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ANIMAL RESEARCH AND OBJECTIVITY

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Introduction

Humans have been interested in animals since the ancient times. This interest is two folded: on the one hand, we are interested in animals themselves, how they are, how they behave, how different species interact with each other, etc. On the other hand, we are also interested in what animals can tell us about ourselves; this interest is especially paramount in research done in the areas of animal intelligence and language skills. Via investigating animal language skills and intelligence, we have an opportunity to find out something about the development of human language and intelligence. This interest has prompted many scientific inquiries about animal intelligence, mind, language etc.

Central question of my thesis is: are these animal studies objective? At first glance it might not seem such a problematic question after all, but if we consider the specificities of studying animals, the question becomes very important. Different species of animals have and are being studied, and all these species have their own peculiarities. Even individual animals have their own wants, needs, moods, desires, etc. We also should not forget that animals seem cute to humans, thus eliciting tender emotions. All this might make working with animals quite difficult. It is definitely different from working with inanimate objects, or small living organisms such as bacteria. After all, investigating animals consists quite often in mutual interaction between the animal and the researcher. These types of studies are in my opinion the most in danger of losing objectivity, since there is the possibility of the scientist and the animal becoming too close. But the chances of learning much about animals are also highest in such studies. This is the reason why we cannot just dismiss them and concentrate on other types of more safe studies.

Objectivity is necessary trait to distinguish a scientific study from pseudoscience but unfortunately it is not so clear what objectivity is. There seems to be an intrinsic understanding of objectivity that humans possess, but this understanding of objectivity does not match well with animal research since this intuitive understanding of objectivity rejects subjective element. Therefore animal research is considered less objective than other sciences. My aim in this thesis is to show that this intrinsic understanding of objectivity is not the same as scientific objectivity and according to the account of scientific objectivity animal studies are objective.

In my thesis, I will concentrate on the types of animal studies where the possibility of compromised objectivity is the highest. I have chosen to concentrate on symbolic communication research and mindreading research since both of these kinds of study could reveal something important about animal minds and intelligence. There is also a possibility of uncovering something important about human minds and intelligence in comparison to animals. The nature of these inquiries demands close and extensive work with animals. But this is also the reason why there is a risk of compromised objectivity.

In the first chapter, I will discuss the notion of objectivity and clarify the term in order to find the best account of scientific objectivity to suit all scientific research. In chapter two, I will consider the wider questions about animal research and objectivity; mainly the question of animal research seeming less objective than other scientific inquiries and if animal studies need an account of objectivity of their own because of that. Then I will turn to examples of animal studies. In chapter three, I will look at the symbolic communication research, and in chapter four, I will analyse animal mindreading studies. I have chosen to analyse these two studies, since they both have been on-going for over thirty years and they show promise to uncover something important about language and intelligence development in animals and humans alike.

1. Objectivity

There are many different accounts of objectivity and many authors have devised their own accounts of objectivity to suit their purposes and context. Also, there seems to be some sort of intrinsic and intuitive understanding of what objectivity is that does not work for scientific objectivity. Since accounts of scientific objectivity tend to be incomplete or invidious, it is important to assess different types of scientific objectivity. My goal in this chapter is to find one account of objectivity that would be best for assessing objectivity of different scientific studies, including animal research. First I will assess the common intrinsic understanding of objectivity in sub-chapter 1.1. Secondly, I will turn to accounts of scientific objectivity presented by Allan Megill, Sergio Sismondo and Helen E. Longino in sub-chapters 1.2, 1.3 and 1.4. I will assess these different ideas of objectivity and try to find among them one superior contradiction free account of objectivity to suit all science.

1.1 What is objectivity?

According to Oxford dictionary of English objectivity is defined as „the quality of being objective“. (Oxford dictionary of English webpage, 2017) This definition is not much help to me, unless I know what is meant by objective. So, next I will look at the definition of objective. In the dictionary, objective is defined as:

1. „(of a person or their judgment) not influenced by personal feelings or opinions in considering and representing facts.

1.1 Not dependent on the mind for existence; actual“. (Oxford dictionary of English webpage, 2017)

Now the picture becomes a bit clearer, but at the same time, also new questions arise. There are two main problems with this definition.

The first problem is the demand for detachment from our personal feelings and opinions; can we really be completely uninfluenced by our feelings or opinions? I find that to be doubtful. As I already mentioned in the introduction, animal research is in danger of being influenced by our feelings, since animals tend to elicit emotions out of humans. Scientists are not free from this threat. Also, this is not a problem only in animal research but in all sciences. I think that it is impossible for scientists to remain completely

uninfluenced by their personal feelings or opinions, since this subjective element is always haunting in the background of scientific work.

The second problem with this definition is that it is expressed for a singular, individual person, but scientific research is not done by just one individual, science is a collective activity, there are many scientists, working alone or together. This definition of objectivity does not take the cooperative nature of science into account.

The definition of objectivity by Oxford dictionary of English's indicates how objectivity might be understood in standard everyday purposes and I think that this definition of objectivity corresponds to the intrinsic universal understanding of objectivity, but it misses the very nature of scientific research and therefore I shall have to elaborate the concept of scientific objectivity in greater detail.

Next I will turn to the accounts of scientific objectivity presented by Allan Megill, Sergio Sismondo and Helen E. Longino. I will analyze them to find one account among these to best judge the objectivity of scientific research

1.2 Four senses of objectivity

Megill (Megill, 1994, pp. 1-11) distinguishes between four senses of objectivity:

1. The Absolute Sense of Objectivity
2. The Disciplinary Sense of Objectivity
3. The Dialectical Sense of Objectivity
4. The Procedural Sense of Objectivity.

I will look each of them more closely.

By the absolute sense of objectivity Megill (Megill, 1994, pp. 2-5) means philosophical objectivity. Absolute sense of objectivity comes from Kant and means that things are represented as they really are. The main problem with this understanding of objectivity is that it is unachievable and therefore limited, if taken to extreme we get view from nowhere. In 20th century objectivity in this sense is taken more as a matter of arriving at criteria for judging claims to have represented things as they really are. It is absolute in the hold it ought to have on us as rational beings.

Megill (Megill, 1994, pp. 5-7) presents the disciplinary sense of objectivity as an alternative to absolute sense of objectivity valid for specific disciplinary field of science. The disciplinary sense of objectivity emphasizes particular, yet authoritative, disciplinary criteria. Consensus among the members of particular research communities is as its standard of objectivity.

The third sense of objectivity that Megill (Megill, 1994, pp. 7-10) describes is the dialectical sense of objectivity. The dialectical sense of objectivity unlike the absolute or disciplinary sense of objectivity holds a positive attitude towards the subjective. It states, that subjectivity is indispensable to the constituting of objects. Doing is preferred over viewing. This applies to areas of cultural and social research, humanities and social sciences where motives, cultural practices, traditions, reasons of behaviour, etc are explored. For objective account of the cultural practices an understanding of the subjective causes and reasons is necessary.

Lastly Megill (Megill, 1994, pp. 10-11) presents the procedural sense of objectivity. The procedural sense of objectivity is impersonal method of investigation or administration. Objectivity in the procedural sense should be seen as a set of rules of procedure for scientists to follow for eliminating any subjective element.

The problem with Megill's distinctions is that I have four senses of scientific objectivity to choose from; the question now is, which one of them is the utmost to judge the objectivity of a scientific study? They all have their strengths but also their weaknesses.

