Master's Thesis of International Studies

The Parallel of Animals:

If Animals Have Rights,

Should Robots Too?

또 다른 인간의 동반자:
동물의 권리를 로봇에게도?

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Abstract

This paper considers the academic debate on and different responses to the emergence of lifelike social robots as *others* from humans in society. The philosophical issues surrounding legal rights that are raised by this regulatory issue will be analyzed by deploying a 2x2 matrix based on two modalities: *can* and *should* social robots have rights? On these two questions, this thesis examines how the legal treatment of animals, the original *others*, has evolved historically, and how the *animal-robot analogy*, which encourages an understanding of social robots as analogues of animals, has risen to prominence as a line of argument to push for the extension of legal rights to protect social robots akin to animals. Using the same modalities, other positions on robot rights will be examined to suggest that the debate on robot rights shows parallels to the debate on animal rights and can be modeled along similar lines. In doing so, this thesis provides an overview of the current rights debate and suggests that the robot rights debate may follow a similar trajectory to the animal rights debate in the future.

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I.   Introduction

The aim of this thesis is to explore the current state of the debate on robot rights by comparing it to the historical debate on animal rights. *Fundamentally*, this research asks the question if society should extend limited legal rights to social robots. *In particular,* this will be done by analyzing if the animal rights debate can be a model for the robot rights debate. In doing so, various parallels will be drawn to show that there the former mirrors the latter in many respects. Particular attention will be paid to the animal-robot analogy, which has come to be one of the most widely used rhetorical devices to advocate for extending legal protection to robots analogous to animals. At its core, it suggests that humans move within a spectrum between treating social robots like simple inanimate household, e.g. toasters, and treating them like domesticated household animals, e.g. cats. Through analogical reasoning, the similarities in the relationship between animals and humans and between animals and social robots are shown to be commutative, where the animal-robot analogy provides a cursory perspective apt for mapping the domain social robots could take in society.

Whereas most attempts at solving the titular question look at robot rights in their own respect, the contribution of this thesis shall be to map and re-engage the debate on robot rights from a different angle by providing a means to succinctly contrast the debate with another, similar debate. The animal rights debate is used as referent object because social robots increasingly tend to penetrate society in roles and functions similar to

animals. Both animals and social robots trigger anthropomorphic responses in humans to make them appear more human-like.

One example to illustrate the usefulness of these animal-robot analogies and the powerful effect of anthropomorphism is the case of the proof-of-concept release video of Boston Dynamic's "Spot." In February 2015, Boston Dynamics, formerly a military robotics company that is now one of the world's leader in civilian robotics, released a video clip on YouTube introducing Spot, a quadruped dog-like robot (Boston Dynamics, 2015).

Spot, the robot-like dog, is representative of social robots as it a robot with a social interface. Inspired by the biological form of humans and animals, this interface sets it apart from other ordinary robots as it allows for the robot to operate in a collaborative social setting with the human. This means that the robot can produce and perceive established patterns of human social behavior, to elicit responses from humans. As such, they imitate animals to be seen and treated like animals. For example, a dog robot that barks and growls once two people stand too close to each other in violation of social distancing rules encourages a flight response in humans to maintain social distancing. While this might sound like science fiction, it is reality in Singapore, whose government has deployed a next-generation model of Spot to patrol parks and encourage social distancing amidst the global Covid-19 pandemic (Vincent, 2020).

Coming back to the concept video, Spot is kicked twice to demonstrate its robustness and its ability to stay on all four robot legs. The intention of this was to show that Spot is able to regain balance following significant external impact. This, however,

was not the message that the majority of the viewers took. In fact, the video quickly went viral with 24 million views as of March 2020 and many commentators expressed discomfort over Spot's treatment, going as far as using the word "abuse" in a way reminiscent of the way language is used in reference to animal abuse. The reams of negative comments eventually compelled the American animal rights organization PETA to issue a statement, acknowledging the incident and noting that there is something unsettling about the video (Parke, 2015). This, of course, all happened despite the full knowledge of the viewers that Spot was an actual robot, not a real dog; with the major caveat being that Spot was distinctly dog-like and more sophisticated than other kinds of ubiquitous household machineries like toasters or washing machines to a degree that made viewers display empathetic reactions, thereby unwittingly likening the human-robot interaction to human-animal interaction.

At first glance, the idea of legally treating differently a robot, such as Boston Dynamic's robotic dog Spot or Massachusetts Institute of Technology's robotic storytelling companion Jibo, and a simpler-function household device, such as a toaster, seems outlandish. After all, both are manufactured products that are commercially available. Yet the current literature on robotics and preliminary studies from the US, one of the forerunners in social robotics, suggest a difference in how humans interact with these two technological products. While simpler-function everyday devices, such as the aforementioned toaster, merely serve their namesake purpose with simple unidirectional input, in other words *toasting*, social robots are more complex and have interactive capabilities; akin to animal companions in literature, they are designed to serve as our

companions in collaborative settings to eventually achieve positive outcomes in diverse applications, such as health care, education, entertainment, quality of life.

With continuing progress in robotics-related technologies, such as autonomous learning, gesture control and language processing, more and more social robots are introduced into society. As these engage with us and elicit emotional responses, we *anthropomorphize*, i.e. ascribe life-like and even limited human qualities as we do to animals, and generate stronger psychological attachment to social robots than we do to other technologies, hence leading to differences in how we perceive and treat them. These differences could lead to societal discussions on the treatment of said robots with legal ramifications.

Such a change in legal perspective would not be unheard of. While a society operates within a set of legal rules, it is in itself also the force that causes law to change. In the specific case of social robotics, this societal force is steered by the growing acceptance of said technology and the disruption it brings to human-robot interaction. Historically, the practice of legal redress concerning the recognition of the rights of *others* has evolved in a way that it challenges its own restrictions to eventually accord legal rights to groups marginalized and previously excluded: foreigners, people of color, women, animals and even the environment.

To explore the societal and legal space where some form of legal protection could be extended to social robots, this thesis will make use of the animal-robot analogy. This analogy builds upon a relational notion of understanding animal rights developed by Kant and is one of the most commonly used conceptual models to frame human-robot

interaction. It compares human-robot interaction with human-animal interaction in terms of their respective intended roles and relational behavior (Johnson & Verdicchio, 2018). Rather than for trying to understand the unique nature of animals and robots per se, it can help in understanding how animals and robots appear to us and how this is manifested in our relationships with them. In a nod to Kant, it suggests to look at how humans experience animals and robots, rather than looking at their intrinsic nature. By way of this analogy, the commonalities that exist between animals and robots - such as both not being alike insofar as none are human and all are less than human, thereby being 'others' in relation to humans (Coeckelbergh, 2010) - can be acknowledged while resolving disputes on the unique ontological status of robots to a degree that allows for an abstraction of how our legal treatment of social robots could be modeled along the lines of our relationship with animals.

In the literature, this analogy uses the term 'animal' to denote the class of household pets and domesticated animals. These are the types of animals with whom society interacts and bonds the most closely with and upon whom we rely either for personal satisfaction or for certain tasks to be performed. In this context, three key similarities between animals and robots drive the animal-robot analogy to work: their otherness, their assistive capacity, and our tendency to anthropomorphize them (Inayatullah, 2001; Calverley, 2006; Darling, 2012; Johnson & Verdicchio, 2018). Based on these three factors, the argument is made that animals are a model for how we treat others that are less than human but still worthy of some moral and legal consideration. Moreover, it is inferred that by way of aforementioned analogies, the discourse on the

treatment of robots shows parallels to the discourse on the treatment of animals, especially with regard to the impact on social behavior and its carry-over effects to human-human interaction.

To further understand where the current discourse on our relationship with social robots stands, we will trace back the animal rights movement and the philosophical underpinnings to its historical origin. Following this, an analysis of the arguments used in English-language academic publications will locate current positions of the rights discourse. Given that legal translations of such demands are yet to be formulated, the significance of this research is that its results may allow us to better grasp the dimension of expert opinion on social robots.

While this thesis is descriptive in nature, it strives to provide a basis for a normative discussion, which could eventually could feed into public-policy making processes as rights talk has "become the normal currency of ordinary political discourse" (Waldron, 1988). For the scope of this thesis, the referent of the analysis shall be mainly US-based English language publications and social robots commercially available in the United States. This restriction derives from the fact that the United States takes the lead in robotics and related artificial-intelligence technologies, hence most studies naturally being US-based (KPMG Advisory, 2016), and that the contemporary animal rights movement, which is one of the fastest growing social movements, has originated in the North American hemisphere about some forty years ago (Grant, 2006). The limitation is further justified by preliminary evidence suggesting that other cultures have a different general understanding and acceptance of robots, such as Japan due to e.g. its Shinto

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heritage, as robots are socio-culturally defined artefacts (Samani et al., 2013; Zawieska, 2016).

The following chapters will outline the current literature on the subject, explore the animal-robot analogy to investigate the adequacy of animal rights philosophy as a conceptual point of departure for the anthropomorphic framing of human-robot interaction and the other arguments common to the debate. Lastly, this thesis will attempt to sketch out a timeline for the debate to conclude with a revisit of the titular question.

II.   Literature Review

Before going into the discourse analysis, a comprehensive literature review will give the lay of the land. Working definitions of social robots, social robotics and anthropomorphism will set the tone and provide an overview of the current state of social robotics. Anthropomorphism will be emphasized as key mechanism of social robotics and intentional design choice by manufacturers to implement a so-called social interface. Then, a historical overview about animal rights will provide a starting point for understanding the conceptual relationship between animals and robots.

To identify and review the existing literature, it is first necessary to define precisely the terms and definitions that the literature on robot rights uses. In general, the overarching theme of legal (and moral) rights for robots is aptly called "robot rights." Generally, the majority of the current literature on robot rights tends to assume futuristic scenarios in which robots are advanced to a point where they are either nearly or entirely indistinguishable from humans.

This, however, is a starting point too different and far-fetched for the purpose of this paper. The theme that this work deals with belongs into above domain indeed, but occupies a conceptual niche in that it narrowly focuses on legal culture and social development, which in academia emerged as an interdisciplinary issue around the mid-2000s (Hegel et al., 2009). Thus, rather than directly looking at the moral and ethical implications of future human-like robots and robotics in general, this paper looks at a specific sub-type of robots that we already have now, i.e. social robots.

Admittedly, the former poses a bigger question and requires an imaginative leap for that it belongs to a future - oftentimes grittily painted in science fiction works à la Blade Runner - in which a very different technological and legal paradigm could be in place. In contrast, the latter asks for a narrower deliberation and asks about the societal effects of emotional human-robot bonding, for which anthropomorphism is used as a vehicle for discussion in this work. Thus, the focal point of this smaller question precedes the discussion of the bigger question; before society is at a stage where it has to deal with fully autonomous human-like robots, it will have to deal with the smaller question on the appropriate usage of analogies with robots. According to Johnson and Verdicchio (2018), such a focus is important in the early stages because it provides a useful approach to understanding what it could mean to be human in a society in which robots interact with humans on a social level and predicting how robotic technology could be regulated in the near-future.

1. Analysis

1. On Social Robots

Most of the current literature on social robots is interdisciplinary and concentrates on algorithmic and technical problems relating to a robot's capabilities to communicate with humans. Within this technical literature, a large part of the research focuses on the design of social robots, i.e. appearance and movement. However, only little attention is paid to defining social robots and their aspects of social functions.

While there are various definitions, one of the most comprehensive undertakings to define social robots was conducted by an interdisciplinary group of German scholars from the Faculty of Technology and Faculty of Linguistics and Literature of Bielefeld University, Germany (Hegel et al., 2013). To do so, the group illustrated the four most widely used definitions over the turn of the millennium by Duffy et al. (1999), Fong et al. (2003), Breazeal (2004), and Bartneck et al. (2004) and boiled them down a triadic relation of biologically-inspired form, social function, and distinct context in interaction with humans. Unlike other types of robots, social robots showed markedly unique points in these three areas. Accordingly, these areas would make up a social interface, which comprises of all the design features by which a human user judges the robot as having social qualities. This social interface posited on top of a robot would distinguish a social robot from other types of robots.

In organizing the various existing definitions, the group also highlighted anthropomorphism as the key mechanism responsible for making humans perceive robots as social entities and reinforcing social attributions (Epley et al., 2007). Herein, one underlying assumption often made by the literature and later scholars is that human users react automatically, in other words subconsciously, to anthropomorphic cues. An important note on this is that they admit that it is up to humans to act socially and to therefore make them social interaction partners, with later scholars adding that social robots are designed to act as companions to humans (Darling, 2012), with some scholars even going as far as to argue that humanoid social robots will potentially even replace human companionship (Hauskeller, 2017).

This change in the framing of social robots from mechanical tools to companions is one regarded as one of the pathways into the animal-robot analogy. This analogy is one of the most commonly used analogies in framing the interactions between humans and robots (Johnson & Verdicchio, 2018). The reason for the dominance of this analogy in the scholarly discourse lies in its comprehensiveness in covering several shared key characteristics between animals and robots, such as their likeliness in both being not (and less than) human, their capacity to elicit responses characterized as anthropomorphization, their potential to assist humans and so on (Coeckelbergh, 2010).

On this line of reasoning, the literature is rife with discussions on the appropriateness of using animals as a model for treating entities subordinate to humans. Scholars such as Hogan (2017), who assume a moral and philosophical viewpoint, argue that biological evolution needs to recognized on its own and state the shared similarity of being something other than human does not warrant that one is used a model for the other. Other critiques put forward the biological argument, namely that animals are sentient beings that can suffer, but that robots are not. This argument is often brought up in discussions of moral status. To this, the literature offers two counterpoints. Firstly, the animal-robot analogy does not rest on or falls with moral claims on sentience as the crux of it rests on its impact on the social treatment on other humans; in other words, the mere ability of an entity, be it an artefact even, to affect human-human relations puts relevance to the entities' moral status. Secondly, it is argued that if robots could be programmed to have a state that could be equated with sentience, which comes with a host of other problems (Kuehn & Haddadin, 2016).

