The dog might e.g. intend to make the postman go away by 'informing' him of its intentions by growling. Obviously, informing here does not have the pre-theoretical meaning, where informing is a mode of communication, but rather it is simply a way of making its intentions effective without any understanding of the role of the receivers' mind in the process. In fact, the animal does not have to have a concept of minds or beliefs at all in order to perform such intentional actions. This interpretation can also explain seemingly deceptive behaviours in animals like the African Drongo bird, without having to assume that Drongos have Gricean communicative intentions. These birds use fake alarm calls to scare away competitors so that they can then steal food (Flower et al. 2014). This does not mean that they have the intention to communicate with their competitors, but simply that they intend to induce a specific behaviour in their competitors.

The question now becomes: In which way is it useful for language evolution for an animal to have the ability to intentionally pursue such "informative" goals? The answer to this question comes back to the flexibility key to the Bayne heuristic. Intentional control allows the animal to attend to the means by which it achieves that goal. The means it will attend to are expressive behaviours, which, as Bar-On established, are external vehicles with a considerable amount of information about the internal state. This allows the animal to attend to important features of the mind before it understands that it has one. It can learn to separate the visible expressions of its mind from the goal that they normally achieve, and to start using them instrumentally. A growl, for example, normally tells the observer that a dog is expressing aggression towards an object (e.g. the postman). In addition, it will normally be accompanied by a look in the direction of the object (i.e. the dog will look at the postman). In turn, this will tell the observer where the object is. It might also tell the observer how close it is, because it might get more intense as the object (our unfortunate postman) approaches. If the dog can produce the growl intentionally, and if the dog owner then tends to give the dog a treat to end the growl, the dog might well

[9] Thanks to an anonymous reviewer for pressing this point.

learn that it is worth producing the growl even in the absence of its original target to achieve the desired effect. The dog has learned to instrumentalise its growling behaviour to achieve a new end. Even more importantly, it has learned to use a new tool as a means to achieve this aim and this tool happens to be a material symbol, i.e. a token of its mind, that can be sensed and manipulated in the external world. The animal now can engage in second order cognitive dynamics without even knowing that it has a mind. It has discovered one of the crucial tools that play such a large role in the cognitive conception of language. It is time now to have a closer look.

6 Intentional Actions and the Cognitive Conception of Language

Bar-On's work is based on the commonly held assumption that the proper function of language is communication and that it is this communication function that needs to be explained. This is a mistake, however, because there is ample evidence that language also has a whole host of cognitive functions. This should be a weak and uncontroversial claim. It is not an endorsement of any strong version of what Boucher and Carruthers call "the cognitive conception of language" (Carruthers and Boucher 1998). It does not commit itself to any specific claims about whether language is necessary for thought. All this claim amounts to is that language is a powerful cognitive tool (Clark 1998) and facilitates a whole host of cognitive operations.[10] Given that this much should be uncontroversial, it is then only natural to explore what roles the precursors of these cognitive functions in our ancestors may be and what role they played in language evolution.[11] These precursors as we will see below have two very interesting characteristics. First, they seem particularly suited to using intentional control to achieve their aims, which helps to explain the intuition that intentional action matters for language evolution. Second, manipulating them does not require Gricean intentions. An animal can manipulate material symbols without realising that this has anything to do with mentality. What is more, there are interesting arguments to suggest that these cognitive tools prepare the ground for metarepresentation, thereby providing a non-Gricean foundation for Gricean thought.

In his article 'Magic words: how language augments human computation' (1998), Andy Clark suggests a number of ways in which language provides these tools for thinking. Language augments memory because we can e.g. write down the items we want to remember. It simplifies environments because we can e.g. put labels on things to tell us what they are. It helps coordination, because we can e.g. share plans about when we are going to be at the airport. Furthermore, language reduces the need for online deliberation, controls attention, and enables data manipulation

[10] In fact, the debate surrounding the cognitive conception of language is clearly orthogonal to our debate, with the protagonists in that debate falling firmly on two different sides in ours – with Davidson being a radical proponent of cognitive conception, and Grice being a strident critic.

[11] Fitch (2020) is one of the few people in the field who points out that animal cognition might be just as important as animal communication when it comes to the development of language. But Fitch does not use the scaffolding element of the visible mind for the cognitive process that we are focussing on here.

(Clark 1998). All of these, while vastly magnified in power by natural language, are possible in embryonic ways for non-linguistic creatures.

Think e.g. of the numeral-trained chimp Sheba that Clark uses as an example. Sheba has to work out how to get the bigger pile of food. She is allowed to decide which of two unequal piles of food a conspecific will get, after which she will get the other one. Sheba finds it incredibly difficult to get the result she wants i.e. the bigger pile for herself, because she always points at the larger pile. If the food is put in labelled containers though, Sheba is able to achieve her goal by pointing at the right sign. The symbol puts some distance between her and the desired food, which allows her to more effectively pursue her desire.