The absolute sense of objectivity to me seems to be too demanding but at the same time also limited. Everything else left aside, if we think about animals, then how we can ever be sure that the claims we make about animals really represent them. Besides facts and claims we have other variables at play here. Our personal beliefs and feelings, animal's behavioural peculiarities, and even the fact, that we really do not know much about animal's inner mental capabilities and workings. Absolute objectivity does not really take those things into account. It is too demanding in the sense that according to absolute sense of objectivity the scientists should see things as they really are without any subjective input. I do not think that this could be humanly possible, in any scientific research. Because of this demand it is also limited; it could apply to a very few scientific inquiries if any at all. So absolute sense of objectivity at best could be an ideal towards which scientists can strive for, but it has very few, if any, practical uses.

Compared to absolute sense of objectivity I think that the disciplinary sense of objectivity could be more useful. According to disciplinary sense of objectivity, if there is consensus among the researchers in a disciplinary community, there is also objectivity. But the disciplinary sense of objectivity is also limited. It is quite easy to imagine different rival groups of research communities with various incommensurable ideas about objectivity. How then can we say which one of them is right? In animal research we do not even have to imagine such a thing happening, because it is a real problem there. And it is not a problem only in animal research but in other sciences, too. The problem with the disciplinary sense of objectivity is that it is always relative to a community. It does not give us unified account of objectivity but instead the possibility of many different groups with their own ideas about objectivity. I think that this sort of relative objectivity would be more confusing than helpful if we want to assess the objectivity of scientific studies. With the disciplinary sense of objectivity we also have the same questions about subjectivity rising as with the absolute sense of objectivity, since disciplinary sense of objectivity is similarly against the subjective element in sciences.

Dialectical sense of objectivity holds a more positive attitude towards subjectivity, but this positive attitude is at the same time what limits it. Dialectical sense of objectivity could be useful in certain types of research, where it is impossible to operate without the subjective input, but we cannot apply it to all science. While holding a positive attitude towards subjectivity in sciences the dialectical sense of objectivity lacks universality in the sense, that it could be applicable to all sciences.

Procedural sense of objectivity is also limited. There are many different ways of scientific research and we cannot reduce them all to the following of rules. This type of objectivity is useful if we have a fixed set of rules to follow, but what then would happen to scientific studies where there are no such rules or where such rules have not yet been formulated? This question becomes important if we consider for example the work done in experimental fields of science, or the social sciences. Another problem here is if following the rules is really enough to achieve objectivity.

All of Megill's four senses of objectivity have their limitations: absolute sense of objectivity is too demanding, disciplinary sense of objectivity could lead us to relativism, dialectical and procedural senses of objectivity can be useful in certain scientific inquiries but they do not apply to all scientific studies. The first two senses of objectivity strive to be

universal, but do not take account the inescapable subjective element in science; and the last two senses of objectivity are too particular, they can apply to some sciences but not all.

What is really needed is an account of objectivity that is universal enough to apply to science in general, but at the same time, flexible enough to consider the peculiarities and differences of various scientific inquiries. Among Megill's four senses of objectivity, there is no one such account of objectivity.

1.3 Formal objectivity

In his book *An Introduction to Science and Technology Studies* Sismondo (Sismondo, 2004) distinguishes between an absolute objectivity and formal objectivity. Absolute objectivity in his use of the term coincides with Megill's absolute sense of objectivity. Formal objectivity is the ideal of perfect formal procedures necessary for scientific work. Objective scientist in this sense would follow the rules with machinelike precision. (Sismondo, 2004, pp. 113-114) Sismondo's formal objectivity seems most similar to Megill's procedural sense of objectivity only with a promise of wider universality.

Sismondo finds that absolute objectivity could at best be a vague ideal but it is very hard to recognize when it really is achieved. (Sismondo, 2004, p. 114) Formal objectivity is much more tangible; it is something that people construct under right social situations. (Sismondo, 2004, p. 117)

Sismondo's formal objectivity is constructed by keeping in mind the needs and interests of the discipline of Science and Technology Studies (STS). It could of course apply to animal research also, but I have my doubts about the suitability of this match. Firstly, in animal research there is hard to find some overall unified formal procedures for scientists to follow. There are many ways of how to research the animals. Procedures for observing animals in the wild are different from setting up experiments for animals in laboratory, and experiments done in a laboratory can differ greatly from the ones done in the zoos.

And there are also differences in investigating different species. What works for apes, might not work for monkeys or birds. Frans de Waal (de Waal, 2016, pp. 13-15) has illustrated this difference with an example of gibbons' problem solving tests. Gibbons were presented with a banana outside their cage and a stick. Chimpanzees would pick up the stick and pull the banana closer, but gibbons failed to do so test after test. These results

were weird since gibbons belong to the same family with humans and apes. It would be reasonable to assume then that they too could solve this problem quickly. Only after the realization that gibbons are arboreal and their hands are unsuitable for picking things up from flat surfaces could scientists solve this mystery. They devised different tests, where the tools necessary for solving the test were hung up and therefore better for gibbons to reach. After these modifications gibbons solved the problems quickly just as the other apes.

This example of gibbons' problem solving tests show quite clearly how finding some unified procedural rules could be problematic in animal research. By following just one set of rules about how to conduct experiments the scientists might miss something important about the animals they are researching. I think that this problem is not confined only to the area of animal research, but it could happen in other sciences too.

Second problem with formal objectivity is the demand for machinelike precision. It is easy to see how that can be achieved in a controlled environment researching something inanimate. Animal research tends to take place in quite uncontrolled environments, be that in the wild or in the zoos. And even if animal research takes place in a lab, there is still the problem of animal behaviour. It is hard to keep up to machinelike precision when your test animal is having a bad mood or is just bored and keeps on interrupting the testing.

Formal objectivity therefore is not a very good fit for animal research. There are of course procedural rules in animal research about how to conduct experiments, how to handle the animals and so on, but the problem I have with formal objectivity is that it seems to be limited to only formal procedures. This problem is not limited only to animal research, but to the other areas of science too. Sismondo's formal objectivity faces the same problem as Megill's procedural sense of objectivity: can science be reduced to just formal procedures? It could be done in some areas of science, like chemical lab experiments, but what about everything else, that does not fit into following procedural rules? What I need is an account of objectivity that encompasses other areas of science besides those where we can talk about objectivity in the sense of following the procedural rules.

1.4 Social objectivity

Longino (Longino, 1990, p.63) has said about objectivity, that:

Objectivity is a characteristic ascribed variously to beliefs, individuals, theories, observations, and methods of inquiry. It is generally thought to involve the willingness to let our beliefs be determined by “the facts” or by some impartial and nonarbitrary criteria rather than by our wishes as to how things ought to be.

This description of objectivity exemplifies the basic universal understanding of objectivity, but as I already mentioned in the beginning of this chapter, this basic understanding of objectivity is not the same as scientific objectivity. For Longino (Longino, 1990) this description of objectivity applies only to individuals, and therefore not suitable for science, since science has a social character. She says: „What I wish particularly to stress is that the objectivity of scientific inquiry is a consequence of this inquiry’s being a social, and not an individual, enterprise”. (Longino, 1990, p.67)

According to Longino (Longino, 1990, p. 68-69) scientific knowledge is produced when scientific community critically assesses, corrects and modifies the work of individual scientist. This means that experiments are repeated by other scientists, hypotheses and theories are critically examined and reformulated before they can be accepted as part of scientific canon. Scientific knowledge is produced by a community of all scientists and it transcends individual or sub-communities contributions.