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2.   On Anthropomorphism

With a look at the practical effects that anthropomorphism has on humans, the literature does recognize that the anthropomorphization of some higher-order mammals and social robots is commonplace and accepts that social robots are intentionally designed in a way to elicit anthropomorphized reactions for performance-purposes (Thrun, 2004; Epley et al., 2007; Eyssel & Kuchenbrandt, 2011). Thus, anthropomorphization is elevated from a mere documented phenomenon to a fact in the literature, and commonly used as supporting evidence to the animal-robot analogy (Duffy, 2003). Yet at the same time, it is also acknowledged in the literature that there are various factors at play that affect the extent to which a social robot is anthropomorphized, including education and other factors, which have not been put into a coherent model yet.

Examples for contemporary studies on the anthropomorphic effect range from applications in health care, education, and entertainment, and in more extreme cases even span into the military. Within this purview, widely referenced social robots are interactive toys, such as SONY's robotic dog Aibo, Innvo Labs' robotic dinosaur Pleo, Aldebaran's NAO Next Generation, MIT's facial-expression simulation robot Kismet, AIST's therapeutic baby seal Paro, Boston Dynamic's Spot (Fink et al., 2012; Parker, 2015) and so on. Out of these, Paro stands out for its richness of coverage in the literature. Designed as a therapy robot for people with dementia, Paro has been commercialized

and used in health care settings in several countries for more than a decade. Paro and social robots in general then will be dealt with in the subsequent chapters.

While not restricted to social robots, more extreme examples of anthropomorphism come from the military. Carpenter (2013) studied robots that were attached to military fire teams, finding that their human handlers generated emotional projection to a level intense enough to for them to identify their robots with names, to award them battlefield promotions and to become upset when they "die", suggesting that there are some parallels to animals embedded in military teams. Tying on to this, researchers at MIT found that personifying a robot in above manner affects responses to robots (Darling et al., 2015).

The literature does acknowledge that anthropomorphism can lead to an inaccurate understanding of complex processes and behaviours, be they biological or not. Yet the ascription of human-like intentions can be a driver of emotional bonding and is even found to be an important positive factor in influencing attitudes towards animal rights (Butterfield et al., 2012). As such, anthropomorphism is also seen as one of the roots of Western animal rights ideology, as it pushed for seeing animals more equal to humans rather than as mere property or even less. The central role of anthropomorphism in pushing the animal rights agenda can further be seen when looking at marketing campaigns or calls for donations where anthropomorphic appeals are made to evoke feelings of guilt and empathy.

For both animals and robots, the literature follows the approach that anthropomorphism is driven by a combination of elements of the human body, e.g. eyes, eyebrows, lips, extremities etc., and micro-behaviours, e.g. eye contact, tone, gestures, facial expressions etc., with the caveat that attributes and qualities are often assumed based on only minimal information.

3.   On the Comparison between Animal and Robot Rights

Apart from these psychological parallels, earlier literature is replete with philosophical arguments pushing towards supporting the animal-robot analogy by drawing comparisons to the animal rights philosophy and movement. Among these, the most often used philosophical arguments range from the moral obligation of humans to prevent pain and suffering in all sentient beings (Singer, 1975) to the recognition of certain animals' inherent dignity (Regan, 1983). In this sense, the philosophical arguments in the literature seem to properly reflect the fact that societal debates on animal protection largely centre on the fact that animals experience pain (Darling, 2012). One implication of this reading of the literature is that parts of the society that favour the protection of animals based on their ability to experience pain and suffering may lack moral reason to extend protection beyond animals; a point that is often brought forward in the pre-2000 literature.

However, a large push from the philosophical side criticising this point gained traction in the late 2000s with the commercialization of the first generation of household

social robots, such as Innvo Labs' robotic dinosaur Pleo. The argument brought forward draws, inter alia, upon the philosophy of Immanuel Kant. Kant, who at large justified the human use of animals, posited that the behaviour towards non-humans reflects human morality – by treating animals in inhumane ways, humans become inhumane themselves. Darling (2016) extends the Kantian logic to robots and states that awarding protection to robots may reinforce positive behaviour in society that society as such agrees to generally hold as morally correct. At a workshop, participants were given Pleo dinosaur robots and made to perform various tasks with them. Afterwards, they were instructed to terminate, i.e. break, the robots. Although the participants were informed that the Pleo robots were purchased to be destroyed and that it was only simulating "pain", most reported a distinct sense of discomforted when the Pleo whimpered while being broken (Jacobsson, 2009).

In fact, this indirect-obligation view goes back to early philosophers, such as Aristotle and Aquinas, who believed in the protection of animals not because they believed that they were worthy of their own moral rights or consideration, but rather because permitting abuse towards them would enable the same kind of behaviour in humans towards one another.

While this point is certainly arguable, the current literature advocating animal rights makes use of psychological studies that emerged around the turn of the millennium, which upholds above position. For example, Marceau (2019) cites a study, which found that people violent to animals tend to be violent to humans as well, and that

many violent criminals, such as rapists and murderers have a history of cruelty towards animals by having 'practiced' on them first. The renowned anthropologist Margaret thus stated that "one of the most dangerous things that can happen to a child is to kill or torture an animal and get away with it" (Lockwood & Hodge, 1998).

Thus, the literature largely seems to accept that deliberate cruelty and abuse of animals is an early indicator of a lack of empathy and that there are parallels between the disregard for animal wellbeing and the disregard for human wellbeing. Yet this point needs to be read with care. While scholarly debates are quick to cite above studies, actual academic studies that draw a connection between the mistreatment of robots and humans are scant and preliminary at best. In other words, evidence proving (or disproving for that matter) a definite transferability of the treatment towards robots to other humans is lacking.

2.   Limitations

In light of this paper's title, a disclaimer regarding the significance and limits of the current literature needs to made on the pace of social change. The literature seems to be able to provide, to a somewhat confident but limited extent, for the case that an analogy between animal protection and robot could be drawn. When it comes to the societal pushes towards the protection of animals and the legislative changes through which those such protection was implemented, many of the successful societal pushes

were the result of collective ambiguity morphing into popular sentiments that reached a tipping point.

One example for this is the protection of whales. Initial campaigns to save whales were largely ignored by the public despite the fact that whale populations were dwindling since the mid-20th century. This changed only in the 1970s when, for the first time, whale songs were recorded and featured on a music album, which went gold and introduced millions to the songs of whales. Saving the whales became a mass movement as people started to relate to them. Eventually, the UK-based International Whaling Commission instituted a ban on whale hunting in 1982 (Darling, 2012).

In fact, the academic literature contains only few published studies on the psychological and social dynamics of the debate on animal rights or robot rights for that matter. Additionally, in the case of social robotics, religious arguments on how society should interface with humans tend to be brushed over quickly, perhaps carefully suggesting a certain degree of irrelevance to the debate. However, this lack of scholarly attention may only be one indicator of the stage that the societal debate is going through and the need for conducting further studies that explore anthropomorphism towards robots in e.g. situations of physical violence, abuse and the likes.

III.   Methodology

This paper will employ a qualitative approach to analyse the range of arguments existent in the scholarly literature for both the animal and robot rights discourse to show differences and parallels in their trajectories by using a collection of secondary sources. These inquiries will be organised along the lines of the two modalities of "*can* and *should* 'X' have rights." Each inquiry then consists of two separate questions: '*can* X have rights?' as a positive statement on the capabilities of robots, and '*should* X have rights?' as a normative statement on the responsibilities of humans as legal rights-givers. Thus, the first is a descriptive statement of what is presumed to be a fact, and the second a normative statement on the consequential value. On the basis of these modalities, a two-by-two matrix will be arranged for each discourse to visualize said differences and parallels.

This conceptual distinction draws its inspiration from David Hume's Guillotine, otherwise known as the is-ought problem. Developed in *A Treatise of Human Nature* (2005), Hume raises caution about inferring normative statements from positive statements, especially in ethical debates when rights are concerned. This way, historical inferences that were used to argue against the extension of rights to others, for instance women - i.e. women should not vote because they are women – are revealed to be circular arguments that block deeper levels of abstraction. According to David Gunkel (2018), such a historically important distinction would be important to stimulate more nuanced debates and to capture currently available positions in the existing literature.

To further explore the titular question with regard to the respective debates, each discourse analysis shall have an additional focal point that is determined by the length of the debate. In human history, the animal rights debate has been a much more longstanding debate, with early thinkers going as far back as to classical Greece. The robot rights debate, however, is much more recent. Social robots, which are different from ordinary accounts on account of their potential social embeddedness in human society, are only a recent phenomenon of the late 1990s. Given that the robot rights debate was almost entirely speculative and based on philosophical musings rather than on controlled field studies, it is then remarkable that the robot rights debate has developed a significant plurality of opinions in such a short amount of time.

In the debate on animal rights, the focus shall lie on the historical evolution of arguments from not granting rights to extending legal rights. In order to do so, secondary sources in the form of current, i.e. post-2000s, animal rights compendia (DeGrazia, 2002; Grant, 2006) shall be used to identify crucial points in the historical discourse when opinions, measured against the two modalities, changed into a different direction, e.g. when a *cannot* became a *can*. Thus, the interpretation of opinions is more likely to reflect the viewpoints of the wider academic audience than that of sole authors or scholars. To provide more contemporary context to what is otherwise a mostly historical review, the current perspective in the US, which posits a geographical limitation to this paper, will be explained briefly with an eye to the meta-aspects of the discourse, e.g. discussion participants, discussion arena and so forth.

Owing to the relative brevity of the robot rights debate, which has resurfaced as a more nuanced topic with the emergence of social robotics and robots in the 1990s, the focus shall lie less on sketching out the history, but more on the different positions and how they relate to each other. By showing the interactions between the different positions, we can arrange them in a manner that facilitates comparison between with the other animal rights debate.

Furthermore, a quantitative reading of relevant academic publications over time will be conducted to show two points: a.) that the discourse has gained traction in the scholarly world by showing a marked increase in publications, and b.) that the most widely discussed positions on the subject have undergone changes. The latter will be proven by looking at the mostly widely cited publication in a given five-year time frame and contrasting it with others to identify a change of opinions over time. For this approach, the assumption is that the most widely cited publications in a given time frame are representative of the most widely discussed, hence cited, position. In other words, regardless of whether the position is held by a majority of the scholars or not, it can be regarded as a major subject of the debate. Plotting these positions over time thus allows for the identification of trends.

In order to do this, the software Harzing's Publish or Perish (hereafter PoP) will be used. PoP is a freely available tool that helps to collect bibliometric results and statistics by retrieving and analysing academic citations from Google Scholar, Scopus, and Web of Science. Out of these three main citation ecosystems, only Google Scholar

will be used as it covers the widest range of publications in terms of type and time, especially in the fields of social sciences, arts, and humanities (Harzing, 2016). One downside of this reliance on Google Scholar is that it is not manually curated like the other two ecosystems, requiring careful screening and weeding out of irrelevant bibliometric numbers. During the screening process, particular attention will be paid to the count of citations and the main position(s), which will be determined after a manual reading. The underlying assumption for this will be that a publication with good citation metrics will likely have had significant impact in the literature – assuming that an article was published in a somewhat well-known medium rather than in an obscure journal.

IV. Defining Social Robots:

Why Do We Talk About Them?

1. Background

As technology makes strides in advancing robotics and its related technologies, the role of robots is changing from that of a tool to a social entity. Here, the 'social' represents the fact that there are two or more entities within the same context in which they interact (Duffy et al., 1999). Inspired by a distinctly biological form, be it animal or human, social robots are understood as physically embodied and autonomous robots that communicate and interact with humans on a social level through social interfacing (Hegel et al., 2009; Darling, 2014). This social interaction follows established patterns of human social behaviour, for instance, picking up on social cues, mimicking various emotional states and tones and so on. Examples of early social include Innvo Labs' robotic dinosaur Pleo, Sony's robotic dog Aibo, Aldebaran's humanoid companion robot NAO, AIST's therapeutic baby seal Paro, Massachusetts Institute of Technology's (MIT) robot head Kismet. The social type of interactivity specific to social robots serves to enhance their functionality and impact on how they are perceived and treated by humans. Thus, depending on the function to fulfil, anthropomorphism, i.e. the deliberate attribution of human traits and characteristics to non-human entities, is an intentional feature.

For example, MIT's dragon robot DragonBot is designed to help children with the process of learning and was shown to often achieve better results than books or computers (Ackerman, 2015). People trying to lose or maintain weight have shown for track their weight statistics for nearly twice as long when using a social robot compared to using a computer or paper (Kidd, 2008). Designed to be used in a mode analogous to animal therapy, the therapeutic baby seal robot Paro has been used to calm distressed people and even been suggested as an effective alternative to certain types of medication (Chang & Sung, 2013). It has also been used to encourage more interaction among people in nursing homes, where conventional animal therapy is often at its limit for being not hygienic or safe enough (Kidd et al., 2006).

Social robots interact intimately with humans in collaborative settings. Given the requirement of familiarity, which is physically and psychologically implemented through anthropomorphic features, social robots tend to look harmless and friendly (Korn et al., 2018). This way, the social robots of today managed to follow humans into personal settings like the home and care. Moreover, social robotics has surfaced as an established interdisciplinary field in the mid-2000s due to massive improvements in sensors, motors, processing chips as well as jumps in related artificial intelligence technologies.

As humans and robots move closer together, the concept of human-like social machines has attracted both fascination and fear that revolve around questions, such as, what should a social robot be able to do, what should remain exclusive to humans, and

how do we treat them not only in front of us but in front of the law. In general, the societal acceptance of social robots seems to increase significantly with familiarity and vice versa. This even extends into social contexts, making e.g. healthcare or educational robots more acceptable than e.g. sex robots.

While social robots do not have key uses yet, where they are critical to the performance of a higher-order task, it is generally expected that they will come to play an important role in the near-future in assisting human users in a variety of tasks. Although forms and function vary greatly in relation to the end goal they serve, there is a strong tendency to anthropomorphize them to aid in the development of more meaningful social interaction between the robot and the human user.

