Robot friendship: Can a robot be a friend?

Emmeche, Claus

Published in:
International Journal of Signs and Semiotic Systems

DOI:
10.4018/IJSSS.2014070103

Publication date:
2014

Document version
Peer reviewed version

Citation for published version (APA):
Emmeche, C. (2014). Robot friendship: Can a robot be a friend? *International Journal of Signs and Semiotic Systems*, *3*(2), 26-42. https://doi.org/10.4018/IJSSS.2014070103

Robot Friendship:
Can a Robot be a Friend?

Claus Emmeche, Department of Science Education, University of Copenhagen, Copenhagen, Denmark

ABSTRACT

Friendship is used here as a conceptual vehicle for framing questions about the distinctiveness of human cognition in relation to natural systems such as other animal species and to artificial systems such as robots. By exploring this very common form of a human interpersonal relationship, the author indicates that even though it is difficult to say something generally true about friendship among humans, distinct forms of friendship as practiced and distinct notions of friendship have been investigated in the social and human sciences and in biology. A more general conceptualization of friendship as a triadic relation analogous to the sign relation is suggested. Based on this the author asks how one may conceive of robot-robot and robot-human friendships; and how an interdisciplinary perspective upon that relation can contribute to analyse levels of embodied cognition in natural and artificial systems.

Keywords: *Embodiment, Friendship, Norms, Robot, Self, Semiotics, Social Cognition*

INTRODUCTION

The question posed here is one about an aspect of human cognition and emotion that is often overlooked or ignored, namely friendship, and its possible instantiation in artificial systems such as robots. Can robots be friends? Probably for most people it seems a bit weird to suggest so, or to imagine that humans and robots can enter into interactive dynamics similar to friendship. The intuition that something would be missing for two artificial systems really to be 'friends' may well be right, but as always with intuitions in the context of research they need to be articulated, and articulating this intuition – or counter-claims that robots could not be friends – demands a deeper understanding of not only the specificities of human cognition, but also the relation between cognition and affection, and the nature of friendship. This article focuses on the later.

The claim of this paper is not that friendships between robots, or between humans and robots, are impossible. The suggestion is to keep the question – about possible future realizations of friendship in human-robot or robot-robot relations – open, and investigate more in detail what friendship among humans

DOI: 10.4018/IJSSS.2014070103

might tell us about similarities and differences between natural human cognition (including distributed cognition) and artificial robotic cognition. Friendship and social cognition in general has been seen as important for the development of an autonomous self in humans, and this may thus teach us something about human autonomy and agency. In the fields of Cognitive Science, Robotics, AI and Artificial Life, the focus has often been one of building adaptive systems intelligent enough to solve practical tasks such as survival, transforming sensory information into organized knowledge to guide movement, and learning instrumental skills needed for supporting human action and cognition. This kind of instrumental rationality and intelligence is important for individual actions in many technical domains, but may not be sufficient for all social actions in domains where values and norms play an important role. By asking questions about forms of human friendship and the possible existence or non-existence of robot friendship, we also ask what it means to say that rational purposeful human action in the social domain is guided by *norms*. Such norms are of a social character, they are expressions of self-control, and they regulate not just the action of isolated individuals, but emphatically social individuals, that is, individuals socialized through their development, like social organisms of other species, or like the 'political animals' (Aristotle) we are qua living in societies with social institutions.

The relevance of discussing friendship in the context of robots is far from being a novelty; this concern has appeared in the history of robotics, although nobody has offered an analysis of the meaning of 'friendship' in this context. Remember that robotics is not only a science, fundamental as well as applied, it is also a field hybridizing with science fiction. This is exemplified by the career of Mark Tilden, robot scientist, author and technical consultant on movie scenes involving robots.[1] Part of Tilden's claim to fame is his invention in the 1990s of what became known as "Tilden's Laws on Robotics", namely: 1) A robot must protect its existence at all costs; 2) a robot must obtain and maintain access to its own power source; 3) a robot must continually search for better power sources.[2] This may not sound especially friendly, but more like rules for Hobbesian agents, all fighting against all. They were suggested as indicating new design principles for a more interactivist and embodied approach to robot architecture, provocatively echoing and subverting science fiction author Isaac Asimov's "Three Laws of Robotics" from 1942,[3] that were concerned with the dangers to humans of the construction of robots. Asimov's laws stated that: 1) A robot may not injure a human being or, through inaction, allow a human being to come to harm; 2) a robot must obey the orders given to it by human beings, except where such orders would conflict with the first law; 3) a robot must protect its own existence as long as such protection does not conflict with the first or second law. These laws seem friendlier and they support an understanding that robots should basically serve as safe tools for humans. However, it is difficult to see Asimov's second law about obedience as enabling anything like a real friendship to emerge, at least if we understand that relation as something between equal beings with a high degree of autonomy. This brief indication of a history attached to the debate about the nature of robot-human and robot-robot relations suffices to surmise that much attention has been paid to safety and utility issues, and much less to issues of deeper interpersonal relationship or true friendship.

