The Extended Mind and Chimpanzee Consciousness: An exploration of the implications of viewing the mind as socially extendable

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Abstract

In 2013, philosopher Shaun Gallagher presented a new interpretation of Clark and Chalmer's extended mind theory. He proposed that our cognition can extend not only to physical objects but to social institutions as well. This understanding of our mind rests upon the interpretation that we as conscious beings have a mind that is able to extend in a way that is observable through our behaviour. In this paper, I apply Gallagher's socially extended mind theory to chimpanzees to argue that if we accept this theory as true, then we must also accept it as true that chimpanzees are conscious. My argument builds upon instances where chimpanzee behaviour parallels human behaviour in a way that the behaviour can be interpreted as arising from a socially extended mind and thus a consciousness. I especially highlight the role of the stable social hierarchy that exists within a chimpanzee colony, and how that influences the behaviour and cognition of the chimps. I conclude the paper by arguing that research into ape consciousness so far has been too human-focused, to a point that we have forgotten what it is like to be a chimpanzee. We should instead listen to Nagel and try to take up the animals' point of view and be more open to the existence of other kinds of consciousness outside of our own.

Keywords: **extended mind, animal cognition, consciousness**

Introduction

Some four-hundred years ago, Decartes argued that the only knowledge we can be absolutely sure of is the existence of our own mind. I think, therefore I am (Decartes, 1641). This also means that the only consciousness we can be absolutely sure of is our own. Now, however true this observation may be, it does not intuitively fit with our actual experience of existing as human beings within a society. For despite my inaccessibility to your thoughts, feelings, emotions, and intentions, I still ascribe these internal states to you. Human beings, in general, automatically assume that other human beings have a conscious experience similar to their own. But despite how natural it feels to ascribe consciousness to ourselves and others, the actual nature of human consciousness still largely eludes us. Whether we approach it neurobiologically through brain scanning methods, developmentally through studies of children, or purely philosophically, there seems to be little consensus on what consciousness is and how we know we have it. And this is despite the fact that investigating human consciousness is, for the most part, the 'easy mode' of consciousness research—for we can (at least try to) communicate our conscious experiences to each other. When one wishes to branch out to other species to the question of whether non-human animals have consciousness, matters are complicated even further. For besides the obvious obstacle of communication, if the nature of our own consciousness still eludes us, how can we ever hope to understand something that is basically completely alien to us, i.e., a non-human conscious experience?

In this paper, I seek to approach the question of non-human consciousness in a slightly different—and perhaps backwards—way. I will be exploring how theories of human cognition can be applied to non-human animals' patterns of normative practices in stable social

groups in order to expand our understanding of what it means to have consciousness.

Specifically, I will be investigating the implications of the socially extended mind theory, as presented by Gallagher (2013), with chimpanzees as a case study. I will be arguing that if the socially extended mind theory is accepted as true, then it must mean that chimpanzees, at least to some degree, have consciousness. The main argument of the paper is based on an analysis of different chimpanzee behaviours. I look at how they parallel human behaviour and thus exemplify the ways chimpanzee minds can be socially extendable. The paper ends with a discussion of the methodological issues of studying non-human animals, and how we can infer consciousness in other beings with inspiration drawn from Nagel's *What Is It Like to Be a Bat* (1974).

What Does it Mean to be Conscious?

To discuss whether a non-human animal can be seen as having consciousness it must first be determined what the definition of consciousness is. As with many concepts within the overlap of psychology and philosophy, it is notoriously hard to agree on a specific definition. In this paper, I define consciousness as philosopher John Searle does, by four features: 1) It's real and irreducible, 2) caused by brain processes, 3) exists in the brain, and 4) functions causally (Searle, 2009). The key takeaway from this definition is that consciousness is a biological phenomenon that is not detached from the brain but rather is a feature of the brain (Searle, 2009). Additionally, consciousness' causal functionality means that phenomena like thoughts, beliefs, and emotions arise from a being's consciousness. These internal phenomena—as they are not directly observable to outsiders—are what I define as the mind, and they can be seen as the mental contents of any conscious experience. In other words, the mind is the

