

## Semiotics in animal socialisation with humans

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The Five Freedoms<sup>1</sup> that represent the basic needs of all captive animals could be interpreted very differently depending on the cultural and institutional backgrounds of the people involved. Some of the many scientists who have drawn attention to this problem are animal behaviourists Geoff Hosey, Vicky Melfi and Sheila Pankhurst. In their book *“Zoo Animals: Behaviour, Management and Welfare”* (2009), they offer a more objective and specific approach to these Five Freedoms. In addition to pointing out the importance of the animals’ ability to thrive in captivity and viewing the behaviours of the animals’ wild conspecifics as a template for good welfare (Hosey *et al.* 2009: 218), they ask for more empathy from animal caretakers. Namely, they emphasise considering animals’ subjective experiences and emotions, and “drawing analogies from ourselves about the needs and abilities of other animals” (Hosey *et al.* 2009: 218). This shift of thoughts, conjointly being suggested and supported by many scientists, has brought up a brainstorm on new ideas to improve animal welfare from the minimum standards to the highest possible levels. These ideas vary from new environmental enrichment methods and training plans to enclosure designs and husbandry routines. One of the rather novel methods of improving animal welfare is the socialisation of captive animals with humans. This process certainly requires focusing on the individual animal (as a subject), considering its emotions, relationships, and consciousness – its subjective lifeworld (Umwelt).

There exist several types of captive animals, such as pets, livestock, laboratory and research animals, working and performing animals, circus animals, and residents of zoos and aquariums. Although proper socialisation with humans is important for the welfare of all captive animals (including dogs, horses or cattle), it is much more difficult and crucial with captive wild animals. Namely, domesticated animals have gone through a long process of selective breeding towards being suitable for living with humans and are, therefore, genetically prone to be more accepting and less fearful of humans. This means they are genetically

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<sup>1</sup> The Five Freedoms stated by the British government Farm Animal Welfare Advisory Committee in 2012 (originally announced in 1965) are: Freedom from Thirst, Hunger and Malnutrition; Freedom from Discomfort; Freedom from Pain, Injury, and Disease; Freedom to Express Natural Behaviours; and Freedom from Fear and Distress. Reference: Farm Animal Welfare Council 2012. Five freedoms. [WWW] <http://www.fawc.org.uk/freedoms.htm> (16.04.2014).

predisposed to be easier to socialise (Goodmann 2015).<sup>2</sup> Also domestic animals usually receive some amount of socialisation as part of their upbringing (*ibid.*), while the proper socialisation of captive wild animals is quite exceptional. For this reason, the following chapter concentrates on the socialisation of captive wild animals (taking the zoo as an example), although the principles of the process would be similar with domesticated animals.

The goal of socialisation of an *ex situ* wild animal with humans is to reduce the animal's fear of humans *as much as possible* and thus make the animal more comfortable living in a human environment. While fear of humans is a crucial survival strategy in the wild, it is not relevant (and definitely not in the animal's best interest) in captivity. An animal that is not suffering<sup>3</sup> from fear exhibits a much wider and more natural range of behaviours compared to an unsocialised animal whose whole behavioural repertoire is influenced by fear. Considering the above-described requirements, socialisation has a doubly beneficial effect on improving animal welfare as it decreases the animal's fear and enables it to exhibit a wide range of natural behaviours (with the exception of fear of humans).

Although fear is to some extent learned, animals' fear of humans has been proven to be species-specific (Carlstead 2009: 600). It depends on the essence of the species' history of interactions with humans as well as its ability to recognise man as an ecosystem's top predator. Therefore, it is most important to socialise animal species that have a genetically induced high fear level of humans. These would include large carnivores (e.g. wolves and big cats) but also other species (e.g. foxes), whom people have been extensively hunting for centuries, in many cases almost to extinction. These animals' predecessors who feared people had a better chance of surviving and were thus selected. Over thousands of generations, these species have developed a genetically forwarded fear of humans, which makes it very difficult for them to adapt to life in captivity. These animals would be suffering from the stress of being surrounded by visitors<sup>4</sup> and handled

<sup>2</sup> Goodmann, Patricia A. 2015. Why Hand Raise Captive Wolves? [WWW] <http://www.everythingwolf.com/news/readarticle.aspx?article=38> (31.07.2015).

<sup>3</sup> Not just any negative subjective state means the animal is suffering. British animal behaviourist Christopher John Barnard has distinguished suffering as "a causal mechanism that triggers adaptive aversive responses in the animal" (Barnard 2004: 213). He has also explained that negative functional consequences for the individual can result in one of two ways: from "adaptive self-expenditure, where negative subjective states reflect adaptive cost-gauging" (for example fatigue while foraging or pain indicating an injury) or from "non-adaptive self-expenditure" (for example hunting fruitlessly in an inappropriate environment or mounting an ineffective immune response against a novel parasite) (Barnard 2004: 214). It is important to comprehend that only the non-adaptive self-expenditure qualifies as suffering (*ibid.*), whereas short-time stress could even be good for the animal.

<sup>4</sup> The widely held view according to which zoo animals habituate with the public and no longer respond to their presence is now abandoned (Hosey *et al.* 2009: 479). Studies have shown that the effect of zoo visitors on animals is generally negative, resulting in displays of behaviour that are associated with stress response, such as stereotypies, increased intraspecific and interspecific aggression, increased activity, and, sometimes, decreased affiliative behaviours (Hosey *et al.* 2009: 475–476).

by caretakers. Also they would be too fearful to participate in the majority of enrichment programs (or they would rather gain negative experiences from it). The problem would be even more severe if the species is known for being neophobic (e.g. wolves, foxes). Such cases usually result in the animals' stress response, stereotypical behaviour, increased aggression towards conspecifics and people (Hosey *et al.* 2009: 475–476), extensive hiding behaviours, (often self-destructive) attempts to escape, etc. Not only does it reflect poor welfare, but this scenario is also not at all in accordance with the accredited zoo's purpose of educating people about the animals. Even more, it does not help with research on the species' natural behaviour nor with conservation aims, considering that knowledge of the species' natural behaviour is the foundation of most conservation efforts. Therefore, finding ways to make visitors (more precisely, people in general) less frightening and more enriching for animals is gradually becoming more relevant in zoo studies (Hosey *et al.* 2009: 479).