We will proceed in the following way. Approaching the question of robot friendship requires a specification of what is meant by friendship. This word in common language is quite polysemous. Friendship has been understood as a social tie, a non-institutional institution, a form of love, or simply a recurrent form of non-antagonistic interaction among selected agents. Thus, in the first section we will briefly review a small selection of the research literature on friendship in an interdisciplinary perspective, including both philosophical and empirical research from the sciences and the humanities. In the next section we suggest a semiotic conceptualization of friendship that highlights the mutual cognitive interpretation of oneself by another being, and that other by oneself. Based on these two sections we argue that friendship in its modern form, both as an ideal and to some degree as practised, is a norm-governed relation that is historically contingent upon a civilizing process forming human social behaviours and emotions, and leading to increasing degrees of human self-control. In this form, friendship can be seen within a framework of emergent levels of embodiment that differentiate zoo-social, anthropo-cultural and societal contexts for particular forms of friendship. With these building blocks for a theoretically richer notion of friendship we return to the question about friendship among robots to suggest that even though robots can be made to *act friendly*, it is not clear to what extent they can enter into *relations of friendship* unless robots could also have the same emotional, cognitive and social capacities for sign interpretation that humans have. Thus, overall, friendship appear in this context as a conceptual vehicle for framing questions about the distinctiveness of human cognition in relation to both other natural systems such as other animal species and to artificial systems.

FRIENDSHIP RESEARCH IN THE NATURAL, HUMAN AND SOCIAL SCIENCES

As indicated, the approach taken is not to block inquiry by any predefined notion of friendship, but rather let the investigation be informed by what is known about friendship phenomena in general, from various theoretical and empirical fields of research. This is not the same as broadening our everyday notion of friendship to the extreme by taking a deflationary stance which would imply that by friendship we not only mean among human beings (and eventually robots) but also 'friendship' between a person and the house, bike or any other things that he or she likes.[4] Neither does it mean that we take every sort of brief, polite, 'friendly' relations between persons, groups, or communities to be an instance of friendship. It rather means that we are interested in being able to recognize both diversity and commonality, both a variety of interpersonal friendship forms, and similarities in the multifaceted patterns of friendship known by people. And we are interested in the origins of such forms of sociability in our natural and cultural history.

Biology and Evolution

Social ties as studied in ethology are of course not understood as mediated by institutions or language as in humans. However, social ties of kinship or friendship in non-human species are often seen as protoforms of the same relationship types we know from human societies. Although humans are distinctive in terms of institutions, culture and language, ethologists and evolutionary biologists ask to the biological 'basis'

(or preconditions) of specific human features. Discussing "the human biology of F" where F is some identifiable human feature with a number of biological and other preconditions, there is a shifting balance between two narratives of which the first is the most dominant: 1) F as a distinctively human trait is determined by and fully explainable by Darwinian selective mechanisms acting "as-if-selfishly" (as altruism is a case of 'selfish' genes working through the mechanics of kin selection). 2) F may or may not be humanly distinctive, but evolutionary mechanisms can also yield genuinely 'social' and 'amiable' outcomes, and such features can also be observed in animals. If we take F to stand for friendship, the first narrative is roughly exemplified by evolutionary psychology, the Darwinian trend in psychology (Tooby & Cosmides, 1996; Lewis et al., 2011; Silk, 2003), while the second is a more recent and subtle movement among ethologists who explore the fact that social behaviour need not be aggressive or even "as-if-selfish" to be kin selection, although it is still adaptive and functional for the individuals engaged.

The focus of ethology is on animal behavior under natural conditions. After a long phase of behaviourism with a focus on simple conditional learning mechanisms, attention was turned to more complex instances of cognition-based and social behaviour, and reference to 'information processing', or 'representations in animal cognition' became tolerated, inspired by the development of cognitive psychology and cognitive science; cf. the work on vervet monkey communication (Gallisted, 1990; Heyes & Huber, 2000). This cognitive and social turn in ethology paved the way for a new set of questions pertaining to non-sexual bonding behaviors – tentatively called 'friendship-like' – in a range of animals and birds. The volume Animal Friendships (Dagg, 2011) summarizes this recent turn by covering different types of alleged friendship among a variety of species, most primates but also birds, mountain goats, giraffes, bisons, buffalos, reindeers, etc. Many of the relations covered have only a slight similarity with any specific human notion of friendship and are realized among kin, like male–female, sisterhood, brotherhood, parent–adult offspring, or stable bonds within larger family groups in social animals. However, also instances of so-called "platonic relationships" (sic, p. 12) among male and female olive baboons are reported, i.e., "relationships that provide protection for the female and her young" (ibid., p. 12). Anthropologist Joan Silk famously organized the first symposium on the subject of friendship in non-human animals (Silk, 2002) at a time when many primatologists denied that relatives can be true friends, because they thought that such relations could and should be reductively explained as a form of automatic self-interest (called reciprocal altruism in the sociobiological literature). Anne Dagg duly notes the criticism made by Barrett & Henzi (2002) that perhaps there are no friendships among primates, and that we can never know what a monkey perceives as a friendship, but she counters that

...observations in the field show that in many if not most social species, individuals do not act randomly toward their neighbors while being sociable, but prefer to interact positively with some individuals rather than others. In this book, we consider friends to be those individuals who do interact affirmatively (Dagg, 2011, p. 228, n.7).

