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MINDREADING IN THE ANIMAL KINGDOM: PHILOSOPHICAL CONTROVERSIES

1. INTRODUCTION

The research on animal mindreading,¹ developed since the 1970's, constitutes one of the fundamental topics in the inquiries on social cognition. It is assumed that the ability to understand and attribute perceptual, intentional, volitional and the belief states of other individuals constitutes the basis for the functioning of organisms in a social environment. When analyzing the behavior of social animals, a hypothesis was put forward suggesting that the ability to read minds is yet another adaptation enabling to function in their group and, consequently, survive. For example, when observing the behavior of rats, Nicholas Humphrey noticed that the limitation of the rats' knowledge about the behavior of other members of their species which behaviorists ascribe to them, would dissipate all of the social interactions in which these animals were engaged. Therefore, the knowledge about the minds of other animals introduces—according to many cognitive ethologists and animal psychologists—basically a new quality to the knowledge about the behavioral patterns of other animals (HUMPHREY 1978, 900–04). At first

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¹ In various publication the terms: “mindreading,” “mind theory,” and “everyday psychology” are often used as synonyms. In this article, we assume the linguistic convention according to which “mind theory” means a distinguished cognitive mechanism which is a part of a complex ability called “mindreading.”

glance, this position seems to be accurate, especially in consideration of our own everyday experience of cognizing other minds which we render onto non-human animals when we anthropomorphize them. Yet even a quick overview of empirical research in this field demonstrates an array of experimental (methodological) and theoretical difficulties which lead to divergent positions on the endowment and distribution, scope of activity and main mechanisms determining the functioning of this cognitive ability. This divergence can be fundamental, suggesting that it is not the empirical data which is the main source of controversy, but its theoretical elaboration consisting of different conceptual categories, general concepts, and theories as well as preferred methodological strategies.²

The main objective of this article is the attempt to describe main controversies in the research on mindreading among animals: what are reasons of the theoretical and empirical controversies?; what experimental paradigms influence the results and their interpretations?; what are the basic elements (modules) constituting mindreading? Answers to these questions are entangled in specific philosophical positions on the nature of the mind, beliefs, and intentionality. One can assume, therefore, that philosophers also ought to enter the dispute conducted by ethologists and psychologists, as well as cognitive scientists, and that they should create a general register of fundamental issues in the discussion on animal minds.

1. THE CONTEXT OF THE ISSUE

The central topic in the debate on animal minds is the issue of animal mindreading, e.g. Lurz considers it to be the most active research program in the realm of comprehending animal minds (LURZ 2011a, 3). This complicated cognitive ability belongs to the key elements of social cognition. As a type of adaptation to distinct circumstances connected with life in a group, mindreading enables animals to understand the mental states such as intentions, desires, and beliefs and to use this understanding to predict and manipulate the behavior of others to their own advantage. The standard model of the structure, development, and evolution of the competence of mindreading consists of four separate components (mechanisms) responsible for the reflection of four properties in the world: will, perception, common attention

² A detailed overview of studies on mindreading is presented in the book by Robert Lurz, *Mindreading Animals: The Debate over What Animals Know about other Minds* (= LURZ 2011a).

and epistemic states. Their components are as follows: the detector of intentionality, the mechanism of sharing attention, and the mechanism of mind theory (BARON-COHEN 1995, 31–58). There have been attempts through empirical research to identify these mechanisms in particular species (mainly primates but also dolphins, dogs and birds), as well as to identify the sequence of them appearing in the process of ontogenesis and phylogenesis (CALL & TOMASELLO 2008, 187–91; TROJAN 2013, 58–76).

The term “mind theory” first appeared in David Premack’s and Guy Woodruff’s 1978 article, “Does the Chimpanzee have a Theory of Mind?” (= PREMACK & WOODRUFF 1978), which presented research conducted with the participation of Sarah, a female chimpanzee. During the experiment, Sarah watched 30-second-long videos presenting a human actor who tried to solve a particular problem; namely, the actor is in a cage and tries to reach a banana that is located outside of the cage. Then, the viewing of the movie was interrupted before the problem was solved, with the aim that the chimpanzee would choose between two photographs illustrating the proper and improper solution to the actor’s problem. The results were surprising: out of 24 trials, Sarah selected the appropriate solution of the problem 21 times. Premack and Woodruff proposed a mentalist hypothesis interpreting these results, according to which, the chimpanzee had the ability to read minds. The ability to select the appropriate solution on the photos was one possible indicator that the monkey could ascribe intention or purpose (“it wants to reach for a banana”) to the actor, as well as ascribe to him the capability to know how to solve the task (PREMACK & WOODRUFF 1978, 518).

This interpretation encountered strong criticism. Critics predominantly raised the problem of alternative and simpler hypotheses (prior learned associations, interpreting the actor’s behavior and not his mind) and methodological simplifications (generalized conclusions based on a singular test) (SAVAGE-RUMBAUGH et al. 1978, 555–57). Despite these criticisms, the scientific significance of this experiment lies elsewhere: a question was posed—whether animals have advanced capabilities to mentalize. It also raised a discussion which resulted in subsequent research, an array of sophisticated experiments, the formulation of diverse concepts of mindreading as well as, generally speaking, the intensification of research on advanced systems of animal cognitive abilities.