Although the idea of socialisation – that is, the understanding of the necessity to reduce the captive animal's fear of humans – has been well-known for a long time (Hediger 1950: 19), the concept of socialisation as an animal welfare program is relatively young.<sup>5</sup> In the scientific literature of animal studies, the existing definitions of socialisation are remarkably ambivalent (often contradictory) and insufficient. For example, Hosey, Melfi and Pankhurst have defined socialisation as “the process, where animals routinely interact with people and become familiar with them, leading to changes in the human–animal relationship” (Hosey *et al.* 2009: 232). An American canine behaviourist, Barbara Handelman, defines the socialisation of dogs as “a systematic process of exposing a pup to a wide range of dogs, people, and places. There is a very narrow window for proper socialisation” (Handelman 2008: 243). The scientists of Wolf Park (Indiana, USA), where wolves, coyotes and foxes have been socialised with humans for over 40 years, define socialisation in various ways, such as “the process of making an animal more suitable to live with humans” (Addams, Miller 2007: 70) or “to rear, or interact with it in such a way that it can use its repertoire of social signals with

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<sup>5</sup> To the best of my knowledge, one of the first scholars studying the socialisation of captive wild animals with humans explicitly for animal welfare purposes were the ethologists Dr. Erich Klinghammer and Pat Goodmann from Wolf Park (Indiana), who started their research in the socialisation of gray wolves in 1972. Previously, socialisation of some kind had been practiced by some zoos and sometimes even scientifically studied but usually for different reasons than improving animal welfare. For example, ethologist Konrad Lorenz studied the process of imprinting and juvenile development. Biologist Heini Hediger talked about the necessity of reducing zoo animals' fear of humans (to improve animal welfare) but not quite in the methods or terms of socialisation described in this article. As far as I am concerned, the only scholars who socialised animals for their research before Wolf Park were ethologist Erik Zimen, who socialised wolves, and ethologist Irenäus Eibl-Eibesfeldt, who socialised wolverines. In his book *The Wolf, a Species in Danger* (1981), Erik Zimen referred to some benefits of socialisation to animal welfare.

other animals [*humans*]]”<sup>6</sup> (Goodmann 2011).<sup>7</sup> In my opinion, although being true, none of the mentioned definitions adequately and sufficiently represent the true essence of socialisation – reduction of the animal’s fear of humans by changing the perception of humans in the animal’s *umwelt*. Nor do they provide understanding of the relations of socialisation and other types of human–animal relationships occurring in the zoo.

Socialisation is truly a matter of navigating in the fields of communication, interpretation, and relationships. As such, it is essentially a semiotic problem. In this chapter, I will introduce the semiotic mechanisms and methods of socialisation and, by doing that, attempt to clarify the definition of socialisation and its position in the discourse of human–animal relationships. Besides scientific literature, the chapter is based on my master’s thesis about the case-study of socialising red foxes (Kiiroja 2014), the knowledge I gained from working with socialised wolves during my internship at Wolf Park, my experience in socialising a litter of European grey wolves in Germany, and, above all, the priceless wisdom of Runar Næss (Animal Zoolution, Norway) and Pat Goodmann (Wolf Park, USA), experts in wolf behaviour and socialisation.

## 1. The semiotic ontology of socialisation of captive wild animals with humans

As previously mentioned, an individual-oriented approach to the welfare of zoo animals requires comprehension of the animal’s *umwelt*. Considering the animal’s *umwelt* is, in fact, an implicit task already in animal behaviour studies (although it has not always been understood as such). American biopsychologist Gordon M. Burghardt has even suggested the attempt to comprehend an organism’s private experience (including its subjective perceptual world, mental states, and subjective responses) to be the fifth aim of ethology<sup>8</sup> (Burghardt 1997: 276). When it comes to the process of the socialisation of captive wild animals with humans, *umwelt* consideration is inevitable and, indeed, of the highest importance.

<sup>6</sup> Although animals can be socialised to many species other than their own, this chapter concentrates on socialisation with humans.

<sup>7</sup> Goodmann, Patricia A. 2011. Explain the difference between an imprinted or socialised animal, or are they the same thing? [WWW] <https://theiwrc.org/archives/1647> (31.07.2015).

<sup>8</sup> The fifth aim of ethology refers to the four guiding questions about animal behaviour proclaimed by the honoured ethologist Niko Tinbergen in 1963: what is the function of the behaviour, what is the cause of the behaviour, what is the ontogeny of the behaviour, and what is the phylogeny of the behaviour (Tinbergen 1963: 410–433).

Umwelt, as a concept first developed by Baltic-German biologist and semiotician Jakob von Uexküll, could be explained as the totality of an organism's perceptual and effector realms, i.e. the sum of all sign processes in which the organism participates as an interpreter (Uexküll 1982: 66–67). To put it simply, an umwelt is the semiotic world of an organism (Kull, Torop 2003: 414). Uexküll explained that through every perception act, “the neutral object is transformed into a meaning-carrier, the meaning of which is imprinted upon it by a subject” (Uexküll 1982: 62). Not only does this process depend on the animal's sense organs, but also on the individual's past and current personal experiences. Therefore, animals obtain a very selective and subjective view of the world around them.

How does the process of interpretation work? It could be explained with the mechanism of a functional circle, which basically means that every perception begins with a perceptual cue and ends by producing an effector cue on that meaning-carrier (Uexküll 1982: 66). While Uexküll claimed the most important general functional circles in most animals' umwelten to be the circles of physical medium (i.e. the surrounding environment), food, enemy, and sex (Uexküll 1982: 67), a Norwegian philosopher and biosemiotician Morten Tønnessen adjusted them to physical medium, food/resources, enemy and *partner* (Tønnessen 2009: 54; Fig.1). This adjustment is important when taking into consideration the various kinds of social relationships, besides the reproductive ones, that function as partnerships in the animal's umwelt.