This, however, seems to be a rather meagre concept of friendship, at least judged from a human point of view. In a recent contribution

primatologists Seyfarth & Cheney (2012) claim that convergent evidence from many species (horses, elephants, hyenas, dolphins, monkeys, and chimpanzees) reveals the evolutionary origins of human friendship. They refer to research documenting the occurrence of bonds among females, among males, or between males and females. They also acknowledge that genetic relatedness affects what they term friendships in primates: In species where males disperse from their social group after becoming adults, friendships are more likely among females. If females disperse, friendships are more likely among males. But Seyfarth and Cheney also emphasize that not all friendships depend on kinship; many are formed between unrelated individuals. Friendships often involve cooperative interactions that are separated in time. They depend, at least in part, on the memory and emotions associated with past interactions. Applying the term "friendship" to animals is not seen as anthropomorphic (as claimed by Henzi & Barrett, 2007): Seyfarth & Cheney posit that although "relationship" is widely used as a descriptive term, no primatologist has ever claimed that monkeys, apes, or any other species can anticipate their future social needs. To the contrary, when scientists have speculated about the mechanisms underlying long-term relationships they have typically assumed that current behaviour is affected, wholly or in part, by the individuals' memory of past interactions. Furthermore, there is now

…an extensive literature indicating that animals recognize other individuals' relationships. (...) Animals also recognize the close bonds that exist among others. In playback experiments conducted on vervet monkeys and baboons, females who heard a juvenile's scream were likely to look at the juvenile's mother (…) The representations that underlie such recognition undoubtedly differ from one species to the next and certainly differ from humans' more explicit social knowledge, but there is no doubt that animals acquire and remember information about other animals' relationships and that this knowledge affects their behavior. (Seyfarth & Cheney, 2012, p. 165).

These primatologists see friendships as adaptive; males with allies have superior competitive ability and improved reproductive success; females with the strongest, most enduring friendships experience less stress, higher infant survival, and live longer. Their basic idea is that for instance baboons in fact form friendship at the practical level of life in the social group, and although these monkeys have no explicit categories (not to say ideals) of friendship, they have certainly expectations and an implicit complex knowledge of the social relations among other members in their group. Seyfarth and Cheney conclude that we "can therefore see the evolutionary origins of human friendships in the social bonds formed among nonhuman primates." (ibid., p. 171). What we see here is an attempt to broaden the complex question of causality to several levels of explanation, beyond those of genes and kin selection, and acknowledge that several puzzles (like that of explaining the evolutionary origin of cooperation) are involved in accounting for the biology of friendship (cf. the review by Brent et al. 2013).

Anthropology

Phenomena of friendship seem to have an ambivalent status within anthropology, first because it is contested whether there are any universal cross-cultural facts to be learned

about friendship as a human relation, or if the very idea of any such traces of universality in the plural forms of friendship is just a cultural (i.e., Eurocentric, Western) construct; second because it is often important for fieldworking anthropologists to be 'on friendly terms' with their informants, to the extent that friendship is even considered by some to be a 'method' useful for fieldworking anthropologists and qualitative researchers (Tillmann-Healy, 2003). Perhaps this ambivalent status of friendship as both object and method helps explain why the anthropological literature on friendship remains "relatively sparse" (Brandt & Heuser, 2011, p.147) as noted by the authors of a comparative study of cross-cultural friendships and family ties, in New Zealand between members of the Māori and the European-Pākehā population, and in Java between inhabitants with a highly divers national and cultural backgrounds.

So in anthropology there is a high sensitivity to the fact that the ways the concept of friendship is understood in the West, as for instance articulated in its philosophy, may be specific to western societies at a certain point in time, expressing more an ideal than a reality, and that friend-like terms in other languages should be seen as highly situated culture-specific idioms demanding careful reading on a background of specific contexts. According to Torresan (2011), anthropologists see friendship in either of two ways. Some take friendship as a specific kind of relationship contingent on a Western notion of the self-conscious individual,

...a product of the transformations brought about by capitalism and its effects on the social codes and moral constraints that separate individuals from society and instil in them the modern distinctions between private and public domains. Being a personal and voluntary relationship comprising emotions that belong in a private place – the individual domain – friendship could only be performed in private by people who identified with each other. According to this model, friendship implies a relationship between social equals who can maintain a balanced reciprocity without the interference of material interests. (ibid., p. 238).

Other anthropologists see friendship as a social process constituted within different cultural contexts and therefore more contextual and diverse than the private, personal relationship rendered in the Western model. In this second view,

...this Westernised ideal type would be seen as a specific manifestation that does not hold true even in the very Western societies to which it has been associated. Here, friendship and the emotions it evokes are part of a multiplicity of interconnected relationships that cross the social and individual spheres. (ibid., p. 238)

In these different spheres, friendship is simply enduring personal ties in which affection and trust are key elements.

Both kind of views are represented in the collection of Bell & Coleman (1999); the second view being the most prevalent. E.g., in Brazil, according to Rezende (1999) friendship is not confined to a private sphere; rather, it cuts across all aspects of personal and social life. The term friendship is used to express feelings of affinity, affection, and trust towards people in similar or distinct social, economic, and racial locations, and combining ideas of individuality and choice with the need for relating to others in any given context. "Thus, rather than referring to equality, which is closely linked to a modern 'Western' conception of the person as having

identical rights, friendship should be seen as an idiom of affinity and togetherness" (Rezende, 1999, p. 93).

Philosophy

Also philosophers have played with the idea that friendship is a notion with no essential core meaning, but a term in language for different things that are related by what Wittgenstein called family resemblance, so that in studying instances of friendship we find "a network of features, which, while similar, are not present in the same degree or in the same combination in all instances of friendship", and "consequently we might not be able to identify a central sense of the term" (Lynch, 2005, p. 21; cf. Konstan, 1997, p. 18; and further developed in Digeser, 2013). Although this is a way of recognizing the multiple meanings (or uses) of the term, contemporary philosophers most often approach friendship as an ethical relationship (distinct from both erotic love and neighbourly love) that has been idealized, for good or worse, by many thinkers in the slim western canon of philosophical texts on friendship, e.g., Plato, Aristotle, Cicero, Seneca, Aelred, Aquinas, Montaigne, and Emerson (all represented in Pakaluk's (1991) collection). This tradition is indebted to Jewish, Catholic and Protestant discourses of love in its various forms. Reviewing another collection of philosophical treatments of friendship in a range of cultures, a commentator stated that "[w]hat certainly emerges from the essays on China, Japan, and India is that in these Oriental cultures there is apparently nothing to compare with the concentration on friendship as a major theme which characterizes all cultures influenced by the Graeco-Roman philosophy and Semitic religions (including Islam) at least up until modern times" (Burns 1997, p. 351).