Natural and intuitive communication between man and robot mostly occurs when a social robot resembles something familiar. The more human a social robot looks, the more likely it is to be appealing to the user, invoking positive and empathetic responses. This effect, however, decreases when a tipping point is reached at which the robot looks almost human but not entirely. Introduced as the 'uncanny valley' effect by an academic from the Tokyo Institute of Technology, this effect captures the phenomenon that the two factors a.) human resemblance of a robot, and b.) its acceptance by the user, are only linearly linked up to a point where the namesake uncanny valley is reached, upon which human users experience a feeling of uncanniness and a loss of empathy (Mende et al., 2019).

2.   Examples of Social Robots

Given the limits placed by the current state of technology, which is at a stage where a social robot's design is not human-like, nor convincingly human-enough, the industry seems to have adapted animal-inspired designs as one way out of the conundrum, making domestic pet-like robots a very distinctly popular type of social robots. Adding to that, preliminary evidence suggests other types of negative correlation between a social robot's physical embodiment and its effectiveness in assisting in human-robot interaction. For example, a social robot that is designed after a human can create certain expectations regarding its behaviour, which can have negative effects when the human user deems those expectations to not be met (Feil-Seifer & Matarić, 2005).

For the reasons explained above and for other technical reasons, animals have come to be a popular design inspiration for social robots. In 1999, Sony introduced its robotic dog Aibo as a touch-sensitive and interactive pet. Its main purpose is to serve as an entertainment companion dog toy. It has facial recognition as well as personality-development capabilities and has been described by a Forbes Magazine senior contributor as the first robot to which he ever felt an emotional bond with (Sag, 2019).

Table 1: Examples of social robots (Aibo, Paro, Robear, Pepper)

Model	Aibo	Paro	Robear	Pepper
Picture				
Assistive Function	Pet toy, social mediator	Therapy, care	Care	Companion, communication

An example for a social robot that is a blend of toy and purpose-oriented robot is the therapeutic baby seal Paro. Since 2009, the social robot Paro is used in hospitals and nursing homes to help elderly people in their convalescence. It is in between being a pet, a toy and a "useful" robot. Paro responds to external stimuli such as petting with body movements, mimicking eye movements and sounds. Adding to its realism, it reacts to haptic feedback by squealing if it is handled too roughly or strongly. As one of the most studied social robots, its positive effects on older people's activity by communicating and engaging them has been well documented (McGlynn et al., 2014).

An example for a social robot that combines the social interfacing with massive physical power is the experimental nursing care robot Robear. Developed by the Japanese joint collaboration project Riken-SRK Collaboration Center for Human-Interactive Robot Research and Sumitomo Riko Company and unveiled in 2015, Robear is designed to support patients and caregivers on account of its physical capabilities by e.g. lifting patients out of bed, positioning them patients into wheelchairs, supporting patients to stand up, and so on. Thus, Robear is supposed to be deployed in nursing and

care, where nurses and caregivers may have to lift patients up to 40 or more times per day, which puts their lower backs at risk for chronic back pain (Dredge, 2015). While it has a somewhat humanoid appearance due to its bipedalism, Robear has been given a cartoon bear head to avoid the uncanny valley effect, which otherwise would make human users react negatively to it. A caveat with Robear is that it has not been commercialised and has not been the subject of many published studies.

A more commercial use can be seen in the French robotic company Aldebaran's social robot Pepper. Originally designed as a robot to greet and welcome shoppers in stores, it talks, gesticulates and moves on wheels. However, its most notable ability is emotion-sensing; it recognises human facial expressions and tones of voice to react accordingly. It does so by influencing buyers' wiliness to make purchases and by assisting them with further information, suggestions, or endorsements. Thus, it not only reacts to commands but tries to correspond with matching moods and emotions. Its emotion-engine has served as basis for other household variants, which could potentially be deployed at nursing homes as concierges or mediation devices (Winfrey, 2016).

3.   Anthropomorphism as Intentional Design Choice

Anthropomorphism describes the human tendency to attribute human qualities to non-human entities, be they living, abstract, or inanimate. With regard to the first, pet holders may refer to their cat's behaviour as vengeful or guilt-ridden when it is caught doing something forbidden. For the second, complex ideas are anthropomorphised in

language and literature when e.g. forces of natures are attributed human qualities by referring to 'the cruel sea' or 'mother earth.' For the third, sports cars are described as sporty and aggressive on account of their design and their high acceleration.

In social robots, anthropomorphism comes into definite play and is, in essence, what separates a social robot from other types of robots, such as industrial service robots. Through an anthropomorphic form, a social robot conveys information on its function, behaviour and context. Yet, even before examining the form and function of social robots, this is evident already from the terminology. As is in the name, social robots are classified as 'social.' Duffy (1999) posits that the word 'social' in social robots represents the fact that there are two or more entities within the same context. To this, I highlight that the word 'social' has a particular power.

Whereas the word 'robot' has a de-humanising effect by default and emphasizes otherness and mechanicalness, 'social' has the opposite allure. Socialness is associated with inclusiveness and belonging, with companionship and community, and society. In everyday usage, sociability, i.e. the quality of being social, resonates in the mind because of its positive associations, such as being able to connect with people. Thus, it is commonly regarded and valued a trait enriching the human experience.

This key sentiment is mirrored in various definitions of social robots. Fong et al. (2003) described social robots as "embodied agents that are part of a heterogenous group: a society of robots or humans." The emphasis lies on society, but also in the heterogeneity of the group. For Fong et al., robots and humans can be part of the same

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heterogenous group. Focusing more on the place that social robots ought to take vis-à-vis humans, Cynthia Breazeal (2002), a widely recognised pioneer in the field of social robotics and human-robot interaction, comments that a social robot, or 'sociable robot' as she called it in the early 2000s, should be able to relate to humans in a personal way and to understand humans and itself in social terms. In turn, she added, that humans should be able to understand a social robot much in the same social terms, meaning to be able to relate to and emphasize with it.

While Breazeal's definition that identifies a mutual need for understanding for both humans and social robots is not always this explicitly shared in the literature, it is very much implicitly understood and accepted that a social robot must have lifelike qualities for the fulfilment of above aim. This is because humans anthropomorphise technology and interpret behaviour as intentional.

This is particularly noticeable in the design of social robots, which tends to be animalistic, humanoid or somewhere in between. In fact, Hegel et al. (2009) identified design and form as one of the defining differences between a social robot and other types of robots, with the wider scholarly literature agreeing that human users have different behavioural expectations depending on what form is interacting with them as the form communicates social cues, signals and behavioural norms (Duffy, 1999; Fong et al., 2003; Bartneck & Forlizzi, (2004).

Despite the fact that the anthropomorphic form is not the key appeal of a social robot, it is for all practical reasons a necessary requirement and forms part of a triadic

relation between form, function, and context (Hegel et al., 2009); the social form implicitly expresses that it is social in specific ways to the human user. For example, a robot without a face communicates in an anonymous manner. But a robot with a face invites the human user to communicate on a deeper and personal level. By having an expressive face, it can indicate attention, and by imitating the user's face, the robot can make it more compelling to the user to engage with it (Hegel et al., 2006; Hollinger et al., 2006). In other words, an anthropomorphic feature, such as a face, facilitates social interaction with humans.

The human tendency to anthropomorphically relate to robots has been the subject of various academic studies, which found that humans already interact differently with social robots than with other objects (Breazeal, 2002; Malle & Scheutz, 2019). This is, as stated above, the result of intentional design choices; of technology that increasingly appeals to an anthropomorphic inclination. The anthropomorphic responses humans display are, to a high degree, automatic and subconscious, and effective: reactions happen despite the rational knowledge of the user that e.g. a social robot is not in a certain state of mind or feeling (Turkle, 2010).

In a study by Bartneck et al. (2007), it was found that the anthropomorphic perception of social robots led to more user hesitation when switching them off. Compared to non-anthropomorphic robots that did not display any resemblance of animacy, i.e. lifelikeness, human users hesitated three times as long to switch off. Further, the authors discussed the explanation that human users might perceive the

switching off as having a negative consequence for the robot, which would only be the case if it were, to some degree, alive or lifelike.

Similarly, Friedman et al. (2003) analysed the language employed in online forums on Sony's robotic pet Aibo and found that people ascribed mental states to their robots. In fact, some online users even seemed to treat their robots in meaningful ways as if they were animals by e.g. not leaving them alone, feeling guilt when putting them back into their boxes, or attributing unique personalities to them. Separate studies conducted about ten years later proved a similar effect, with the study subject being AIST's robotic seal Paro (Calo et al., 2011). This is particularly interesting for the animal-robot analogy to follow up on because the human mind emerged in the company of animals from an evolutionary perspective. Thus, animal images are woven deeply into human cognition and language. Implicit in this finding is then the question what larger societal implications the increasing penetration of robotic animals into society will have.

In both of above studies, the authors could reasonably conclude that the human users knew that the anthropomorphic social robots were, in the most literal sense, a piece of technology and not alive. Yet the evidence gathered suggests that, to various degrees, the robots evoked feelings or responses *as if* the robots were alive. The psychologist Sherry Turkle, whose research is on the psychology of human relationships with technology, developed the proposition that social robots evoke feelings of reciprocity and create an effective illusion of mutual relating (Jacobsson, 2009).

Such effect is particularly pronounced in human users that have little understanding of the complexities of technology. As the user is confronted with an unknown, the mind subconsciously tries to make sense of it by filling the knowledge void with something familiar, i.e. anthropomorphised images, ideas, and concepts. Studies found that that small children, who will increasingly come of age with robots, are regularly confused when asked if the robot that they interacted with experiences pain or other sentiments (Kahn et al., 2013). On the opposite end of demographics, preliminary studies suggest elderly people in nursing homes unfamiliar to modern technology were likewise found to struggle with the difference between robotic and biological animals (Taggard et al., 2005; Tergesen & Inada, 2010). Nevertheless, even being aware of the technology does not shield from subconscious responses. At MIT, Cynthia Breazeal observed her students in the robotics lab to often put up a curtain between themselves and Kismet, a social robot designed to simulate emotions through facial expressions. Asked for the reason why, the students stated that they felt that the Kismet's face was distracting them (Garreau, 2007).

In summary, it stands to reason that anthropomorphism in social robotics is an effective deliberate design choice. Both in terms of form and function, it is a deliberate design guideline that separates e.g. a toaster from a social robot. Active engaging creates an effect of bonding, even though it is only unidirectional, and makes the human user treat the robotic counterpart as if it were alive, to varying degrees. To investigate this, evidence was presented above to highlight the effectiveness of anthropomorphic social robots in targeting involuntary biological responses. In fact, it appears that

anthropomorphism puts human users on a point somewhere along a spectrum; one which spans from treating social robots like simple inanimate devices, e.g. a toaster, to treating them like pets. Thus, anthropomorphism is a useful mechanism that can be used to enhance the acceptance and use of a robot. It encapsulates a complex notion on the qualities of being human, and it can be expected that it will be implemented to a further degree in the future. The possible implications of this, will be explained in chapter VI on the suggested analogy between animals and robots.

V.   The Animal Rights Debate

1.   Background

The historical and philosophical underpinnings of animal rights provide one half of the basis for understanding the suggested animal-robot analogy in the chapter to come. Given the earlier explicated human tendency to anthropomorphise and that the field of social robotics draws from both human and animal characteristics, the development of robot rights could follow the history of animal rights. After all, animals were the original 'others' with whom humans had to confront similarity and difference, with an increasing tendency to deconstruct hierarchical visions in favour of granting rights; whereas in the past, animals were merely regarded as property available for the exploitation by man, modern science and philosophy have progressed to a point of recognising them, in varying degrees, as more than inanimate objects, such as trees or simple machines, but less than human still. Thus, this exercise gives insight into the positioning of 'non-human animals' in society and a possible pathway onto which the current state of the debate can be mapped onto.

Debates on animal rights can be traced back to the ancient Greek philosophers and span well into the 21st century, with significant paradigm shifts occurring during the Enlightenment period and after the Second World War. However, it was mostly in the 17th century that the breadth and depth of these debates started to expand significantly; while animal rights were originally merely philosophical scenarios and hypotheticals among the Greek classicist, the discourse on animal rights came to include many other

fields, such as ethics, law, religion, biology, sociology etc. This culminated into the biggest period of concentrated progress starting from the late 1970s, which Kistler (2000), in reference to the exponential increase in publishing activity, described as an 'explosion' of societal interest in animal rights. For each of these historical frames, society was beset with different historical and socio-political legacies, radically altering the perspectives on and outcomes of the debates on animal rights up their movementization. The following paragraphs will explain these different perspectives and conclude with a sketch of the current state of animal rights.

2.   Debate Analysis: From Indifference to Advocacy

For most of human history, man regarded animal as distinctively different; up until the 17th century, the prevailing notion was that humans were endowed with rationality, which animals lacked. Subsequently, animals were nothing more than mere *others* not worthy of any consideration of rights. On account of this, it was believed that animals had only instrumental value and were subject to the whims of man as it pleased him or her.

From this starting point, however, a relational turn came about through the increasing penetration of animals into human societal, which positioned animals as part of society and tended to award rights based on a growing acceptance of their value for humans and their inherent value. Eventually, this led to the current point of the debate where it is argued that animals are not on par with humans, but more than objects and

ought to be equipped with limited rights. In the following parts, this historical development will be explained more in detail.

The early Greek philosophers set the foundation for this by widening the perceived differences between man and animal. Aristotle (384 – 322 BC), for example, who is well known for his teachings on ethics and logic, thought that man was the only in command of *reasoning*, the highest of all abilities. This alone would set man apart from other creatures and allow the formation of a great hierarchical structure (Duncan, 2019); through this, those with reason would control those without. Accordingly, Gods would control men; men would control women; and humans would control animals. This view would be taken even more to the extreme during the Roman period (26 BC – 476 AD), which was infamous for cruelty to both animals and humans in the name of entertainment.