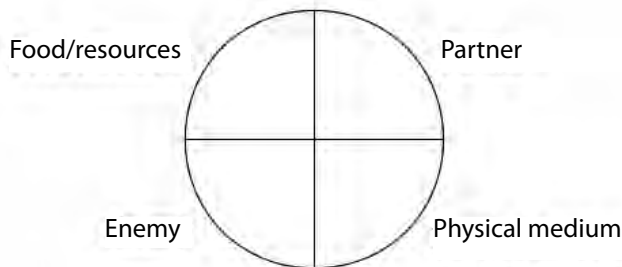


Figure 1. Phenomenal fields (Tønnessen 2011: 44)

Tønnessen has brought out the concept of ontological niche, inspired by Danish biosemiotician Jesper Hoffmeyer's theory of semiotic niche. While Hoffmeyer's semiotic niche involves all the interpretive challenges offered for the animal by its ecological niche (Hoffmeyer 2008: 13), Tønnessen's ontological niche involves the set of the animal's active relationships at the current moment of the history of nature (Tønnessen 2009: 54). The ontological niche, therefore, determines the area in the phenomenal world occupied by the animal. Tønnessen has depicted

the ontological niche as phenomenal fields, where one animal's phenomenal fields overlap with those of the other animal with whom it is in interaction (Tønnessen 2009: 54). Such an ontological map sufficiently describes the various possibilities of human-animal relationships (as well as animal-animal relationships).

Adapting this theory helps us understand the essence of socialisation. An animal that needs to be socialised is fearful of humans to begin with – man occupies the phenomenal field of enemy in this animal's *umwelt*. In order to properly socialise the animal, its *umwelt* needs to be reconstructed by shifting the position of man from the phenomenal field of enemy to that of partner (Fig. 1). However, in practice, this reconstruction is not that simple. It seems to me that there exist many transition-phases, such as the “rather negative significance”, “neutral significance”, “rather positive significance” of people, before people in general obtain a meaning-carrier of a partner in the animal's *umwelt*. To make it even more complicated, it so happens that some people, who have a strong positive relationship with the animal, are considered as partners, whereas unfamiliar people could still, by default, carry a meaning of an enemy.

The degree to which the animals are socialised is a matter of the zoo's priorities. There exist three basic levels of socialisation, although only two of them should be recommended in zoos when high animal welfare is a goal. First, an animal could be socialised to one person only. It will still have a relatively high fear level of other keepers as well as of visitors, which makes the beneficial effect of socialisation rather low. Additionally, the animal could suffer under severe stress should the one caretaker quit working with the animal. A second and better way (animal welfare wise) would be socialising the animal to the zoo staff. In this case, the animal would have positive relationships with the zoo workers, but it could still be fearful of visitors. The third way would be general socialisation. Here, the animal would be socialised to all people. This would require multiple positive relationships with the zoo staff as well as actively including positive interactions with visitors in the process of socialisation so that, eventually, visitors (at least the ones coming into the enclosure) would carry a positive significance for the animal and be perceived as enriching (Næss, personal conversation, 30.03.2012).

At this point, it becomes indispensable to explain the difference between relationships and significance. Namely, a positive significance of a human for the animal does not automatically mean that there exists a positive human-animal relationship (or any relationship at all) between them. A relationship requires two individuals to have a “history of interactions between them that lead to a greater predictability about the outcome of future interactions; in other words, they get to know what each other is likely to do” (Hosey *et al.* 2009: 483). Deriving from that definition, in this chapter the development of human-animal relationships is considered possible between the animal and people who regularly spend time with it. A visitor-animal relationship as such does not exist (apart from the exceptional cases where the visitor frequently and regularly visits a zoo animal

and interacts with it). A visitor can have positive or negative significance for the animal according to how the animal perceives it, but (s)he does not have a relationship with the animal. However, it is important to understand that the relationships that the animal has with its caretakers heavily influence the animal's perception of zoo visitors as well as its experience of interaction with them (Hosey *et al.* 2009: 487).

With this in mind, it is comprehensible that the third way of socialisation – that of general socialisation – is the most favourable for umwelt-reconstruction. The first two methods change the meaning-carriers of the people with whom the animal has a positive relationship to that of partner; however, the general public may still remain in the phenomenal field of enemy, and the animal may still be stressed by unfamiliar people. This is so because, in such cases, the animal's socialisation with humans only includes the people who look and behave a certain way (the way of the familiar keeper or the zoo staff). In general socialisation, the umwelt-reconstruction is much more encompassing as positive partnership-based relationships, positive visitor interactions, and proper desensitization (which will be discussed later in this chapter) enable the animal to perceive even unfamiliar people on a scale from neutral to positive (Fig. 2). Only then can one say that humans (in general) occupy the phenomenal field of partner rather than of enemy in the individual animal's umwelt. This is the level of umwelt-reconstruction, set as a goal for proper socialisation in the context of this chapter.



Figure 2. Generally socialised zoo wolves relaxing with a handler in front of visitors in a 10000 m<sup>2</sup> enclosure.

## 2. Human–animal relationships involved in socialisation from the perspective of umwelt theory

The previous analysis revealed the importance of umwelt consideration in order to properly socialise an animal. The perspective from umwelt theory could also offer opportunities for much-needed understanding of the differences between human–animal relationships related to or involved in socialisation methods such as imprinting, taming and habituation.

Let us start with the process of imprinting. Imprinting, especially human-imprinting (i.e. the phenomenon of animals imprinting on humans), is quite a perplexing concept. In the scientific literature, imprinting is usually defined as a process of learning about one's species identity, gender identity, or relatedness to other individuals during a young animal's "critical period"<sup>9</sup> when it is primed to bond easily with any living thing (Addams, Miller 2007: 70; Hosey *et al.* 2009: 79–80). However, it is known that, in some species, food and habitat preferences may also be developed during this very young age (Goodmann 2011). Since in this chapter I am aiming to differentiate between different types of human–animal relationships, I will concentrate on the bonding and relationship-building element of imprinting.

