

Is Language Necessary for Thought?
Part I: Can Non-Linguistic Animals Think?

This question has generated considerable controversy among philosophers and cognitive psychologists.

For the most part, the focus has been on a slightly more specific question, namely:

Q: Do non-linguistic animals have propositional attitudes?

Some background:

Propositional Attitudes = mental attitudes towards propositions (e.g., *belief, fear, imagining, hope, desire*).

So *Q* is asking: *Do non-linguistic animals have beliefs, desires, and the like?*

Arguments for Animal Beliefs

Perhaps the most straightforward argument for animal beliefs is that ascribing beliefs to animals provides the best explanation of their behavior. Here's the general form of argument:

- 1) Animals behaves in manner *M*.
- 2) The best explanation for why a creature would behave in manner *M* is that they have certain beliefs and desires.
- 3) Therefore, the best explanation of animal behavior takes them to have certain beliefs and desires.

A specific example:

- 1) Jays hide beakfuls of food in various caches, spread over a wide distance. In the winter they survive by retrieving the food from these caches. When retrieving food, they retrieve the food that they like best first, unless that food was buried at a time sufficiently long ago that it will have gone rotten. (Clayton, Emery and Dickinson 2006; discussed in Gallistel, "Prelinguistic Thought", pp.258-259)
- 2) The best explanation for why the jays would behave in this way is that the jays have **beliefs** about *where* they buried the food, and *when* they buried it, and they have **desires** to eat food, and to eat tastier food if possible.
- 3) Therefore, the best explanation of the jays' behavior is that they have various beliefs and desires – specifically, beliefs about where and when they buried the food, and desires to eat food, and to eat tastier food if possible.

Qs: Do you find this argument convincing? Are there any ways one might object to this argument?

The Scope and Extent of Animal Thought

For those who are convinced that some animals do have beliefs and desires, there remain important questions about the extent and scope of these beliefs and desires. In particular:

- Which animals have beliefs and desires? (Even if birds do, do insects? What about sponges?) How do we distinguish between animals that have propositional attitudes from those which do not?

Researchers like Gallistel claim that the behavior of at least certain insects (specifically, bees) is best explained by ascribing beliefs:

- When foraging bees return to a hive, they perform a “waggle” dance that indicates to other bees compass directions to the location of a food source. Some researchers have concluded this is only possible if bees are capable of forming *beliefs* about their surroundings.
 - Do you agree with this? Are there any ways of explaining the information-transfer of the waggle dance that do not involve attributing beliefs to bees?
- *Unlikely location study*: When foraging bees were led to a feeding station on a rowboat on a pond, they returned to a hive and danced directions indicating the rowboat’s location, but failed to recruit any other bees to visit the site. Gallistel takes this to show that bees represent probabilistic information:

“This last result implies that they do a kind of Bayesian integration of spatial likelihood function centered on the location indicated by the dance and a spatial prior probability distribution that is nonzero only over land, generating a posterior likelihood function that peaks at the shore nearest the boat. The posterior likelihood function takes into account both the information provided by the dance and the prior information on the map.” – Gallistel, “Prelinguistic Thought”

- Do you agree with this interpretation? Are there any other ways of explaining the bees’ behavior?

Worries About Ascribing Beliefs to Animals

Above we suggested that we can explain the jays’ behavior by saying that the jays have beliefs about where they hid their food and when they hid it. In doing so, we seem to ascribe beliefs with fairly specific content to the jays. But are we justified in doing so?

Stich raises a worry on this front:

[C]onsider trusty Fido who sees his master bury a meaty bone in the back yard. Fido goes out the door and begins pawing at the very spot where the bone is buried.