The work of Singer (2009) illustrates some general aspects of contemporary philosophy of friendship: It is often embedded within a philosophy of love that distinguishes friendship as a particular kind of love. A philosophy of friendship needs to deal with the kinds of affections and attitudes involved, and the extent to which such affections overlap affections in other relation types. Furthermore, a philosophy of friendship does not need to be articulated as an explicit philosophy; also artistic work such as poetry or novels can express philosophical themes of friendship, and subsequently be used as a source for philosophical interpretation. There are no sharp borders between philosophy, literature studies and other approaches to friendship. A philosophy of friendship may try to categorize distinct types of the relation (e.g., ordinary vs. heroic forms). Often the very categorization is contested, but may serve as a preliminary tool to assess a variety of friendships. A philosophical taxonomy frequently takes form of a normative hierarchy, like the Aristotelian distinction between friends of utility, of pleasure and of virtue (in Aristotle, only friends of virtue are considered as 'real' friends in the fullest sense; yet friends of utility and of pleasure, though wanting in virtue, are still friends; such less supreme relations are still thought of as being formed by the supreme kind). Moreover, a historical dimension is often emphasized in an attempt to map major shifts in the conception and ideals of friendship. This empirical and sociological point is manifest in the structure of Singer's treatise covering both ancient, Christian-medieval and modern conceptions, and in his pluralist method of "philosophical history" tracing "the formation of ideals" (2009, v.2, pp. xx-xxi) to provide a conceptual analysis. Finally, contributions to the philosophy of friendship may be guided

by some overall philosophical conception or theory; in Singer's case his view of love as a dispositional attitude to action, and as a dual form of valuation comprising both creative-valuative bestowal of emergent value within the relation, and evaluative appraisal of useful or pleasurable existing value for the individual in question (2009, vol.1).

Contemporary accounts of friendship are often given by philosophers who, like Singer, along with conceptual analyses provide edifying or epistemic alternative models of friendship, for instance a model of friendship predicated on difference between the friends rather than similarity (Lynch, 2005), or a model that sees friendship 'from below' avoiding to romanticize or idealize the relation as something perfect, exquisite and very rare, and instead takes a more pragmatic stance to its inherent ambiguities (Vernon, 2005). A third model proposes to use ancient resources like the Homeric eposes and Greek tragedies to construct a classic-modern ethics of friendship in its aspects of self-discovery through receiving and accompanying the other through life as a person (Holst, 2013). A fourth account rejects a strongly individualistic conception of persons, often taken for granted in philosophy, and sees friendship as a kind of plural agency, analysing how our emotional connectedness with others is essential to our very capacities for self-determination (Helm, 2010).

Other Disciplines

This overview is far less than a review of all work on friendship in the social sciences and the humanities. One often finds a high degree of interconnectedness or 'internal' interdisciplinarity within each discipline. We have seen how some questions about modern vs. non-modern friendship forms recur in philosophy and anthropology, and also in sociology this is discussed. An example is the debate initiated by Giddens (1992) who claimed that in traditional societies, the available choices for individual action were mostly predetermined by the customs. In a post-traditional society people are less concerned with standards set by earlier generations, and they have more choices, due to flexibility of law and public opinion. Thus, individual actions now require more analysis and thought; society is more reflexive and self-observant, and this also applies to intimate relationships. Intimacy, in Giddens' optic, means "the disclosure of emotions and actions which the individual is unlikely to hold up to a wider public gaze" (*ibid.,* 138). This diagnosis, however, has been contested by sociologists who argue that "the constraints placed on the practices of friendship by the norms of heterosexuality, as well as the social divisions of gender, class and ethnicity, illustrate how far removed everyday friendships typically are from 'the pure relationship'." (Jamieson, 1998, p. 105). Needless to say, also the history, psychology, social psychology, and politics of friendship form important areas of research that cannot be commented upon here.

A SEMIOTIC CONCEPTUALIZATION OF FRIENDSHIP

Suggesting a semiotic perspective upon friendship serves two purposes here, related to interdisciplinarity and to cognition: (i) If the aim is to study friendship by integrating different comparative perspectives within an interdisciplinary field, it might help to have a more general idea about the relation of friendship, an idea broad enough to be worked out in many special ways, and simple enough to nourish a vision of continually making progress in understanding friendship dynamics (among

humans or robots) based upon such a guiding idea. (ii) Friendship in humans involves an advanced kind of social cognition whereby the very life of one agent is expanded through the relation to that of the friend – as one author noted, "each friend represents a world in us, a world possibly not born until they arrive, and it is only by this meeting that a new world is born."[5] This expansion also allows both friends to think together in dialogue, and thus expand each person's own reasoning – on self, identity, and Other within the relation, and on the surrounding world situating the friends.