The hypothesis of animal mind reading (and, as a result, sophisticated mental capabilities) fitted into the context of the discussion on the distinct features of human cognitive abilities in comparison to those of animals. In

a banal sense, all animals have their own distinct morphological and physiological behavioral and mental traits (biological diversity is extremely abundant). Thanks to this, we can differentiate and classify them as separate species. Formally, *Homo sapiens* was as distinct as any other biological species. The assignment of a qualitative character to the human cognitive system carries a stronger thesis. Namely, some cognitive abilities (or their systems) do not occur in the entire non-human world and their subject is the human being exclusively. Universal cognitive abilities in the non-human world can be characterized by quantitative differences (the degree of intensity of a given trait, ability, function), but some mental properties (e.g. having beliefs, the attribution and awareness of having them) are specific for *Homo sapiens* and are separated from the first class by an essential difference. In the dominant scientific paradigm—Evolutionism—the problem is usually resolved to the advantage of advocates for evolutionist continuity: mindreading is an ability which is broadly distributed in the animal kingdom, yet that does not mean that there are no distinct systems of elements comprising this “macro-ability.” In other words, the evolutionary continuity of mental abilities refers also to advanced forms of social cognition, for which—according to “evolutionary logic”—one can point to their simpler forms and components. All in all, we are dealing with a detailed application of the general evolutionary theory about the continuity of biological features (in the broadest understanding of the term). The position that evolutionary continuity occurs with respect to the distribution of mental abilities between *Homo sapiens* and animals is not common among evolutionists. There are also such scholars who believe that the thesis about the qualitative difference in cognitive endowment does not contradict contemporary Neo-Darwinism. The criticism of the thesis of evolutionary continuity, which comes from the evolutionist milieu, encompasses also the issue of the distinct human form of mindreading (PENN & POVINELLI 2007, 731–44). From the point of view of evolutionary studies, one can, therefore, concentrate both on the thesis on the evolutionary continuity of mental powers and also on the studies on the diversity of cognitive abilities, which do not rule out the exclusivity of particular evolutionary forms.

Assuming the legitimacy of the evolutionist paradigm in cognitive studies, one ought to draw attention to the fact that positions on mindreading in the animal kingdom require taking a stance on even more fundamental issues, e.g. the nature of beliefs, conditions of having them, the role of language in thinking and mindreading, and the nature of the mental repre-

sentation as well as of second-order cognitive dynamics, etc. Each of the enumerated problems is conceptually connected with the issue of mindreading in such a way that they constitute conditions of a substantive discussion on the topic. For example: a being, to which the ownership of beliefs is ascribed, must somehow signify that it knows how to discern divergent aspectual shapes in the encompassing of the subject (SEARLE 1992). Simply put, every such belief refers to the subject from a specific point of view and additionally describes it in a specific way. When speaking about the aspectual profile, we do not speak about the subject's various properties, but about different mental contents and subjective points of reference (properties of the conceptualization of the subject, properties of the cognitive act). In other words, mental representations (e.g. beliefs) are characterized by referential (semantic) opacity (GUT & WRÓBLEWSKI 2015, 372–73). If the cognizing subject can testify that it differentiates various shapes, one can assume that it, therefore, possesses beliefs. Donald Davidson elaborated on this state in the following manner, formulating two conditions for having beliefs:

(a) if we use the word “belief” or we use the formula “*x* believes that *p*”, simultaneously questioning semantic opacity, then *de facto* we are not using these words and formulas in order to ascribe belief stances, because (b) semantic opacity discerns speaking about beliefs and belief stances based on statements about other things (DAVIDSON 1982, 321).

An individual subject, that does not fulfill the abovementioned conditions, probably does not have mental representations that could be described as beliefs, and relation to the object is not carried out based on the subject's beliefs. This would occur, if the subject did not notice the dissimilarity of the points of view within its every mental representation; this manifests itself, among other things, by breaking the rule of limited substitutivity in belief contexts. In developmental and comparative (inter-species) studies, a variety of empirical tests have been elaborated that enable the discovery whereby subjects acquire competences of discerning cognitive perspectives (aspectual shape, semantic opacity), e.g. tests of false beliefs or the double identification of the subject.

The problem of the nature of beliefs is connected with the issue of the linguistic component of thoughts. In general, it relates to the nature and the function of language in thinking and, more precisely, to what is its evidence or condition. There is extensive philosophical tradition which ascribes to language a fundamental role in thinking, e.g. language is the only expression of thought concealed in the body (Descartes); language is the window that