collection of thoughts, emotions, perceptions, and other mental states that make up an individual's conscious experience. For example, if you are experiencing the sensation of pain, your mind would be said to include the mental content of that experience: The sensation itself, your awareness of it, and any thoughts or emotions you have about it. So the mind arises from our consciousness and is an integral part of the phenomenological experience of being at any given time. Now, as over a century of thought has been spent trying to define mind and consciousness, the definitions presented here do not try to be definitive or comprehensive. To highlight just a few different accounts, a classic example is Bentham (1789), with the role of suffering in assessing consciousness. Other papers emphasize the role of certain brain connections (Lagercrantz & Changeux, 2010), attention (Posner, 1994), or an awareness and experience of time (Kent & Wittmann, 2021). Others still use behaviour to infer consciousness (Kotchoubey, 2018), or a computational framework (Dehaene, Lau, & Kouider, 2017). The same goes for the mind, where the different approaches include viewing the mind as the representation of subjective experience removed from brain function (Libet, 2006), an evolutionary developed system for information-processing (Pinker, 2005), or the attribution of thoughts, beliefs, and intention in others, also known as "theory of mind" (Sprong et al., 2007). Instead of using this paper to argue for or against any specific approach in this larger philosophical discussion of how to define consciousness and mind, I have decided to go with two simple definitions for the purpose of clarity which simultaneously emphasizes the link between the two.

Lastly, there is the concept of cognition. I will be working from an embodied view of cognition, which sees cognition as inherently tied to our body and bodily experiences. Essentially, our cognitive processes emerge from our bodily interactions with the world

(Pfeifer & Bongard, 2007). This means that cognition, the mind, and the body are not separate entities, but rather they are meshed together and shaped by our body's interaction with the world through its particular perceptual and motor systems (Thelen, 2000).

The Extended Mind

A central question is where the demarcation between our mind and the rest of the world should be. Can our mind and cognition extend beyond our brain and body? In their 1998 paper, Andy Clark and David Chalmers argue for an *active externalism* of the mind. They want to acknowledge the active role the environment plays in our cognitive processes, and how the mind and cognition can integrate the physical world (Clark & Chalmers, 1998). Their main argument for the extension of our cognitive processes, which is known as *the parity principle,* is:

> If, as we confront some task, a part of the world functions as a process which, were it done in the head, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world is (so we claim) part of the cognitive process. (Clark & Chalmers, 1998, p. 8).

Essentially, if an external object, for example, a calculator or notebook, takes on the function of an otherwise 'inside job', e.g., the working memory or long-term memory, then that object becomes part of the cognitive process. It creates a coupled system between the person and the external object, where each of the components play an active causal role in the performance of the task at hand (Clark & Chalmers, 1998). In addition, the mind can be extended to and be formed by the environment much in the same way cognition can be extended, both by objects and other people (Clark & Chalmers, 1998). This notion of a socially extended mind has been elaborated

upon by philosopher Shaun Gallagher (2013).

The Socially Extended Mind

In his 2013 paper, Gallagher presents a liberal and expanding interpretation of Clark and Chalmers' extended mind theory. In essence, Gallagher argues that cognition can be socially extensive in a way that includes not only interaction with other humans but also interactions with so-called *mental institutions* (Gallagher, 2013). The socially extended mind theory sees extended cognition as not merely including physical objects, but also social situations and institutions that in some way create the coupled system Clark and Chalmers describe. According to Gallagher, if the cognitive process somehow relies on a cognitively produced tool, rule, or institution, then there is no reason to limit mind extension to tasks which we can imagine being "done in the head" (Gallagher, 2013). A good example of this is the legal system. The legal system consists of agreements, decisions, and systems of rights that are the representation of several externalized minds. It reinforces certain behaviours, and allows us to solve certain problems by guiding our thinking about social arrangements such as property, contracts, and rights (Gallagher, 2013). Essentially, engagement with these tools and institutions created by the legal system makes simple behaviours and decisions, such as building a fence around your house, part of a larger cognitive process incorporating the cultural understanding of property and what it means to own.

Cognition and subsequently the mind are thus not only confined to the brain and body. Rather, they are co-constructed and supported by both the normative practices and institutions in our environment which we engage with and contribute to (Cash, 2013), as well as our biology which gives rise to our consciousness, mind, and cognition.

What Does it Mean for Consciousness?