On the belief-desire account, Fido believes that there is a meaty bone buried in the yard and wants to get it. More has to be added to flesh in the belief-desire explanation of the dog's behavior, but we already have enough to see where the problem arises. It surely cannot be quite right to say that Fido believes there is a meaty bone buried in the yard and wants to get it. After all, Fido does not even have the concept of a bone, much less the concept of a meaty bone or a yard. He may be able to recognize bones tolerably well, provided they are typical examples and are not too outlandish. But this is hardly enough to establish that he has the concept of a bone or any beliefs or desires about bones. For Fido does not, it seems safe to assume, have any beliefs about the origin and general anatomical functions of bones. Nor would he recognize or exhibit any interest in chewing atypical bones – the bones of the middle ear, for example, or the collar bone of a blue whale. Worse yet, Fido does not know the difference between real bones and a variety of actual or imaginable ersatz bones (made of realistic looking plastic, perhaps, and partially covered with textured soy protein suitably flavored). Nor is there anything that would count as explaining the difference between real and fake bones to the dog. Fido is incapable of understanding that distinction. But given Fido's conceptual and cognitive poverty in matters concerned with bones, it is surely wrong to ascribe to him any belief about a *bone*. (1975, p.18)

One way of reconstructing this argument:

- 1) If Fido believes there's a bone buried in the ground, then Fido needs to have the concepts, *bone*, *buried*, and *ground*.
- 2) In order for Fido to have the concepts, *bone*, *buried*, and *ground*, Fido would need to have a rich body of background knowledge and inferential connections associated with these concepts.
- 3) But Fido lacks this rich body of background knowledge and inferential connections.
- 4) So Fido does not have the concepts, *bone*, *buried*, and *ground*. (from 2, 3)
- 5) So Fido does not believe there's a bone buried in the ground. (from 1, 4)

While the conclusion is specific to Fido and his belief about bones, it seems we can run a similar line of argument for just about any belief we're tempted to ascribe to an animal.

Note that the conclusion of this argument isn't quite that nonhuman animals don't have beliefs. Rather, it's that we can't properly ascribe any beliefs to nonhuman animals: all our attempts to do so fail.

Questions: Is this argument convincing? If not, where do you think it goes wrong? Can we find any principled grounds for ascribing some beliefs to animals and not others?

Davidson's Objection to Animal Beliefs

While Stich does not deny that animals have beliefs, some philosophers have denied this. For example, here's the philosopher Donald Davidson:

Can a creature have a belief if it does not have the concept of a belief? It seems to me that it cannot, and for this reason. Someone cannot have a belief unless he understands the possibility of being mistaken, and this requires grasping the contrast between truth and error – true belief and false belief. But this contrast... can emerge only in the context of interpretation, which alone forces us to the idea of an objective, public truth. – Davidson, "Thought and Talk"

This is a bit opaque, but here's one way of reconstructing the argument:

- 1) A creature S can only have a belief if S has the concept of a belief.
- 2) In order for S to have the concept of a belief, S must have the concepts *truth* and *falsity*.
- 3) S can only have the concepts of truth and falsity they have a language.
- 4) So, nonlinguistic creatures can't have the concept of a belief. (from 2, 3)
- 5) So, nonlinguistic creatures don't have beliefs. (from 4)
- 6) If S has any propositional attitudes at all, S has beliefs.
- 7) Nonlinguistic creatures don't have propositional attitudes. (from 5, 6)

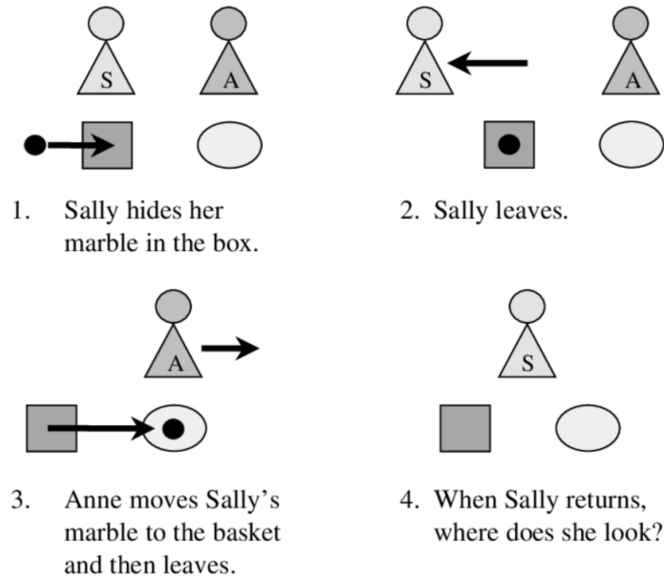
Questions to consider:

- Is Premise 1) true? Does having a belief require having the concept of a belief? (Think about what would be involved in having a belief without having the concept of a belief.)
- Is Premise 2) true? Does having the concept of a belief require having the concepts of truth and falsity?
- Is Premise 3) true? Can nonlinguistic creatures still have the concepts of truth and falsity?
- Does this argument prove too much? Does it also show that small children lack propositional attitudes?