For Longino (Longino, 1990, p. 74-76), science is done in a social setting, it is a community practice and objectivity is a characteristic of this community practice. Since hypotheses and their accordance to evidence is mediated by background assumptions, that might not be available to empirical confirmation or disconfirmation the objectivity of scientific methods cannot be identified with only empirical features. Through conceptual criticism, we have a possibility of identifying any subjective background assumptions and only through this conceptual criticism can scientific community guarantee it’s objectivity.

Thus, criticism and answering to it is what gives the scientific community it’s objectivity. I think that of the kinds of objectivity discussed in this thesis, only the account of social objectivity might provide us with a productive approach to scientific objectivity. It does not demand unachievable levels of detachment from subjectivity like the absolute sense of objectivity did. Instead social objectivity recognizes that there is indeed a subjective element in science and offers us a way to assess and limit this subjectivity via mutual criticism. Another strength of social objectivity is that it involves the whole

scientific community; this means in principle all the scientists in the world who belong to the community. This gives social objectivity its universality.

A by-product of social objectivity is that Longino's social objectivity comes in degrees:

„Scientific communities will be objective to the degree that they satisfy four criteria necessary for achieving the transformative dimension of critical discourse:

1. Recognized avenues for criticism;
2. Shared standards;
3. Community response;
4. Equality of intellectual authority“ (Longino, 1990, pp. 76-79)

Criticism plays a significant role in the objectivity of a scientific community, but this criticism cannot be just any criticism. For criticism to be useful and productive it needs to adhere to the four criteria presented by Longino. I will discuss each of them more closely.

By recognized avenues for criticism Longino (Longino, 1990, pp. 76-77) means that criticism can be presented in academic journals, conferences etc. Peer review plays big part in here. This criterion also means that criticism is valued equally with original research.

By shared standards Longino (Longino, 1990, pp. 77-78) means, that there are public standards or criteria that members of scientific community uphold. Without such shared standards criticism loses its meaningfulness.

Community response for Longino (Longino, 1990, p. 78) means that the beliefs of the members of a scientific community can change in the result of criticism. It does not mean that those who are criticized have to give up their beliefs, but they have to keep in mind the critical discussions going on about their beliefs.

By equality of intellectual authority Longino (Longino, 1990, pp. 78-79) means, that those who are in power do not silence those who disagree with them. Majority in power positions should not discard the opinions or beliefs of the minority and discriminating someone's views based on their race or sex should not be tolerated.

I think, that Longino`s social objectivity is the best account of objectivity at hand by which to judge a scientific study, including animal research. It is universal enough to encompass all different types of scientific research, but it is not unreasonably demanding since social objectivity admits to the subjective element in science.

With social objectivity Longino also gives us a way to assess the objectivity of some scientific research: this is answering to criticism. In my opinion this is the biggest selling point of social objectivity, because through assessing researchers` answers to criticism we have a good way of assessing the objectivity of many different types of researches. This point is what was missing in Megill`s four senses of objectivity and Sismondo`s formal objectivity, at least not in such an universal scale like Longino presents us.

Now that I have found a plausible account of objectivity it is time to turn back to animal research. In the next chapter I will analyze the more general questions about animal research and objectivity in light of Longino`s social objectivity, and in chapter three and four I will illustrate this analysis with examples of specific research programs.

2. Do animal studies need new kind of objectivity?

In the previous chapter, I briefly noted how animal research might appear to be incompatible with some accounts of objectivity; now it is time to consider this problem more fully.

Animal studies are bound to contain some form of subjectivity, especially in studies where animals and researchers have to interact very closely, but this subjective element is also a reason why some forms of animal studies are considered less objective and therefore less scientific than other scientific studies. This assessment is problematic since it banishes some promising animal studies in the periphery of scientific world. But at the same time these animal researches could tell us much about animals and ourselves.

We cannot expect animal research to be objective on the same grounds as chemistry or physics. In animal studies, scientists are investigating living beings with minds of their own and this research is different from that of chemistry or physics. There is much more subjective input in animal research than in the “hard sciences”. This intrinsic subjectivity poses a problem for assessing the objectivity of animal research, since the basic universal understanding of objectivity seems to correspond with absolute sense of objectivity in regard of discarding any subjective input in a research.

In their book *Objectivity* Lorraine Daston and Peter Galison (Daston, Galison, 2007) have traced the history of this absolute understanding of objectivity. This extreme denial of subjectivity came to play sharply in 19th century science and it was a reaction to the crisis that the science was facing at the time. Since science in the 19th century was developing so fast the scientists needed some safe, reliable grounds upon which to found their research on. Their answer to that problem was to eliminate any type of subjectivity from the sciences and from the scientists.

At the time it was a necessary move, but the question today is, if it still is necessary? I think that it is not necessary any more since science has changed from the 19th century and we are able to see the meaning and role of subjectivity in certain disciplines. Also, we now are able to incorporate both, some subjectivity and the aim of objective knowledge in our research. We have better accounts of objectivity suit well with our contemporary science. Thus we do not need to pursue the absolute objectivity at any cost. Clinging blindly to

unattainable ideal would hamper the development of science and exclude many fields of science with the intrinsic subjective element. Since to some degree subjectivity is still unavoidable in all sciences, adhering to the absolute sense of objectivity would render most sciences far from objective and therefore undermine their feasibility. That would be a very unfortunate result.

Thus, as it is clear that classical ideal of absolute objectivity and the intrinsic wider understanding of objectivity that conforms to it might not be the best way to judge animal research or any research, this poses us with a question: do animal studies need their own disciplinary account of objectivity? As pointed out in the previous chapter, there are many alternatives to absolute sense of objectivity, some of those suiting animal research to some extent, but most of them are suffering from their limited nature except for one: social objectivity.

Longino's social objectivity seems to be free of the difficulties the other alternatives suffer from, as it really is the only option for the judgement on the objectivity of any scientific study including animal research. Also, the account of social objectivity is not entirely free of problems: there is always a possibility that the majority of scientific community might be wrong in their judgment. This is a possibility, but given the assumed perspective of possible future criticism, social objectivity is still preferable. If we were to follow the unattainable ideal of absolute objectivity, there would be little chance of any scientific research ever living up to that ideal. This applies especially to the types of animal research that I analyse in my thesis. In case of close, interactive work with animals, eliminating all subjective elements is impossible and perhaps even hampering to the research.

The strength of the social objectivity is that it leaves room for correcting errors. Even if scientific community deems some type of research to be less objective, the scientists still have a way to sway that opinion. In the case of animal studies, if animal researchers keep up with the criticism, give their reasoned replies, consider possible misrepresentations and change their tests and methods when necessary, it is possible to sway majority opinions about their research. Therefore, I find Longino's social objectivity as a good account to serve well the aim of evaluating the objectivity of animal research. There is no explicit need for animal research to develop its own special account of objectivity. If we were to look animal research in light of absolute objectivity, then yes, the question would arise,

that maybe animal research needs an account of objectivity of its own. But social objectivity saves us from inventing that. Social objectivity does not exclude the subjective and interpretive parts of animal research, instead it advises researchers themselves to pay attention to alternative positions about their research and give well-rounded replies to criticism. In the end this helps research develop and remain objective at the same time.

In the next two chapters, I will illustrate the suitability of social objectivity to animal research with examples. I have chosen to analyse two well-known research projects where we could gain valuable knowledge about animal language skills and intelligence to show that we have a good way to assess the objectivity of these animal studies. In chapter three, I will concentrate on the symbolic communication research and in chapter four; I will analyse the mindreading experiments.

