

THOUGHT AND REASONING IN NON-HUMAN ANIMALS

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Can animals think? If so, what thoughts can they have and what forms of thinking do they engage in? Can they make inferences? If so, of what kinds? Can they act rationally, guided by their thoughts? The answers to these questions depend, to a large extent, on how we understand these notions, a matter that is still quite controversial in both the empirical and philosophical literature.

A long and prestigious philosophical tradition has adopted restrictive, idealized, and intellectualist views of thought and thinking processes, understanding them as constitutively dependent on normative, reflective, and linguistic capacities that, arguably, only human animals possess. Consequently, this tradition has tended to deny, solely on *a priori* grounds, that non-human animals can think. By contrast, a very different picture emerges if we consider the growing corpus of empirical evidence from animal cognition research over the last few decades. This evidence suggests that different animal species bring to bear complex cognitive abilities, mechanisms, processes, and representational mental states when dealing with natural and experimental environments. Empirically informed philosophers have contributed to this alternative view, according to which there is a diversity of minds—and probably also of thoughts and thinking processes—in the animal kingdom, by developing proposals on how to study and characterize these other minds, and by drawing distinctions between more and less complex mental states, cognitive processes, and abilities across species.

However, even those who are willing to accept that there are diverse minds and intelligences among animals use terms such as “thought”, “thinking”, and “reasoning” in very different ways. Some employ them liberally to refer to a wide range of mental states and

cognitive transitions and, consequently, are willing to apply them to describe the mental lives of many animal species. Others prefer to reserve these notions to refer to higher-level rational inferential and representational capacities and are often more cautious about which animal species qualify for description in such terms.

The papers in this special issue engage with a range of debates concerning the attribution of thought and reasoning to non-human animals, often adopting “intermediate accounts” between the most demanding views of these phenomena and those that equate them with different kinds of low-level cognitive states and processes. A first group—including papers by Erik Nelson, Andrés Crelier, and Carolina Scotto—challenges classical, anthropocentric, intellectualist, and “lingualist” (to use the expression coined by Hans-Johann Glock) views of thought, reason, and other closely related phenomena, such as animal communication. A second group brings together the papers by Giacomo Melis, Robert Lurz, and Sebastián Mejía-Rendón, and looks into different varieties of thought, thinking, and reasoning that other animal species may have. A third group, including contributions by Mateo Arias-Vélez and Jon Garthoff, focuses on the relationship between thinking, rationality, and normativity in non-human animals, exploring the social and intersubjective normative responses that regulate their social lives or that ought to guide our interactions with them.

One methodological virtue shared by all the papers in this issue is a genuine interest in integrating philosophical reflection with empirical research on animal cognition. In addition, each of them advances new arguments, hypotheses, and conceptual tools, thereby illustrating different ways philosophers can contribute to understanding an extremely complex interdisciplinary phenomenon. In what follows, I briefly summarize the main ideas of each paper, offering a glimpse of what this issue has to offer.

In “Is Language Necessary for Acquiring Conceptual Capabilities?”, Erik Nelson discusses the view held by a prominent group of intellectualist philosophers, which he calls “normative holists”. Normative holists, such as Wilfrid Sellars, John McDowell, and Robert Brandom, are well known for arguing, on *a priori* grounds, that concept possession depends on the possession of language and that, lacking the latter, nonlinguistic animals necessarily also lack the former.

As Nelson reconstructs their position, normative holists hold that any account of concepts that allows for nonlinguistic conceptual content relies on a myth: that there are contents which are “given” to

their (non-linguistic) possessors in the sense that (i) they can gain knowledge from them, but (ii) this knowledge does not depend on any prior knowledge they may possess. To avoid this so-called “Myth of the Given”, they claim that conceptual capabilities can only be acquired and used by linguistic creatures, who inhabit the normative and holistic “space of reasons”. Nelson argues, against normative holism, that even though according to this view conceptual capabilities are acquired, it actually makes it impossible to explain content acquisition. The only way for normative holists to avoid this conclusion is to allow for the existence of contentful non-conceptual states (Nelson also sketches a promising account of how conceptual capabilities might emerge in non-linguistic subjects that already have non-conceptual states). Taking that step, however, undermines their lingualist view and turns the question of whether some non-linguistic animals possess concepts into an empirical issue. On his view, if normative holists accept this conclusion, they stand to benefit from the possibility of engaging fruitfully with some recent findings from research on animal behavior instead of rejecting them *a priori*. Since normative holists have a rich and sophisticated repertoire of theoretical tools for thinking about the mind, empirical researchers might also benefit from such a theoretical shift.