Sheba can transform her thinking from two BANANAS to TWO bananas by looking at the label instead of looking at the food. The label facilitates what Pettit and McGeer (2002) call content attention. It allows the animal to make and maintain features of content salient-independent. The label keeps the twoness of the bananas salient and helps the animal to not focus on their juiciness instead. The label simplifies the environment, controls attention and reduces the need for online deliberation (Clark 1998).

Crucially, all these features are enabled because the material symbol allows the animal to manipulate an object in the world intentionally and in so-doing, achieve useful cognitive effects. This manipulation of material symbols is exactly what Pettit and McGeer were talking about when they claimed that language enables belief regulation.[12] In addition, the animal can achieve these effects without being aware that the manipulation of the object has the effect it has because of its connection to the animal's mind. The material symbol enables intentional control of the mind without intentionally controlling the mind (Vierkant 2012).

There is a pressing worry one might have here. Sheba is a chimp that has been trained by humans to learn the basics of sign language.[13] It might seem very odd to use a language-trained chimp as an example of how a non-linguistic animal could acquire language. There are two things to be said in reply. The first is that Sheba clearly shows that the gap between natural signs on the one hand and rudimentary

[12] There is an interesting link between what has here been said about mindshaping and Joelle Proust's account of procedural metacognition. Metacognition is often understood as mindreading for self. Once we understand what minds are, we then begin to try to read and influence them. In the case of others, this comes under the heading of mindreading and in the case of self, under the heading metacognition. Joelle Proust, probably the philosopher who has contributed more to the philosophy of metacognition than anyone else, has always argued that this understanding is a mistake. According to Proust, what she calls procedural metacognition is primarily about self-evaluation. These evaluations often do not involve the capacity to self-attribute mental states. Instead, they operate e.g. with noetic feelings like fluency to monitor ongoing cognitive activity. (Proust 2013).

This form of metacognition is exactly what the use of expressive behaviours as precursors of material symbols facilitates. Being able to hold a mental state before your eye, e.g. by producing a sound, allows the agent to fully make use of her capacity to evaluate that state. In fact, once we have these manipulable external tokens of mental states, it becomes much easier to understand why procedural metacognition plays such a crucial role in mental actions, as Proust claims. For an interesting paper exploring the link between mindshaping and evaluative metacognition see also (Fernández-Castro and Martínez-Manrique 2021).

[13] Thanks to Dave Ward for pressing that worry.

language might be less deep than one might have thought. This is precisely because it is possible to train her to use symbols to aid her cognition, despite the fact that she clearly does not possess anything that fulfils the more stringent requirements for a real natural language. Obviously, there are many definitions of exactly what it means to have a language, but if we assume that what we should have in mind for real language is the ability to formulate truth-evaluable propositions (see also Bermudez 2007 for this point), then it seems very unlikely that Sheba can do that. Accepting that Sheba does have a capacity that is genuinely somewhere between natural signs and real language is therefore nothing else than admitting that there is an evolution of language and that cognitive boot strapping by labelling is a way in which it can be achieved.

Additionally, Sheba is just one rather advanced example of the cognitive tricks described by Clark. In fact, in his appraisal of Clark's six cognitive technologies Jose Bermudez (2007) points out that most of them are possible without any even basic symbol use and that none of them require language in the more demanding sense of truth evaluable propositions.[14] One very neat example that Bermudez picks out here is the food store hiding behaviour by both birds and squirrels. These animals clearly simplify the environment by labelling caches and create control loops that will influence future behaviour, and this behaviour clearly happens in the wild and without human training.

Hence, it is clearly possible for animals to use at least some of these tricks without human training and there does not seem to be a mysterious gap between these kinds of behaviours and the behaviour Sheba exhibits.

7 The Cognitive Conception of Language and Expressive Behaviours

Importantly, the potential of the cognitive dimension of language for language evolution is not supposed to be an alternative to Bar-On's expressivist account. Rather, it is supposed to supplement it, especially in areas where otherwise there might be worries. This can easily be seen in Bar-On's case by combining the lessons of the last section with Bar-On's description of the properties of expressive behaviours.

If one of the main advantages of the manipulation of material symbols is that they allow the manipulation of the mind in the world, then anything that provides a direct and subtle way of linking manipulables in the world with the inner mind will be particularly useful. As we have seen, this link is exactly what is special about expressive behaviours: they are designed by nature to make the mind visible.