There are two important nuances of this sophisticated process that I would like to emphasise: the possibility of imprinting on inanimate objects, and the sexual and social elements of imprinting. There are examples of animals imprinting on lifeless objects in case no living organisms are present during the "critical period" of imprinting (Ramul 1972: 99–100). It is a well-known fact that Konrad Lorenz had some of his geese imprinted on various inanimate objects, such as a lightbulb or a pair of gumboots. Chinese rice farmers have a centuries-old tradition of imprinting ducks on a special stick, which they later use to bring the ducks to the rice fields in order to restrain the snail population.<sup>10</sup> The fact that animals can imprint even on lifeless objects illustrates the strength of the bond of imprinting – something that becomes very important to comprehend in socialisation.

Namely, proper socialisation (changing the meaning-carrier of humans in general in the animal's umwelt) requires the animal to have strong positive relationships with its caretakers. These relationships could be divided into primary (imprinted) and secondary relationships (built after the animal's "critical

<sup>9</sup> The critical period is "a period of development [...] during which an animal develops a familiar bond with whatever species with which it is in primary contact. Also known as 'socialisation window'" (Addams, Miller 2007: ix). The length of the "critical period" varies between species. For example, in foxes it ends at approximately three or four weeks of age (Addams, Miller 2007: 69). In wolves, the "critical period" is known to end at about six weeks of age (Næss, personal conversation, 25.06.2013).

<sup>10</sup> Public Broadcasting Service 2012. My Life as a Turkey: Who's Your Mama? The Science of Imprinting. [WWW] <http://www.pbs.org/wnet/nature/my-life-as-a-turkey-whos-your-mama-the-science-of-imprinting/7367/> (31.01.2015).



period”) (Næss, personal conversation, 30.03.2012). Without primary relationships, the animals’ bond with humans will be significantly weaker, and the animals will never be as fearless of humans and able to enjoy their man-made surroundings in as relaxed, stress-free manner (Addams, Miller 2007: 70). The process of imprinting provides the necessary strong foundation for changing man’s position in the phenomenal fields of the animal’s *umwelt*.

This line of thought brings us to the second important nuance of imprinting. Namely, it is a widely held view that being human-imprinted is not favourable to animal welfare since it results in animals who do not possess proper social skills to communicate with their own kind and are not interested in interacting with their conspecifics. Instead, human-imprinted animals are constantly looking for attention from people and direct all their behaviour (including sexual and socially challenging behaviour) at humans, making them both miserable and not suitable for the educational display of natural species-specific behaviour (Næss, personal conversation, 30.03.2012). How does this aspect fit in with socialisation? Here I would like to suggest recognising two different elements in the process of imprinting: sexual, i.e. imprinting the animal’s species identity and future mate preferences as was originally suggested by Konrad Lorenz (Goodmann 2011), and social imprinting, i.e. accepting another individual as being a natural part of its social group. All animals have an innate tendency to imprint on their biological parents or somebody who most resembles their biological parents (Addams, Miller 2007: 70) (among the organisms or objects that are present during the “critical period” of imprinting). This explains the reason why animals have to be hand-raised (starting during the “critical period”, before the onset of fear) in order to be properly socialised with humans.<sup>11</sup> It is not enough to visit the baby animals regularly while letting them be raised by their socialised biological mother: this method (attempted by Wolf Park) will most likely produce animals who “will show some shortened flight distance<sup>12</sup> from humans as they mature

<sup>11</sup> It is beyond the scope of this article to discuss the advantages and disadvantages of removing baby animals from their mother. However, it has to be explained that people’s concern about the welfare of the mother is highly anthropomorphic. For example, practical experiences with wolves reveal that the mother animal returns to its normal behaviour within an average of three days after its pups have been pulled, and this has been related to the time it takes for the mother’s milk to dry up (Goodmann, personal conversation, 14.01.2015; Næss, personal conversation, 25.06.2013). Thus I would conclude that the lifelong advantages of baby animals being socialised with humans outweigh the short-period stress of the mother animal whose offspring have been removed. However, I acknowledge that the situation would be different with species known for their extraordinarily strong mother-offspring bond (e.g. elephants and chimpanzees).

<sup>12</sup> The flight distance is a characteristic escape reaction – specific for sex, age, enemy, and surroundings – that the animal shows when the enemy approaches within a certain distance (Hediger 1950: 19). That means flight distance is the distance that, when crossed by the enemy, makes the animal flee. If the possibility to flee is eliminated, the animal’s subsequent response is defensive aggression (Hediger 1968: 123–124).

but they will not show much of their social repertoire to us [*people*] and they will not solicit many affiliative interactions; rather, they tend to stay out of reach" (Goodmann 2011). Such animals would also be significantly more fearful of humans when compared to animals that were hand-raised (Næss, personal conversation, 30.03.2012).

But how to avoid sexual imprinting on humans as foster parents during hand-raising? This is why it is necessary to socialise multiple young animals together – if an animal has a choice, it will imprint sexually on its own species or the species who most resembles their own species (Addams, Miller 2007: 70; Næss, personal conversation, 30.03.2012). It has a genetically induced tendency to prefer its own species to humans (or any other species) if given a chance. When hand-raising young animals together with their littermates, they will learn their species identity as well as adequate species-specific behavioural and social skills<sup>13</sup> by sexually imprinting on their littermates. Due to being exposed to humans as foster parents, the animals will imprint on humans socially, considering these certain people as members of their social groups. The validity of this differentiation is supported by practical experience (both my own and that of experienced animal socialisation experts), according to which such a socialisation method results in animals who are able to clearly discriminate between conspecifics and extraspecifics (humans) and who have proper communication skills for interacting with both of them (Næss, personal conversation, 30.03.2012).