3. Symbolic communication research

In this chapter, I will discuss symbolic communication research. I will first introduce briefly what symbolic communication research is like, and then I will analyse the objectivity of some main research projects in the field in light of Longino`s account of social objectivity.

3.1 What is symbolic communication research?

In this sub-chapter, I give a brief introduction to symbolic communication research also known as animal language research projects. Contrary to what the name of such projects might suggest, the idea of those projects is to teach animals human language and not to explore the animal`s own language. By teaching animals a human language the scientists hope to learn more about the origins of language production and also about animals linguistic capabilities.

This interest to teach animals symbolic language systems arose in the 20th century. First forays to this subject were unsuccessful, because the scientists tried to teach chimpanzee`s spoken human language. After the discoveries about chimpanzees` vocal apparatus and its unsuitability for spoken human language, the focus shifted on teaching chimpanzees` a sign language and other artificial symbolic communication systems. (Andrews, 2016) These attempts were successful. First of those was Beatrix and Allen Gardner`s Project Washoe. They used shaping, moulding and modelling to train chimpanzee Washoe to form at least 132 American Sign Language (ASL) signs. This experiment took place in a social setting to mimic children`s language-learning environment. This success was soon repeated by other researchers working in the field, but there were also many sceptics. (Andrews, 2016)

The field flourished despite the critics. New projects were started and many different species were taught and investigated – among them were other apes, dolphins, parrots and sea lions. Besides Washoe, other famous animals include Koko, the talking gorilla, and bonobo Kanzi, who acquired lexigram symbols spontaneously. Advocates of those research programs argued that these studies will reveal something essential about the relationship between language and mind, the evolution of human language, and the roles played by developing and scaffolding in human language. (Andrews, 2016)

In light of symbolic communication research, many questions and problems were brought up. These include the questions about animal language, intelligence and minds: are animals in these projects really using language, how to define language, what do such success stories tell us about animal and human capabilities etc. To take seriously the answers to these questions that animal researchers give, it is important to assess how objective these projects are. Before we can do that, we must take a look at the criticism of symbolic communication research projects, since criticism and answering to it are one of the main ways to assess the objectivity of scientific study according to Longino's social objectivity. This is the topic of next sub-chapter.

3.2 Criticism of symbolic communication research

There has been and still is a lot of criticism about symbolic communication research. For most of the critics, these studies show that humans have the ability to train animals to do nearly anything humans want. Noam Chomsky has been very critical towards the claim that animals have acquired language. For him, language requires syntax, and he could not see any syntax in all the communication systems of the animals. He pointed out that human children learn language effortlessly while animals have to be taught. Language for him is innate, so if animals had the capacity for learning language, they would speak without human intervention. (Andrews, 2016)

Chomsky's criticism as well as of many others about language or the lack of it in these programs might be justified to some extent, but the nature of the problem with the language question depends on how do we define language. If language is defined in very general terms, the animals could also qualify as language users, but if language is defined as something more complex, such as in Chomsky's case, then according to that definition animals do not have language.

Temple Grandin (Grandin, 2005) has summarized this language debate as scientists forming two camps: on one hand, we have people who think that human language and animal communication are two separate and distinct things, and on the other hand, there are people who find that human language and animal communication are on the same spectrum.

If we keep Grandin's distinction in mind, Chomsky and other likeminded researchers would be in the first camp, and the advocates of symbolic communication research would fall into the second camp.

The language question plays a significant role in the criticism towards symbolic communication research, but there are other faults found in this type of research. Thomas A. Sebeok (Sebeok, 2000) has also been a very vocal critic of symbolic communications projects and he finds these projects to have other even wider problems than language defining.

Sebeok (Sebeok, 2000, p. 50) distinguishes between three main issues with these projects:

1. „Inaccurate observations and/or recordings of ape behaviours;
2. The over interpretation of ape performances;
3. The unintended modification of all animal`s behaviour in the direction of the desired results“.

Within these three issues, we can already see how Sebeok`s criticism might touch on the objectivity question. All of the above points, if they are true, in my opinion speak about wider problem – the loss of objectivity. I will discuss each of them separately.

Firstly, about inaccurate observations Sebeok (Sebeok, 2000, pp. 50-52) finds that the expectations of the experimenter can greatly affect how they interpret or score responses of their subjects. They want to see their subject succeed and therefore interpret the signs made by animal in that light. Sebeok also finds that since the assistants teaching the animals have sole purpose of inducing in the animals certain carefully programmed communication skills, they are more likely to see those skills where there actually are none. Furthermore the assistants have frequent discussions with other assistants and project leaders, they read each other`s notes and therefore the chances of the researchers influencing each other are fairly high. For example an assistant can use a certain tool when the sign for that object has been reported by another observer.

Sebeok (Sebeok, 2000, p. 56) points out that usually researchers fail to take into account natural behaviour of their experimental animals, mistaking species-typical reactions to humans for learned responses. For example, the vocabulary of each ape includes signs as pick (signed by picking a part of their anatomy), hug (signed by hugging), tickle (signed by tickling), kiss (signed by kissing), scratch (signed by

scratching), and others. The term „sign“ is inappropriate since these behaviours do not stand for or represent any referent, they simply are activities exhibited by wild apes.

Symbolic communication research projects often invite outside observers to see their results, but for Sebeok (Sebeok, 2000, pp. 84-85) even that is not helpful. Outsiders are dependent on the project members for the bulk of the information they receive during their visits, even if they are fluent in ASL, they do not have any experience with the animals and they cannot determine which actions are natural to the species and which ones the result of training. Because of their lack of expertise in animal behaviour they might be distracted by the non-signing behaviour of the animal and the hosts.

Secondly Sebeok (Sebeok, 2000, pp. 58-71) turns to the over interpretation of animals' performance. He finds that it is reasonable to apply the principle of Ockham's razor in the case of animal language. If the animals' behaviour can be explained in other or simpler terms, we should do that. For Sebeok, it is more likely that the scientists have over interpreted animals behaviour than that the animal is actually using language. He finds that we may be dealing with the Clever Hans Effect.

Hans was a horse in the beginning of 20th century who allegedly was very good at math, but later it was found out that Hans could read subtle involuntary queues given by his owner. Sebeok (Sebeok, 2000, pp. 60-62) says that we cannot really know if the animal is only imitating humans or really trying to convey a message, he himself thinks its imitation. He also remains sceptical about researchers reporting jokes, metaphors and insults in their communications with animals. For Sebeok it is more likely that the scientists are trying to find some sort of explanation for the animal's erratic behaviour.

Thirdly, Sebeok (Sebeok, 2000, pp. 72-75) brings out a possibility that scientists have unintentionally modified animal behaviour. He finds it highly likely, since most of the animal language research groups are very close-knitted, almost family-like entities. Animals have their favourites and so do scientists. For Sebeok this raises the clever Hans question again, since it is unclear how well animals can read humans body language, it is likely that in the case of „favourites“ it is easy for the animal to get cues from experimenter. This doesn't mean that there is some language involved.

de Waal (2016) has also raised similar concerns:

It is hard to evaluate linguistic skills if we never get to see the raw data, such as unedited videotapes, and hear only cherry-picked interpretations by loving caretakers. It also doesn't help that whenever apes produce wrong answers, their interpreters assume that they have a sense of humor, exclaiming „Oh, stop kidding around!“ or „You funny gorilla!“ (de Waal, 2016, p.105)

According to Sebeok and de Waal it would seem then that symbolic communications projects have far deeper problems besides the language question. If the scientists are really too close to their test animals and co-workers, if the outside observers are compromised, if only favourable data is presented and animal's mistakes are explained away, these projects cannot be regarded as very objective. Without objectivity they are also far from scientific and their results and data lose their credibility.