In order to develop a more general conception of friendship with special affinity to its emotional and cognitive aspects, one option is to focus on the many ways that friendship is addressed, represented and interpreted, and see them all, though different, within the perspective of semiosis, the action of signs. Friendship as a form of love, a social bond concretely situated and embodied, a relation essential for personhood, for having a self, and for having a responsible belonging to a community; friendship as a term in language that is not fully possible without reflective uses of language – all these aspects could seen within a guiding schematic idea, that of sign action or the logic of signs. It may engage researchers from various disciplinary backgrounds to participate in fleshing out this idea in different ways. In the literature of friendship studies, and in the classical traditions of philosophy, history, sociology, etc., there are resources for such an inquiring venture.

A suggestion for further exploration could be that friendship is a relation with an irreducible triadic structure, basically similar to the sign relation in Peirce's semiotics, the general logic of sign action. In this perspective, friendship as a relational category can be conceived as a complex relational sign-like structure, which is triadic and thus structurally richer than mere dyadic relations. A semiotic-pragmatic first take on a conceptualization of a friend could be:

F1: A friend is a First (a *Self*) which stands in such a relation to a Second (an *Other*), as to be capable of determining a Third (called their *Friendship*) to assume the same relation to the Other in which it (the Self) stands itself to the same Other.

A way of reading this would be to see the Third as the normative component of a mediational structure, for instance, some guiding principles that can subsume individual actions under a set of norms, the idea of friendship (a complex sign that may consist of several ideas in interaction). To emphasize that the First within the relation is not simply the total psychic self of a person as such, but a self in the process of presenting and interpreting itself and being interpreted by another, we may call that processual representation of the self for *Another-Self* (to hint at Aristotle's original notion of the friend as another self). Furthermore, as the other as a Second is not any other but an existing person addressed as a 'you' in a relation that is, or is about to become, a mutual one, we could call it the *Other-You*. Thus we arrive at an expanded formulation:

F2: A friend, or *Another-Self*, is a First which stands in such a genuine triadic relation to a Second, called its *Other-You*, as to be capable of determining a Third, called their *Friendship*, to assume the same triadic relation to the Other-You in which it stands itself to that same Other-You.

The triadic relation is genuine, i.e., its three members are bound together by it in a way that does not consist of any complexus of just dyadic relations. This is in formal analogy with Peirce's 1902 definition of a sign:

S1: A sign, or *Representamen*, is a First which stands in such a genuine triadic relation to a Second, called its *Object*, as to be capable of determining a Third, called its *Interpretant*, to assume the same triadic relation to its Object in which it stand itself to the same Object. (CP.2.274 [my emphasis, CE.])

Implied by the analogy is that friendship, belonging like signs to the category of mediation, or Thirdness, is an interpretative evolving relation of communication allowing for a joint kind of distributed cognition where the friends who follow some parts of their life together also partly think together in joint communication. Friendship as an interpretant (a dynamic complex triadic structure) in the sense of Peirce does not have to be an explicit instance or process of interpretation, it is rather the joint trajectory of friendship as a little community that translates two individual selves into an interlaced unit, an evolving habit of dialogic action, influenced by the enacted norms of friendship defining the character of the relation.[6] A potential interpretive activity is presupposed by the concept of signhood, but the subject of that activity does not have to be a single mind. The interpreter might be, but need not be an individual, and many places Peirce locates the interpretive activity in the community (Skagestad, 2004, p. 245). The Peircean approach allows for a more general account of the 'plural agency' that one finds in true friendship,[7] an agency that has a triadic structure even for what seems to be just two friends in a so-called 'friendship dyad'. Friendship in general can never be a relationship between just two individuals, as it always involves a third instance. This third instance is mediational, and not only of an intellectual character, but also related to norms, values, affections, or what we could call the emotional interpretant, understood here as being the first proper significate effect of friendship (cf. Peirce, CP.5.475).[8]

This semiotic notion of friendship could be further developed, as what we have indicated is not only true for a single triadic unit of two friends in a friendship. Such a unit has implications for the wider community, and the next step would be to inquire into the relation between the friends and this wider community. Such an inquiry can take many forms, but the point in relation to robotic friendship, as we shall argue below, is that such relationships need to be seen in a wider context of human communities.

SOCIETAL EMBODIMENT OF FRIENDSHIP

As we saw, both in anthropology, philosophy and sociology, a special form of friendship – variously called 'western', 'modern', or 'the pure relationship' – is discussed and contrasted with more casual and broader uses of the term in a variety of contexts (for kin, patrons, etc.). The modern notion of friendship (that is not completely absent in ancient sources, cf. Aristotle on 'perfect' friendship) is characterized by a set of features, addressed differently by philosophers, sociologists, anthropologists, etc. that may be listed like this, in no particular order:

- The relation has a private rather than public character, and is only quasi-institutional ('institutional' only in the sense of a conventional accept of its contrast to more

institutionally entrenched and legally regulated relationships such as marriage or parenthood);
- Is affectionate and to some extent preferential and exclusive – the particular other person means something existentially special to you, and unless your heart is infinite, the number of people to whom you can have this kind of relation is finite (and less than the number of 'friends' you can have on Facebook);
- Is constituted by liking and caring for the person for his or her own sake (the relation is not primarily entered for some instrumental reason, though benefits from the relation are not excluded) – there is an honest wish to see the friend thrive and flourish (so as a form of love the relation is not possessive);
- Is mutual, dialogic, and with some degree of realistic assessment of its nature, whether passionate or calm (there is no unrequited friendship – infatuations and unrequited love are a different domain);
- Is constituted by a sharing of important parts of the life of the two friends, shared doings, exchanges of thoughts and experiences, and thus also investigative, open to novelty, curious of better knowing the world, the other self, and how the other sees oneself;
- Characterized by confidentiality and trust, making possible the sharing of secrets, disclosing things to the friend that one normally would keep outside the public sphere;
- Entered voluntarily and based upon mutual respect and regard for similarities as well as differences between friends;
- Presupposing a surplus of time and material goods, i.e., characterized by affordability and generosity (but not being focused upon or constituted by any needs for political or material of support in the fight for survival or social advancement);
- Never perfect, and accepting imperfections both in the relation and in the friend, but reflective about gaps between reality and ideality; and vulnerable to the breaking off the relation by one of the friends.