In terms of *umwelt* processes, during the "critical period" of imprinting, the animal learns about the functional circles and phenomenal fields in its *umwelt*. The phenomenal fields of enemy and partner will be established. (Depending on the species, for example in wolves [Næss, personal conversation, 25.06.2013], the functional circle of the physical medium – the animal's habitat preferences – and the functional circle of resources – e.g. the animal's food preferences – will also be established in that early period of life.) One may conclude that to have humans obtain a meaning-carrier of only a social partner and the members of the animal's own species obtain a meaning-carrier of a sexual (and social) partner in the animal's *umwelt*, it is essential to socialise multiple young animals together (or at least have another compatible animal included in the socialisation process).

Another way to build a human–animal relationship that is partly involved in socialisation is taming. It is easy to confuse tame animals with socialised animals, and it is also often unclear what advantages socialisation has over taming. One fact unanimously agreed upon among scholars is that taming is the active (i.e.

<sup>13</sup> Except for the few behavioural and social skills that require being taught by parents or other adult members of their species, for example hunting skills or interacting with adult animals. Successful hunting is not a relevant skill in a captive environment. Communication skills with adult animals would be necessary if the young animals are to be introduced to the rest of the pack after their hand-raising period. In such cases, frequent but short visits of socialised adult animals are included in the process of socialisation (Næss, personal conversation, 25.06.2013).

intentionally conducted by humans) reduction of an animal's flight distance from humans to zero (Addams, Miller 2007: 70; Handelman 2008: 266; Hediger 1950: 156; Sebeok 1990c: 125). Therefore, taming is innately involved in the process of socialisation. However, taming *per se* does not determine the methods of husbandry and, hence, the animal's fearfulness of humans or whether the human–animal relationship is positive or negative. An animal could be tamed by using aversive methods (such as punishment, dominance, etc.) so that a negative human–animal relationship will be developed, despite the animal's zero flight distance from humans (Næss, personal conversation, 25.06.2013). Excellent examples of such cases would be circus animals (elephants, big cats, and most wild animals) who usually do not have a positive partnership-based relationship with their trainer but a rather negative and fear-based one (Christian 2015<sup>14</sup>; Pryor 1999). It is clear that animals tamed in such ways have poor welfare and are more likely a danger to their caretakers (Næss, personal conversation, 25.06.2013; Pryor 1999).

Additionally, an animal could be tamed at any age (Addams, Miller 2007: 70–71; Pryor 1999), which means that taming does not necessarily involve the development of a primary human–animal relationship – a relationship which, as explained before, is critically important for changing the meaning-carrier of humans in general in the animal's *umwelt*. On the other hand, taming an animal by positive interactions (such as social play and grooming, positive reinforcement training, etc.) contributes to establishing positive human–animal relationships. Hence, taming via positive methods is always an essential part of socialisation.

Habituation is yet another process partly involved in socialisation but often confused with it. In my opinion, the most adequate definition of habituation as a learning process is “the loss of an animal's fear response to people [*or to any environmental element that can elicit fear*] arising from frequent non-consequential encounters” (Smith, Stahler 2003: 5). The most important difference between socialisation and habituation is that the latter is, in its essence, an *absence* of a substantial human–animal relationship. There is no history of interactions between a man and an animal that would lead to the development of a social relationship (as relationships are defined in this chapter). Neither does it involve changing the “enemy” meaning-carrier of man into that of ‘partner’ in the animal's *umwelt*. Habituation simply results in man's *neutral to positive significance* for the animal in a certain situation. The phenomenon of habituation could occur even with animals living in the wild (who share their habitat with humans). Let's take the example of raccoon dogs who eat at human garbage sites. These raccoon dogs have learned about human habits of leaving food scraps behind and have been reinforced (by food) to lose the fear response to humans in this situation. However, there is no relationship between an individual human and a raccoon dog.

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<sup>14</sup> Christian, Paul 2015. The Barbaric Tradition of ‘Breaking the Spirit’ of Elephants for Their Use in the Tourism Industry. [WWW] <http://www.onegreenplanet.org/animalsandnature/breaking-the-spirit-of-elephants-for-use-in-the-tourism-industry/> (31.07.2015).

It is important to understand that habituation is not always a favourable scenario either for humans or animals. Wild animals need a healthy fear and flight distance from humans; it is a valuable survival mechanism. If they lose it, many species can become dangerous or pests to humans – both situations increase the risk of conflicts between the two. Apart from other problems, becoming dependent on human food, for example, can lead to animal health problems and suffering from improper nutrition, as well as from a lack of hunting or foraging skills. It may also lead to unbalanced populations and changes in the animals' important movement patterns (BC SPCA 2014).<sup>15</sup> With these statements, I do not suggest that culture and nature should be kept separate and that all people should move into cities. The message I wish to send is that respecting wild animals for their natural behaviour and letting them live normal lives with a healthy fear of humans contributes to a life in harmony with other species much better than habituation does.

In a captive environment, some animals are habituated to humans to some degree and may benefit from it. However, animal species that have a strong fear of humans usually do not get habituated enough (to people) to improve their welfare. Additionally, if the goal is to be able to get in direct physical contact with the animal (for husbandry purposes), habituation is usually not the best nor the safest situation. As mentioned before, habituation requires non-consequential (i.e. non-changing) encounters. Once an encounter with people has a negative consequence for the animal (which could easily happen in the dynamic zoo environment, even during indirect contact), the animal will likely become stressed and experience fear of humans. Some species may exhibit aggression towards people in such situations (this could often result in an attack).

This is the reason why [*unsocialised and only*] habituated animals are the most dangerous animals to go in with – since they have a shorter flight distance from humans than wild animals do, they are more prompt to attack should they not approve of your behaviour. What makes the situation even worse is that, since there is no social relationship involved, there will be very little communication – the animal will either flee or attack immediately. A tame animal, who has a negative relationship with people, would at least give a fair amount of warning signals first. (Næss, personal conversation, 14.05.2014).