opens the access to the mind (Chomsky); entities lacking language do not have the ability to have thoughts and think (Wittgenstein); language forms the distinct system of our consciousness (Dennett) (GUT 2009, 47–66). In this context, the key question is not whether animals use memorized symbols, which are arbitrary and intentional, but, in connection with a more fundamental issue, whether the language they use has a proper structure, on account of which it can express the cognitive resources at their disposal. It is indicated that animal communicative systems lack transformations depending on grammatical structures and forms. Using language, free of these drawbacks, enables the use of such linguistic constructs (e.g. a subject complement of the *oratio obliqua* type) which are necessary to create representations of the mental states of other individuals. The type of thinking presented above, about the relation between linguistic abilities and the ownership of mental representations, can be confronted with other positions in which the mental capabilities of non-linguistic beings are presented. The lack of a complex natural language does not presume, according to some researchers, the lack of mental representations within non-linguistic beings. According to them, one can sensibly pose questions about what thoughts can occur without the presence of language, especially in situations when one cannot explain the behaviors of non-linguistic beings in a stimulus-reaction scheme, and the only satisfactory clarification is the psychological scheme referring to beliefs and intentions. In the context of ethological research, it is indicated that the suggested psychological patterns for explaining animal behavior should refer to more sophisticated types of mental representations than “proto-thoughts” (perceptual contents connected with current stimuli), namely to representations, the contents of which features an internal structure and a specific type of reification (WEISKRANTZ 1997, 132–35).

2. EMPIRICAL RESEARCH

Generally, one can assume that researchers studying animal mindreading are focused on acquiring data referring to: following another animal’s gaze, monitoring attention, the ability to attribute knowledge to another individual, the ability to deceive, the ability to attribute beliefs, and symptoms of self-awareness. This data is supposed to signify the presence of a particular form of mindreading as a complete and mature ability or its specialized module that can be integrated at subsequent developmental or evolutionary stages of

this form of social cognition. Let us, therefore, take a closer look at the empirical data connected to the participation of animals which contains crucial intuitions about the structure and functioning of mindreading.

The capacity for gaze-following the response of another animal involves tracking the direction in which another individual is looking in order to have the same object in sight. One of the best-known studies (HARE, CALL, & TOMASELLO 2001, 129–51) described by researchers relates to a situation in which two chimpanzees participated: a subordinate and a dominant one. The subordinate animal had visual access to two sources of food, while the dominating one could see only one of them. Under these circumstances, the subordinate participant made a selection of the food that was not visible to the dominant one. The subordinate chimpanzee (*Pan troglodytes*), only approached the food and consumed it after having made sure that it was not in the reach of the dominating participant. The results may demonstrate the ability to differentiate perceptive points of view, i.e. chimpanzees are capable of discerning the point of view of another individual. This group of experiments included those which showed the ability of gaze-following among chimpanzees, as well as the ability to make eye-contact (POVINELLI & EDDY 1996, 153–91), demonstrating the animals' capability for ostensive-inferential communication based on a shared attention mechanism (GÓMEZ 1998, 76–93), and other tests which examined similar abilities among dogs looking for eye contact with their masters and asking for food when the owners looked in their direction (MIKLÓSI et al. 2003, 763–66).

In a subsequent group of experiments, an attempt was made to examine whether animals have the ability to identify knowledge with the use of the false beliefs test.³ One such trial was conducted by Alain Tschudin on bottlenose dolphins (*Tursiops truncatus*) with the use of a paradigm of a bait with an exchange (TSCHUDIN 2006, 413–36). In this experiment, the dolphin was present between two identical, empty, opaque containers. The experimenter placed a fish inside one of the containers in the presence of another person—the pointer. The dolphin did not have the possibility of spotting in which container the fish was placed because of a screen blocking its view. However, it saw the pointer without any obstacles. The screen was always removed after placing the bait. The dolphin's task was to select a container with a prize in the form of a fish inside (by hitting the container with its nose) based on a hint given to it by a pointer, who knew in which container

³ Other studies that illustrate false belief tests in animals: KAMINSKI, CALL, & TOMASELLO 2008, 224–234; KRUPENYE et al. 2017.

the fish was located. The animals in this experiment reached positive results of belief attribution. In the false-belief task, the experimenter swapped the containers' positions after putting the bait in one of them in the presence of the dolphins but without the pointer. After returning, he pointed at the container in which the prize was initially located. The dolphins ignored the hints of the pointer and selected another container which could indicate the positive completion of the false-belief task. In a similar experimental arrangement, Sanjida O'Connell and Robin Dunbar studied chimpanzees and reached the conclusion that one of the chimpanzees, called Josie, was able to discern between the situation where the experimenter had true beliefs, referring to the pointer indicating the container with the bait, and the situation in which the experimenter had a false belief. Nonetheless, this experiment did not overcome the problem regarding whether Josie the chimpanzee actually attributed beliefs or does she simply read behavior in a complementary way. Her behavior may be explained in the context of the abilities that she learned during training attempts: did she choose the drawer above which, ultimately, a marker was located which was directly in the line of sight of the experimenter or did she choose the drawer that the experimenter saw last and above which the indicator was located. Similar experiments were also conducted on domestic dogs (TROJAN et al. 2011, 72). It was examined whether they responded to signals that informed them whether another animal had visual access to the object or not, in addition to whether they could use information as the basis for choosing a credible informer. The experiment was constructed in such a way that there would be a possibility of resolving whether the animals participating in it could read behavior or whether they had the ability to read minds. The results of these experiments demonstrated that the dogs preferred to pursue the hints of the human, who was the witness of hiding the food, rather than the man, who did not see it (Guesser-Knower Task). The trial for the situation connected with reading behavior relied on the fact that out of the people demonstrating identical behavior, but on account of those people having different positions in the room, only one had the possibility of seeing where the food was hidden by a third party. Dogs showed that they preferred the person who knew (and did not guess) where the food was located. This experiment was intended to prove the capability of animals to attribute mental states to external parties (CATALA et al. 2017, 581–89).