In the second paper in this special issue, “Non-Human Intentional Agency in Light of Reasons: A Critique of Robert Brandom”, André Crelier discusses the views of a prominent normative holist: Robert Brandom. According to Brandom, only linguistic creatures who can publicly produce and understand reasons qualify as intentional agents. Crelier interprets Brandom as offering a transcendental argument to support this claim. Roughly, his reconstruction of this argument runs as follows: to be an intentional agent, a subject must be able to respond to reasons, understood as propositional contents with normative force. Since propositional contents are composed of concepts, intentional agents must possess concepts. However, possessing concepts and propositional contents is only possible for creatures endowed with social and communicative capacities. Finally, the social and communicative capacities required for concept possession are solely possible within the practice of asking for and giving reasons that only linguistic creatures can participate in. Hence, only linguistic creatures can be intentional agents.

Based on this reconstruction, Crelier examines recent empirical evidence and theoretical interpretations of it, which allow him to challenge Brandom’s conditions for intentional agency. Some of this evidence and its theoretical interpretations support the claim that

deliberation and reason-guided action might be grounded in non-linguistic and non-conceptual representations. Other findings suggest that some animals have flexible and complex capacities that may qualify them as concept possessors, including the ability to identify, re-identify, and classify the items they interact with, to establish associations between different representations of their environment, or to make multiple kinds of inferences. Crelier also considers studies indicating that, despite lacking a language, several animal species have rich social lives, engage in complex communication, and even display non-reflexive (and non-linguistic) capacities to respond to reasons. This leaves open the possibility that some non-linguistic animals may also fulfill Brandom's requirement that only creatures with sophisticated social and communicative capacities can be concept possessors. Moreover, Crelier adds that even if one agrees with Brandom that intentional agency necessarily involves a normative dimension, one may dispute his demanding account of normativity, which ties it to the capacity to give and ask for reasons, and argue that animals may satisfy more deflationary versions of this phenomenon. Interestingly, Crelier also acknowledges that philosophers like Brandom have correctly identified the normative dimension of agency and intentional thought and concludes by suggesting ways in which some Brandomian insights might be fruitfully incorporated into a pluralist view of cognition, thought, and agency.

The third paper in this issue deals with a different but related debate: how orthodox, idealized, and anthropomorphic views of human language and communication have distorted our understanding of how other animal species communicate. Focusing on primates, in "Dismantling the Linguacentric Bias: Primate Communication is Multimodal", Carolina Scotto argues that a "linguacentric bias" has led many researchers working in comparative animal communication to adopt a formal and idealized view of human language and communication as their model or standard for studying animal communication. This assumption has had the effect of widening the gap between animal and human communicative capacities without sufficient justification. In particular, Scotto suggests that it may have influenced primatologists' tendency to focus almost exclusively on a single modality when studying communication in non-human primates. This has led to a fragmented view of primate communication, making it harder to integrate results from studies of different modalities and to reach a holistic understanding of how signs from such modalities interact.

Scotto urges us, instead, to adopt a pragmatic-interactive approach to both human and (non-human) primate communication, which can account for the many functions of non-verbal signs used by animals engaged in close social interactions with others. Although still in the minority, studies on multimodal primate communication have already revealed that when interacting closely with others, these animals frequently combine different signals in flexible, dynamic, and intentional ways that serve diverse functions such as increasing the efficiency of their signaling, attracting the attention of a distracted audience, modifying the meaning of a previous or subsequent signal, among others. Additionally, this research provides insight into the complexity of the socio-cognitive capacities underlying these communicative skills.

In “The Study of Inference in Philosophy and Comparative Psychology”, Giacomo Melis focuses on a paradigmatic type of thought process, inferences, in human and non-human animals, comparing how philosophers and comparative psychologists have approached the topic and what each discipline can learn from the other. Philosophers have traditionally understood inference as personal-level thought transitions that conform to rules and are guided by reasons or evidence. They also often characterize humans as the only animals capable of making rational inferences. Moreover, they justify this claim by arguing that responding to reasons or evidence requires that one can reflectively think of evidence as such, a capacity which is exclusively human. Evidence from comparative psychology, however, suggests a different picture that philosophers should attend to. In a wide range of cases, animals seem to engage in processes that show striking similarities to the human case: the premises are accepted in response to evidence, and the acceptance of the conclusion is likewise based on evidence. However, none of this seems to require more than first-order mundane representations and the capacity to respond unreflectively to evidence. Taking this line of thought one step further, Melis advances a deflationary account of the capacity to take the premises of their inferences as supporting the conclusion, which characterizes it as an unreflective ability based on epistemic feelings and rational dispositions that non-human animals may possess.