In a zoo environment, some form of habituation is implicitly always present in the process of socialisation: a socialised animal is usually well-habituated to the visitors (strangers) outside the enclosure. Habituation to the public is the result of non-consequential exposure – the situation changes when the visitors come into the enclosure. In the case of a generally socialised animal, visitors that come into the enclosure will usually be perceived as positive. For an animal that is socialised

<sup>15</sup> The British Columbia Society for the Prevention of Cruelty to Animals 2014. Don't Feed the Animals. [WWW] [www.sPCA.bc.ca/assets/documents/locations/wild-arc/teacher-resources/dont-feed-wildlife-2014.pdf](http://www.sPCA.bc.ca/assets/documents/locations/wild-arc/teacher-resources/dont-feed-wildlife-2014.pdf) (31.07.2015).

only to the zoo staff (the second way of socialisation) or to one keeper (the first described way of socialisation), visitors that come into the enclosure could then have a negative significance for the animal. I myself have been (immediately after entering the enclosure) attacked by a wolf who was well-socialised only with his keeper and habituated to the visitors behind the fence.

At this point, it has become clear that socialisation (to the level considered most favourable for animal welfare in the context of this chapter) involves the animal's social imprinting on humans, taming methods that contribute to building a positive human–animal relationship, and habituation to unfamiliar people (whereas ideally, unfamiliar people would obtain a positive significance for the socialised animal). However, it is crucial to understand that man as a meaning-carrier in a captive wild animal's *umwelt* has a temporal dynamic. Socialisation (as well as taming) has to be kept up for the animal's entire lifetime (Beaver 1999: 140; Hediger 1950: 156). Also, neither of the previously described processes result in genetic changes in the animal (i.e. they do not result in domestication) and have to be repeated for the animal's offspring (Addams, Miller 2007: 70). Domestication is the selective breeding over the animals' generations, aimed to produce offspring that are *genetically* more adjusted to living with humans (Addams, Miller 2007: 71; Barnard 2004: 265). Socialisation as well as taming may eventually result in domestication if, and only if, selective breeding is processed. A merely tame or socialised animal is genetically still a wild animal and, under certain circumstances, can have a full wild behavioural repertoire. "Being ignorant about this aspect and expecting a wild animal to act like a domesticated animal, may result in accidents causing bodily harm or even death" (Næss, personal conversation, 14.05.2014).

### 3. The semiotic basis of efficient human–animal communication

The described processes of building positive partnership-based human–animal relationships and changing the meaning-carrier of man in an animal's *umwelt* requires certain methods of human–animal interaction and animal management. These methods include various types of social interaction and enrichment, positive reinforcement training,<sup>16</sup> handling routines that are not stressful for

<sup>16</sup> In positive reinforcement training (PRT), the frequency of a desired behaviour is increased by rewarding the animal. PRT always includes a minimum amount of negative punishment, which means decreasing the undesired behaviour by removing the positive stimulus (i.e. ignoring and not rewarding the behaviour). PRT does not use negative reinforcement (i.e. increasing the desired behaviour by removing something the animal does not like, for example physical pain) or positive punishment (i.e. decreasing the frequency of an undesired behaviour by adding an aversive stimulus). (Ramirez 1999: 546–547). It is important in socialisation never to use any kind of aversive training methods (nega-

the animal, and visitor interactions. It is beyond the scope of this article to discuss the essence of each of these management methods more specifically. However, the goal of the following analysis is to explain that in order to add a positive association to the meaning-carrier of man in the animal's *umwelt*, one has to make sure that the animal gains *only* positive experience from all these interactions with people. (In a zoo environment, it is not quite possible to foresee all negative experiences, but the goal should be to give one's best effort to avoid them.) For that to happen, it is essential to have a profound understanding of the animal's communication skills and interpretation processes in order to enable efficient human–animal communication.

Therefore, during the process of socialisation, one always has to be aware of the components that every communication act is built upon: the sender, receiver, channel, signal, code and context (Jakobson 1976: 346). To begin with, every individual animal requires different ways of communication. There are multiple studies that prove the existence of animal personality traits and their genetic basis (Briffa, Weiss 2010; Freeman, Gosling 2010; van Oers *et al.* 2004; McDougall *et al.* 2006; Hansen, Møller 2001; Tetley, O'Hara 2012; etc.). Additionally, the ways of communication that are acceptable by the animal greatly depend on the relationship between the human and animal (sender and receiver) (Wenner 1969: 116–117). For example, an animal might enjoy a bellyrub or accept being picked up by someone with whom it has a primary relationship, while it may interpret an unfamiliar person's attempt to initiate such contact as a threat.

Being able to recognise signals<sup>17</sup> conveyed through different channels used by the animal is another critical skill for successful human–animal communication. Not only do some animal species use more communication channels than humans,<sup>18</sup> but many species also have an ability to perceive a wider range of signals through most of the communication channels (Sebeok 2001b: 24). For example, wolves are able to smell the changes of pheromone levels or hormonal balance in humans (e.g. they can smell fear or even detect human pregnancy) (Goodmann, personal conversation, 14.01.2015; Næss, personal conversation, 25.06.2013). How they interpret these smells is another question, but this fact illustrates the

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tive reinforcement or positive punishment) as it evidently damages the human–animal relationship and increases the animal's fear of humans.

<sup>17</sup> Here it is worthwhile to explain the difference between a sign and a signal. For semioticians, a sign is basically something that stands for something else to someone in some capacity and context (Sebeok 2001a: 156). While adjusted to animal studies as the unit of communication and interpretation processes, one might consider the semioticians' 'sign' to be synonymous with the ethologist's 'display' (which differ in involving behaviour patterns) (Sebeok 1990a: 81). Signals, on the other hand, could be viewed as signs that "mechanically (naturally) or conventionally (artificially) trigger some reaction on the part of a receiver" (Sebeok 2001a: 44). For this reason, 'signal' is the key concept in animal communication.