For the next thousand years, recorded history is rather sparse on the subject. History only began to pay attention again in in the 13th century with the arrival of Saint Thomas Aquinas (1224 – 1274). Rooting his own philosophy on that of Aristotle, Aquinas agrees the rationality, or the ability to reason, set humans apart. Heavily inspired by the rise of Christianity during the Middle Ages, Aquinas drew a different conclusion though. Albeit admitting that animals - as soulless creatures - are not worthy of human moral consideration, he postulates that humans are still bound to an indirect obligation towards animals. This indirect obligation is constructed out of two arguments. First, abuse of animals may lead to the abuse of humans as the abusive behaviour could carry

over into other contexts. Second, an animal owner has the right to have the animal in possession protected against actions, including cruelness, by the hands of others. Thus, while Aquinas did not award animals any moral standing of their own, he laid the theoretical foundation for extending a form of limited protection to animals on the basis of indirect obligations. As for the first argument, recent studies have proven a linkage between early childhood animal cruelty and violence against humans in later years (Ascione & Arkow, 1999; Hensley & Tallichet, 2004). In spite of this progressiveness, these views would not find their way into the mainstream until centuries when Kant rediscovered them.

René Descartes (1594 – 1650), commonly regarded as the father of modern philosophy and the first of the modern school of mathematics, followed the footsteps of Aristotle and Aquinas in believing that rationality set humans apart from animals. To this, he added the role of language, which he described as a uniquely human attribute that is the only real test of rationality. Going a step further, Descartes devised his own metaphysical framework, through which he separated things either into bodies or minds. In doing so, Descartes introduced the notion of animals as natural 'automata' or machines. By this, he meant that animals act by way of natural impulses, rather than pure thought; ergo, animals would be bodies without minds, i.e. machines. This would constitute a specific and definite difference separating animal from man. The rational mind which thinks and doubts, and therefore must exist, is exclusively human. Acknowledging that animals can appear to be conscious or more, Descartes argues that the simplicity of their behaviour, especially considering the lack of speech, would be an

indication of a more mechanical modus operandi (Duncan, 2019). For him, hitting a dog with a hammer for no other purpose would be of the same moral significance as hitting a clock with a hammer. An issue might only arise if the clock was in possession of someone else or if the mere process of hitting it with a hammer caused harm or injury to another person (Calverley, 2006). Roughly four-hundred years ahead of the arrival of anthropomorphic robots, Descartes firstly compared animals to machines, focusing on their displayed behaviour rather than on Christian notions of their essence, all the while tacitly agreeing with earlier thinkers.

It is only in John Locke (1632 – 1704), a champion of the natural law perspective, that a significant change in the debate surrounding the nature of animals can be seen. Starting from the premise that humans have ownership over their own body and the labour they perform, Locke argues that this labour applied to an object of nature, in this case an animal, warrants, by extension, a right to that object. This right, which is akin to a property right, implicitly takes animals from nature and classifies them as resources exploitable by man, and then converts them to property (Waldron, 1988). Hence an owner can protect an animal against the whimsical attempts of others to unduly take it. Drawing inspiration from the school of Aquinas, Locke thus expands upon the use of property rights to argue for the protection of animal rights.

In what is arguably a big departure from Descartes, however, Locke brings forward the idea that animals have the capacity to remember and are capable of simple mental abilities, such as conceiving very simple ideas and comparing things while ruling

out that animals are capable of mental abstraction (Reynolds, 2014). Despite the fact that Locke's conclusion is that there are fundamental differences between man and animal, his contribution to the debate is that he acknowledges the simple cognition and mental lives of animals. This careful broaching into the animal mind stands out as a big departure from earlier writings, e.g. by those of Descartes, in which animals were likened to automata or mere machines.

Immanuel Kant (1724 – 1804) maintains Locke's view that animals are merely of instrumental value, i.e. an object of nature unable to reason and appropriable through the application of labour, therefore being unworthy of direct moral consideration. Yet picking up on Aquinas' position, Kant diverges here and states that animals derive a moral status from their relationship to humans. From this, he draws an indirect duty to refrain from harming the animals of others as property. Moreover, he postulates that being cruel to an animal, i.e. abusing them, would corrupt one's moral character and could translate into the poor treatment of humans:

> Our duties towards animals are merely indirect duties towards humanity. Animal nature has analogies to human nature, and by doing our duties to animals in respect of manifestations of human nature, we indirectly do our duty to humanity… We can judge the heart of a man by his treatment of animals (Regan & Singer, 1989, pp. 23-24).

Thus, even if a cruel act itself may not infringe on any rights or affect the intrinsic value of an animal – for that it has none since it is devoid of rationality – it

remains wrong independently of its effect on the animal, for that it could have an effect on other humans. Keeping the two core notions of the previous philosophers, namely (1) that humans command rationality, and (2) that rationality makes humans worthy of moral consideration unlike animals, which are devoid of it, Kant cements much of the philosophical underpinnings of the 19th and 20th century thinking on animal rights and protection by linking the treatment of animals with that of humans and attaching moral significance to it. In the contemporary debate on the extension of legal protection to robots, this is one of the defining core notions.

In contrast to Kant, Jeremy Bentham (1748 – 1832) did not put weight on rationality as divisor. For Bentham, who was an English social reformer and utilitarianist concerned with the rights of labourers during the Industrial Revolution, the question "is not, Can they [animals] reason? Nor, Can they talk? But, Can they suffer?" (Bentham & Anta, 2019). By way of this question, he became one of the first to espouse a positivist stance towards the intrinsic value of animals and brought animal rights into the debate on account of their own subjectivity, i.e. the capacity for suffering, as opposed to being mere derivatives of human considerations.

Curiously, the debate on animal rights came much to a century-long standstill after Jeremy Bentham. Despite the fact that the philosophers above contributed to bringing increasingly progressive as well as complex notions of animal rights into the debate, animal rights as a discipline did not develop much further and a society-wide understanding, wherein philosophers, scientists and society in general came to a mutual

agreement, could not be reached. One explanation for this century-long hiatus is the emergence of Behaviourism as a key approach in studying humans and animals. A branch of psychology developed in the USA in the beginning of the 20th century, it focused on measuring behaviour objectively and eschewed subjective notions, such as sensation, perception, emotion, thinking etc. Coupled with a sudden rise of behaviourism as an accepted discipline, animals' subjective experiences, many of which were previously increasingly being linked to the experiences of humans, were removed from debates, thereby having an inhibiting effect on the animal rights debate and on academic interest on animal sentience and related fields (Duncan, 2019).

Above historical perspectives can be summarized into *table 2* using the two modalities of "*can* and *should* animals have rights?" Two similar observations can be made from this: First, there is a trend to acknowledge that animals *can* and *should* have rights. Second, the idea that animals *should* have rights, despite a supposed lack of innate ability to *have* them, preceded the idea that they *can*. A similar trend can be observed in the robot rights debate, where propositions for extending rights to robots are mostly made on the basis of '*cannot* but *should*,' which will be dealt with in the next chapter.

Table 2: Summary of the animal rights debate

Scholar	Main Point	Could	Should
Aristotle (384 – 322 BC)	▪ Only man commands *reason*, the highest of all abilities, which sets him apart from all other creatures. ▪ Through reason, 'great hierarchical structure' -> God controls men; men control women; humans control animals. ▪ Taken to extreme during Roman period (26 BC – 476 AD) → infamous for cruelty (to animals and humans).	X	X
St. Aquinas (1224 – 1274)	▪ Influenced by Christianity; saw animals as 'soulless creatures' not worthy of moral consideration. ▪ Advocated animal protection; a right of the owner to have his animal be protected against the hands of others.	X	○
René Descartes (1594 – 1650)	▪ Language, on top of rationality, as unique to humans. ▪ Notion of animals as robots / 'automata' (animals act by way of impulses → 'bodies without minds').	X	○
John Locke (1632 – 1704)	▪ For the first time, view that animals are capable of simple mental abilities → broaching into 'animal minds.'	X	○
Immanuel Kant (1724 – 1804)	▪ Animals as merely of instrumental value; object of nature unable to reason and unworthy of *direct* moral consideration. ▪ However, animals may derive *indirect* moral consideration from their relationship to humans --> cruel treatment of animals reflects treatment of humans ('animal nature as analogue of human nature,' hence indirect duty to humanity).	○	O
Jeremy Bentham (1748 – 1832)	▪ Disregarded rationality as criterion; espoused a positivist stance on the basis of intrinsic value. ▪ "[The question] is not, 'Can they reason?' nor, 'Can they talk?' But, 'Can they suffer?'" → capacity to suffer.	O	O
Singer (1975)	▪ Moral obligation to prevent pain and suffering in all sentient beings. ▪ Rejecting speciesism, puts animal rights as distinct from human rights. ▪ Animal 'interests' rather than rights → consideration of subjective experiences of animals encouraged re-thinking of space animals take in society.	O	O
X = No	○ = in between (conditional)	O = Yes	

While the table above provides a concise summary of the different historical positions, it can also be simplified into a 2x2 matrix to show the dynamics of the debate, which will also facilitate a later comparison with the debate on robot rights. Using the two modalities to condense the perspectives into four key positions, the following graph can be drawn:

Figure 1: Summary of the animal rights debate using a 2x2 matrix
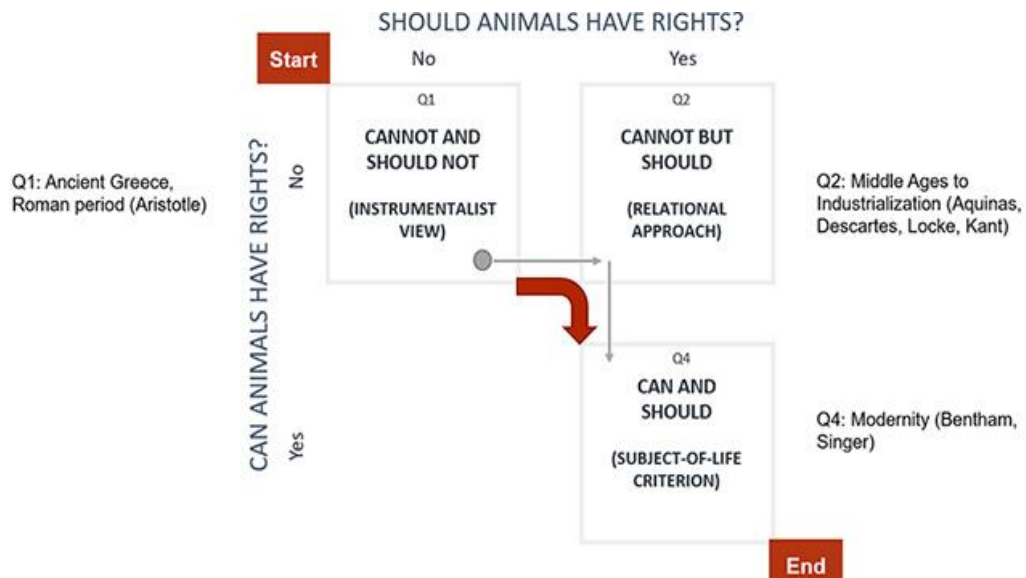
From this verbal distinction between *could* and *should*, it is possible to organize four different positions. The positions along the two different axes can be inter-related to generate four different options, which may be consecutively labelled Q1 to Q4. Written out as sentences, these options can be expressed as follows:

Q1: Since animals cannot have rights, they should not have rights.

Q2: Even though animals cannot have rights, they should have rights.

Q3: Even though animals can have rights, they should not have rights.

Q4: Since animals can have rights, they should have rights.

Option Q3, however, is not shown in the figure above since the position that animals '*could*, but *should not*' have rights is not seriously debated and most often

amalgamated with Q1, the other *should not* option, as the position that animals *should* have rights historically drew its inspiration from property rights, which gradually developed into the view that animals *could* have rights. With that notion, the view that animals *should* have rights increasingly gained traction, eventually putting animals somewhere between inanimate objects and humans, with which the need for re-balancing a *should* with a *could not* never emerged as a serious point of debate.

3.   Contemporary Perspective

Animal rights only started to come into the limelight again after the Second World War. In response to surging demand for cheap food, a rapid industrialisation of food, including meat, production methods took place. Animal-related industries adopted large-scale institutionalised production techniques, such as mechanised slaughter houses, automated battery cages for hens, crates for white veal production, sweat-box conditions for pig fattening and so on. While much of the general public was unaware of these methods, journalists and writers would turn their attention to animal suffering and on their negative subjective states, i.e. stress (Harrison et al., 2013).

The origins of the modern animal rights debate can be then traced about fifty years back to Australian-born ethicist Peter Singer's seminal work, Animal Liberation. Published first in 1975, he sparked the modern debate on whether animals should have rights or not, and on what grounds. While Singer himself did not use the word "rights," he spoke of 'interests.' Accordingly, these interests would be sufficient to claim moral

consideration for animals. He believed that the widespread degree of industrialised animal suffering in society could not be justified in terms of human utility (Grant, 2006). Hitting the zeitgeist, Singer bestowed intellectual respectability and disciplinary transformation to the study of animals, and eventually galvanize the modern animal rights movement. Regarding himself as an utilitarianist rather than an abolitionist, he did not object to the use of animals per se; the condition he set for the human exploitation of animals was that they have a good quality of life and a painless death.

Having legitimized the consideration of the subjective experiences of animals and their place in society as a means to human ends - albeit in a restrictive manner under a certain modus operandi - Singer opened up new approaches to the study their study. These circumstances have given rise to a new literature on issues of animal sentience, welfare and rights (Dawkins, 1980; Appleby, 2011). From earlier views that were limited to pain perception and suffering, many other characteristics came into consideration for describing the mental states of animals, on the basis of which the debate was led on whether they are worthy of rights or not, including fear, pleasure, enjoyment, happiness, desires, expectations, memory, intentionality, self-awareness, language and so on (DeGrazia, 2002). Positions would thus emerge that argued for protecting animals on the basis that animals and humans alike are subject of a life with a consciousness, or in other words, protection on the basis of an inherent value, which Regan (1983) put into the following words "Individuals who have inherent value have an equal right to be treated with respect. It follows that we must never harm individuals who have inherent value."