After showing some ways in which research on inferences in comparative psychology is relevant to philosophers, Melis examines how the former may benefit from engaging with philosophy. He focuses in particular on what comparative psychologists working on deductive inference in non-human animals stand to gain from paying closer

attention to the distinction between logic and reasoning. Comparative psychologists typically take the degree of confidence with which the conclusion is reached by the inferring subjects as a sign of the kind of inference performed. Thus, high confidence or certainty is taken as an indicator of deductive reasoning, while lower confidence is considered to be a sign of non-deductive reasoning. Yet Melis argues that philosophical work on the distinction between reasoning and logic shows that a subject may make a deductive inference while not necessarily being certain of the conclusion, or perform a non-deductive inference while feeling almost certain of it. In these and other related matters, the cooperative work between philosophers and psychologists could play a crucial role in moving these debates forward.

Robert Lurz's paper, "Occurrent Thought and *A Priori* Reason in Chimpanzees", turns to what he identifies as a specific kind of thought—"occurrent thought"—understood as conscious propositional attitudes that suddenly and unexpectedly occur to subjects and can cause and justify their beliefs. Although one might initially be inclined to regard such thoughts as exclusively human, Lurz argues that they may already have evolved in chimpanzees to enhance the effectiveness of their unconscious inferential reasoning abilities. Thus, Lurz's hypothesis is that chimpanzees would not only be able to make unconscious inferences leading to reliable guesses about how to solve specific problems; they would possess a mechanism which takes these solutions as inputs and gives as outputs occurrent thoughts.

Lurz enumerates several reasons why having occurrent thoughts could be beneficial for chimpanzees: these thoughts would enable them to reach strong and memorable beliefs about how to solve a problem, inhibit unhelpful instinctive or conditioned responses, and provide them with an internally motivated form of curiosity, which generates knowledge-seeking behavior even in the absence of external rewards. According to Lurz, this hypothesis offers a more unifying and less *ad hoc* explanation of the differences in performance of chimpanzees and monkeys on inferential problem-solving tests than its rival, the hypothesis that chimpanzees solve problems merely by performing unconscious inferences. Moreover, attributing occurrent thoughts to chimpanzees helps us better understand several unique features of their rational intelligence and highlights some striking continuities with human rationality and reasoning abilities. Lurz acknowledges, however, that these explanatory advantages provide only modest support for his novel hypothesis and goes on to outline three experiments that could test whether chimpanzees can have occurrent

thoughts. Finally, he closes the paper with a bold suggestion: that occurrent thought might be the earliest evolutionary source of a *priori* reasons for beliefs and, consequently, that chimpanzees probably also have, like humans do, some primitive *a priori* reasons for some of their beliefs about the world.

In “The Perdue Case: Non-Human Animal Metacognition from the Perspective of Metacognitive Feelings”, Sebastián Mejía-Rendón focuses on a specific kind of cognitive capacity, frequently associated with thinking and rationality: metacognition. Traditionally, philosophers have understood metacognition as requiring meta-representations and reflective capacities and have consequently often denied that animals are capable of it. In order to argue against this view, Mejía-Rendón examines a set of experiments conducted by Perdue and colleagues, which he refers to as “the Perdue Case”. These studies revealed that chimpanzees use tools strategically to search for food only when they ignore its location, which suggests that they can detect their lack of information and use tools to overcome this problem. It remains controversial, however, how chimpanzees achieve these results. Philosophers like Carruthers, who endorse a demanding meta-representational view of metacognition, have offered low-level explanations of animal behavior in similar tasks. Mejía-Rendón, however, finds this view insufficient to account for the evidence offered by Perdue and colleagues and argues in favor of a different account. Drawing on previous work by Joëlle Proust and Santiago Arango-Muñoz, he holds that the best framework for interpreting this evidence is a procedural understanding of metacognition, according to which there are implicit, non-conceptual mechanisms that enable human and non-human animals to evaluate, monitor, control, and regulate their actions, without invoking meta-representations or second-order cognitive capacities. Key components of these regulatory processes are so-called metacognitive feelings—such as the feeling of uncertainty—which are non-conceptual affective states that help regulate behavior by providing subjects with epistemic information about their cognitive states, activities, or processes.