Obviously, the mind becomes visible in some way or other in all behaviours that are caused by an animal's mind, but as Bar-On has rightly insisted, there are some behaviours (and some informational displays) which have evolved exactly for this purpose. As a result, they are much more salient and specific to the inner states that

[14] See also Gomez (1998).

they indicate. They are therefore the perfect candidates for giving the animal a first grip on the general principle.[15]

Clearly, the intentional modulation of expressive behaviours is not quite the same as Sheba's manipulation of her material symbols. In Sheba's case, the space between sign and signified is already a lot more substantial than in the case of expressive behaviours, but the distance becomes larger as animals learn to intentionally instrumentalise their expressions. In such cases, there clearly is a gap between sign and signified that the animal exploits and the first tender steps on the way to language seem quite conspicuous.

8 Intentional Control of Expressive Behaviours and Informational Displays

As the last section demonstrated, the manipulation of material symbols might well be one key reason why expressive behaviours could play a role in language evolution. But if this is the case, there is one interesting consequence for a distinction that Bar-On seems to take for granted. Bar-On argues that only expressive behaviours but not other mind-revealing states like informational displays play this role. Let's remind ourselves of the reasons for why Bar-On makes this distinction and see why the mindshaping approach might throw up a problem for the distinction.

Bar-On argues that expressive behaviours are special because of their "Janus-faced" characteristic of pointing inwards and outwards at the same time, in contrast to informational displays which do not obviously have this "Janus-faced" characteristic. But is this difference really as clear as Bar-On suggests? Think e.g. of the raised hair on the back of the dog. This clearly seems to be a merely instinctive and automatic reaction of an angry dog, but nevertheless, it carries information about the anger of the dog, the presence of something in the dog's environment that makes it angry, and the likely aggressive behaviour of the dog. Bar-On rightly points out that expressive behaviours contain far richer information than that: they not only signify the presence of the cause of the anger, but they also inform the observer where the cause of the anger might be, etc. However, it is easily imaginable that instinctive bodily reactions might also carry information about specific features of the cause of the anger. The hair might e.g. be raised more if the cause is closer, bigger, etc. Thus, it does not seem obvious that there really is a clear line between the informational richness of expressive behaviours and informational displays.

The same point can be made by looking at Bar-On's discussion of alarm calls. Bar-On argues that they are a particularly fascinating example of how a form of proto-objectivity arises from animal signalling (2013, p.33). A monkey hearing the

[15] That expressive behaviours are used by agents in order to improve cognition is also well documented in other contexts. The case of gesture is particularly instructive. Clark (2007) uses Goldin Meadows' research to make the point that gesturing is not just expressing fully formed thoughts, but aids cognition by providing the agent with information it is cognizing on in a visible and stable representational format. In the experiments Goldin Meadows conducted, it could be shown that gesturing very significantly aids memory tasks.

alarm call of a conspecific will learn about the callers' impending behaviour, independent of the presence of the predator. If the hearer is in a position to be confident that there is no predator present, it can now use the information about the flight behaviour contained in the call to, for example, steal the caller's food.

This is an excellent example of how animal signalling can acquire some language-like properties, because it allows for a weak notion of mistake or misrepresentation, but unfortunately it also does not achieve a distinction between expressive behaviour and merely automatic behaviour. Bar-On's account would work just as well if the caller, instead of calling, developed red spots if it perceived a predator. The animal could e.g. develop the spots because it mistakenly takes a shadow for a predator. Upon seeing the spots and not spotting a predator, a suitably clever receiver could use this information to steal the food of the fleeing sender.

Given that the lines between expressive behaviours and informational displays are so blurred when it comes to informational richness, Bar-On needs a different reason to maintain the specialness of expressive behaviours. The perfect candidate here is the idea that expressive behaviours are important for language evolution, because they – but not instinctive reactions and certainly not informational displays – are expressing the mental state using the agentive capacities of the animal. Given that the hair-raising is not an action by the animal, but simply a physiological reaction that can still contain informational richness, it cannot be that which differentiates informational displays from expressive behaviour, but rather the fact that the latter and not the former can be brought under intentional control.

Unfortunately, there are two problems with this argument: First, it does not seem to be clear what counts as bringing a behaviour under intentional control. In a sense, there clearly can be intentional control over informational displays like the raising of the hair. On the one hand, it might be possible that the animal could learn to intentionally raise its hair. At least in humans, it seems that we can learn to exercise a modicum of intentional control over seemingly automatic behaviour like heartbeats, etc.

Secondly and more importantly, even if the animal cannot ever directly control an unintentional behaviour, it can obviously control it in an indirect way. An animal could e.g. turn its head to hide its fearful instinctive grimacing. There are various examples in the literature that seem to suggest that animals are exercising such indirect control, such as chimps hiding their play faces or young male chimps hiding their erections in the presence of dominant males (Parker and McKinney 2012).[16] Such indirect intentional control seems to fulfil very much the same function as intentional expressive behaviour. The non-intentional expressive behaviour or informational display provides the evolved communicative functionality, while the indirect intentional modulation allows the animal to make sure the sign is only used in line with its own purposes.