The attribution of belief and intentional states to other individuals, as internal and unobservable mental factors which determine their behavior,

poses high requirements with respect to cognitive resources before the individuals that attribute them. The aforementioned types of research suggest that animals have such resources, but there have also been many experiments that question this assumption. The impossibility of representing unobservable causes in an abstract conceptual shape in animal minds is demonstrated, not exclusively, in the research conducted by Daniel Povinelli (POVINELLI 2000), Elisabette Visalberghi and her colleagues (VISALBERGHI & LIMONGELLI 1994), and also Dorothy L. Cheney and Robert M. Seyfarth (CHENEY & SEYFARTH 1990) which refers to the understanding of the principle of causality. The trap tube task experiment conducted by E. Visalberghi delivers well the basic topic of the research (the understanding of unobservable reasons of behaviors and processes) as well as the conclusions which were inferred in this experimental paradigm. Four capuchin monkeys (*Cebus apella*) participated in the experiment—their task was to extract a piece of food from a transparent tube. In the middle of the tube there was an indentation—a trap—in front of which there was some food. The capuchins were supposed to pick out a piece of food with a stick, but they could do that by inserting a stick from one side of the tube only, otherwise the food would fall into the indentation-trap and it would become impossible to get it out. The accurate solution to the task required the capuchins to understand that (a) if the stick is inserted from the wrong side, the food will fall into the trap (principle of causality) and (b) that the food (objects) will fall down (gravity). The results of the experiment clearly demonstrated that these monkeys do not understand the principle of causality; they tried to extract the food by randomly selecting a side from which to put the stick into the tube. Generally speaking, animal minds are not capable of using abstract causality while solving problems in their environment. D.L. Cheney and R.M. Seyfarth proposed another experiment in natural circumstances to verify whether animals understand the principle of causality. Distinct patterns of the traces of the greatest enemy of the guenon monkeys—the python—were made in the sand on paths that these apes frequently passed. The guenon monkeys did not demonstrate any anxiety at the sight. A conclusion was drawn from the observation that the animals do not comprehend a cause-and-effect relationship between the traces and the presence of a snake in the vicinity: they cannot infer the cause (a python) based on its results (traces).

Generally speaking, the question whether animals are capable of attributing beliefs remains an open question on the empirical level. Robert Lurz (LURZ 2011a, 164–83) proposes three possible protocols for experiments, the

use of which could allow differentiation between the attribution of beliefs from perceptual-appearing-attributing and from reading behavior, which is complementary to it.

Revisability tests examine the capacity of animals to differentiate appearances from reality with the use of deceptive amodal completion stimuli. One element is the Appearance-Reality Screening Test (AR test). If an animal can discern reality from the way things appear, then it would be natural that, as a result of selective pressure on individuals of the same species, it will have the ability to attribute the way in which it appears to another individual. AR tests can be divided into two groups: tests using visual amodal completion stimuli and those using auditory amodal completion stimuli. In the experiment described by Lurz, the chimpanzee was the subject of a simple AR test with the use of computer animation presenting half of a banana covered up by a rectangle but manifest as an entire fruit. After being uncovered, the banana can be seen as a whole or in two parts. The basic question refers to that, whether the chimpanzee will be convinced that the banana is the way it seems (then sight of the fruit in parts will be a surprise) or whether the chimpanzee would be convinced that the banana consists of two parts (then its attention is drawn to the image of a whole banana).

Animals which positively completed this test for discerning appearances from reality were later subjected to belief-attribution tests. R. Lurz distinguishes two protocols for it: Belief-Attribution Protocol No. 1 — conducted with the aid of animated video stimuli, and Belief-Attribution Protocol No. 2 — conducted with the aid of auditory amodal completion. These protocols constitute two ways of understanding the difference between the attribution of beliefs and the attribution of perceptive states on the grounds of the Appearance-Reality Mindreading theory (ARM). The first one relates to the ability to revise one's beliefs in light of countervailing evidence, such as is not possible in the case of perceptive states. The second way to differentiate the attribution of beliefs from the attribution of perceptive states is by differentiation with respect to abstractness. Beliefs, contrary to perceptive states, can refer to abstract states of affair, such as higher-order properties and relations (e.g. recognizing compatible objects that have the same properties such as a square shape). The last protocol indicated by Lurz is the abstract belief-attribution protocol which is supposed to allow primates to take advantage of cognitive abilities to represent abstract concepts and higher-order relational states as well as the possibility of using them to represent the issue that other subjects can have intentional relations towards these sorts of conjunctures.