With this broadened understanding of the mind and its relation to the world, the central question returns: Where should the demarcation between the mind and the world lie? If the mind and cognition extend to everything we interact with, is the whole world then potentially part of our cognition? This is known as the *cognitive bloat* worry—the critique that the extended mind theory over-extends the mind so the term becomes meaningless (Rupert, 2004). This critique has been refuted by Gallagher as he asserts the role of active engagement: The cognitive process extends as we engage with the external world in the right way (Gallagher, 2013). Specifically, when our engagement with the external object or institution defines the cognitive process in such a way that without the extension the process would be different or non-existent, then it is an extended cognitive process. One might argue, though, that this does not actually address the problem of over-extension: Maybe not all cognitive processes are extended, but those that are, do they not still potentially over-extend the mind and over-incorporate the external world? However, the nature of the extension needs to be considered as well. A socially extended cognitive process does not mean that the literal objects that are manipulated become part of our minds. Instead, the process itself is what extends to draw upon the resources in the environment that make the process a possibility at all. Take, for example, building a pasture for cattle. The wooden poles, the wire, and the actual manipulations of those objects are not part of the cognitive process, but the engagement with the local custom of solving such a problem with a fence is an extension—if the local custom had been different, the solution would have been different (Gallagher, 2013). Subsequently, it is not the brain, or any other bodily part that extends, nor physical objects that become our mind. Instead, a socially extended cognitive process should be understood as our cognition shaping and being

shaped by the external environment, in such a way that the cognitive process is simultaneously occurring in the brain and extending to the resources in the outside world which inform our cognition and make the cognitive process possible.

When we then as conscious human beings engage in behaviour that is seen as extending our minds, it also becomes possible to infer consciousness based on specific behavioural patterns using the socially extended mind theory. If our behaviour arises from (extended) cognitive processes that are part of the mind, which is defined as the mental contents of consciousness, then consciousness is necessary for a mind, mind extension, and thus our behaviour. If we accept this as true, then it must also be true that if some other being engages in behaviour that is best explained as arising from mind extension, it must also arise from some sort of consciousness. And it is this exact thought process I wish to apply to chimpanzees.

Although the applicability of the social extended mind theory to other non-human animals besides chimpanzees is missing in this account, I maintain my focus on chimps for a couple of reasons. First, in order to apply a theory of human cognition to non-human animals, it seems natural to start with our closest living relative on the tree of evolution—if any animal is going to have similar internal states to humans, it should be chimps. Second, the long history of research into the mental capabilities of chimps means there is a plethora of both controlled experiments and structured observations of chimps in the wild and in captivity (see Call and Tomasello, 2008 for a review). However, this does not exclude the possibility of applying the social extended mind theory to other animals, or that this is the only way of asserting consciousness in non-human animals. Instead, the primary purpose of this paper is to assess how a theory of human cognition might be applied to investigate consciousness and

internal mental states based on external behaviour in order to both argue that chimps can be ascribed consciousness, and that this methodology is a useful and meaningful way of approaching the question of consciousness in non-human animals.

The Chimpanzee Extended Mind

With this theoretical groundwork, it becomes interesting to investigate how chimpanzee behaviour can parallel human behaviour. I will use descriptions of chimpanzee behaviour as observed both in the wild and in captivity in tandem with the socially extended mind theory to argue that the behaviour exhibited by the chimps is not only a parallel to human behaviour but also evidence of a socially extended chimp mind and thus chimp consciousness.

Object Manipulation

Nearly 60 years ago, Dr. Jane Goodall reported seeing wild chimpanzees producing and using self-made tools on many different occasions (Goodall, 1964). For example, three adult chimpanzees, independently of each other, tried to open boxes of bananas by using sticks to either pry open the lid or create a hole in the box (Goodall, 1964). Since Goodall's discovery, an increasing number of long-term field studies of chimpanzees have further investigated the use of tools among chimpanzee colonies and have found a widespread use of tools and even evidence of cultural differences (Whiten et al., 1999). Specifically, it seems that chimpanzees from different colonies in different countries have different "tool kits"—a term used to describe the specific repertoire of tools a chimp colony habitually uses (McGrew, 2010). For example, in Ngogo, Uganda, tools are mainly used for courtships and hygiene, whereas in the Republic of Congo, tools are used for foraging (McGrew, 2010). These instances of cultural differences in how chimpanzees engage with the physical world