Essentially, modern animal rights emerged as a progression of philosophy amalgamated with scientific advances that, in opposition of widening the perceived the differences between man and animal prior to the 17th century, highlighted the similarities and the place of animals in society as being next to humans rather than below. In the last century, the number of animal rights organisations has drastically increased, of which some address only the needs of specific animals, such as domesticated pets, while some work globally. These organisations have been instrumental in translating progressive notions of animal rights into laws. In the United States, the growth in interest on animal rights has coincided with rising activism against other social inequalities, for instance the civil rights and women's rights movements (Black, 2008).

Many of those who sought to protect the rights of animals were also devoted to other social causes and vice versa. Women, for example, flocked to animal rights movements too and incorporated it into their own wide agendas by drawing a connection between abuse in its various forms: animal abuse, child abuse, domestic abuse. These groups began to think of societal ills begetting other ills, which, in turn, would tear at the seams of the entire moral fabric of society, and linked animal rights to larger issues. As the captive audiences then grew in number, animal rights began to seep into the mainstream and advocacy began to proliferate.

This linking of entrenched societal ills with the advocacy for animal rights was aided heavily by the shifting currents of the cultural mood in the United States. The post-war era was described as having been marked by a sense of nostalgia and anxiety, of

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which the core lied in the victimisation of nature by modern society (Marshall, 1992). With industrialisation gnawing away at nature, and urbanisation uprooting society away from its rural roots, more and more of the interactions in society came to revolve around urban structures and settings. The rise of an urban, industrial society and all its concomitant ills – capitalism, poverty, consumption, loss of community – severed the once supposedly intimate relationship with nature. This led to a sentiment that seeked to restore the tattered bonds with nature, which included animals.

The contemporary animal rights movement is composed to a disproportionately large degree of a membership that is integrated well in the economic and educational spheres of society (Ginsberg & Lowe, 2002). The goals that they that advocate offer only little to no immediate benefits to themselves, but are motivated by claims on behalf of non-members. Thus, unlike other traditional social movements driven by working-class radicalism, where efforts are made primarily on behalf of members, such as labour or suffrage movements, the animal rights movement is characterised by a lack of direct political, economic, or social benefits and the pursuance of a greater moral vision, e.g. ecology, veganism etc.

As of 2019, the sum of these debates took the form of the widespread acceptance of animal cruelty as being morally and legally wrong, with all fifty US states having enacted criminal animal anti-cruelty statutes. Given the difficulty in enacting federal legislation, most efforts to translate the animal rights debate into legally binding terms focused on the state or local level. In addition to pursuing traditional legal reform, the

animal rights activists had to take the discourse to other, alternative domains, such as to the corporate level by birthing campaigns to encourage retailers to voluntarily embrace more rigorous animal husbandry standards (Bryant & Sullivan, 2019).

When looking at the legal reforms, two very interesting points emerge: (1) The suffering of animals experienced in the service of what is considered a legitimate human goal, e.g. scientific and medical advancement, is treated with more leeway and subject to few legal constraints; (2) Not *all* animals are awarded legal protection. Those that are used in food production methods and the agribusiness as a whole make up 98% of the animals used for any purpose in the US. Yet these are, in a legal perspective, rather counted as exemptions, with most protection going to domesticated household animals. Considering the closeness that domesticated animals have to lives of humans, this may not be common-sensical, but a supposed exemption of 98% is a very substantial one (Wolfson & Sullivan, 2004; Bryant & Sullivan, 2019).

In essence, above points suggest that rather than strict biological criteria, which have often been arbitrarily interpreted in different times, the closeness to humans – be it in whatever form – plays a decisive role in deciding whether an animal is worthy of moral and legal protection or not. From this, it follows that animals caught up in interactions with society receive more attention and elicit more debate. This comes with implications for the treatment of social robots, which will be taken up in the next chapter.

VI.   The Robot Rights Debate

1.   Background

The central question of robot ethics revolves around asking what a robot is. One way to make sense of something unfamiliar is to make analogies. If the answer to the question "what is a robot?" seems too far, one can approximate an answer by asking "what is a robot *like*?" One popular answer to this is the animal-robot analogy, which claims that social robots are quite *like* animals.

In this abstract form, putting animals as analogues of robots seems counterintuitive: inarguably the most obvious difference between animals and robots is the fact that animals are *animate*, whereas social robots are *inanimate,* or more precisely, merely *lifelike*. Yet the previous chapters have also shown that there are definite similarities in the treatment of animals and robots by human users. These similarities are rooted in anthropomorphism, i.e. the projection of inherently human attributes and qualities onto non-human entities to make them seem more human-like.

In the case of animals, this provides humans with a pathway to award moral consideration to certain classes of animals, such as domesticated mammals of a higher order. In the last forty years, this way of thinking has gained historically unprecedented mainstream appeal and been translated into limited legal protection through e.g. with the growth in anti-cruelty and animal abuse laws around the world being testament to this. Additionally, by looking at the history of animal rights and the philosophical underpinnings, the observation was made that the legal protection of animals was to a

large extent driven by a Lockean and Kantian indirect-duty approach, at which end the moral protection of humans in their dealings with other humans was at stake.

In the case of social robots, which are specifically designed to elicit anthropomorphic responses, this changes the way human users perceive and treat them: as stronger psychological attachment is generated, human users treat social robots on a spectrum – one, which spans from treating social robots like simple unifunctional household devices, e.g. a toaster, to treating them more like household animals, e.g. a pet dog or cat (Darling, 2012). In other words, the bonding that occurs between a human user and a social robot is of a social nature and goes well beyond the usual attachment to non-robotic entities. Thus, there seems to be a semblance in the way human users treat social robots to animals.

With this in mind, the debate has reached a point where the major point of criticism against using animal rights as a model for robot rights emerged. These are 1.) robots do not have a consciousness; 2.) robots do not suffer; 3.) animals fulfil both previous points, hence they are deemed worthy of protective rights; 4.) followingly, robots would not. In essence, this is an ontological conundrum that is concerned with what robots are, rather than how what they robots do to humans, in both an abstract metaphorical but also practical way. The following debate analysis shows how the robot rights debate has found its way around such categorical assertions by making use of the animal-robot analogy, which has recently emerged as a core rhetorical device supporting the extension of rights and will be explained in detail following the debate analysis.

2. Debate Analysis: From Tools to Social Entities

The matrix below shows the four most prominent positions and the thematic progression patterns of the discourse. To provide a structure most similar to the animal rights debate, the discourse has been divided into the two dimensions that have historically organized any inquiry into rights: *can* and *should*. To reiterate, the distinction between the two different modalities carries considerable weight. In the words of David Hume, the first is a descriptive statement of fact and the latter a normative statement of value; an ontological matter versus an axiological decision (Schurz, 1997; Gunkel, 2018). In this context, *can* and *should* respectively are one half of a question each that, at the core, deals with how society want to respond to social robots: The y-axis '*can robots have rights?*' asks about the capability of social robots; the x-axis '*should robots have rights?*' asks about the obligation society ought to have in the face of them.

Figure 2: Summary of the robot rights debate using a 2x2 matrix.
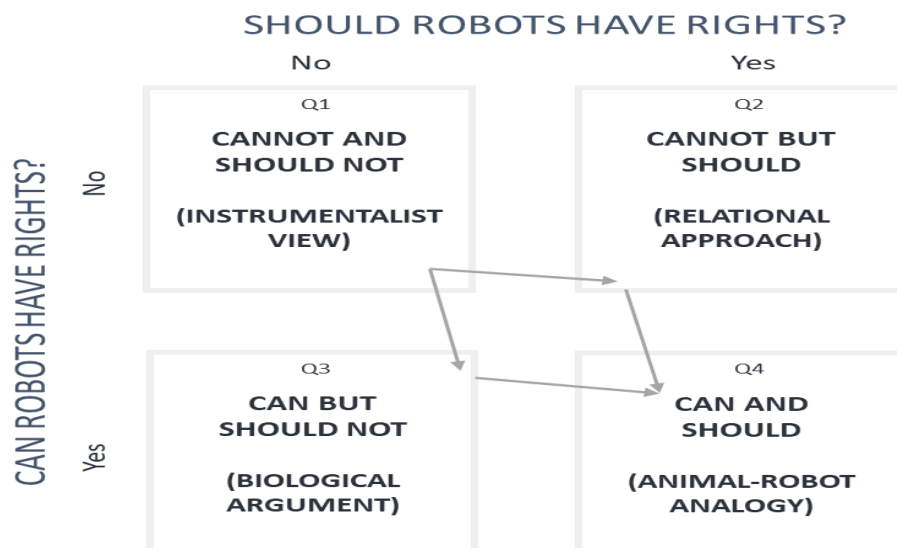
By employing this verbal distinction, it is possible to qualitatively organize the different positions. The positions along the two different axes can be inter-related to generate four different options à four quadrants, which are consecutively labelled Q1 to Q4. Written out as sentences, these options can be expressed as follows:

Q1: Since social robots cannot have rights, they should not have rights.

Q2: Even though social robots cannot have rights, they should have rights.

Q3: Even though social robots can have rights, they should not have rights.

Q4: Since social robots can have rights, they should have rights.

In the following part, these four positions will be briefly laid out to show how the animal-robot analogy has been developed and deployed in the literature in the face of the other three, more long-standing positions.

1.) Q1: Since social robots cannot have rights,

they should not have rights.

Whether the subject is a social robot or any other type of robot, Q1 represents the most intuitive and most common sensical argument in the literature. Starting from the premise of incapability, it surmises that social robots should not have rights because they cannot. In other

words, since robots are incapable of holding rights, the question of extending rights becomes superfluous.

This is known as the *instrumentalist view* in the literature and is, in fact, quite a common view of the role of technology in the human life. It is based on the notion that technology is a mere means to human ends. As such, robots are considered to be just passive and obedient *tools* or *instruments* that are inherently neutral in nature, devoid of any agency, rationality, suffering life in general. Consequently, robots, regardless of their sophistication or socialness, would be just another piece of technology not any different from simpler pieces of technology, such as toasters or rice cookers. With such a universal claim under the belt, the central premise of Q1 then is that social robots, like any other piece of technology, are akin to tools and instruments and therefore outside of the purview of any consideration of rights.

For the largest part in human history, this view had dominated the discourse on animal rights and also, by default, the one on robot rights. For animals, this only started to change about two-hundred years ago with the emergence of Jeremy Bentham's philosophy (1748 – 1832). For him, the question of rationality, which had been previously widely acknowledged as the divisor between humans and non-human animals,

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was not the key question. Rather, it was 'Can they suffer?'[1] Bentham's suggestion is that animals are capable of suffering, and that they should therefore not be subject to actions outside a moral domain.

In terms of robots, it is still commonly accepted that, in an abstract sense of being subject to a life and rationality, robots are less than animals. In fact, the French philosopher Rene Descartes went as far as to state that animals were nothing more than complicated biological machines, and *therefore*, i.e. due to their mechanicalness, are not entitled to have any rights or moral consideration.[2] In this sense, all technologies are regarded to be the same. Yet, the existence of a discourse on the rights of robots suggests that there are intricacies and that there seems to be a vague and somewhat undefined difference between robots and simple inanimate devices like a toaster, despite both types being technological artefacts.

While this view has existed for the longest out of the four positions, it is possibly also the one that has come into scrutiny the earliest. As an argument, it is regarded as partial and weak because it is an anthropocentric explanation of a controversial phenomenon.

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[1] See Chapter V. 'A Perspective on Animal Rights' – Historical Perspectives
[2] Ibid.

Concepts such as rationality, or the Christian idea of the soul[3] and suffering are not only controversial but also unclear. As dependent as these concepts are on scientific inquiries, they are equally difficult to prove and establish in an empirically sound way, hence them being subject to dogmatic readings.

2.) Q2: Even though social robots cannot have rights, they should have rights.

This position is based on the previously mentioned Kantian perspective on the indirect duty towards animals and is derived from the proposition that cruelty towards robots could translate into cruelty towards humans. As explained in Chapter V ('A Perspective on Animal Rights'), this argument holds that cruelty towards animals would translate into a propensity for cruel treatment towards humans. At the same time, Kant denies animals any direct rights due to their lack of rationality. From this, it follows that animals should be protected through rights for the sake of human morality, i.e. to prevent the spread of morally undesirable behaviour in society. Thus, indirect duties

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[3] Christian theology teaches that only beings with a soul, i.e. only humans, deserved ethical consideration.

towards animals can be derived from direct duties towards fellow human beings.

Most prominently in relation to robots, Massachusetts Institute of Technology's robot ethicist Kate Darling co-opts the Kantian approach and expands it to include social robots. Through interviews and clinical studies on the interaction between human users and social robots, such as the Pleo (Darling, 2013), she laid bare a chasm between the instrumentalist view of theory and the practical experiences humans have with social robots in a variety of situations.

In an experiment she conducted, participants were given several Pleo dinosaur pet robots. The participants were instructed to interact with them in a variety of ways. At the end, however, the participants were instructed to tie up the robots and beat them 'to death.' While they were told that the robots were purchased for disposal in the course of the experiment, only one out of twenty participants could be persuaded to follow the instructions under the condition that the others be saved. Before this compromise was reached, one participant had removed her robot's batteries to 'spare it the pain.'

In another experiment she offers as supporting evidence, Darling cites a military experiment of the US Army (Garreau, 2007; Darling, 2016). Having built a giant centipede-like prototype of a mine-

clearing robot, roboticist at the Los Alamos National Laboratory demonstrated the robot's capacity to defuse mines by triggering them on purpose with its legs and having them blown off. During a demonstration, an attending Army colonel called off the experiment before completing its assignment of defusing all mines as the colonel could not stand the sight of the robot being increasingly more crippled as it lost its legs one by one. He was cited as having described the experiment as 'cruel' and 'inhumane.'