Before making a final decision about the objectivity of symbolic communication research we should look if the researchers have presented a plausible answer to the critics, since according to Longino's social objectivity, answering to criticism was paramount for objectivity. In the next sub-chapters I will assess the answers to the critics by the researchers in symbolic communication and their sympathizers.

3.3 Answering to criticism

I will first discuss John Dupré's (Dupré, 2002) response to Sebeok's (Sebeok, 2000) points of criticism outlined in the previous sub-chapter. Dupré has tried to answer to all three lines of Sebeok's criticism.

Firstly, in the case of inaccurate observations and/or recordings Dupré (Dupré, 2002, pp. 240-244) finds that if some sort of communication is supposed to happen, certain amount of interpretation is needed. If what the ape is producing really is a kind of a language, we should not be surprised by the listener having to contribute a measure of interpretation to the communicative interaction. Literal transcriptions of conversations even between linguistically competent human adults typically look very different from grammatically correct written language, but nobody doubts that communication took place. Utterances of human children are even more aberrant, but we are prepared to believe that the parent understands what is being said.

Secondly, Dupré (Dupré, 2002, pp. 240-244) finds that we may not deal so much with the over interpretation, but fundamental conflicts between intrinsic features of this kind of research and commonly held ideals of scientific enquiry. This encompasses the idea, that data requiring interpretation is scientifically unacceptable. Dupré reminds us that all data is

interpreted in the light of some theoretical background. In the case of animal language research projects that background is that animals are trying to say something. Unfortunately that is exactly what the critics are denying missing the point that it would be impossible to investigate animals' sayings without at least a hypothesis that they are trying to say something. Dupré also brings out that it might be impossible for scientists to stay completely dispassionate and detached. In the case of animal language research projects it seems to be inevitable part of this kind of research for scientists to not be completely dispassionate and detached. They are trying to communicate with live and active beings after all. He states that much of human learning might be inaccessible to a thoroughly disinterested and objective study.

Thirdly, in the case of unintended modification, Dupré (Dupré, 2002, pp. 240-244) finds that it seems very difficult to devise experiments that eliminate every possible channel of communication other than that intended by researchers. Animal language research projects are facing a methodological dilemma: the more controlled and predictable the animals behaviour is, the harder it is to fend off the accusation of manipulation, but when animal is given more freedom, and its utterances are spontaneous and uncontrolled, the reports of animals behaviour are called „anecdotal“. Sceptics aren't convinced either way. We should pay attention to what is being investigated – interaction between two intelligent subjects.

All of these counterarguments are very good and could be indicators of the peculiarities of these types of researches. Nonetheless the worry about objectivity still remains. Even if interpretation and social interaction with animals is a necessary component of animal research it doesn't mean that scientists should present only favourable data and explain the mistakes away.

Dupré does not say it explicitly, but it seems to me that when he is talking about conflicts between intrinsic features of this kind of research and commonly held ideals of scientific enquiry he might mean absolute objectivity and its unsuitability to animal research. Absolute objectivity was indeed hostile towards subjective input in science and it might be a big contributor into commonly held ideals about scientific enquiry. But as concluded in the first chapter, absolute objectivity is not attainable in most type of scientific research, and therefore general understanding of science assuming absolute objectivity is misleading.

If we see this problem in the light of Longino`s social objectivity, we do not have such a sharp conflict between the ideals of scientific inquiry and this type of animal research, since social objectivity does not demand the same level of detachment as absolute objectivity. The question now is whether according to Longino`s social objectivity the symbolic communication research projects are objective? In the next sub-chapter I will concentrate more closely to this objectivity question.

3.4 Objectivity of symbolic communication research

I will start this sub-chapter with a story forwarded by de Waal (de Waal, 2016). In 2014, when Robin Williams died, gorilla Koko was said to be mourning the man also. This could be a plausible claim, because Koko was said to be close friends with the actor. What makes this claim problematic, is that Koko and Robin Williams had only met once, thirteen years before, and the only evidence of Koko`s grief was a picture of sombre looking Koko. This grieving claim is one example of inflated claims that the symbolic communication researches do and these claims are reason why the field of talking apes has bad reputation. de Waal concludes, that: “There is too much of this going around and too little hard-nosed science”. (de Waal, 2016, pp. 105-106)

I think that one of the main reasons why symbolic communication systems projects are not taken so seriously is that the scientists who have led them have lost their objectivity. The story of Koko grieving somebody whom she has only met once shows quite clearly that the objectivity of these researchers might be compromised.

Instead of claiming something implausible it would be more reasonable to claim that Koko was affected by the mood of the researchers (de Waal, 2016, p. 106). To illustrate this further, I will take a look into typical setting of an animal language research project.

Typically these projects take place in a social setting, even homelike environment. The leaders of a project are usually a married couple or relatives. Work with the animals has been on-going for decades and the lead scientists and their followers together with the animals have formed a tight-knitted community. Even if outside observers are on the premises, they are first given training on what do they see or they are given interpretations on the animal behaviour they are observing. All of this was mentioned by Sebeok (Sebeok, 2000) too.

We can already see how such a setting raises some serious issues about objectivity. Can we talk about objectivity in such a case at all? If we are dealing with a very close and even isolated community, it is plausible to assume that this community has its own standards – the standards about which tests to conduct, how they are to be conducted, which animals are to be tested and by whom. And there are obviously standards about how to interpret the data collected with such testing. All of this does not necessarily mean that the objectivity of the group is compromised.

If we think back to Megill's (Megill, 1994) four senses of objectivity, the symbolic communication systems projects might fall under the category of the disciplinary sense of objectivity. Consensus among the researchers would then give this group their standards for objectivity. All would be well if we could just draw the line there and leave things like that. Unfortunately we cannot do that.

Science and research is not carried out in a vacuum. Besides your own research group there are other groups and scientists out there. If we settle for disciplinary objectivity then we have the problem of relativism raising its head. We either accept that every group has its own objectivity, thus gaining a great number of accounts of objectivity which might be incompatible with each other, or try to find a more general approach. As indicated in chapter 1, the absolute sense of objectivity is not helpful in this respect. Symbolic communication research does not fare any better in that regard.

The problem with absolute objectivity is that animal research is bound to have some element of subjective in it. Like John Dupré (Dupré, 2002) pointed out, it might be impossible for the scientists to remain completely dispassionate and detached. Unfortunately absolute objectivity does not allow the subjective element in it, making animal research not objective in that regard.

I have chosen Longino's (Longino, 1990) social objectivity, since it is universal on the one hand, and allows taking the subjective elements in science into account on the other. Now the question remains whether symbolic communication research projects are objective according to social objectivity.

According to Longino's objectivity, animal language research projects are not strictly objective. According to social objectivity, criticism is a necessary requirement for objectivity. In previous sub-chapters I outlined some of the criticism towards the symbolic

communication research projects, and also possible answers to this criticism given by Dupré. In this sub-chapter I will elaborate it.

Symbolic communication research projects mostly fail according to the third criticism criterion of Longino's objectivity – community response. They have answered to criticism, but at the same time, there seems to be no change in their research taking notice of that criticism. There seems to be a sort of stalemate between the animal researchers and their critics. Criticism is presented and some sort of answer is given, and then the research goes on like nothing has happened. Such an attitude is problematic for objectivity, since it means that scientist's individual beliefs override anything that might come from the outside. This is also problematic for the development of the research, since in such a stalemate there can be no real development, only repetition of the same thing over and over again. In answering to criticism we can see how the close relationship of symbolic communication research groups becomes a hindrance not strength.