parallel human behaviours which are seen as socially extended cognitive processes. After all, as mentioned earlier, the bodily manipulations of e.g., a wooden pole to build a fence is not considered an example of mind extension. However, the engagement with the particular culture and the common practices of the environment *does* make the cognitive process of solving a problem by perceiving a wooden pole as a tool an extended process (Gallagher, 2013). This means that when chimpanzees seemingly have cultural differences in tool use, their specific object manipulations stem from an engagement with their common social practices which shapes their cognition and thus their behaviour. The local custom of the colony is what guides a chimpanzee to perceive a stick as, for example, a tool to "fish" for termites (Goodall, 1964), instead of a tool for hygiene purposes. The cultural practices of each individual colony are essentially shaping the cognitive processes of the chimpanzees and the ways they perceive the objects in their environment, extending their minds to incorporate the parts of the external world that allow these processes to take place.

The Arnhem Colony

Ideally, the study of chimpanzee consciousness would be carried out on wild chimpanzees. However, a number of complications arise when attempting to do so. Most notably, the access to the apes is often unreliable—fieldworkers might not see the chimps regularly, making it impossible to notice the subtleties in their behaviour (Waal 1982). Therefore, this section will primarily build upon the work of Frans de Waal and his description of the Arnhem colony in the Burger's Zoo in the Netherlands. Specifically, his book *Chimpanzee Politics* (Waal, 1982), presents a comprehensive study of the social life among a chimpanzee colony in an open-air enclosure. With a colony consisting of around 20 chimpanzees, Waal has systematically reported

and interpreted the chimps' different behavioural patterns—some of which can be argued to arise from mind extended cognitive processes.

Central for life in the chimpanzee colony is the stable hierarchy that exists between the apes, which is manifested by the so-called submissive greetings (Waal, 1982). Submissive greetings are a special form of social behaviour that confirms and reinforces the colony's hierarchy in a way that leaves no room for doubt (Waal, 1982). This non-mutual behaviour is expressed by a lower-ranked chimp greeting a higher-ranked one with a series of bows. The non-mutual nature of the behaviour means that a higher-ranking chimp will never greet a lower-ranking chimp, except in times of power take-over and instability (Waal, 1982). This essentially means that, just as our legal system is comprised of laws and contracts that are the representation of mutually agreed upon decisions, the chimp hierarchy is comprised of communicative signals that are mutually agreed upon to mean either a reinforcement or an undermining of the current power structure. It is a product of shared mental processes, i.e., a mental institution.

Quarrelling Infants

From the chimpanzees' behaviour it is evident that this complex social structure governs much of the animals' cognitive processes. Just as the legal system makes otherwise 'simple' behaviours part of a larger cognitive process, incorporating the social understanding of laws and rights, the hierarchy in the Arnhem colony has the same effect. In an example presented by Waal (1982), two mother chimpanzees, Jimmie and Tepel, are sitting in the shadow with the oldest female chimp, Mama, in between them while their infants are playfighting. The playfighting evolves into a quarrel but ends when Tepel wakes Mama, points to the infants, and Mama barks loudly at them.

On the surface, this might seem like simple chimp behaviour, but, according to Waal, in order to interpret the behaviour properly, two things about the colony are important to note: (1) Mama is the highest-ranking female, and (2) conflicts between infants regularly lead to conflicts between the mothers (Waal, 1982). To avoid a conflict with the other mother, Tepel solved the problem with the fighting infants by waking the higher-ranking female to act as an arbitrator. Mama, seemingly understanding Tepel's motivation and intention, ends the fight. From a socially extended mind perspective, this behaviour is a clear example of a chimpanzee mind being socially extended. Tepel's behaviour would have been different had the social structure and norms of the colony been different, but because the colony is constituted the way it is, it effectively shapes Tepel's cognition to incorporate the social understanding of motherhood, conflicts, and the chimps' individual rank. It creates the coupled system between her mind and the hierarchy—which as previously noted essentially functions as one of Gallagher's mental institutions. And this instance is not just Tepel being an especially clever chimpanzee. The higher-rank female, Mama, also understands what she is supposed to do when Tepel wakes her and points to the infants. Mama's behaviour is equally shaped by the social structure and norms of the colony when Tepel's pointing makes it clear that she should be the one to stop the fight in order to prevent further tensions between the two mothers.