Darling claims that robots currently do not bear the properties that would entitle them to rights. However, the human tendency to anthropomorphize would make humans perceive social robots more as companions than simple inanimate artefacts. Following this, the proposition is made that cruelty to robots could encourage cruelty to fellow humans.

The merit of this argument is that it maintains the long-standing assumed view of human moral superiority while finding some leeway to argue that rights should be extended to animals and robots to protect them from cruelty, which would be instrumentally, rather than intrinsically, wrong. It does not, for that it does not need to, resolve the fundamental ontological question of what a robot can be. In fact, this *relational* approach makes robot rights dependent on the human

experience and does not award them rights of their own. As an argument, it is also popular because it can accommodate the developing field of social robotics and 'the apparent changes [it] produces in our moral intuitions (Gunkel, 2018).

Despite its merits, this relational approach is not without criticism, and Darling herself is aware that this approach is 'a bit of a provocation' (Darling, 2017). While the relational turn rests on Kant's indirect duty theory, the supporting evidence is not thoroughly robust. Even though prominent proponents, such as Kate Darling, have gained considerable traction in the popular press (e.g. Fisher, 2013; Collins, 2015; Lalji, 2015; Walk, 2016; Darling, 2017) and been cited in other academic works (e.g. Knight, 2014; Larriba et al. 2016), the studies and experiments emphasized in the literature have not been independently repeated and verified (Gunkel, 2018). This, of course, limits the validity of the empirical findings and makes the approach as a whole reliant on determinist assumptions. Part of it is because social robotics is still a relatively young and nascent discipline. Yet the popularity of the relational approach in popular media has proven to be valuable in furthering the discourse on a societal discourse. This point will be furthered in the next chapter.

3.) Q3: Even though social robots can have rights,

they should not have rights.

In contrast to the other previous two approaches, this position starts from the assumption that social robots can have rights. Nevertheless, the objection is raised that being entitled to rights does not necessarily mean that legal rights should be conceded. This view is most commonly associated with AI ethicist Joanna Bryson (2010), who surmises that granting rights to robots would humanise them, which, in return, would dehumanise human beings. In doing so, 'poor human decision making in the allocation of resources and responsibility' would be encouraged at both an individual and institutional level. She argues that there could be grave complications in terms of e.g. responsibility and liability for robot misdeeds, which could be used to skirt attribution, deceive or manipulate humans. Furthermore, the venture of establishing and protecting rights for robots would be disrespectful towards those humans who are deprived of theirs and drain resources away that could otherwise be utilized to their benefit. In this sense, her argument is straightforward: Since robots are property, and moreover, servants of society, as expressed in her provocatively titled essay 'Robots Should Be Slaves' (2010), they should stay non-human-like.

In an attempt to counter any analogies, Bryson and her camp contend that designing robots with anthropomorphic features, i.e. features that conceptually move robots closer to humans, is a conscious design choice; one, that *can* and *should* be avoided. Doing otherwise would take away the humanness from humans, which would be intrinsically wrong.

Although this line of argumentation is vague and somewhat tautological, it draws its reasoning from a long-standing idea that is known as the *biological argument*. Put simply, it is speciesism to the core, i.e. the belief in human supremacy, and as old as ancient Greek philosophy; it can be found in various iterations in the early philosophical readings of the ancient philosophers, such as Aristotle (384 – 322 BC)[4], who argued that man is atop all hierarchy on account of the highest of all abilities: the ability to reason. In contemporary thought, this has been re-iterated by Peter Singer (1975), the father of the modern North American animal rights movement, as 'a prejudice or bias in favour of the interests of members of one's own species and against those of members of other species.' In this context, it is commonly read in support of human supremacy to decry the extension

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[4] See Chapter V. 'A Perspective on Animal Rights' – Historical Perspectives

of rights to non-humans - be they animals historically or robots contemporarily - as arbitrary.

While this approach seems to have a common sensical and intuitive air to it, it loses its persuasiveness due to its dogmatic radicalness and the lack of sound supporting evidence. The resentment of lifelike, anthropomorphic robots limits the development and deployment of social robots. Given current trends in social robotics, which draws heavily from anthropomorphism, this might seem detached from practice. More crucially, however, some of her claims, such as that the humanisation of robots would be followed by the dehumanisation of human, or that extending legal protection to robots could lead to difficulties in attributing responsibility for robot misdeeds, either lack supporting literature or further explanation.

Nevertheless, this position has shown surprising flexibility in conceding the point that social robots could potentially be entitled to bear rights, albeit with some scepticism and the addendum that *can* does not mean *should*. In this respect, this approach reasserts the core of the instrumentalist theory (Q1) while shedding light onto new challenges, namely that robots should stay instruments and be disposable as needed to be more beneficial, and that certain issues, such as responsibility, should stay strictly in the human domain. Thus, this approach warns of

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the dangers of being too generous in extending rights if the path of social robotics that it has taken in the late 1990s continues to be taken.

4.) Q4: Since social robots can have rights,

they should have rights.

This option is diametrically opposed to Q1 and stands for the animal-robot analogy. While it has been more thoroughly explained in sub-chapter V.3., a brief summary of the core elements will be given.

It affirms both modalities to state that social robots *should* have rights since they *can*. In reference to the thesis title, this can be put more bluntly as *if animals have rights, robots should too*. Considering the first modality, that robots *can*, i.e. are able to hold rights, the popularity this position has gained in recent years might seem rather surprising.

More thoroughly explained in the beginning of this chapter, it builds upon the relational approach (Q2: Even though social robots cannot have rights, they should have rights) but proceeds with the animal-robot analogy, in other words, the recognition that social robots may be regarded as analogous to animals. This approach specifically highlights anthropomorphism as underlying key mechanism to bring the Kantian approach, which originally dealt with animals, not robots, into

compatibility with social robots. Through the three commonalities mentioned in sub-chapter V.3., it allows for a perspective that supports treating robots *like* animals, which are more familiar. In this sense, it is not as much of a new stand-alone argument as an extension of it. Similarly, it borrows from the idea that consequences of actions towards non-humans ought to be calculated; otherwise, they could spill over into human domains.

The difference in modality with Q2 comes from the idea that social robots, while ontologically different from animals on account of their non-biological nature, bear enough phenomenological similarities to warrant such a comparison; that is to say, that there are similarities in the way humans perceive animals and social robots. Since animals hold rights that protect them from e.g. unjust or cruel treatment, the logical conclusion is that robots should too.

Yet another, bigger difference is that it provides not only for a reason for justly treating robots, but for an entire model on how to imagine the place they could potentially come to take in society. As the most current mode of inquiry into the debate, this option advocates understanding social robots as potential companions, which is in line with the current direction that social robotics is taking. Thus, it goes

beyond being a mere injunction against cruelty towards animals; it encourages us to be kind to robots as we are to animals.

This position draws part of its appeal from the fact that it does not challenge human exceptionalism, a long-standing tradition of Western thinking. Yet it opens up a host of other questions by extending the rights of animals to robots, which constitutes an innovation in moral thinking. As such, position Q4 is the furthest away from the instrumentalist view of Q1.

5.) The Dynamics of The Discourse

In the preceding parts, the four most prominent positions were reviewed and assessed. Particular attention was paid to the animal-robot analogy as a position that has gained significant attention in the last decade (Gunkel, 2018). To further bolster the qualitative analysis of the *dynamics* of the discourse, this part shall briefly attempt to provide a quantitative element by identifying trends and patterns in the publications of related academic publications on the issue at hand. First, a timeline shall be provided through a simple bibliometric analysis. Second, significant publications and their general direction shall be highlighted to infer a trend and a pattern of the discourse in the context of the 2x2 matrix.

In order to map out a timeline of the discourse, a simple bibliometric data analysis based on *Google scholar* shall be employed. Entering service for the public in

2004, Google Scholar is a web search engine that indexes academic literature across a range of formats and disciplines. As of 2018, it includes most peer-reviewed academic journals, books, conference papers, theses and dissertations, and other scholarly literature and counts as the world's largest academic search engine (Gusenbauer, 2019). Thus, Google Scholar offers a comprehensive coverage over the academic literature relevant to this topic.

One apparent downside of it is that Google Scholar mainly relies on automated data crawling and is, at the cost of being free, likely not as well curated as manually maintained databases from other (commercial) repositories such Web of Science or Scopus.

To thematically narrow the scope for the timeline, publications relating to the issue at hand were identified by conducting a limited query on Google Scholar by using the key words "robot rights" and 'social robots.' In the case of robot rights, the term was surrounded with quotation marks to tell Google Scholar to only index publications that had an exact word match. This was done to filter out results which would contain both words (either together or on their own), but not together as a contextual term.

For instance, inputting *robot rights* (without quotation marks) would output publications on intellectual property rights and robots, i.e. where both terms were hits, or only on robots, i.e. where only one term was a hit. As for *social robot*, quotation marks were not included given the narrower usage of the term and that it merely serves as a secondary parameter to refine the search results surrounding "robot rights" as otherwise

robot rights (including robo-ethics) is a field that includes many other rights-related sub-discussions, for example on damage liability, attribution of responsibility etc., that are surely important but not strictly pertinent to this work.

To further narrow down the results, only publications which had above key words included in their title were considered. As one would usually expect that important publications contain the relevant key words in the title, this served to narrow down false positives that had those words in their body but not in the title.

Additionally, the time frame was restricted from the year 2000 onward for practical reasons since the issue itself came only to significant attention in the early 2000s when social robotics surfaced as a discipline of its own.

Using above parameters, the first query returned 879 results. Out of those 879 results, all publications not in English and those with less than five citations in total were filtered out to ensure a minimum standard of quality of the publications as well as increased compatibility. The minimum threshold of five citations was established arbitrarily as it correlates with a minimum of 25 citations per year, which according to Harzing (2016), indicates that a publication had a somewhat significant impact in the field. Plotting the filtered data resulted in the following chart.

Figure 3: Count of academic publications on rights via Google Scholar
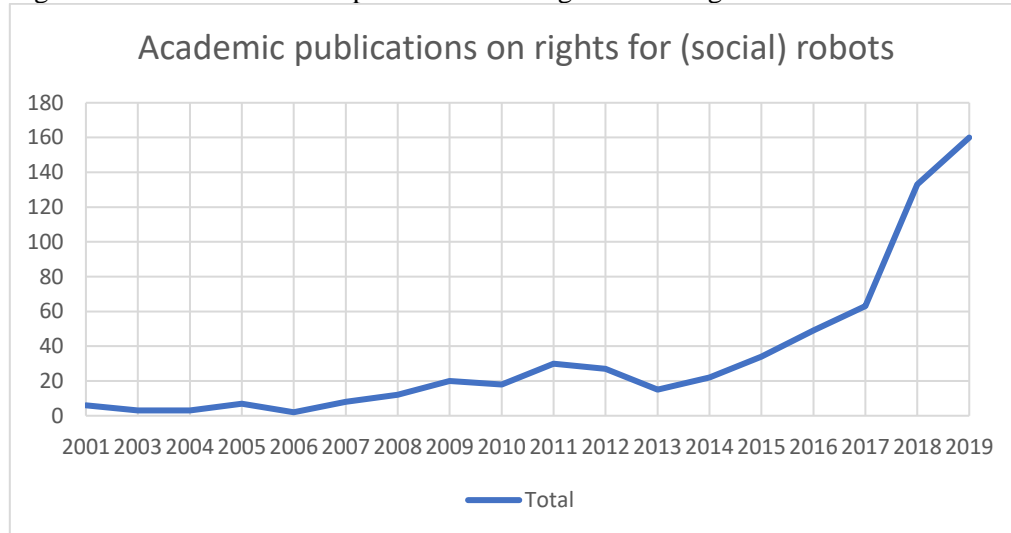
A quick look at the chart reveals that there has been a marked increase in publications on rights for (social robots). An upward trend can be observed starting from 2004, which roughly coincides with the emergence of social robotics as a discipline; from three publications in 2004 to eight publications in 2007, with 2006 being a negative outlier for unknown reasons. A steepening of the trend can be observed from 2013 onwards and again in 2017, when the number of publications doubled in a time frame of only one year. The number of publications peaked at about 160 publications in 2019, the last point of the data observed. This number stands in stark contrast to the early years after the turn of the millennium, when the number was the lowest at about three to six.

From the chart alone, it is not possible to explain why the number of publications rose markedly in the years mentioned above. Speculative reasons can be deduced, however. For the early 2000s, it would make sense to assume that the slight increase

came about due to the emergence of social robotics, which subsequently picked up in the mid-2000s. This might have caused social robotics or robots to appear more often in publication titles. For the 2010s, one reason could be found in the rise of popularity of the options Q2 and Q4. Both affirm the modality *should* robots have rights, thus offering a departure from the previous notions that robots should not, by inter alia, employing animal analogies as an easy to understand and somewhat intuitive rhetorical device.

While speculative, the emergence of these two options might coincide with advances in the development and deployment of social robots. After the commercialization of the first and second generations of social robots, such as the Aibo and the Paro, in the early 2000s, a range of newer generations and models were (re-) introduced in the mid-to-late 2000s and early 2010s. The Paro robot, for example, was classified as a medical device by American regulators in 2009, and has been seeing updates since. Similarly, the Pleo, which was first introduced in 2006, saw the launching of its second generation in the United States in 2011. As for the marked uptick in the late 2010s, in other words the current period, this might overlap again with the release of a newer generation of models. Thus, there might be some cycles in the development of social robots, which go hand in hand with academic research and output as shown below by the colored graphs under the y-axis.