In “Social Norms in Bonobo Societies: Applying the Normative Pluralism Framework to Behavioral Evidence”, Mateo Arias-Vélez applies the normative pluralism framework developed by Andrews, Fitzpatrick, and Westra to examine relevant evidence on bonobos’ social behavior. According to this novel approach, social norms are observable regularities within a community defined by two behavioral components: (i) patterns of behavioral conformity and (ii) some forms of social maintenance that promote conformity or discourage

non-conformity. Based on this non-psychological understanding of normativity, Arias-Vélez argues that bonobos exhibit social norms in at least three domains of behavior. The first one is inequity aversion: in cooperative contexts, these primates show social responses that can be interpreted as reinforcing a norm of equitable distribution of rewards among individuals who have performed similar tasks. The second concerns bonobos' reactions to the interruption of social activities: while engaging in social activities like grooming or play, bonobos tend to maintain these interactions until a clear disengagement signal is given. Moreover, they often use gestures to reestablish the interaction if it is interrupted. The third domain concerns female coalition formation, which, Arias-Vélez claims, operates as a form of third-party punishment aimed at protecting females and preserving group cohesion. After carefully arguing that both components of such normative regularities are present in each of these domains, he concludes that bonobos display genuine forms of normativity that structure and regulate their societies.

As Arias-Vélez points out, social norms are typically taken to be a phenomena that depends on thinking and reasoning capacities unique to humans. The normative pluralism framework, in contrast, defines social norms in behavioral terms, and leaves open the possibility that they might be the product of diverse and heterogeneous cognitive and affective processes of varying degrees of complexity, thereby allowing to identify social norms beyond the human case. Thus, a fairly straightforward conclusion follows from the normative pluralism framework and Arias-Vélez's application of it to bonobos' social life: socio-normative behavioral patterns are independent from human-specific varieties of rationality and thought. But this might not be all. It seems to me that this careful analysis of the specific normative behavioral responses that bonobos display (with their distinctive flexibility, contextual sensitivity, intentionality, etc.) may also pave the way for exploring the particular cognitive, or even thinking, capacities that underlie normative behavior in *these* specific animals.

The final paper in this issue, Jon Garthoff's "Accountability without Equality in Social Relations with Thinking Animals", explores a complex topic: what kind of moral and social status should be attributed to rational non-human animals and how we ought to behave toward them. Garthoff begins by pointing out that both common-sense and prior scientific and philosophical work provide strong reasons to believe that animals such as apes, whales, and elephants have beliefs. Moreover, beliefs and other propositional thoughts are reason-responsive psychological states that can result from rational

inferences and can serve as a basis for further inferences. Yet it appears unlikely that all non-human animals who possess beliefs are also capable of reflecting on them or thinking about reasons as such. This leads Garthoff to conclude that some animals are probably rational and reason-responsive creatures even if, unlike us, they lack the capacity to reflect explicitly on their thoughts and reasons and are thereby incapable of engaging in explicit deliberation or justification. In this sense, they possess what he calls “non-critical reason”.

Having drawn these distinctions regarding the kinds of thinking and rationality that might be found among human and non-human animals, Garthoff turns to their ethical significance. On his view, non-human animals lack all moral and legal responsibilities, and should not be considered our social equals. Nevertheless, some of them have a capacity for reason-responsiveness. Moreover, they can be instructed to respond to certain reasons, and they may sometimes fail to do so. Hence, even if they do not have moral responsibilities, they can be said to have non-moral responsibilities that they can fail to meet, and may therefore be appropriate targets of reactive attitudes, such as praise or blame. Lastly, Garthoff draws some consequences of his view regarding the distinct moral status of these non-critical thinking subjects. Since they are capable of understanding and acting responsibly, we must, when interacting with them, not only take into account their interests, but also how *they* understand this treatment. Likewise, when collaborating with them, we must seek a form of willingness which is mediated by their capacities for thought or understanding.

This brief review of the papers in this issue illustrates how many different philosophical questions can be addressed by those interested in better understanding what kinds of thought, thinking, and reasoning can be found in non-human animals. Clearly, much work remains to be done. We must still critically revisit traditional philosophical and common-sense views on the topic, reflecting on their impact, on what is worth keeping from them, and on what requires modification. We must think further about the kinds of thoughts and thinking processes of non-human animals, probing the explanatory fruitfulness of new categories and examining how best to understand the old ones. And we should also explore how our views regarding the kinds of thinking and rationality that animals have can shape debates on other fields, such as animal ethics. The papers in this issue will, hopefully, help keep all these debates alive, fostering further interest and interdisciplinary work on the topic.