3. BASIC PHILOSOPHICAL CONTROVERSIES

When we take into consideration the data from empirical research on mindreading abilities, predominantly from the field of comparative psychology, evolutionary cognitive science, and cognitive ethology, expressed in the form of hypotheses as well as in complex concepts of animal mental capabilities, then we shall also confront the philosophical nature of the problems. One can group them around several keynotes from the realm of epistemology, the methodology of empirical research, and ontology of the mind such as the nature of the mind, thoughts, analogical reasoning, anthropomorphism, and mindreading.

In the foreground of the discussion on mindreading there are two competitive hypotheses ordering empirical research: mindreading versus reading behavior. The dispute regards whether or not animals predict and read the mental states behind the behavior of other individuals through the attribution of simple mental states (e.g. seeing, hearing or knowing) (LURZ, KANET, & KRACHUN 2014, 429), or whether animals only read the behavioral/environmental hints that serve as observable factors (LURZ 2011a, 21) to predict the behavior of other individuals without understanding anything about these mental states (which are/can be the basis of the behavior). Reading behavior would be a process based on associative learning, conducting the inferencing operation in non-mentalist categories and the type of reaction to the apparent behavior of other individuals as well as extra-sensual (mindless) learning of rules of behavior. The mind question concerns the difficulty to distinguish “genuine belief-attributing animals and those animals that use the very same observable cues to predict targets’ behaviors that the belief-attributing animals are hypothesized to use to attribute beliefs” (LURZ 2011b, 34), called the logical problem.

Josef Call and Michael Tomasello, in an article summarizing 30 years of research on mindreading, present the fundamental essence of the first hypothesis:

It is time for humans to quit thinking that their nearest primate relatives only read and react to overt behavior. Obviously, chimpanzees’ social understanding begins with the observation of others’ behavior, as it does for humans, but it does not end there. Even if chimpanzees do not understand false beliefs, they clearly do not just perceive the surface behavior of others and learn mindless behavioral rules as a result. All of the evidence reviewed here suggests that chimpanzees understand both the goals and intentions of others as well as the perception and knowledge of others. Moreover, they understand how these psychological states work together to produce intentional action [...]. (CALL & TOMASELLO 2008, 191).

It turns out, in practice, that a clear conceptual distinction (between reading behavior and mindreading) is difficult to apply as a classification of specific research cases. There are attempts to construct tests to resolve with what sort of cases are we dealing: the representation of another individual or the representation of behavior, or the environment (LURZ, KANET, & KRACHUN 2014, 430). The methodological works by Lurz pursue this direction – he analyzes the protocols used in empirical research on primate belief-attribution: bait-and-switch in experiments conducted by Krachun, cooperative bait-and-switch in experiments conducted by J. Call and M. Tomasello as well as S. O’Connell and R. Dunbar, and also the competitive bait-and-switch experiment conducted by J. Kaminski. However, conducting the experiments with both the aid of the first as well as the second (more natural one for the way chimpanzees function) protocol yields negative results in the context of the false-belief task. Robert Lurz draws attention to the fact that the bait-and-switch protocols are conducted in a cooperative, competitive, or neutral context—they are not protocols that test the ability of animals to anticipate the behavior of other individuals, but they are first of all differentiation tasks, clearly designed to test how animals make a selection between various containers (LURZ 2011, 144–47).

There are paths leading to the understanding of the difference between the belief-attribution (mindreading) and the attribution of perceptive states on the grounds of the ARM theory. The first one refers to the possibility of revising beliefs in light of countervailing evidence in such a way that is not possible for perceptive states. The second way to differentiate belief attribution from perceptive state attribution is the differentiation with respect to abstractness. Beliefs, contrary to respective states, can relate to more and more abstract states of affairs, such as the properties or higher-order relations that are possible to define (e.g. recognizing objects that are compatible with one another or that have the same properties such as, for example, a square shape). The last protocol shown by R. Lurz is the Abstract Belief-Attribution Protocol, which allows primates to represent abstracts and higher-order relational states of affairs and the possibility of using them to demonstrate/represent that other subjects can bear intentional relations to this sort of states of affairs (LURZ 2011, 184).

The proposal to differentiate between beliefs and quasi-beliefs fits well into the alternative of mindreading versus reading behavior. In this view, one can include the possibility that many animal behaviors can be explained by (a) reasoning referring to behavioral factors or the frequency of events

that can target the reading of intentions of other beings, or (b) behavior based on the contents owned solely in the form of “proto-thoughts” (in contrast to thoughts) or “aliefs” (in contrast to “beliefs”), which are spatially organized contents, connected solely with what is “here and now” as well as currently undertaken action, the function of which, yet not the structure, is reminiscent of conceptual (propositional) contents (GUT & WRÓBLEWSKI 2015, 379–80). In such a situation, the categories of “aliefs” are recognized as a foundation on the basis of which every the animal takes action, functionally resembling the mechanism of action based on beliefs. However, the difference is such that the identification of “aliefs” is linked to action and sensually perceived reality—precisely because their content is spatially organized. Hence, not the principle of “sense”, but that of similarity is the mechanism which triggers the reaching for the base of knowledge.