A Social Faux Pas

Another example presented by Waal (1982) also involves Tepel. Here, Tepel silences her child, Wouter, by placing a hand over his mouth to stop him from screaming and engaging in a quarrel with another chimp. On another occasion, a different mother also silences her child to stop them from barking at and starting a conflict with a dominant male ape. According to Waal, to properly understand this

behaviour, it is important to note that in the colony, when two infants are having a noisy conflict for too long, a chimp male will come to stop the conflict. However, in such cases, the child usually retreats to their mother who then becomes the receiver of the male's punishment. When looking at Tepel's behaviour from an extended mind perspective, the social norms and customs are essentially shaping how she perceives the situation. Realizing she can avoid a beating if her child stops being so noisy, she comes up with the solution of silencing him. This solution is tied to her previous experiences and would have been different had the social hierarchy and norms of the colony been different. A similar thing is true for the second instance of silencing which Waal interprets as a mother's reaction to a "social faux pas committed by the child" (Waal, 1982, p 48). This idea of a "social faux pas" in a chimpanzee colony emphasizes how complex and intricate chimpanzee social life can be – and how much of chimps' behaviour and cognition are shaped by this mental institution. It allows for what Waal describes as a "*social* application of reason and thought" (Waal, 1982, p 51), or, in other words, an example of a socially extended cognitive process.

What is it Like to Be a Chimpanzee?

Based on this evidence, it appears that chimpanzees' complex social behaviour arises from some sort of socially extended mind. And as mentioned earlier, the prerequisite for mind extension is some sort of consciousness. In this section, I will discuss what that means for our understanding of both chimpanzee and human consciousness.

Why the Research Method Matters

The current paper builds upon primarily anecdotal accounts of chimpanzee behaviour, which has been the most prevalent approach to studying chimpanzees since Dr. Goodall broke ground in the '60s.

More recently however, the field has shifted towards a predominantly experimental approach (Povinelli & Vonk, 2003). The experimental approach seeks to eliminate the problems that arise when looking at anecdotal evidence, namely, the problems of objectivity. As Waal (1982) also discusses, one of the main problems with using anecdotal evidence is that it is never absolutely certain that the interpretations are truths. Researchers must rely on intuition and learned associations between different behaviours that make up patterns of interaction between the chimps (Waal, 1982). Even though it is possible to computationally calculate which behaviours occur together frequently, it is problematic to rely on our human view and interpretation of animal behaviour as humans are notoriously known for anthropomorphizing. We ascribe even simple, geometric figures moving about a computer screen with intentions and desires (Heider & Simmel, 1944), just as we would do in a social situation with another human (Atherton & Cross, 2018). It is obvious that inferring mental states, and thus consciousness, in geometric figures on a computer screen is nonsensical. As such, it seems natural to both be wary of attributing any kind of humanization to animals (Waal, 1982), and to have a desire to move towards a more objective and neutral study method.

However, "because the most fundamental problem associated with the use of anecdotes was never widely identified, the same conceptual problem has crept, almost unnoticed, into our experiment" (Povinelli & Vonk, 2003, p. 158). What Povinelli and Vonk argue is that the same problems with inferring mental states from behaviour arise even in experimental settings, as it is often possible to explain the chimpanzees' behaviour purely based on behavioural abstractions. Instead, to avoid this problem, the experimental setups must provide a truly novel situation for the chimps (Povinelli & Vonk, 2003). Even though experimenters are trying to do so

(Tomasello et al., 2003), I will argue that experiments will still fall short of truly studying chimpanzee experiences and mental states. Because another of the main problems with both the anecdotal and the experimental approach is our undeniably human perspective. We cannot escape the fact we are humans trying to understand a different animal entirely. And just as we are unable to imagine what it is like to be a bat (Nagel, 1974), our experiments will always be tainted by the fact we are humans on the impossible task of trying to imagine what it is like to be a chimpanzee. This may sound exaggerated, but the mere fact that in studies about chimpanzees, researchers use videos of humans (Premack & Woodruff, 1978) and human experimenters (Povinelli & Vonk, 2003), shows a clear bias against taking the animals' point of view in favour of our own human point of view. To return to Nagel, this becomes problematic as we can never know what it is like to be something non-human without first taking up their point of view (Nagel, 1974). So, instead of trying to create experimental setups that remove the chimps from their natural settings, one must first take up the chimp's point of view. I will therefore argue that looking at how chimpanzees engage with their environment, and especially the other chimpanzees in their colony—as that evidently plays a central role in chimpanzee life—takes us closer to taking the chimp's point of view, and thus closer to a more accurate understanding of the chimpanzee experience. Even though anecdotal evidence has its limitations, the social nature of chimpanzee colonies makes the anecdotal approach justifiable.