Relevant Empirical Work

There is a growing body of psychological research on when children acquire the concept of a false belief:

False Belief Test. A number of studies, starting with Wimmer and Perner (1983), uses the following experimental paradigm: a child is presented with a scene in which character, Sally, leaves a chocolate in a basket, before departing. Then another character, Anne, comes in and removes the object and places it in a box. The child is then asked, "Where will Sally look for the chocolate when she returns?" Researchers found that at about the age of 4, children "pass" the false belief test, answering that Sally will look in the basket. But 2-3 year old children fail the test, answering that Sally will look in the box.



The Sally-Anne test of false belief. See text for description. Adapted from Baron-Cohen et al. (1985).

So, one potential conclusion to draw from this is that until the age of 4, children lack the concept of a false belief. On the face of it, this might seem to provide support for Davidson's premise 3): you only have the concepts of truth and falsity once you have a language. At the same time, this would (given Davidson's other assumptions) seem to have the surprising consequence that 2-3 year old children lack beliefs. Some might regard this as a *reductio ad absurdum* of Davidson's argument.

But there's a wrinkle... In more recent years, eye-tracking studies have called into question the received view that children don't pass the false belief test until the age of 4. In these studies, the child watches a similar scene, in which a character places an object in a green box, and then the object is transferred to a yellow box while the character isn't looking. Children then see one of two possible continuations: in one, the character returns and looks for the object in the green box; in the other, they return and look for the object in the yellow box. 15-month-olds presented with the second continuation looked for longer at the scene than 15-month-olds presented with the second first continuation, which some researchers take to be evidence that the children were surprised (Baillargeon *et al.* 2010). This is known as "Violation of Expectation" (VOE) task. Perhaps, then, very young children do have the concept of a false belief after all! (Note: some researchers have reported being unable to replicate these results with 18 month old children (Powell *et al.* 2018), suggesting that some cautions is warranted!)

Do Non-Linguistic Animals Pass the False Belief Test?

Follow-up work applying this methodology to nonhuman animals found that rhesus monkeys displayed VOE when watching a scene where a character did not act on their knowledge (that is, a scene where a character did not look for an object in a location where they correctly believed it to be). But the monkeys did not display VOE when watching a scene where a character did not act on a *false* belief (that is, a version of the second

continuation of the VOE experiment on children, described above). Some researchers have thought this provides support for the idea that while human children have the concept (perhaps implicit) of a false belief, monkeys do not.

If this is right, what conclusion should we draw?

- Davidson would conclude that if rhesus monkeys don't have the concept of a false belief, then they don't even have the concept of beliefs; indeed, Davidson would go on to conclude that this shows that rhesus monkeys don't have beliefs at all!
- Manticorena *et al.* 2011 agree that this shows that monkeys don't have the concept of *beliefs*. But, these researchers argue, monkeys do have the concept of *knowledge*, as reflected in the fact that rhesus monkeys understand that they can steal food from a person who can't see the food, or who can't hear them approaching.
- *Some further evidence...* Some evidence suggests that apes and monkeys fail to represent true beliefs when those beliefs do not amount to knowledge. Experimental design: two opaque containers, A and B. A character sees food placed in A. When the character isn't looking, food is removed from A, but then placed back in A (not B). In this case, rhesus monkeys failed to predict that the character would act on their true belief by looking for the food in A: the monkeys did not stare any longer when the character reached in container B compared to when the character reached in container A. But in a version of the scenario where the food is never switched the monkeys did stare longer when the character looked in container B rather than container A (Horschler *et al* 2019).
- Building on these last two points, Philips *et al.* forthcoming argue for a big picture conclusion: the concept of knowledge is more widespread across the animal kingdom than the concept of belief. Indeed, they suggest that the concept of belief might be uniquely human, but the concept of knowledge is widely shared.