These features, although listed separately, are partly interdependent. In this notion, friendship emerges as a norm-governed relation that is contingent upon the existence of certain emotional, cognitive and social boundary conditions that make such a relation possible at all. One very material condition, as mentioned, is a surplus of time, curiosity, and capacity to afford a free space for actions not primarily guided by concerns of self-defence or survival. Both the 'guest-friendships' related in texts from the ancient Greece (Holst, 2013; Konstan, 1997) and the institution of 'big-manship' known from the Icelandic sagas (Durrenberger & Pálsson, 1999) are examples of such 'strategic' or political friendships dictated by a sheer need to have some reliable allies in a rough social world with no states, no social or political security and no strong institutions that could guarantee individual rights or a minimum of law and order.

So at a relatively recent societal level of human life, a special kind of friendship relation (in lack of better words called 'modern') – that includes certain forms of social cognition related to identity, interpersonal understanding and self-understanding – seems to have emerged based upon certain material preconditions that are also of a macro-historical kind. Anticipations of this relation may have been partly realized by the elites of ancient societies, but only later, with the generalization to broader groups of a

society of the material conditions needed to more fully realize this interpersonal relation, it could take a form that would be recognized by a much higher percentage of the world population (and eventually denoted as 'true' or 'close friends', 'soul mates' etc.).

It is obvious that even though some animals, like olive baboons as we saw, may have 'friends' (demanding some form of social cognition such as recognizing relationship types among other members in the group), such a relation is of a very different kind than those more complex ones involving humans, of which modern friendship takes a distinct form. This brings into focus semiotic analyses of "semiotically competent body types" (Stjernfelt, 2007, p. 257) or different "forms of embodiment" (Emmeche 2007, p. 468). The important point here is not the exact number of embodiment types (or biosemiotic thresholds of increasing complexity) but to analyse a continuity of increasingly complex forms of semiosis and acknowledge the existence of different thresholds, such as the one between the shared attention upon some types of relationships, as in the baboons (Seyfarth & Cheney, 2012), and more complex forms depending upon language and institutions and also the formation in language of a concept about such a relation. This marks the threshold to a particular *anthropic* form of embodiment, universally characteristic of humans as creatures forming distinct language-dependent socio-cultural groups (as humans are "the abstract animal"; Stjernfelt, 2007, p. 241ff). In the case of modern friendship, this form is related to a *societal* form of embodiment (Emmeche, ibid., p. 471ff), tied to the emergence of societies with intense division of work and different social institutions, as only they enable a distinction between private and public spheres, and are productive of a degree societal wealth and surplus time as necessary boundary conditions for this kind of friendship. In the political sphere 'friendship' may still have a survival character of forming strategic alliances, while in the private sphere, less 'strategic' forms of friendship can thrive. Thus, a long civilizing process forming human social behaviours and emotions (Elias, 2000) leads to increasing degrees of self-control and differentiation of types of interpersonal relationships. In this process, modern friendship can be seen within a macro-historical framework of emergent levels of embodiment that differentiate, first, a universally human *anthropic* plurality of friendship types in distinct cultural forms, and secondly, in some *societal* contexts, creates particular modern forms of friendship.

EMBODIED ROBOT FRIENDSHIP?

The work of Peirce allows for a further reflection on the relation between human self-control and friendship as facilitating such a regulative habit. Self-control as a general phenomenon depends upon the organism's semiotic capacity. As a non-dualist synechist thinker Peirce saw a continuity of levels of control within an organism such as a human being. There are

...modes of self-control which seem quite instinctive. Next, there is a kind of self-control which results from training. Next, a man can be his own training-master and thus control his self-control. When this point is reached much or all the training may be conducted in imagination. When a man trains himself, thus controlling control, he must have some moral rule in view, however special and irrational it may be. But next he may undertake to improve this rule; that is, to exercise a control over his control of control. To do this he must have in

view something higher than an irrational rule. He must have some sort of moral principle. This, in turn, may be controlled by reference to an esthetic ideal of what is fine. There are certainly more grades than I have enumerated. Perhaps their number is indefinite. The brutes are certainly capable of more than one grade of control; but it seems to me that our superiority to them is more due to our greater number of grades of self-control than it is to our versatility. (CP.5.533)