Figure 4: Count of academic publications on via Google Scholar (highlighted for periods of change)
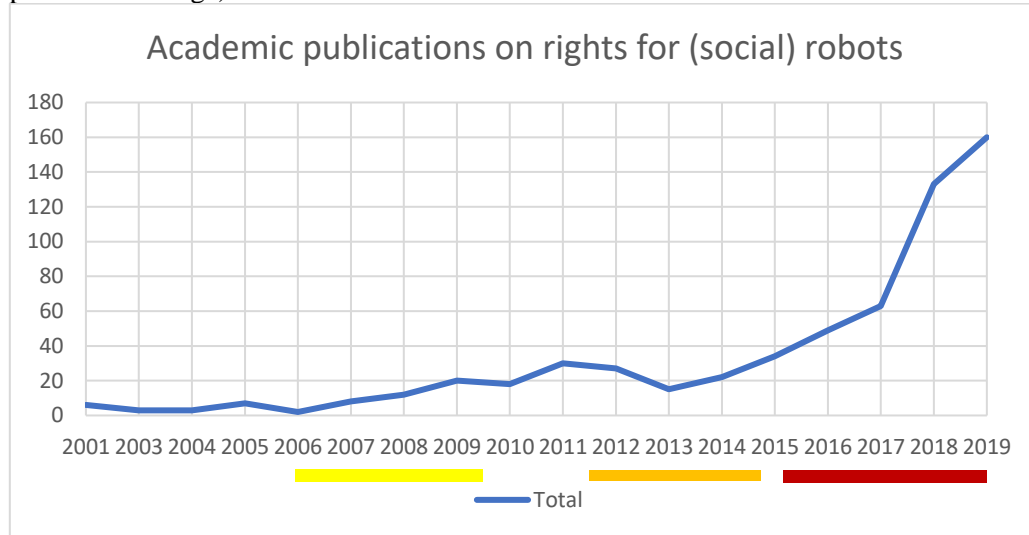
Considering that there is no previous analysis of this in the literature, and that these cycles are mere speculations, this interpretation needs to be read with caution. For example, the chart indicates that there was a decrease from 2012 to 2013. Even though this downward trajectory corrected itself quickly in only one year, from 2013 to 2014, no visible reason for this can be discerned from the data available.

Yet with the use of these cycles, assumptions can be made on the popularity of certain positions and ideas. Coming back to the 2x2 matrix with the two modalities and four options labelled Q1 to Q4, a look at the most cited articles in each of those three cycles suggest a change in opinion. For this, the time period from 2005 to 2020 were divided into periods of five years. For each time period, the most widely cited article was reviewed. Resorting to a qualitative reading of the article, the position taken was equated with one of the four options as closely as possible. The underlying assumption

was that the most widely cited article, whether the literature agrees or not, may be representative of the most widely discussed positions in that period. By doing that, a change in opinion towards extending some form of rights to robots could be observed.

In detail, supposing that position Q1 (Since social robots cannot have rights, they should not have rights) has been the historically dominant view until recently, changes from Q1 to Q2 and Q3 respectively and Q4 eventually could be seen.

For the first period starting from 2005, and thereby roughly overlapping with the yellow bar, the most cited publication was an article titled '*The Paradox of Social Robotics: A Discussion'* by Duffy and Joue (2005). In this article, the authors posit that there are scenarios under which robot rights could be imaginable, but that such a blurring of lines between what it means to be human and not should be avoided, for that a robot needs to stay a tool to be of maximum utility. This is exemplified by the statement '*The machine tool can then become Mr. Robot but Mr. Robot will always be a tool,'* which advocates an understanding of robots that strikes a balance between understanding its socialness while embracing and keeping its machine-like qualities to avoid difficult ethical issues. This position is most similar to position Q3, which states social robots should not have rights, even though they could on a theoretical basis since every property or capability that grants rights can be manufactured or programmed in the future.

In the next five-year period, which starts in 2010, the most widely cited publication was an article titled '*Robot rights? Towards a social-relational justification of moral consideration'* (Coeckelbergh, 2010). Coeckelbergh is a well-known name in

the field and deals with robot ethics from a mostly philosophical perspective. As the title reveals, his article takes a stance that advocates the relational approach as exemplified in position Q2. Carefully admitting that social robots may not be able to hold rights, Coeckelbergh reviews that standard direct and indirect arguments for moral consideration and proposes a social-relational approach that focuses on subject-object relationships that are formed in social relations to determine moral worthiness. Put differently, this implies on a societal level that human-robot relations should be key to understanding the rights question, rather than the moral status of humans and robots alone, which is a key point of position Q2.

This turn away from ontological features is sustained in the next period. Strictly speaking, the next five-year period would only span until 2015. Including one additional year, e.g. 2016, however, allows to make a clearer point. In 2016, the most widely cited publication was an article by robot ethicist Kate Darling titled '*Extending legal protection to social robots: The Effects of Anthropomorphism, Empathy, and Violent Behavior towards Robotic Objects*' (2016). In this article, Darling, who is commonly associated with position Q2, builds on her previous work (relating to Q2) and puts emphasis on anthropomorphism and the animal-robot analogy to discuss the transferability of violent behavior towards animals to robots and eventually humans. While still adhering to Q2, the article explicitly makes use of the animal-robot analogy and points towards Q4 to state that robots, while on their own could not have rights, could have rights similar to animals, ergo *since animals have rights, so could social*

robots, and so should they. In doing so, a slight morphing of Q2 to Q4 can be observed, which in itself may not be a surprise as Q4 is distinctively built upon Q2.

At this point, it needs to be reiterated that these time periods have been chosen rather arbitrarily. The animal-robot analogy, for example, has of course been around in the literature for longer than since 2016. In fact, Darling published a series of conference papers on the same issue in the early 2010s, in which she made careful use of the analogy. However, it is perhaps hers and the work of other later academics that gave the analogy a more solid foundation by complementing a simple rhetorical device with the latest findings from sociology, psychology and robotics to give it a more rigorous empirical foundation, thereby moving the debate from the purely philosophical to a more interdisciplinary field with more appeal and timeliness.

Due to the inherent limitations of Google Scholar, it is difficult to say that above graph is complete. In fact, unless further research is conducted, it should not be taken at face value. Yet above paragraphs lend support to the statement that there has been an increasing interest in the issue of rights for robots in connection with social robots and that there has been a shift in opinions from looking away from ontological features and more towards relational and phenomenological features. This has to be understood in the wider context of the development of robotics in general, with social robotics being a sub-field of it.

3.   The Animal-Robot Analogy

Regardless of how much humans actually share with animals and robots, anthropomorphization is a key mechanism in both cases to facilitate interaction and increase acceptance (Fink et al., 2012). When it comes to the question of how far this acceptance should go on a societal level, one of the most commonly cited lines of argumentations in the literature is the so-called *animal-robot analogy*.

As the name itself reveals, the animal-robot analogy draws a positive comparison between animals and robots and pushes towards employing animals as a reference for modelling the space of social robots in society. It is based on three shared characteristics that suggest a semblance close enough to override the biological-mechanical divide: a.) the shared otherness; b.) the shared capacity to trigger anthropomorphic responses in humans, and c.) their shared assistive capacity (Inayatullah, 2001; Calverley, 2006; Darling, 2014; Johnson & Verdicchio, 2018).

By way of animal-robot analogy then, an argument supporting the extension of limited legal protection to social robots analogous to animal protection can be crafted. In order to make sense of the intricacies of such an argument in the context of a societal debate, this chapter will first analyse the analogy itself with an eye on its appropriateness for understanding social robots.

The animal-robot analogy is used by both academics and laypersons to have a reference for framing interactions with social robots. In such endeavours, analogical reasoning plays an important "heuristic role, as aids to discovery" (Bartha, 2010). By

using *the familiar*, in this case animals, something *the less or unfamiliar*, in this case robots, can be understood in terms already known. For this, the two referents do not have to be exactly same – being sufficient in key aspects is enough as the inference from the "source [i.e., the familiar] domain to the target [i.e., the less familiar] domain is selective" (Forbus & Gentner, 2001).

In this analogy, animals are the familiar. While their status and rights have changed, animals have played a leading role in the development of civilizations. In the last forty years, significant progressive moral and legal changes have been made on their behalf, and anti-cruelty laws have been established in most countries. In the Western hemisphere, animals have become ubiquitous and are viewed as having enough moral weight to not be treated like simple things or commodities. In sum, animals are awarded *moral consideration*. This comes with the caveat that animals are not recognized as having *moral agency*, without which no ethical or moral significance can be attributed to their own actions.

Social robots, in contrast, are the unfamiliar. As much as the field of social robotics has been making strides in recent years, it is still young and evolving (Sheridan, 2016). The ontological status of robots, be they ordinary or social, is still much disputed. Whereas some academics argue that robots are merely *tools,* created by humans for specific ends and not any different than a hammer or a toaster, others argue that robots are caught in a limbo between being something more than a mere object, yet less than an animal, and by extension, than a human. For the most, the popular view aligns more with

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the former notion, which is of instrumentalist and anthropocentric character. From ancient to postmodern times, it remained in place and largely unchallenged until recently, when the rise of the contemporary animal rights movement unearthed Lockean and Kantian arguments to prompt questions on the moral consequences of unfettered *human exceptionalism* (Gunkel, 2014).

By mapping the relationship of humans with animals onto robots, the proposition is made that there are commonalities. A disclaimer here is that the analogy primarily means *domesticated animals* as these are the kinds of animals that humans have social relations with. The three commonalities are a.) the shared otherness; b.) the shared capacity to trigger anthropomorphic responses in humans, and c.) their shared capacity to assist in human objectives. Although they all apply to robots in general too, they become even more compelling when applied to social robots as will be explained in detail below.

a.) Otherness

The first commonality is the shared *otherness* of animals and robots. This otherness is determined in relation to humans. Both animals and robots are alike insofar that they are *not human*. Consequently, both animal-human and robot-human relationships constitute relationships with others that are not just *not human*, but, in some aspects, even *less than human* (Coeckelbergh, 2010).

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Some scholars, for instance Hogan (2017), argue that the biological factor, of which sentience is an essential part of, must be acknowledged and that mere shared otherness is not sufficient to bring animals as a parallel of robots. This presumption rests on the notion that biological beings are, to varying degrees, sentient and capable of experiencing pain and intrinsic autonomy; a notion that many people can likely easily agree with.

Even though it is beyond the scope of this paper to discuss the philosophical definitions of sentience, autonomy etc., a counterpoint advanced in the recent literature will be given to show the other side of the issue. To counter above claim, it is possible to argue that, in theory, robots could be engineered around this problem (Calverley, 2005). The argument goes that robots, due to their programmable and manmade architecture, can be given any desired characteristic. Thus, any distinguishing factor could, functionally speaking, possibly be turned into a similarity. One critical juncture of this counterargument is that, in the process of undercutting the categorical assertion that animals are and will be different from robots, it suggests that robots could be, at some point, become functionally alike to humans.

Both the original and counter claim come with a host of other related questions, e.g. if programming the sensations of pain and suffering into a robot would be morally permissible. Yet the claims underline the point that

the biological differentiation, from a functionalist point of view, offers only little in the way of substantive reasoning; a point that becomes more plausible when considering that not all sentient animals are neither treated nor considered equally.

In fact, the contribution of the argument on otherness is that it prompts a re-inquiry into the division of species into humans and non-humans. It reveals the circular reasoning in taking it for granted that the biological differences between humans and animals are significant enough and morally relevant, and further asks if species or biology are the only meaningful criteria for grouping (DeGrazia, 2002). By this token, this argument derelicts the biological criteria and sketches out a way of differentiation based on social relations, through which animals and robots are grouped together as others in relation to humans, and more substantially, as being subordinate.

b.) Capacity to trigger anthropomorphic responses

Other than being others subordinate to humans, another shared commonality is the capacity to trigger anthropomorphic responses. Albeit in reference to mainly humanoid social robots, this idea was firstly explicitly stated in the literature by Johnson & Verdicchio (2018). This particular

relationship with anthropomorphism influences many of the contemporary approaches in making sense of human-robot interactions and hypothesizes that anthropomorphism facilitates social interactions with humans as covered in chapter IV.

Whatever the underlying cognitive and psychological mechanisms of anthropomorphization are, the literature has only little doubt that it does occur, with even only minimal anthropomorphic cues evoking a range of attitudinal and behavioural consequences. Through this, a wider range of interaction modes that are potentially more comfortable and longer-lasting can be unlocked.

In both cases then, anthropomorphism is used to understand behaviour and interaction. The same way it can help to make animal behaviour more predictable to the human mind (Kennedy, 1992; De Waal, 1997), robot designers make use of it to work with and around human user expectations.

From this, one implicit proposition is that social robots would evince a social presence that could elevate their perception as well as status from being mere tools or instruments to a sort of a companion as is the case with domesticated animals, which are unusually adept at capturing and producing cues salient to humans. It is then easy to imagine that humans would extend to robots some of the moral and legal considerations given to

animals as they come to attain an increasingly similar repertoire of anthropomorphic characteristics.

Table 3: Overview of some popular social robots

Model	Paro	Pleo	Robear	Aibo
Picture				
Shape	Animal (Seal)	Dinosaur (Camarasaurus)	Mix (humanoid torso, bear head)	Animal (Dog)
Locomotion	Immobile	Four-legged	Rolling	Four-legged
Bodily Movement	Head, legs (flippers)	Head, neck, tail, mouth, legs	Head, arms, torso	Tail, joints, neck, mouth, leg
Interaction Mode	Facial expressions			-
	Vocalisation		Speech	Music, speech
	Tactile, audition, temperature, posture sensor	Tactile, camera, audition, personality	Tactile, camera	Tactile, camera, audition, personality
Autonomy	✓ + learning	✓	?	✓ + learning

The table above shows four popular and well-studied social robots.

Except for Robear, which is only used in some designated healthcare

facilities, all robots are available commercially and deployed in domestic settings. All four robots feature a distinctly anthropomorphic shape and also use social cues and biologically-inspired movements to interact with humans on a social level. This way, the robots are able to generate emotional responses in their human users. For example, owners of AIBO, which is designed to be dog-like, have been found to ascribe mental states to their robots, despite being fully aware that they are devoid of any as robots (Friedman et al., 2003).

c.) Assistive capacity

Related to the previous point, another shared characteristic between animals and social robots is that both have the capacity to assist humans in their objectives. To this end, the capacity to elicit anthropomorphic responses and engage in social interaction is highly critical. It is through understanding and exchanging social cues that social robots can enter into collaborative scenarios with humans to not only share the same space but also to share the same goals for the achievement of human objectives.