<sup>18</sup> For example, there are species known to use UV-light, ultrasound, magnetic, electric, solar, lunar and other stimuli in communication (Sebeok 2001b: 24).

differences in channel-usage one has to be aware of when communicating with other species.

Additionally, the misleading idea that the communication context is totally shared is the cause of the most serious accidents in which a human is attacked by an animal (Bouissac 2010: 53). Apart from actually transmitted signs and the current situation, context involves factors such as previous experience; exterior noise; seasonal, ecological and life history factors; the presence of strangers; etc. (Barnard 2004: 165; Hediger 1968: 3; Hosey *et al.* 2009: 476). Hence, it is clear that the perception of context is highly subjective. When working with foxes, I quickly learned that their willingness to perform certain behaviours during a training session or to get in physical contact with me depended on many factors, including the time of day, their motivation,<sup>19</sup> or the presence of zoo visitors. Even more, it is important to take into consideration that the information of a signal and the response evoked by it may vary radically in different situations even if the physical characteristics of a signal remain unchanged (Marler 1961: 267). For example, approaching hands during the visit of a veterinarian is probably not perceived to be as pleasant by the animal as reaching hands during a regular social interaction when this would indicate social grooming.

As far as the role of codes in human–animal communication is concerned, there are three important aspects to bring to light. First, in order to make sure that the animal gains a positive experience from interacting with people, one must be constantly aware of the human signals emitted and their potential significance according to the communication codes of the animal. For example, direct eye contact, fast movements, high body postures (e.g. standing up) and wide body movements (e.g. waving hands) can be perceived as threatening by many animal species. Another example is hugging, an essentially primate behaviour, which canines tend to interpret as antagonistic (Goodmann, personal conversation, 14.01.2015).

In the second important aspect about codes lies yet another fundamental reason for why hand-raising is important in socialisation. French zoosemiotician and philosopher Dominique Lestel has explained that a relationship based on partnership has two requirements: shared codes<sup>20</sup> and rationality<sup>21</sup> between the different species (Lestel 2002: 56). It is a common understanding that a wild animal does not inherit human codes or rationality, and neither does a human

<sup>19</sup> “Motivation is generally thought of as some kind of internal process that influences the likelihood of whether or not the animal will do the behaviour” (Hosey *et al.* 2009: 85).

<sup>20</sup> “A code is a transformation, or a set of rules, whereby messages are converted from one representation to another; an animal either inherits or learns its code, or both” (Sebeok 1990b: 92–93).

<sup>21</sup> “The rationality of the actors we are concerned with is further limited by the skills they have acquired or inherited for exploiting this information and, in particular, their semiotic abilities to produce signs and to interpret those produced by others or by the environments in which they find themselves” (Lestel 2002: 59).

inherit animal codes or rationality by birth. These are skills learned by growing up together (Sebeok 1981: 115). In the process of socialisation, the young animal is desensitised<sup>22</sup> to physical handling, loud speaking, laughing, singing, whispering, coughing, sneezing, smiling (teeth-exposure) and many other behaviours common to humans (Fig.3). In that way, the animal will learn to accept these behaviours as natural and a non-threatening part of human communication.



Figure 3. Wolf pups being safely desensitised to novel objects (camera) and human smiling.

At this point, one could ask why can't the animals be desensitised to all potentially threatening elements of human behaviour, including direct eye contact, fast and wide movements, and high body posture? The answer lies in the fact that these are threat signals individually and are, hence, much more difficult to desensitise (whereas, for example, smiling is more threatening when accompanied by a certain body posture and facial expression). It is not practically possible to

<sup>22</sup> Desensitisation means safe and nonthreatening introduction of novel experience (Addams, Miller 2007: 74–75). It is extensively used in the process of socialisation as living in a human environment and meeting people can involve experiences (for example, loud or aversive sounds, arousing odours, unnatural or synthetic materials, human handling) that are very unusual in the animal's natural lifestyle and can therefore be frightening and stressful for the animal (Addams, Miller 2007: 74–75; Hosey *et al.* 2009: 227). The most efficient way of desensitising is to start during the "critical period" of the young animal's development when it "has no inbuilt knowledge of what is and is not 'normal' and is inclined to accept novelty rather than fear it" (Addams, Miller 2007: 75).

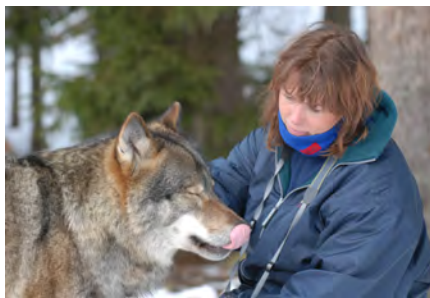


desensitise *all* potential human threat signals as it would be too time-consuming. Plus continuous exhibiting of threat signals could be too stressful for the young animals (and could therefore have a damaging effect on their socialisation). In addition, there might be situations in the future where threat signals could be benefited from. For example, when bringing new people in with wolves, the people are usually asked to stay standing (not in order to threaten the wolves but to appear less vulnerable) until the wolves have confirmed their acceptance of and positive attitude towards the strange people.

Humans, too, learn about the codes of the animal in the process of hand-raising. For instance, appeasing signals (small eyes, lip-licking, turning sideways, non-threatening body movement, etc.) are an everyday tool in calm and safe communication with animals (Fig. 4, Fig. 5). Also, when teaching the fox kits and wolf pups that humans are not to be bitten, I used auditory cut-off signals that I had observed the animals using with each other when they had crossed the borders during social play. However, such kind of imitation of the other species' codes is rather an exception than a rule. Namely, the third aspect about codes is something that does not seem to be widely known: being aware of the species-specific communicational aspects does not mean that people should try to "speak the animal's language", i.e. communicate prevalingly by codes similar to the codes in the animal's intraspecific communication. The reason lies in the mere fact that humans are not capable of producing all the species-specific signals used by the animals. Trying to imitate them could result in confusion and frustration for both communication partners. For example, in dominance displays, canines try to avoid fighting by providing the other with various warning signals (both consciously and subconsciously transmittable): lateral display,<sup>23</sup> facial expressions, vocalisations, piloerection,<sup>24</sup> pheromone signals, etc. (Addams, Miller 2007: 8, 85). Humans are not competent enough (if capable at all) in communicating with such signals through such channels. Human attempts to dominate an animal usually result in the overuse of physical aggression, which could easily increase the animal's fear of humans and potentially result in a defensive attack by the animal (Addams, Miller 2007: 87).