One example of symbolic communication research advocates answer to criticism is presented by Roger S. Fouts and Deborah H. Fouts (Fouts, Fouts, 1993) who both work with the famous chimpanzee Washoe.

They find that the fault lies in human arrogance. We want to be special and therefore discriminate against every other species who might rob us of our special status. Human arrogance is to blame for the reason, that symbolic communication research is not taken seriously or not seriously enough. They trace this arrogance back to René Descartes, who depicted animals as unthinking and unfeeling machines. (Fouts, Fouts, 1993, pp. 30-31)

It might be true, that due to the philosophical tradition of Cartesians we might not be so inclined to accept the reports of talking animals. But is human arrogance here really the reason? Critics like Sebeok or de Waal seem to be more concerned about the muddled data that the symbolic communication research scientists present, not that the animals are somehow beneath us or Cartesian machines.

One other problem with referring to Cartesian tradition is that Descartes himself had quite conflicting views about animals. Yes, they were machines, like a human body was a machine. They could not speak and they could not reason, but they were not unfeeling. They could feel pain, heat, hunger, fear and joy. (Guerrini, 2007, p.125) It is important to keep that in mind while referring to Descartes.

So, Fouts' and Fouts' counterargument misses their mark and raises questions about the authors themselves. Instead of delving in the arguments of their opponents, they announce, that all who disagree with them are arrogant. This example of a counterargument to criticism about symbolic communication research shows how advocates of said research concentrate on the wrong things in the light of criticism. Instead of calling disbelievers arrogant, the debate could be solved by presenting and analysing the data that the critics are asking for. Moreover, the stance that animals do not have language like humans do does not necessarily stem from arrogance.

de Waal (de Waal, 2016, p. 106) has said:

We honestly have no evidence for symbolic communication, equally rich and multifunctional as ours, outside our species. It seems to be our own magic well, something we are exceptionally good at. Other species are very capable of communicating inner processes, such as emotions and intentions, or coordinating actions and plans by means of nonverbal signals, but their communication is neither symbolized nor endlessly flexible like language.

de Waal's position stems from lack of evidence, not from arrogance. Symbolic communication research has been around for a long time, over thirty years, and we still do not have any good, reliable evidence that animals have language similar to human language. So it is quite reasonable to assume, that animals do not have language or at least, that their language is not like human language. It does not mean that they are somehow worse than humans in that regard, it just means that animals do not have the need for a complicated symbolic communication system.

de Waal (de Waal, 2016) points out on many occasions that animals are much better at reading expressions and body language than humans are. They are so good at it, that it makes us feel like they understand what we are saying to them. But actually they just follow our body language. They have no need for symbolic communication on human scale, since they are already masters of other type of communication – the body language.

Animal's expertise in reading body language could be one explanation as to how they could excel in language testing. They read the involuntary cues that the experimenters unwillingly give them. Even if body language expertise cannot explain fully the behaviour of signing apes, it is one possible alternative explanation to apes having language. At least it could be a worthwhile research direction. Unfortunately symbolic communication research advocates usually do not consider this possible explanation.

Francine Patterson and Wendy Gordon (Patterson, Gordon, 1993, p. 61), who work with the famous gorilla Koko, have also explained the criticism towards their work through critics needs to defend the uniqueness of human language. Apes threaten that uniqueness; therefore their claims about ape language are not taken seriously.

This line of defence for the symbolic communication research is similar to Fouts` and Fouts` (Fouts, Fouts, 1993) line of defence albeit a bit milder. It could be true that some critics want to defend the uniqueness of human language, but this counterargument misses its target if we consider Sebeok`s or de Waal`s arguments. If the critics are pointing out problems with data interpretation or even data tampering, then an argument about the defence via the uniqueness of human language does not help here. It just shows that there could be serious problems of miscommunication between the two opposing parties.

This miscommunication could be a sign of problems with fulfilling Longino`s second criterion of criticism: the shared standards. Under shared standards Longino (Longino, 1990, pp. 77-78) means that members of scientific community uphold shared public standards or criteria. Only if there are such shared standards, can criticism be relevant to those who are criticized.

Since researchers of the symbolic communication systems seem to dismiss or misunderstand the criticism directed at them, it could mean that their standards are different from those of the critics. Given the close-knittedness of these research communities, it is quite plausible since this close community has also become a somewhat closed community. Misdirected answers to criticism seem to indicate that. If it is so, then there could not be a meaningful dialogue between the critics and the criticized parties. And it also means that the objectivity of criticized parties is compromised. For objectivity, responsiveness to criticism is necessary.

Longino (Longino, 1990) stresses that even if research is criticized it does not mean that scientists should give up on it. What it does mean is to review your work in the light of this criticism. After all, someone from the outside of a research project might notice something yourself researcher is blind or oblivious to.

In the case of symbolic communication research projects, no such revision is done. Ignoring criticism is a striking sign of compromised objectivity. It is commendable, that the researchers have not given up on their positions or research, but at the same time,

clinging blindly to questionable theories and interpretations of data is not a good solution. In the long run, it does not help the research program to progress or researchers to acquire new and more reliable data.

And if the tests are not objective, the test results also are not reliable. We never can be sure that these results are given us in an accurate and unmodified form. It is quite possible, that the results of these tests have been misinterpreted in a favourable light, without considering alternative interpretations. As Sebeok (Sebeok, 2000) points out: everyone wants to see their favourites to succeed.

In conclusion of the chapter, we must admit that symbolic communication researches have some serious issues with their objectivity. In the light of Longino`s social objectivity these research projects are not really objective since they have problems with shared standards of criticism and community`s response to criticism. This does not mean that all of this kind of animal research projects face the difficulties, but some of the landmark projects in the field, such as the project Washoe and the project Koko have lost their objectivity. The unfounded claims about their test animal`s capabilities like the grieving Koko story and the insufficient reaction to criticism illustrate this loss of objectivity. And since the star projects in the field are not objective, the whole field becomes compromised as the star projects receive more attention than less known projects. Unfortunately this also means that the failings of the star projects overshadow the other projects.

In the next chapter I will look into mindreading experiments. Similarly to symbolic communication research, also mindreading experiments have a long history. It is to see if the lack of objectivity is a problem in only symbolic communication research or if the lack of objectivity could be a wider problem in animal studies.

4. Mindreading experiments

In this chapter, I will turn to animal mind reading tests. These tests also have a long history behind them and they have attracted many supporters as well as many critics. Mindreading experiments also demand quite close interaction and training between the animals and scientists. In this regard, they are quite similar to symbolic communication projects. First I will give a brief introduction to animal mind reading, then I will look at the criticism of these studies and lastly I will assess the objectivity of these tests.

4.1 What is animal mind reading?

Besides humans there are many species that are social animals. For an animal to be successful in a competitive social world, it would need some sort of understanding of the minds of others. (Andrews, 2016)

In this context, the term “theory of mind” comes from psychologists David Premack and Guy Woodruff. They were interested in whether the chimpanzee could attribute beliefs and desires to others in order to predict and explain their behaviour, as humans do. They wanted to know if a chimpanzee understands the behaviour of others as being caused by propositional attitudes. (Andrews, 2016)

Theory of mind most simply put means ascribing mental states (beliefs, desires) to oneself and to other agents. Animal mindreading research has the potential to uncover and solve many debates about mindreading. (Heyes, 2015) Peter Carruthers (Carruthers, 2011, p. 254) finds that if we have strong evidence of animal mindreading then this would indicate that mindreading in humans could be evolutionary.