In this moral aspect of self-control, friendship and other social relations play a role, as the social norms and sociability in general teach the individual to aim at diminishing the distance between an ideal (such as "of what is fine") and the real actions performed by the agent, and also to reflect critically upon rules to improve them. This would also apply to "autonomous robots" – which perhaps ironically would have to be just as interdependent upon a community, as humans are, to be considered just as 'autonomous' as humans, being able to exercise control over their control of control. The robots we know of today are only quasi-autonomous in the sense of being "hooked-up in socio-technical networks, including human technicians to keep them functioning" (Emmeche, 2007, p. 477). The robots of today are being made (cf. Asimov's rules) to *act friendly* towards humans. But it is far from clear to what extent they can enter into *relations of friendship* unless also having the same emotional, cognitive and social capacities for sign interpretation that humans have. They may be programmed to show a kind of friendly behaviour or seek out allies to collaborate together, perhaps similar to the behaviour of the olive baboons. We have not yet seen higher levels of self-control in robots, nor signs of friendship – neither on the universal human level of culturally specific forms of anthropic embodiment nor on the societal level where one of the forms of friendship is the modern one, emphasizing self-disclosure, intimacy, and reflexive exploration of identity. Of course, it is difficult to forecast how complex behaviour that robots (equipped with clever machine leaning algorithms for adapting interactively to humans and other robots) may achieve in the future. One thing to notice is that just like the brutes in Peirce's quote, the robots will certainly be capable of more than one grade of control. And similarly it seems to us that our superiority to robots is more due to our greater number of grades of self-control and semiotic competencies than it is to our versatility, adaptability and multiplicity of specific cultural adaptations. However, the human versatility, also indicated by the high variety of friendship forms, may be seen exactly as an expression of the semiotic freedom made possible through higher-order controls and semioticity.

CONCLUSION

We have used the interpersonal relation of friendship in this context as a conceptual vehicle for framing the question about the distinctiveness of human cognition and emotion in relation both to other natural systems (such as non-human primates) and to artificial systems build by humans (such as robots). Often when embodiment is discussed in relation to cognition and action, the focus has been on whether robots could implement semiotic capacities similar to animals for their adaptive behaviour. By choosing a relation that seems to be distinctively human, although with evolutionary protoforms in animals, the full spectrum of forms of embodiment is brought to attention, including specific human forms. This allowed

us to approach the question of robotic friendship in a more precise way: Whether robot-robot or human-robot friendships are possible will depend upon the chosen model of friendship, and whether an artificial system can emulate such a model. Here, an interdisiplinary perspective upon friendship including the social sciences and the humanities is indispensable. Taking a 'modern' model of friendship as an example, robotic friendship will demand higher-order forms of self-control than those we know how to emulate in the artificial systems of today (which does not make it impossible *per se*). Furthermore, the question cannot be answered within a purely individualist framework, so easily presupposed talking about 'autonomous robots', because friendship, as seen in a semiotic perspective, constitutes a little moral and dialogic community in interaction with norms and values of the wider community. Robotic friendship, if it is to be realized, cannot be conceived as a closed dyad, but only as triadic, social and societal. Perhaps this applies also to the robot as an entity that is not simply a thing, but a product of collective human labour and ingenuity.

ACKNOWLEDGMENT

The research was supported by the University of Copenhagen and the Velux Foundation grant no. 437810 ('Humanomics'). Thanks are due to David Budtz Pedersen, Frederik Stjernfelt, Simo Køppe and the other members of the Humanomics research group; and to Maria Eunice Quilici Gonzalez, Mariana Claudia Broens, Maria José Vicentini Jorente, Susan Haack, Henrik Zinkernagel, Rasmus Grønfeldt Winther, Theresa Schilhab, Di Ponti and Jon Nixon for their comments, help, suggestions, critique and support.

REFERENCES

Bell, S., & Coleman, S. (Eds.). (1999). *The anthropology of friendship*. Oxford, New York: Berg.

Brandt, A., & Heuser, E. A. (2011). Friendship and socio-cultural context. Experiences from New Zealand and Java / Indonesia. In Descharmes, B. et al. (Eds.): *Varieties of Friendship. Interdisciplinaty perspectives on social relationships* (pp. 145-174). Göttingen: V&R unipress.

Brent, L. J. N., Chang, S. W. C., Garriépy, J.-F., & Platt, M. L. (2014). The neuroethology of friendship. *Annals of the New York Academy of Sciences*, *1316*(1), 1–17. doi:10.1111/nyas.12315 PMID:24329760

Burns, R. (1997). Friendship (a review of Leaman, O. (Ed.). 1996: *Friendship East and West: Philosophical Perspectives.* Curzon Press). The Expository Times 108: 350-351.

Cocking, D., & Kennett, J. (1998). Friendship and the self. *Ethics*, *108*(3), 502–527. doi:10.1086/233824

Dagg, A. I. (2011). *Animal Friendships*. Cambridge, UK: Cambridge University Press. doi:10.1017/CBO9780511794155

Digeser, P. E. (2013). Friendship as a family of practices. *AMITY: The Journal of Friendship Studies*, *1*, 34–52.

Durrenberger, E. P., & Pálsson, G. (1999). The importance of friendship in the absense of states, according to the Icelandic sagas. In Bell, S. & Coleman, S. (Eds.). (1999). *The anthropology of friendship* (pp. 59-77). Oxford & New York: Berg.

Elias, N. (2000). *The civilizing process* (Revised edition). Oxford: Blackwell.

Emmeche, C. (2007). A biosemiotic note on organisms, animals, machines, cyborgs, and the quasi-autonomy of robots. *Pragmatics & Cognition*, *15*(3), 455–483. doi:10.1075/pc.15.3.06emm

Emmeche, C. (in prep.): Interdisciplinary challenges in the study of friendship.

Gallistel, C. R. (1990). Representations in animal cognition: An introduction. *Cognition*, *37*(1-2), 1–22. doi:10.1016/0010-0277(90)90016-D PMID:2269003

Giddens, A. (1992). *The Transformation of intimacy. Sexuality, love and eroticism in modern societies*. Cambridge, UK: Polity Press.