In methodological discussions, attention is also drawn to several issues, the resolution of which substantially influences the evaluation and interpretation of experiments. The supporters of the position on the exclusiveness of the ability to read minds underline that their adversaries use the results of research-bearing methodological shortcomings. For example, these thinkers underline that the value of anecdotal accounts of animal behaviors is overestimated, similarly to the value of introspection and arguments from analogy. These doubts can be generalized in the form of the accusation of anthropomorphism. Generally speaking, anthropomorphism is a manner of describing and explaining animal behavior in which the role of causal factors is played by animal mental states, e.g. intentionality, emotions, beliefs, planning, remembering. Just as in the case of human beings we explain behaviors and actions in the categories of mental states, we act analogously with animals: we interpret animal behavior in the categories of their mental states (ANDREWS 2014a; GRIFFIN 2004, 41; FISHER 1996, 6–8). An array of accusations of varying logical and methodological significance is formulated in the critique of anthropomorphism. The most serious accusation is that a category mistake is being committed when one attributes mental states to animals. This type of erroneous reasoning in the context of the mind-body discussion was highlighted in the 20th century by Gilbert Ryle, who accused the Cartesian mind theory that it erroneously reifies mental states, i.e. describing them as the properties of a separate (mental, psychical) substance, instead of treating them as descriptions referring to persons and their behaviors or dispositions to behaviors (RYLE 1970, 48–52). The mind does not exist as a separate substance that coexists with the body (“ghost in the machine”). In

case of the discussion on the logical deficiencies of anthropomorphism (e.g. anthropomorphic explanation), the intention of accusing that a category mistake has been committed does not refer—paradoxically—to Ryle’s behaviorist position on the mind-body relation, but to the more general content of the argument. The category mistake in this case would be based on attributing mental states to creatures that do not actually have them in reality, since the category “human being” is characterized, among others, by mental predicates that are completely different than that of the “animal” category, described in a different conceptual grid than in the “human being” category. Attributing mental states to animals is a category mistake in the same sense as saying that Chopin’s *Polonaise in A-flat major* is green. A similar—theoretical—character is that of the methodological argument which treats anthropomorphism as an unjustified strategy of scientifically explaining something, while there are simpler explanations at our disposal that do not refer to higher cognitive capabilities. Conwy Lloyd Morgan’s Canon is often referred to in this context—it introduced the following limit to psychological research:

In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale. (MORGAN 1903, 53).

According to this methodological postulate, radical critics of anthropomorphism treat all references to mental states in the explanation of animal behavior as methodological over-interpretation, since these behaviors can be explained without referring to higher-order properties, e.g. one does not have to explain that a nestling opens its beak in the direction of the upcoming parent in intentional categories, but in the categories of elementary reactions to directional stimuli. Such a research strategy corresponds with the general rule of cognitive frugality, which is the scientific variation of “Occam’s razor.”

In reply to such criticism, it is indicated that anthropomorphism delivers an effective methodological tool for explaining animal behavior. If we assume that animals have internal (mental) states that can play causal roles in their behaviors, then the full description and explanation of their behavior, except for the mechanisms presented in classical ethology, should also contain a description of the relations of internal representations with their counterpart behaviors. Relatively strict conditions for the existence of such representations were formulated in the field of cognitive ethology, not based on the spontaneous and natural tendencies typical for folk psychology. This

is one example of defining the conditions for the existence of external representations in the view of cognitive ethology:

Representations exist if:

1. There is a mapping/projection of beings and events on mental or neuronal variables that serve as substitutes of these events or beings.
2. There is a formal relationship/adequacy between relational and combinatorial operations carried out on mental or neuronal variables as well as relational and combinatorial operations carried out on actual entities or events.
3. The processes of mapping/projection as well as operation processes enabling the organism to make relatively accurate prognoses about future events in its vicinity.
4. The ability to formulate accurate predictions is used to generate behavior (in a biological sense). (PISULA 2003, 13–14).

The scientific explanations of behaviors that take into account such representations fulfill an array of important methodological functions which cannot be ignored in the context of the criticism of anthropomorphism: Full predictive function, increasing the predictability of animal behavior and heuristic function, enabling the formulation of hypotheses and the testing of them.

The philosophical profile of the discussion on the mindreading ability is defined also by an array of ontological issues, mainly from the realm of the philosophy of mind. Let us begin with the basic problem from this field, namely, whether animals think at all. The criticism of the position attributing mindreading to animals is conducted from several separate points of view. In its radical version, it denies animals the ownership of the fundamental cognitive capacity, i.e. beliefs. One cannot attribute beliefs without having beliefs (representations in the form of beliefs and meta-representations of beliefs). The classic argument on the lack of beliefs was formulated by Donald Davidson in the article “Rational Animals” (= DAVIDSON 1982).

Davidson’s condition for thinking is built upon the statement that all propositional statements require a background for their beliefs. The starting point is the assumption that it is necessary to have the concept of belief in order to have propositional positions. By introducing a distinction between a belief and the concept of belief, Davidson relates to Norman Malcolm’s view, according to which one must discern between thinking and formulating thoughts (MALCOLM 1972–1973, 5–20). However, contrary to Malcolm, he states that having a belief requires the ability to formulate it. In order to think, it is necessary to have the concept of thought, and having a language enables the fulfillment of this condition (DAVIDSON 1982, 317–27).