Wimmer and Perner designed the false belief task, which became a standard test for theory of mind:

Children watched a show in which a puppet named Maxi puts away a piece of chocolate in a box before leaving the room. While Maxi is out, his mother finds the chocolate and moves it to a cupboard. Maxi returns to the scene, the show is stopped, and children are asked to predict where Maxi will go to look for his chocolate. If the child says Maxi will look in the cupboard, she fails the test, and thus shows that she doesn't have a theory of mind. If the child says Maxi will look in the box, she passes; passing the task shows that the child has a theory of mind, because she

demonstrates that she can attribute mental states and use them to predict Maxi's behavior.
(Andrews, 2016)

Testing theory of mind in children seems quite clear and doable, since children can answer to the questions about the situation they are viewing. But how could we test similar knowledge in animals? Cecilia Heyes (Heyes, 2015) lists three types of experiments that also illustrate the history of animal mindreading research. They are false belief/conditional discrimination training; seeing/conditional discrimination training and transfer tests; and "seeing"/tests only. I will discuss each of them in greater detail.

First types of tests that Heyes (Heyes, 2015, pp. 314-315) lists, the false belief/conditional discrimination training experiments, were popular in the 70s and 80s. These tests were conducted by Woodruff and Premack who were interested in the chimpanzees' ability to deceive. They wanted to know, if the apes could induce a person to hold false belief about the location of food. In the trials, they first placed food in one of the two containers visible, but out of reach to the chimpanzee. Then a human trainer entered the room and searched the container that the chimpanzee was indicating to. If the trainer was dressed in green he/she was cooperative and gave the food to chimpanzee. If the trainer was dressed in white, they were competitive and they kept the food for themselves. Chimpanzees learned the difference and pointed toward the container with food when the cooperative trainer was present, and towards the empty container in the presence of competitive trainer.

Heyes (Heyes, 2015, p. 315) notes that Premack and others recognized from the start that such behaviour could be induced by more visual clues than mental states. The chimpanzees could have instead learned that in the presence of green trainer they were rewarded if they pointed to the container with food and in the presence of the white trainer there was reward if they pointed to the empty container. Nonetheless, these types of experiments launched the animal mindreading research enterprise.

According to Heyes (Heyes, 2015, pp. 314-315) in the 1990s seeing/conditional discrimination training and transfer tests were devised to avoid the ambiguity of Woodruff and Premack tests. Chimpanzees were first given conditional discrimination training and afterwards a transfer test. In the training phase in the presence of the chimpanzee and one trainer (Knower) food was placed into one of the four cups. The chimpanzee could see the Knower and that food were placed into one of the cups, but not at which cup. Then the

second trainer, the Guesser, entered the room, and each trainer pointed at a cup — the Knower at the cup with food, and the Guesser randomly at one of the other three cups. The chimpanzee was then allowed to select one cup to search for the food. If the chimpanzee selected the cup pointed by the Knower it could eat the food, but if it selected any other cup, no food was given.

To avoid chimpanzees using physical cues the roles of the Knower and the Guesser were switched around and a transfer test where both trainers were present was also given. In the transfer tests the Guesser had a bag over its head. Chimpanzees learned to choose the cup indicated by the Knower, but at the same time these results still did not provide strong evidence about mindreading. Possibility of the apes using visual indicators was still very high. (Heyes, 2015, p. 315)

In the 2000s Tomasello and his Leipzig colleagues focused on `Seeing`/tests only to assess the chimpanzees` understanding of `seeing` and `knowing`. They used in their testing competitive feeding situations without any prior training done on apes. (Heyes, 2015, p. 315)

At the beginning of each trial in the competitive feeding paradigm, a subordinate chimpanzee (the subject) and a dominant chimpanzee (the putative target of mindreading) were confined on opposite sides of an enclosure containing two occluding objects . In all trials, a human trainer entered the enclosure and placed food on the subordinate`s side of one of the occluders, and in some trials the trainer re-entered the enclosure 5–10 s later and moved the food to the subordinate`s side of the other occluder. In all conditions, the door to the subordinate`s cage was open during the baiting event(s). The conditions varied according to whether the dominant`s door was open or closed, and therefore whether the subordinate could see the dominant, during the baiting event(s). After baiting, both of the chimpanzees were released into the enclosure, with the subordinate being given a head start. (Heyes, 2015, p. 315)

Leipzig group interprets the results of these tests as evidence that animals have some understanding of the relationship between `seeing` and `knowing`. Subordinates approached the food more often, when the dominants door had been closed. If the dominants door was left open subordinates didn`t try so hard, assuming that the dominant saw where the food was placed and, that they would lose it anyway. (Heyes, 2015, pp. 315-316)

These three types of experiments illustrate the developments and difficulties in the mindreading research. In the next sub-chapter I will look at the criticism of these tests.

4.2 Criticism of mindreading research

Heyes (Heyes, 2015, pp. 316-317) notes that these three experiments illustrate three trends in animal mindreading research. Firstly, the bar has been lowered. Secondly, methodological standards have declined. Thirdly, the social structure of research has changed. Heyes finds that the research on animal mindreading has declined and she blames underlying theoretical and methodological problems.

It is no longer clear what research on animal mindreading is looking for (theoretical problem), and consequently it is not clear how the quarry can be hunted down (methodological problem). (Heyes, 2015, p. 317)

Overall this paints a picture of research in crisis – without the understanding of what it is that the scientists are investigating and how they should do it.

de Waal (de Waal, 2016) criticizes mindreading experiments for underestimating the role of body language. Chimpanzees can read the body language of other chimpanzees to get clues about the knowledge that the other chimpanzee might possess, such as the location of hidden food. Because of that de Waal also has a problem with the terminology in mindreading experiments:

The central question became whether apes or children hold a theory about the minds of others. I have trouble with this terminology, too, because it makes it sound as if we understand others through a rational evaluation not unlike the way we figure out physical processes, such as how water freezes or how continents drift apart. It sounds far too cerebral and disembodied. I seriously doubt that we, or any other animal, grasp the mental states of someone else at such an abstract level. (de Waal, 2016, pp. 131-132)

According to de Waal it would then seem that the theory part of mindreading experiments might be presupposing too much from the animals and even us.

Heyes (Heyes, 2015) has tried to find a solution for mindreading experiments, to help the research get out of this crisis. To solve the theoretical problem, she advocates the minimal solution. It is:

The ‘minimal solution’ raises the possibility that, rather than involving metarepresentation of propositional attitudes, animal mindreading involves the representation of mental states as relations between agents, objects and locations. (Heyes, 2015, p. 320)

If we take mindreading in the light of the minimal solution, then we do not have the problem of no creature qualifying as a mind reader. At the same time, this concept is still

difficult enough to be worth researching. If we would conceptualize mindreading in a very vague and general term, then every being could be a mind reader, and the necessity of researching this phenomenon would be nonexistent. So, the minimal solution could be an acceptable term on which to ground further research.

Heyes (Heyes, 2015) also finds that to overcome the methodological problems researchers could revert back to the more demanding tests of the 1990s. They might be more bothersome and time consuming to set up, but we could get better and clearer results from them.

de Waal (de Waal, 2016, p. 146) has pointed out that one big problem with theory of mind tests is that apes are asked to guess what humans do and do not know. But the apes have every reason to believe that human caretakers are all knowing. Tests with human presence only test ape`s theory of the human mind. De Waal notes that the field started to get real results only after pitting apes against other apes.