Helm, B. W. (2010). *Love, friendship, and the self: Intimacy, identification, and the social nature of persons*. Oxford: Oxford University Press. doi:10.1093/acprof:oso/9780199567898.001.0001

Henzi, S. P., & Barrett, L. (2007). Coexistence in female-bonded primate groups. *Advances in the Study of Behavior*, *37*, 43–81. doi:10.1016/S0065-3454(07)37002-2

Heyes, C., & Huber, L. (Eds.). (2000). *The Evolution of Cognition*. Cambridge, Mass.: MIT Press.

Holst, J. (2013). *Venskabets Etik. En antik-moderne idéhistorie* [The Ethics of friendship. An ancient-modern history of ideas]. København: Forlaget THP.

Jamieson, L. (1998). *Intimacy. Personal relationships in modern societies*. Maldon, MA: Polity.

Konstan, D. (1997). *Friendship in the Classical World*. New York: Cambridge University Press. doi:10.1017/CBO9780511612152

Lewis, D.M.G., Conroy-Beam, D., Al-Shawaf, L., Raja, A., DeKay, T., & Buss, M., D.M. (2011). Friends with Benefits: The evolved psychology of same- and opposite-sex friendship. *Evolutionary Psychology*, *9*(4), 543–563. PMID:22947994

Lynch, S. (2005). *Philosophy and Friendship*. Edinburgh: Edinburgh University Press. doi:10.3366/edinburgh/9780748617272.001.0001

Pakaluk, M. (Ed.). (1991). *Other selves. Philosophers on friendship*. Indianapolis: Hackett.

Peirce, C. S. (1931–58). *Collected Papers of Charles Sanders Peirce.* Vol. 1–6. [Hartshorne, C. & Weiss, P. (Eds.); vols. 7-8, Burks, A.W. (Ed.)]. Cambridge, Mass.: Harvard University Press. (References: CP, followed by volume and paragraph number)

Rezende, C. B. (1999). Building affinity through friendship. In S. Bell & S. Coleman (Eds.), *The anthropology of friendship* (pp. 79–97). Oxford, New York: Berg.

Seyfarth, R. M., & Cheney, D. L. (2012). The Evolutionary Origins of Friendship. *Annual Review of Psychology*, *63*(1), 153–177. doi:10.1146/annurev-psych-120710-100337 PMID:21740224

Silk, J. B. (2003). Cooperation without counting - the puzzle of friendship. In P. Hammerstein (Ed.), *Genetic and Cultural Evolution of Cooperation*. Cambridge, Mass.: The MIT Press.

Singer, I. (2009). *The nature of love* (Vol. 1-3). Cambridge, Mass.: The MIT Press.

Skagestad, P. (2004). Peirce's semiotic model of the mind. In C. Misak (Ed.), *The Cambridge Companion to Peirce* (pp. 241–256). Cambridge: Cambridge University Press. doi:10.1017/CCOL0521570069.010

Stjernfelt, F. (2007). *Diagrammatology. An Investigation on the bordelines of phenomenology, ontology, and semiotics*. Dordrecht: Springer.

Tillmann-Healy, L. M. (2003). Friendship as method. *Qualitative Inquiry*, *9*(5), 729–749. doi:10.1177/1077800403254894

Tooby, J., & Cosmides, L. (1996). Friendship and the banker's paradox: Other pathways to the evolution of adaptations for altruism. *Proceedings of the British Academy*, *88*, 119–143.

Torresan, A. (2011). Strange bedfellows: Brazilian immigrants negotiating friendship in Lisbon. *Ethnos: Journal of Anthropology*, *76*(2), 233–253. doi:10.1080/00141844.2010.544854

Vernon, M. (2005). *The philosophy of friendship.* Houndmills, Basinstoke: Palgrave Macmillan. (2nd ed. published 2010 as *The meaning of friendship,* same publisher). doi:10.1057/9780230204119

ENDNOTES

1 The entry on Tilden (http://en.wikipedia.org/wiki/Mark_W._Tilden), assessed December 2013.

2 See http://en.wikipedia.org/wiki/Tilden%27s_Law_of_Robotics, assessed December 2013.

3 See http://en.wikipedia.org/wiki/Three_Laws_of_Robotics, assessed December 2013.

4 In the treatise on love by Singer (2009) the notion of love includes the love of things, of persons, and of ideas. But 'loving' or 'liking' things, such as a place, is a non-mutual relation very different from the core notion of friendship between two relatively autonomous agents.

5 Anaïs Nin, March 1937 (in: Gunther Stuhlman (Ed.) 1967. *The Diary of Anaïs Nin, Vol. 2: 1934-1939* (p. 193). Orlando, Florida: Harcourt Brace & Company)

6 The semiotic model of friendship is compatible with an analysis of the self in friendship given by Cocking & Kenneth (1998), stating that "as a close friend of another, one is characteristically and distinctively receptive to being directed and interpreted and so in these ways drawn by the other", thus on account of this receptivity to my friend's interests and interpretations of my traits, "I develop

in a way that is particular to the relationship; the self my friend sees is, at least in part, a product of the friendship." On this account, the self is a dynamic and, we must add, semiotic phenomenon too, viz. "the self in friendship is, in part, a thing that is constituted by and particular to the friendship" (*ibid.*, p. 510).

[7] Compare Helm (2010) whose account of plural agency is Davidsonian.

[8] I thank professor Ivo Assad Ibri for suggesting the relevance in this context of Peirce's notion of the emotional interpretant and the ground of signs. I also thank João Queiroz, with whom I collaborate to develop this notion further, for the correspondence.