Apes Are Conscious, So What?

Ascribing consciousness to chimpanzees will, for most, probably seem like the most natural thing to do. After all, they are very similar to us, sharing a whole 99% of our DNA (Gibbon, 2012). What I will discuss in this final section is why this analysis of chimps should lead

us to change how we think about consciousness and how we approach the question of non-human consciousness.

As Nagel discusses in his paper, *What Is It Like to Be a Bat* (1974), when discussing whether a bat has conscious experiences, it must be argued whether "there is something that it is like to be that organism" (Nagel, 1974, p. 436). If it is like to be a bat in some way, then that something is an experience that arises from some sort of conscious awareness of the experience. So, when trying to understand whether chimpanzees are conscious, it is first a question of whether it is like to be a chimp in some way. This puts us in much the same position as an alien would be in if it tried to conceptualize the human experience (Nagel, 1974). With this perspective, an interesting thought problem arises: If aliens had the same knowledge and evidence of us humans as we have of chimpanzees, would it be justified for the aliens to *not* think of us as conscious beings with mental states? If aliens had systematic reports of humans engaging in complex social behaviour within a clear hierarchical social structure, would a dismissal of mental states as well as a sceptical account of pattern recognition and behavioural associations be welcomed? I imagine most would think it wrong of the aliens to make this conclusion, because *we know* what it is like to be us. *We know* that there is more to humans than meets the eye because we experience it every day. So, who is to say the same cannot apply to chimpanzees?

The idea of some sort of chimpanzee consciousness rests a great deal on the wording "some sort". It is impossible to know whether chimpanzee consciousness is the same as human consciousness. It is actually very likely that the two are different since humans and chimpanzees embody quite different perceptual and motor systems, and are social animals that are substantially shaped by their own environment. However, the same holds true for individual humans. I cannot

possibly know that your consciousness is the same as mine, or that your conscious experience is the same as mine—again, it is probably not the same as we are both shaped by our own, and therefore different, circumstances. But that does not mean we do not both have consciousness. The main reason it is easier to infer a conscious experience in other humans than in non-human primates is first, we know what it is like to be human, and second, we have the means of communication. You can communicate your intent, emotions, and thoughts to me. Chimpanzees cannot. But disregarding animal consciousness based on this is unwarranted—non-verbal autistic people are still viewed as conscious, even if their means of communication are different. Just because chimpanzees are unable to live up to the traditional, human perception of consciousness, the conclusion that chimps are therefore not conscious is not justified. We must move beyond our own brain and body and try taking the perspective of the chimpanzees. I would argue that shifting the focus away from the individual chimp's capabilities and instead look at how behaviour in a colony arises from a complex social structure, moves us closer to the chimps' perspective and thus closer to an understanding of their internal mental states. But whether or not chimpanzees are conscious, this paper is at its center an appeal to a less human-focused perspective on consciousness and a change in the way we study the mental states of non-human animals.

References

Atherton, G., & Cross, L. (2018). Seeing More Than Human: Autism and Anthropomorphic Theory of Mind. *Frontiers in Psychology*, 9. https://doi.org/10.3389/fpsyg.2018.00528

Bentham, J. (1789). Introduction to the principles of moral and legislation. *Clarendon Press*, Oxford.

Call, J., & Tomasello, M. (2008). Does the chimpanzee have a theory of mind? 30 years later. *Trends in Cognitive Sciences, 12(5)*, 187–192. https://doi.org/10.1016/j.tics.2008.02.010

Cash, M. (2013). Cognition without borders: "Third wave" socially distributed cognition and relational autonomy. *Cognitive Systems Research, 25–26*, 61–71. https://doi.org/10.1016/j.cogsys.2013.03.007

Clark, A., & Chalmers, D. (1998). The Extended Mind. Analysis, 58(1), 7–19.

Decartes, R. (1641). Mediations.