Daniel J. Povinelly and Jennifer Vonk (Povinelly, Vonk, 2003) find that the problem with mind-reading experiments is that the test results used to prove the existence of mindreading could at the same time instead be proving behaviour – reading in animals. They think that the solution would be to devise such a test where the animal is given an experience that they cannot predict from the environment and the scientists then can research if the animal understands the nature of that experience.

Carruthers (Carruthers, 2011, pp. 258-259) points out that although in many experiments when interpreting the result simplicity could be a better option while theorizing about animal intellectual capabilities it can be a double-edged sword. As an alternative to mindreading scientists have presented behaviour – rule explanations. This means that instead of mindreading animals are following some behavioural rule that helps them get similar test results to mindreading. The problem is that this simpler explanation of animal behaviour might not be so simple after all since in complex situations the behaviour – rule explanation needs to postulate many distinct rules and becomes less plausible. Carruthers finds that instead of behaviour – rule explanations it would be more reasonable to assume that animals have a stage-one mindreading account.

Through all of these abovementioned criticisms we can see that there is a vivid discussion about the possibility of mindreading going on. Researchers present their

theories and hypotheses about animal mindreading according to the data and analyse the answers of their opponents. There are also propositions about improving or modifying the tests to get better and clearer results.

Keeping in mind the aim of the present study, one may wonder whether the mindreading experiments are objective. This is the topic of next sub-chapter.

4.3 Objectivity of mindreading research

Mindreading research has to face many problems but the real question is: do these problems in mindreading experiments speak about lost objectivity? I think that the answer for that question is not really.

If to refer back to chapter three, where objectivity of symbolic communication research was discussed, we can see a clear difference between these two kinds of inquiry. This is answering to criticism. In the case of symbolic communication research, the criticism did not change the ways how the experiments were conducted or how the data was interpreted. In the theory of mind research, scientists tried and are still trying, to come up with new ways to explore mindreading in light of criticism or ambiguous test results. Most of the time, alternative explanations were taken into account or given serious considerations.

Symbolic communication and mindreading research both have problems, but at the opposite ends. Symbolic communication research is too unified; alternatives are either ignored or not considered. Mindreading experiments consider alternatives and try to devise better tests, but the disagreements have led research into crisis. Researchers are not sure any more about what they are studying and how. If one kind of research is too unified, the other is not unified enough. Symbolic communication research speaks about the dangers of absolute agreement and mindreading research about the dangers of disagreement.

Nonetheless, on the objective scale mindreading experiments fare better than symbolic communication research. To remind Longino's (Longino, 1990) social objectivity, one main point for remaining objective is criticism and answering to that. Mindreading research has answered to criticism and also revised its hypotheses, tests and theories in light of that criticism. Like Heyes (Heyes, 2015) pointed out: even from the start of the first experiments, the scientists have been aware of alternative explanations to their test

results. In reaction to this, they have tried to devise better, more conclusive tests to eliminate the ambiguity of test results.

In conclusion of this chapter, one may admit that mindreading research is objective according to Longino`s social objectivity. Despite the problems in mindreading research, there is a possibility of overcoming them, since the scientists are mindful of the criticism and alternative perspectives.

5. Conclusion

The central question of my thesis has been whether animal research is objective? Answer to that is yes, but depending on the account of objectivity. I have found good reasons to choose Longino`s account of social objectivity. I have analyzed two types of major research projects in animal research in light of the account of objectivity.

One of these research projects, symbolic communication research, turned out to be not very objective. A central requirement of social objectivity is answering to criticism. Symbolic communication research projects fails in that regard. Their answers are either inconclusive or miss their target. Another sign of failure in reaction to criticism is that these research projects have remained quite unchanged for over thirty years.

The other research project, the mindreading research, fares better. Although this research also has its difficulties, there has been at least clear reaction to criticism. Researchers have tried to devise better tests in light of criticism and sought alternative explanations to test results. According to Longino`s criteria of social objectivity, mindreading research is objective.

So, overall it is possible to remain objective while researching animals. There is a subjective element in animal research but this subjectivity can be limited and controlled by reacting to criticism. In the end it is scientific community as a whole who decides via criticism if some research is objective or not. Criticism and reacting to criticism help scientific research to remain scientific and objective. Animal research is no different in that regard. There are studies that are not very objective in animal research and also studies that are objective. In light of social objectivity, the answer to my main question in this thesis is yes, it is possible to research animals objectively.

6. Summary

In my thesis I have been interested in the objectivity of animal research. Since animal studies have an inherent subjective element, some of these studies are considered not objective or even unscientific. My first step for inquiring this problem has been clarifying the concept of objectivity. I found that the common understanding of objectivity and corresponding idea of absolute objectivity in science are not suitable for the nature of scientific research. I agree with Helen E. Longino that science is a social activity by nature and therefore objectivity should also be understood socially and not individually like in the classical understanding of objectivity. Secondly, I used examples of two research projects in animal studies to see if animal research could be objective on the same grounds as other sciences. In the symbolic communication research the leading researchers in the field were unable to react to criticism, thus compromising the objectivity of those studies. Mindreading experiments turned out to be objective, since scientists were open to criticism, alternative hypotheses and a lively discussion between the critics and scientists were achieved. From these examples, I concluded that animal studies can be objective if the scientists are participating in an open critical discussion.

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Loomauuringud ja objektiivsus: kokkuvõte

Oma magistritöös huvitusin ma loomauuringute objektiivsusest. Loomade uurimisega seondub interaktsioonist tulenev subjektiivne element, mis on vastuolus tavapärase arusaamaga objektiivsusest. Selle vastuolu tõttu peetakse mõningaid loomauuringuid ebaobjektiivseks või suisa pseudoteaduslikuks. Esimeseks sammuks selle probleemi uurimisel selgitasin objektiivsuse mõistet. Selle käigus leidsin, et tavapärane arusaam objektiivsusest ja sellega kattuv arusaam absoluutsest objektiivsusest teaduses ei sobi tegelikult teadustöö loomusega. Nõustun Helen E. Longinoga, et teadus ja teadusloome on oma olemuselt sotsiaalsed ja seetõttu peaks ka objektiivsust mõistma sotsiaalselt, mitte individuaalselt nagu klassikalises arusaamas objektiivsusest. Minu teiseks sammuks oli uurida konkreetseid loomauuringute näiteid sotsiaalse objektiivsuse valguses, et näha kas loomauuringud saavad olla objektiivsed samadel alustel kui teised teadused. Keskendusin kahele suurele uurimissuunale loomauuringutes: loomade keeleprojektidele ja mõttelugemise eksperimentidele. Esimene neist, loomade keeleprojektid, ei olnud väga objektiivsed, kuna selle ala juhtivate projektide teadlased ei olnud võimelised kriitikale adekvaatselt reageerima ning seetõttu oli nende projektide objektiivsus kompromiteeritud. Mõttelugemise eksperimentidid seevastu osutusid objektiivseteks, kuna uuringute algusest peale olid teadlased avatud kriitikale ja alternatiivsetele hüpoteesidele ning kriitikute ja teadlaste vahel toimus elav diskusioon, mis pani aluse uutele eksperimentidele ja uurimissuundadele. Järeldasin, et loomade uuringud võivad olla hoolimata neis sisalduvast subjektiivsest elemendist objektiivsed, kui loomadega tegelevad teadlased osalevad avatud kriitilises diskusioonis.

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