Similarly, from an evolutionary point of view, the assistive potential of animals may have been a driving force behind *domestication*, for that domestication allowed humans to keep animals around for aiding in various

activities and vice versa, e.g. to keep farm animals for meat, wool, milk, or labour, such as sledge puling (Beauchamp, 2011).

In both cases, assistive capacity constitutes a powerful appeal for humans, a point that is has been noted by a range of scholars, including Ashrafian (2015), who wrote that many animals were *reared* and specifically *bred* – with predefined genotypes, phenotypes, and traits - by humans to fulfil specific duties in human society, as with e.g. guide dogs). From this, the implication is that robots, similar to animals, are designed and specifically programmed for specific tasks. The table below illustrates this point by using the example of Paro, Pleo, Robear and Aibo. Designed after animals, or in the case of Pleo, a dinosaur, they serve specific purposes and engage with humans in collaborative settings to do so.

Table 4: Assistive function of some popular social robots

Model	Paro	Pleo	Robear	Aibo
Picture				
Assistive Function	Therapy, care	Pet toy	Care	Pet toy, social mediator

In this regard, social robots make a more compelling case than industrial robots as they can enter, in a broad sense, into more intimate roles that are hitherto reserved to companion pets, such as guide dogs to assist the

blind or guard dogs to protect the owner and their home. Further, social robots can also come to serve as caregivers for the elderly (Borenstein & Pearson, 2010), nannies for children (Sharkey & Sharkey, 2010), and even sexual partners (Sharkey et al., 2017).

With this in mind, Sullins (2011) suggests to construe domesticated animals and robots as parallels for that both domestication and technology are means of taming and manipulating nature to serve human ends:

> For millennia humans have been breeding dogs for human uses and if we think of technology as a manipulation of nature to human ends, we can comfortably call domesticated dogs a technology. This technology is naturally intelligent and probably has some sort of consciousness as well, furthermore dogs can be trained to do our bidding, and in these ways, dogs are much like the robots we are striving to create. (Sullins, 2011, p.24)

Equating animals to technology this way, however, can also be interpreted in a Descartian way, according to which animals can likened to automata. After all, Descartes reasoned that animals can be treated like machines as both were unable to entertain a mind of their own, which he also set forth as a fundamental difference animal and man.

Nevertheless, this shared assistive capacity approach offers a simplified model for understanding how humans let non-human entities

enter into their domestic communities based on their utility to task achievement. Both animals and robots have the potential to provide humans with functionality that humans do not have or are unwilling to use on their own.

Above commonalities suggest that there are grounds to construct an animal-robot analogy. All three points provide a common frame of reference for juxtaposing animals to social robots. The weight of commonalities two (anthropomorphism) and three (assistive capacity) cannot be understated. With respect to commonality two, it needs to be additionally mentioned that humans have been long attracted to animals, and have been partly utilized as an outlet for increased social needs (Miklósi & Gácsi, 2012). Hence, animals, particularly domestic ones, may provide a useful biological model for developing social robots. With respect to commonality three, the fact that animals have been present through most of human history speaks for the idea that animals have a general function or utility to them - one which social robots will likely to come upon to take themselves.

In a nutshell, if a social robot is close to an animal in terms of appearance (commonality two) and capabilities (commonality three), and if humans are willing to cede areas of responsibilities to it, e.g. protection, companionship, labour assistance etc, and in consideration of studies that demonstrate that humans react to social robots in

different ways than to ordinary robots, it is possible to imagine the analogous extension of some moral and legal consideration as given to animals (Calverley, 2006).

For the purpose of a debate on robot rights, the weakness of applying the Kantian approach *as it is* to robots is that it talks about animals as non-rational beings, whereas robots are non-rational non-beings. Subsequently, the elephant in the room is how the Kantian approach to understanding animals can be applied to robots if there is a major categorical and ontological difference between animals and robots.

The merit of the animal-robot analogy lies in its ability to bridge the Kantian perspective on animal rights with social robots. Specifically, it provides a basis for asking "is a robotic social dog companion *like* a real pet dog?" The three commonalities of the animal-robot analogy, especially commonalities two, on appearance, and three, on assistive capacity, move animals and social robots closer in an ontological sense. By referring to recent studies that draw parallels between human-animal and human-robot interaction, the analogy gains further persuasiveness. Out of these two commonalities, it is foremost the eminence of anthropomorphism as one of the most observable and well-studied features in the recent supporting literature that supports such juxtaposition of images and concepts between animals and social robots.

Thus, the achievement of the analogy is that it takes the indirect-duty approach of the Kantian perspective, which had a major influence on the animal rights debate, and offers, in light of the recent technological advances in social robotics, a re-inquiry against a contemporary background by upgrading the indirect-duty approach to include a wider

relational approach. Hence, the basis of the Kantian approach is extended to become applicable to robots too; if the Kantian discourse is about non-rational beings, the animal-robot analogy provides the setting for a discourse on non-rational *life- (or rather, animal) like* entities. In other words, if the Kantian defence of animal protection boils down to *'treat animals rightly for your own morality,'* the animal-robot analogy makes a case for the protection of social robots by saying *'treat social robots as rightly as you would treat real animals.'*

Summarily, the animal-robot analogy lays out a starting point for the extension of protection. It draws its persuasiveness from the strength of the Kantian perspective in that it avoids the dogmatic discussion around the ontological features of animals and objects to focus on phenomenological experiences, e.g. on how animals and robots are similarly experienced. Further, it goes beyond the Kantian account of 'do not treat animals cruelly' to offer a frame for visualising the place of robots in society as analogues of animals. In fact, the mere emergence of the analogy and its prominence in the literature suggests that there is a need to discuss how society should relate to robots. If the treatment of animals is moral practice for treating humans, the treatment of social robots may be a moral practice of sorts, too. As for the actual moral status, the Kantian argument denies animals any moral status, whereas the animal-robot analogy either assumes Kant's position or does not make any further explicit comment on it. Rather than discussing abstract moral obligations, the analogy assumes a more practical stance and suggests that consequences should be the guiding principles in this debate, instead of abstract philosophical musings that have no practical bearing.

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4.   Contemporary Perspective

Despite being in an early stage, the debate on robot rights bears some significant semblance to the historical debate on animal rights. While there is no significant mass movement that actively advocates rights for robots, it is striking that the academic circles mentioned in this work seem to be similar to the post-1990s animal rights movement. The character of both can be described as post-citizenship and the goals, in this case the extension of rights, offer little to no direct benefit to advocates. At the same time, the goals imply a call for a cultural change and may be even called overtly altruistic, much in a similar way how early critiques of animal rights and welfare equated the extension of rights to animals as a luxury problem (Ginsberg et al., 2003). In fact, I posit that the reasons for advocacy seem to be largely guided on moral beliefs guided by anthropomorphism rather than personal or collective gain.

In light of different and tiered legal rights given to various animal groups to protect them, it could be imaginable that a possible extension of robot rights would first target animal-like social robots. Although speculative, this could be a consequence of the human tendency to care more about animals that we more easily and readily relate to, such as domesticated animals (Darling, 2017). With increasing relatability, concepts such as consciousness and intelligence that are analogous to themes of the animal rights debate move into the spotlight. At the same time, that is also part of the reason why the robot rights debate runs into ontological problems, which it carries over from the animal

rights debate. Definitions of consciousness, intelligence, and even life itself are not strict and narrow, and exposes the arbitrariness in our thinking of rights.

Currently, the proposition that robots could and should be granted some rights in the future is being increasingly discussed. Should there be a societal push for granting rights, the issue of rights for robots could take even more similar forms to the animal rights movement. Similar to how the increasing penetration of animals into society forced a discussion about the place of animals in society, the increasing penetration of social robots will force a discussion too.

While most often only a footnote in the literature on robot rights, a number of scholars also raise a question about the purpose of law. If law is to be understood as a social contract to construct rules that most agree on, law can be used to uphold everyone to the mutually agreed contract. Thus, the interest of the majority is safeguarded in a democracy and commonly reflects current societal norms and preferences. However, if law is understood to govern the behavior of society, rather than the other way around, the debate on robot rights becomes more complex as costs and benefits to society as a whole must be carefully balanced.

Currently, there are only very few policies for robots, and virtually none that specifically target social robots. Given the fact that the current stage of social robotics is still at a stage where private social robots are not affordable for all (for example, SONY's robotic dog AIBO was initially priced at $2,899 when it came out in 2018), it is reasonable to say that this could change in the years to come once social robotics reaches

a certain level of mass commercialization. For example, South Korea, which boasts the world's highest robot density in the manufacturing industry and is one of the leading nations in A.I. technologies globally (Heer, 2019), started to develop a code of ethics for human-robot interaction in 2007 in an attempt to codify ethical behavior and deal with the rights question (Lovgren, 2007). Even though the project was one of the earliest one of its kind and never finished for reasons unknown, the code attempted to limit potential abuses of robots by humans in order to prevent human-human abuses. In fact, commentators curiously noted that the language employed does not mention anything about the dignity or inherent worth of robots, which, if it is not for legal reasons, perhaps points at the human-centric nature of any rights debate. This, however, should be interpreted with caution as robots and non-human rights might be very differently debated in the Anglo-American sphere and South Korea.

VII. Conclusion

Based on the preceding analysis, it could be shown that social robots are different from ordinary robots by way of their social interface, which is at the crux of the arguments advocating some form of legal protection in the form of rights for social robots. Reliant on triggering the effects of anthropomorphism in humans, social robots are able to establish a unidirectional emotional relationship with the human user to situate them in a social context. While this anthropomorphism happens involuntarily on the side of the user, it is an intentional design choice by the manufacturers to enhance the robots' cooperative utility in achieving human objectives.

Due to the anthropomorphic effect, a survey of the recent literature revealed that human users tend to treat social robots like domesticated animals. While such treatment is not identical, there are surprisingly significant similarities that elevate the robot from being more than a simple inanimate device to something that is somewhat closer to an animal. Going back to the philosophical arguments for animal rights, Kant was highlighted as offering a relational approach that focused on treating animals rightly not for their own sake but for the sake of fellow humans for whom the treatment of animals is substitutable moral practice for the treatment of humans.

Building upon this, the animal-robot analogy as one of the most widely used arguments in the debate was highlighted. To understand the merit of the analogy, three commonalities were worked out. The shared otherness, i.e. both not being human; the ability to trigger anthropomorphic responses; and the human-assistive capacity. It was

found that the animal-robot analogy draws its persuasiveness from the strength of the animal-based Kantian relational perspective in avoiding dogmatic ontological questions on the intrinsic mechanicalness of robots to focus on phenomenological experiences, and thereby offering a more comprehensive picture for painting the space that social robots occupy in society. Rather than prescribing to not be cruel to robots, it encourages to treat robots like animals. In light of animal rights, this stipulation comes to mean that robots should be treated like animals and that robot rights could be modelled after animal rights. Internal logic notwithstanding, the appeal of the analogy stems from its ability to provide a familiar image, i.e. the animal, to map out an unfamiliar, i.e. the robot.

Thus, the two debates on animal and robot rights respectively share the key point of having a relational turn, which changed the predominant view from indifference to difference as illustrated in the figure below.

Figure 5: Debates side-by-side
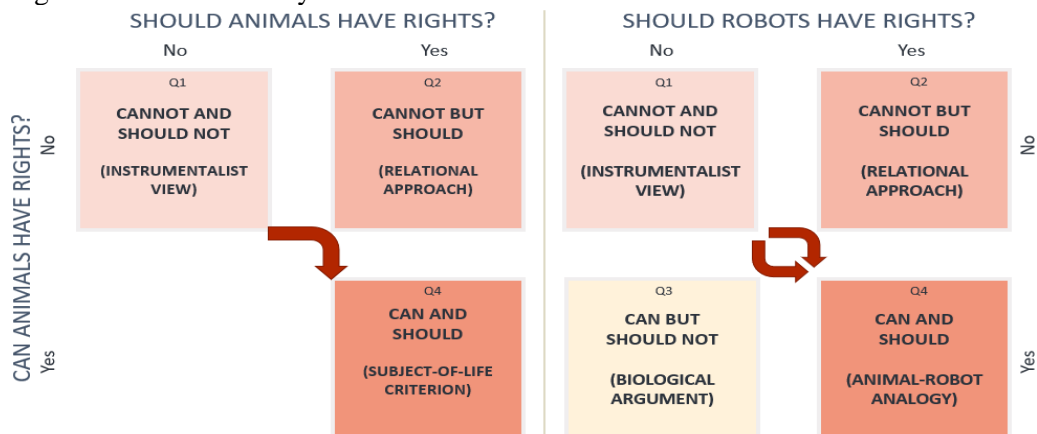
One key difference between the two debates is that the animal rights lacks an option Q3. This is because the debate on animal rights evolved from the point of *should*

not to *should* (while maintain the *cannot*), after which a *can* followed. In other words, historically, the *can* followed a should, hence no *can but should not* as *can* was a consequence of *should*. In the robot rights debate, option Q3 exemplifies the dogmatical minority notion that robots *can but should not* have rights to preserve the sacrosanctity of biology, while in principle agreeing that every measure that grants biological beings rights can be programmed or modelled in the future. This type of argument, of course, can only exist with non-biological entities, ergo robots.

The question whether robots should have legal rights to protect them is by no means simple and still debated in the discourse. Yet, the debate analysis shows that the animal-rights analogy has been gaining traction as one of the recent main arguments in the debate. As the analogy extends the Kantian argument and moves the debate from the philosophical to an interdisciplinary domain that includes empirically observable metrics, it becomes also more widely accessible and satisfyingly provable.

In light of this, it might be timely to think about the place of animals and social robots in society and to think of them as analogues as the analogy could become the new orthodox. After all, the history of rights has consisted of perpetual re-readings of inclusion of formerly marginalized or excluded others, such as animals. Considering that the robot rights debate has mirrored the animal rights debate up to this point, it might thus be the case that the latter can serve as a model for the former to model the future trajectory of the debate.

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