A subsequent element of Davidson's argumentation is the aim to draw attention to the issue that from the nature of the concept of belief, one can assign it truthfulness, falseness, accuracy or inaccuracy. Therefore, every creature that has a concept of belief, must have concepts of the truthfulness and falseness that correspond with it. This entails the concept of objective truth, the understanding of which is possible through understanding and participating in the common linguistic exchange with intersubjectively comprehensible standards of attributing truthfulness or falsity to propositions and statements. It is impossible for a creature which is unable to comprehend the concept of objective truth to have thoughts. In a certain approximation, one can characterize thoughts as true or false, and their most basic form is a belief. A subject, however, cannot have beliefs without understanding that its beliefs can be false. Beliefs belong to the individual and, in this sense, they are subjective. Truth, however, is objective. A common mental phenomenon, such as astonishment, allows to encompass properly the dependencies among these categories. One cannot be astonished or have expectations without having the concept of objectivity, because astonishment depends on noticing the difference between the content of the subject's thought and that which actually occurs. In order to experience astonishment, it is necessary to have beliefs as well as to be aware of the contrast between the belief a subject had before a particular situation occurred and the belief that it had after that situation occurred. Astonishment can only take place in the situation whereby the subject believes that the beliefs that he or she holds are correct. Astonishment becomes the necessary and sufficient condition for thinking in general (DAVIDSON 2004, 4–8). So far, the lack of an evident empirical proof that animals can pass the non-verbal version of the false-belief task strengthens this sort of argumentation against animal mindreading capabilities.

The ability of animals to read minds can be questioned from a higher level than Davidson's criticism; namely, it can be assumed that animals have beliefs, but they cannot attribute them to other individuals. Such a position is presented by José Luis Bermúdez (BERMÚDEZ 2009, 145–64), among others. Bermúdez differentiates a belief from the perception of its effects in the behavior of a subject. Propositional positions, including beliefs, do not have a direct translation into behavior. The behavior of an individual that has a specific belief does not depend only on the other beliefs or desires that a particular individual has, but also on the inference leading from the content of the propositional position, that the subject has, to action. The labor on the alleged practical inference of another individual encompasses thinking and

reasoning with the aid of propositions, especially conditional ones. Furthermore, the cognitive process used by the subject to follow the practical reasoning of other individuals must constitute information influencing its own practical decisions, because every practical process of making a decision takes place on a conscious level. On account of this, propositions used to follow the subject's practical reasoning must be propositions to which the subject has conscious access. Animals, therefore, cannot assess logical inferences within conditional states of affairs through presenting their propositions in natural languages; they cannot follow logical inferences of other subjects and, as a result, they cannot predict the behavior of other individuals through the attribution of beliefs. Animals are not able to attribute beliefs (LURZ 2011a, 138–40); therefore, mindreading of propositional positions is not available for them. This does not mean that this ability is excluded in its entirety. It can mean the opening of the discussion on the existence of various versions of this ability and various stages of its development or evolution, to which levels of mindreading would correspond. José Luis Bermúdez poses the issue in this spirit by, among other things, distinguishing a hierarchy of animal mindreading levels: (1) minimal mindreading constituted by unconscious and automatic adjustment of behavior to the changes of psychological states of other individuals, (2) proper mindreading consisting of attributing mental states to other individuals by way of (2a) perceptive mindreading (interpreting seeing as having knowledge) or by way of (2b) having and attributing propositional states (BERMÚDEZ 2009, 145–50). Minimal mindreading is connected with behavior that simultaneously manifests two factors: the level of social interactions and the dependence of behavior on the mental states of other participants in the interaction. According to the definition presented by J.L. Bermúdez, an animal can be attributed minimal mindreading if its behavior is systematically dependent on the changes of the mental states of other participants in the interaction. Mindreading of perceptive states, as well as mindreading of propositional positions, belongs to the distinguished substantive mindreading type, in which the behavior of a particular creature is systematically dependent on the representation of mental states of other participants in the interaction. Representing perceptions differs from representing propositional positions such as beliefs and desires. Bermúdez demonstrates that representing another living creature, which is experiencing the same propositional position, is much more complex than the case of representing another individual as one that perceives a given state of affairs. This complexity arises from the fact that, in the case of mind-

reading of propositional positions, there is a metarepresentation,⁴ and the propositional positions themselves, such as beliefs, can be true or false—something of which the subject with the propositional positions must be aware. Operating with representations of propositional stances is not possible without language, because only this type of operation is capable of reflecting the structure of the represented propositions (BERMÚDEZ 2011, 407–40).