If it is correct that the only thing that seems to justify the distinction between expressive behaviours and mere informational displays is that the former but not the latter express the mind by using the agentive capacities of the animals (i.e. they can

[16] Thanks to Richard Moore for this example.

be brought under intentional control) and if it is also correct that animals can intentionally control the way in which they express their minds in informational displays, then it seems that it is not the intentional production of the expressive behaviour that matters, but instead what matters is that the expressive properties of the behaviour are used intentionally in the right kind of way. In other words: We can separate the contribution of expression from intentional control. Whether or not the expression of the mind is agentive is not crucial. What is crucial is that the expressed mind can be manipulated by the agent.

Does this mean that Bar-On is wrong and that there is no important difference between informational displays and expressive behaviours because both can be brought under intentional control and used as material symbols to start the first shoots of second order cognitive dynamics? It certainly suggests that Bar-On might overemphasize how important the difference is, but there is nevertheless a reason why we should still think of expressive behaviours as special.

While informational displays can be brought under indirect intentional control, the difference in terms of intentional production might matter more than one might think at first glance.[17] The dog can learn to growl instrumentally in order to get a treat, even if there is no postman to be seen, but it is at the very least much harder to produce raised hair intentionally. This difference is important because it establishes a loop between the visible mind expressed in the behaviour and the actions of the agent. This looping attracts the animal's attention to the dependencies between its actions and its mental states made visible in its behaviour.[18] This is a powerful tool to encourage learning to pay attention to the manifestations of its mind and this in turn is nothing else than one step towards the development of second order cognitive dynamics and mindreading.

9 What about Neo Griceans?

So far, we have explored how we can use the mindshaping features of material symbols to shore up Bar-On's non Gricean account of language evolution. The motivation for looking at Bar-On's account was that it seemed more plausible than a classical Gricean account with its demand for enormous cognitive sophistication before language learning would be possible. However, as everyone vaguely familiar with this literature knows, classical Gricean accounts are not the only version of the broadly Gricean approach. Neo-Griceans like Moore (e.g. 2017, 2018) accept that the classical Gricean conditions are too demanding, but insist that there are less demanding precursors, which nevertheless are rightly understood as communication. The obvious advantage of such an account is that it is no mystery how e.g. the ability to address utterances at another animal that is central to Moore's account is possible, even if the animal in question has no grasp of metarepresentation. The

[17] Thanks to Dorit Bar-On for pointing this out to me!

[18] The ability to generate these loops between outputs and that can be used as inputs for new cognitive operations is key for embodied cognition more general. (See eg Clark 2007).

obvious disadvantage is that it is less clear whether these minimal Gricean abilities are sufficiently robust to fulfil the same functional role as Gricean communicative intentions.

There is no room here to adjudicate between sceptics and proponents of the Neo-Gricean position. What is important in this context is that while this paper focussed on non-Gricean accounts, the point about the importance of mindshaping and the cognitive dimension of language is equally compatible with a Neo-Gricean account – as long as such an account does not demand that language evolution is exclusively driven by minimally Gricean communication.

Focussing on the cognitive characteristics of language even provides support for Moore's minimally Gricean story. This is because material symbols might foreshadow the linguistic mechanisms that allow the formation of metarepresentation. If this is the case, then material symbols might be one element that eventually allow the animal to bootstrap itself into a full-blown Gricean metarepresenter.

In his discussion of Clark's material symbols Bermudez argues that the real achievement of language, in contrast to all the other advantages Clark discusses, is that language allows second-order cognitive dynamics. Bermudez is interested in how these can lead to fully-fledged reflective thought. Obviously, at the early stage of language evolution there are not yet sentence-like structures that can form the basis of thoughts about thoughts, but again the example of Sheba very much seems to suggest that these material symbols provide the very modest beginnings of influencing thought by using external vehicles and in that respect, this might very well be the very humble beginnings of Gricean thought.[19]

10 Conclusion

Gricean communicative intentions are clearly an integral part of human communication, but they are cognitively so demanding that it seems a mystery how a non-linguistic animal could ever acquire them without being already a language user. By focussing on the cognitive as well as on the communicative function of language, I hope to have shown that this puzzle does not have to be as paradoxical as it might seem. The ability to intentionally manipulate material symbols, especially in the form of expressive behaviours, is not beyond the wit of our non-linguistic forebears, but still achieves enormous cognitive gains. Crucially, it also relies on the ability to control symbols flexibly and intentionally without requiring any metarepresentational abilities. On its own, this might still not be sufficient for language to evolve, but it does provide a powerful additional tool to the toolbox discussed by Neo-Griceans like Moore and expressivists like Bar-On, because these accounts ignore the additional resources for language evolution that the cognitive conception of language has to offer. Language evolution is a complex process and it is highly likely that it is fed from multiple sources.

[19] See Gomez (1998).

Declarations

Conflict of Interest None.

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