<sup>23</sup> Lateral display – a behaviour where the animal "walks side-on to their intended targets, displaying their largest dimension, with their back and tail arched, [...] legs extended, [...] ears held parallel to the ground, [...] and their fur piloerected" (Addams, Miller 2007: 8).

<sup>24</sup> Piloerection – "the raising of fur by muscles attached to the hair root, most often seen in the back of the neck, the shoulders, down the back and occasionally on the tail. This raised line of hair is commonly called the 'hackles'. An autonomic reaction, and therefore a good indicator of an animal's mood, as the animal cannot consciously control whether its hackles are up or down" (Addams, Miller 2007: xi).



*Figure 4. A visitor using appeasing signals. Figure 5. A wolf using appeasing signals.*

This is the reason why getting involved in dominance relationships with animals is not viewed as a proper method of socialisation in this article. Dominant-submissive relationship between animals is a “consistent relationship between individuals – one of whom ‘wins’ in ritualized aggressive displays, while the other regularly and voluntarily submits” (Handelman 2008: 84). It requires clear communication and is, in essence, a survival strategy rather than a forced power-relation. A human-animal dominance relationship is usually forced and fear-based, which is not compatible with the goals of socialisation as social conflicts and fear of humans is exactly what has to be avoided for the described reconstruction of the animal’s *umwelt*. For example, in a wolf’s *umwelt*, dominant pack members do not occupy the phenomenal field of an enemy – all pack members cooperate in everyday tasks and are partners regardless of their rank. The only exception could perhaps be the moment when the pack is trying to disperse the omega or to challenge the alpha wolf (which sometimes could result in fatal injuries for that one wolf) (Næss, personal conversation, 14.05.2014). Wolves from other packs are potential enemies, but there are no dominant-submissive relationships between wolves of different packs. On the other hand, human attempts to dominate a wolf – due to the communication problems described above – tend to position the human on the phenomenal field of enemy instead of partner in the animal’s *umwelt*.

Thereby, I find the term ‘leadership’ much more adequate when talking about teaching the animal acceptable social behaviour with humans. “Leadership is the ability to influence others to perform behaviours that they would not necessarily perform on their own” (Yin 2007: 415). It is crucial to understand that a strong human leader modifies the animal’s behaviour by bestowing or withholding resources, not by using aggression and dominance (Handelman 2008: 85; Yin 2007: 415). Here one could draw a parallel between being an authority and being an authoritarian (or a dictator). A good leader anticipates social conflicts

by means of distraction<sup>25</sup> or substitution<sup>26</sup>. If the situation is of a more serious kind and none of the previous methods seem to have an effect, the keeper could resolve the situation by using cut-off signals that signify a disliked behaviour. It is important to understand that the cut-off signal itself is not a punishment but is rather a sign that indicates that a punishment is coming should the animal not stop the undesired behaviour. The punishment in the latter case would simply be a “time-out” (i.e. a form of “non-reward” or negative punishment where the animal is deprived of human interaction). (Addams, Miller 2007: 78–79) These methods, coherent with positive reinforcement training principles, enable the solving of critical situations without damaging the animal’s perception of humans, while still keeping the experience of both the animal and the human positive (or at least as positive as possible).

## Summary

The article explains the essence of the highly semiotic process of socialisation of wild captive animals with humans for animal welfare purposes. Although there are many more nuances about the methods of socialisation not discussed in this article, the main semiotic methods of socialisation were brought to light.

When approaching the phenomenon in question from the perspective of umwelt theory, it becomes clear that socialisation is the process of reducing the animal’s fear of humans with an ultimate goal of reconstructing the animal’s umwelt by changing man’s meaning-carrier of enemy into the meaning-carrier of social partner. It has the most favourable effect on animal welfare if the animal is generally socialised so that the process includes reducing the animal’s fear and improving its perception of unfamiliar people (including zoo visitors). As a result, the animal will feel more comfortable living in a human environment and exhibiting its full range of behaviour in the presence of humans (Addams, Miller 2007: 10).

The level of socialisation considered adequate in this article requires the animal’s social imprinting on humans (possible to achieve by hand-raising a litter of animals during their “critical period” of imprinting), taming via methods

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<sup>25</sup> Distraction – preventing behaviour before it happens by distracting the animal from undesired acts. An animal could be distracted by using anything that would draw its attention, e.g. velcro, car keys, crinkle of plastic wrap, a cardboard box, movement in leaves, touching its leg or tail, waving with some object, etc. (Addams, Miller 2007: 76–77).

<sup>26</sup> Substitution – offering the animal a better object to trade with or training the animal to perform an incompatible behaviour on demand. For example, when the animal has taken hold of a person’s glove, a keeper might offer the animal an attractive branch, ask it to run to a specific place to receive a treat, give it a cue to roll over and sit, or use another effective option. However, in order to avoid reinforcing the undesired behaviour, the animal should not be given treats as a trade item (Addams, Miller 2007: 77).

beneficial to building positive trust-based human–animal relationships, and in many cases (for example in zoos), habituation to unfamiliar people. It is important to understand that socialisation is a lifelong process that depends on continuous, positive human–animal interactions. The latter is only possible when the communication between a man and an animal is efficient. Therefore, profound insight into the animal's species-specific behaviour and different aspects of interspecific communication (including codes, channels and contexts) is required. All things considered, socialisation is ontologically a semiotic process that requires a constant awareness of the semiotic aspects in the animal's Umwelt.

## Acknowledgements

The research for this chapter was supported by the Norway Financial Mechanism 2009–2014 (project contract EMP151).

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