The Polish cognitive scientist, Piotr Przybysz, presented a clear order of the types of different experimental paradigms as well as hitherto typologies. He assumed three main parameters necessary for ordering the solution of the animal mindreading issue: (1) degrees of this ability, (2) general mechanisms that perform it (that is, the representation of behavior with the help of the “line of sight,” “external purpose of action,” and “the state of the environment” in order to predict behavior or to represent mental states such as unobservable behavioral factors?), and (3) social circumstances that encourage the use of this ability. The first parameter directs our attention to the gradeability of this type of cognition: (1a) reading perceptive states, (1b) reading intentional states, (1c) reading epistemic states (knowledge, beliefs). Among the mechanisms used for mindreading, one can discern (2a) representing behavior/the environment and (2b) representing mental states (unobservable reasons of behaviors). The last parameter differentiates the social context of mindreading: (3a) the conditions of competition as well as (3b) conditions for cooperation and costless exchange of information. By making the abovementioned distinctions, one can put the hitherto mindreading research in order, locating them on a scale of “intensity” of this cognitive capacity: from the least controversial cases, e.g. chimpanzees interpreting the behavior of other individuals—such as the direction of gazing—in order to anticipate their behavior and to adjust their own behavior accordingly (variation 1a/b–2a–3a) until later controversial cases; chimpanzees having the capability to attribute mental states, interpreting them in the categories of causality in the non-competitive situation (variation 1c–2b–3b). Between these poles, there is space for the interpretation of possible behaviors in the categories of the distinguished parameters. However, one must be aware that the general problem with mindreading is not resolved in this article – it only presents an assembled structure of possible answers (PRZYBYSZ 2014, 123).

⁴ According to J.L. Bermúdez, mindreading of propositional positions includes the representing of representations of states of affairs that are carried out by another subject. The term “proposition” is understood here as the representation of a state of affairs.

SUMMARY

If there were unambiguously positive results of research on the presence of mindreading among animals, then the state of affairs would act in favor of the hypothesis of a broad distribution of this skill within the animal kingdom. Unfortunately, according to many scholars, we do not have such results at our disposal. Basically, such positions are accepted in literature according to which the descriptions of much animal behavior, that suggests the presence of mentalizing processes, can be explained in mentalist categories as well as non-mentalist, i.e. such behaviors can be explained by the attribution of mental states or by the consequence of associative learning or through the reasoning not about mental states, but about the states of the environment in which the given behavior took place (HEYES 1998, 101–148). The rephrasing of the fundamental research problem, in order to resolve the issue in reference to which sophisticated experiments and observations have been elaborated, would sound the following way: are animals talented “behaviorists” (behavior readers) thinking about the behavior of other organisms or are they mentalists reasoning about the minds of other animals? (CHENEY & SEYFARTH 1990, 285–86). Research in this field leads to divergent conclusions, especially in the situation where one assumes that the competences of mindreading are binary by nature: either there is a competence present among animals at a level equivalent to that as of an adult human being or no animal at all has this ability. When one takes into account the ambiguous results of experiments as well the attempts to formulate a more optimal interpretational model, then the initial research question is divided into several more detailed questions, e.g. (1) whether mindreading is complex and gradable competence and (2) with the aid of what general mechanisms is this capability fulfilled, e.g. representation of behavior and the environment or of mental states. The detailed expansion of this multi-variable model, indeed, does not definitely resolve the dispute whether primates have their own mind theory, but at least it enables us to put controversial cases in an order according to the degree of their mentalization.

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MINDREADING IN THE ANIMAL KINGDOM:
PHILOSOPHICAL CONTROVERSIES

Summary

The central issue in the debate on animal minds is the issue of mindreading. This complicated cognitive ability belongs to the key elements of social cognition — as a form of adapting to specific circumstances connected with living in groups, it enables the reading of the mental states of other individuals, e.g. intentions, desires, and beliefs as well as the adaptation of one's own behavior to this information. The primary purpose of the article is to present the main philosophical controversies which arise in the discussion of whether this ability can be attributed to animals; if so, then to what extent. Philosophical discussions concentrate on methodological issues: alternative interpretational models of animal behavior (mindreading vs reading behavior), anthropomorphism, experimental protocols, and gradeability of mindreading as well as the nature of the mind (thinking).

CZYTANIE UMYSŁU W KRÓLESTWIE ZWIERZĄT:
KONTROWERSJE FILOZOFICZNE

Streszczenie

Główną kwestią w debacie na temat umysłu zwierząt jest kwestia czytania umysłu (*mind-reading*). Ta złożona zdolność poznawcza należy do kluczowych elementów poznania społecznego — jako forma dostosowania się do konkretnych okoliczności związanych z życiem w grupach umożliwia odczyt stanów psychicznych innych podmiotów, np. intencji, pragnień i przekonań, a także adaptację własnego zachowania do tych informacji. Celem artykułu jest przedstawienie głównych kontrowersji filozoficznych, które pojawiają się w dyskusji na temat tego, czy zdolność tę można przypisać zwierzętom, a jeśli tak, to w jakim stopniu. Dyskusje filozoficzne koncentrują się na zagadnieniach metodologicznych, takich jak: alternatywne modele interpretacyjne zachowań zwierząt, antropomorfizm, protokoły eksperymentalne i zdolność oceny umysłu, a także natura umysłu (myślenia).

Słowa kluczowe: czytanie umysłu; umysły zwierząt; antropomorfizm.

Key words: mindreading; animal minds; anthropomorphism.

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