Dehaene, S., Lau, H., & Kouider S. (2017). What is consciousness, and could machines have it? *Science, 358(6362)*, 486–492. https://doi.org/10.1126/science.aan8871

Gallagher, S. (2013). The socially extended mind. *Cognitive Systems Research, 25–26*, 4–12. https://doi.org/10.1016/j.cogsys.2013.03.008

Gallagher, S., & Crisafi, A. (2009). Mental Institutions. *Topoi*, 28, 45–51. https://doi.org/10.1007/s11245-008-9045-0

Gibbon, A. (2012, June 13). Bonobos Join Chimps as Closest Human Relatives. Science | AAAS. https://www.sciencemag.org/news/2012/06/bonobos-join-chimps-closest-human-relatives

Goodall, J. (1964). Tool-Using and Aimed Throwing in a Community of Free-Living Chimpanzees. *Nature, 201*, 1264–1266. https://doi.org/10.1038/2011264a0

Heider, F., & Simmel, M. (1944). An Experimental Study of Apparent Behavior. *The American Journal of Psychology, 57(2)*, 243–259. *JSTOR*. https://doi.org/10.2307/1416950

Kent, L., & Wittmann, M. (2021). Time consciousness: the missing link in theories of consciousness. *Neuroscience of Consciousness*, 2. https://doi.org/10.1093/nc/niab011

Kotchoubey, B. (2018). Human Consciousness: Where is it from and what is it for. *Frontiers in Psychology, 9(567)*. https://doi.org/10.3389/fpsyg.2018.00567

Lagercrantz, H. & Changeux, J.-P. (2010). Basic Consciousness of the Newborn. *Seminars in Perinatology, 34(3)*, 201–206. https://doi.org/10.1053/j.semperi.2010.02.004

Libet, B. (2006). Reflections on the interaction of the mind and brain. *Progress in Neurobiology 78(3-5)*, 322–326. https://doi.org/10.1016/j.pneurobio.2006.02.003.

McGrew, W. C. (2010). Chimpanzee Technology. *Science, 328(5978)*, 579–580. https://doi.org/10.1126/science.1187921

Nagel, T. (1974). What Is It Like to Be a Bat? *The Philosophical Review, 83(4)*, 435–450. https://doi.org/10.2307/2183914

Pfeifer, R., & Bongard, J. (2007). How the Body Shapes the Way We Think: A New View of Intelligence. https://doi.org/10.7551/mitpress/3585.001.0001

Pinker, S. (2005). So how does the mind work? Mind and Language, 20(1), 1–24. https://doi.org/10.1111/j.0268-1064.2005.00274.x

Posner, M. I. (1994). Attention: the mechanisms of consciousness. *Proceedings of the National Academy of Sciences, 91(16)*, 7398-7403. https://doi.org/10.1073/pnas.91.16.7398

Povinelli, D. J., & Vonk, J. (2003). Chimpanzee minds: Suspiciously human? Trends in Cognitive Sciences, 7(4), 157–160. https://doi.org/10.1016/S1364-6613(03)00053-6

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences, 1(4)*, 515–526. https://doi.org/10.1017/S0140525X00076512

Rupert, R. D. (2004). Challenges to the Hypothesis of Extended Cognition. *The Journal of Philosophy, 101(8)*, 389–428.

Searle, J. (2009). John Searle on Consciousness [Interview]. https://www.youtube.com/watch?v=WFQ0Spu50Oc&feature=emb_title

Sprong, M., Schothorst, P., Vos, E., Hox, J., & Engeland, H.V. (2018). Theory of mind in schizophrenia. *The British Journal of Psychiatry, 191(1)*, 5–13. https://doi.org/10.1192/bjp.bp.107.035899

Thelen, E. (2000). Grounded in the World: Developmental Origins of the Embodied Mind. *Infancy, 1(1)*, 3–28. https://doi.org/10.1207/S15327078IN0101_02

Tomasello, M., Call, J., & Hare, B. (2003). Chimpanzees versus humans: It's not that simple. *Trends in Cognitive Sciences, 7(6)*, 239–240. https://doi.org/10.1016/S1364-6613(03)00107-4

Whiten, A., Goodall, J., McGrew, W. C., Nishida, T., Reynolds, V., Sugiyama, Y., Tutin, C. E. G., Wrangham, R. W., & Boesch, C. (1999). Cultures in chimpanzees. *Nature, 399(6737)*, 682–685. https://doi.org/10.1038/21415

Waal, F. de. (1982). Chimpanzee Politics: Power and Sex among Apes (First Edition). *Jonathan Cape Ltd.*