

Ethology of dog behaviour—what/how do dogs think?

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“Behave” is defined in the Macquarie dictionary as 'to act in a socially acceptable manner'. The study of behaviour involves not only WHAT an animal does but when, how, where and why it does the behaviour. Behaviour is a series of movements with a beginning, middle and end. Behaviour should always be considered in the context in which it occurs, not in isolation.

The behaviour a dog exhibits at any particular time is determined by three main factors. These are:

- 1 the dog's genetically inherited tendencies or predisposition to exhibit a particular behaviour,
- 2 the dog's previous experience and what it has learnt,
- 3 the particular environment the dog is in at the time.

The domestic dog, *Canis familiaris*, is thought to be one of the first species domesticated (Thorne, 1992). Indeed, historical accounts suggest that as far back as 12,000 years ago dogs have been used as pets (Thorne, 1992; Clutton-Brock, 1995). The fact that in Ein Mallaha, Israel, an archaeological finding revealed an old woman buried with her arm over a five month old puppy suggests that a close relationship was present between the two. Dogs have also been selectively bred for specific purposes such as hunting, herding and fighting. However, extensive selective breeding of dogs as pets only began early in the nineteenth century (Willis, 1987; Thorne, 1992).

Approximately three to four thousand years ago the major groups of dogs were evident that are still recognised today (Thorne, 1992; Clutton-Brock, 1995). The diversity of dog breeds has increased dramatically since then, particularly in the last 600 years. There are approximately 400 breeds worldwide, and within Australia, there over 170 registered breeds.

THE EVOLUTION OF THE DOG

The domestic dog is thought to have evolved from the wolf, *Canis lupus*, and was probably domesticated at least 12,000 years ago (Thorne, 1992; Wayne, 1993; Clutton-Brock, 1995). However, some recent evidence from fossil DNA, suggests that dogs may have been genetically separated from the wolf as far back as 100,000 years suggesting that domestication may have been earlier than previously recognised (Newby, 1997; Vilà et al, 1997). Studies of the behaviour, morphology, and genetics all indicate that the principal, and perhaps, sole ancestor of the dog, is the wolf (Clutton-Brock, 1995). Molecular genetic studies show that the dog and grey wolf differ at most by 0.2% in their mitochondrial DNA sequence (Wayne, 1993).

The family *Canidae* can be subdivided into three types based on the behaviours of group structure and mating patterns.

The first type is solitary with a temporary pair bond during mating. The second comprise permanent pair bonds with longer interaction between parent and offspring. The third type is pack forming showing strong allegiances and exhibiting both male and female dominance hierarchies (Fox, 1971, 1975). The domestic dog most closely resembles the third type as it exhibits socialisation patterns and can form into packs when feral.

Due to artificial selection and intensive breeding, dogs today vary greatly in size, shape, colour and behaviour from the wolf. Nevertheless, some behavioural and physical features are still common to both species. However, although over 50 behaviour patterns are found in common (Scott, 1950), not every behaviour pattern seen in wolves is seen in dogs.

The social behaviour of dogs and wolves has marked similarities. Both species live in a relatively stable group or pack with a strong social hierarchy. Wolves have a pack leader, usually a male, and there is thought to be a separate hierarchy for each sex. Group size varies depending on conditions and season but may consist of 2-15 individuals, and the pack is usually made up of related individuals (Jordan, Shelton & Allan, 1967; Mech, 1975). The feral dogs that have been studied do not always live in a group that is fully related but while some studies found groups to be stable (Boitani, Francis, Ciucci & Andreoli, 1995), others did not (Beck, 1975). The groups usually comprise between 2-6 dogs (Boitani et al., 1995), and have a male at the top of the dominance hierarchy.

Dogs and wolves both exhibit a highly ritualised greeting behaviour involving tail wagging, inguinal presentation, and anal sniffing (Fox, 1971). Unlike more solitary canids, such as the fox and coyote, both the dog and wolf have developed complex visual signals composed of multiple elements. Visual signals such as the position of the tail, body, and facial expressions are used to communicate status and agonistic behaviour. Group harmony and cohesion is maintained through an elaborate system of postures which minimise overt aggression (Fox, 1971, Klieman, 1967).

Social hierarchies are seen in dogs as well as wolves. An animal who ranks higher in the hierarchy most frequently wins in an encounter while the other yields. This tends to reduce rather than escalate encounters (Drews, 1993). Higher status in agonistic encounters is conveyed in both species by a rigid forward stance, erect, forward pointing ears and piloerection that together provide an impression of large size. Animals with lower status in an encounter lower the body and tail, flatten the ears and do not exhibit piloerection. The wolf and the dog also display many similar facial expressions. Both species use eye contact to regulate social distance. Additionally, the animal with higher status generally will maintain direct eye contact longer than the subordinate (Bradshaw & Nott, 1995).

Both species are also strongly territorial. Scent marking, with urine and faeces, is common in both species to communicate rank and reinforce the social order. It is also used to mark territories (Mech, 1975). However, unlike wolves, dogs are extremely vocal and bark in response to many stimuli. Wolves produce only two types of bark, the alarm and threatening bark, while dogs produce a different bark in a variety of situations such as when seeking attention, in defence, play, greeting and warning and as a lone call (Bradshaw, 1995). However, dogs howl less than wolves (Scott, 1950).

It is probably these qualities of territorial protection and barking, and hence their use as an early warning system, that attracted people to the dog as a companion (Fox, 1971, 1974, 1978; Thorne, 1992; Young, 1985; Newby 1997). It is also likely that dogs also served as scavengers to clean up around early human habitation (Newby, 1997). Domestic pet dogs also live in a group, with the human family members forming part of the social hierarchy. Indeed, Scott (1950, p 1019), stated that “the patterns of behaviour of dogs in human society are the same as those of wolves in wolf society”. Like humans, dogs have a social system based on deference with a fluid or changeable hierarchy (Overall, 1997).

In summary, dogs and wolves share many behavioural features. Some of these, for example, their social system and territorial behaviour, facilitated the incorporation of dogs into human families as part of domestication.

UNDERSTANDING THE DOG'S SENSES

In order to try to understand how a dog behaves it is also important to know just how it perceives the world. Each species has different sensory capacities from man and hence its perception of the world will vary. This will affect the way the dogs communicate with each other as well as with other species.

i) Sight:

- can discriminate colours, see world like red green colour blind people
- very sensitive to moving objects
- poor vision for detail or close up
- good night vision

ii) Hearing:

- four times more acute than man
- can hear higher frequency
- can hear ultrasonic noises

iii) Smell:

- predominant sense
- 1,000 times greater than man
- can discriminate between thousands of different odours
- can detect very low concentrations of odours

iv) Taste:

- poorly developed
- sucrose is highly acceptable
- palatability based on odour, mouth feel then taste
- prefer beef > pork > lamb
- prefer meat to cereals
- prefer canned > cooked cubes > raw minced > raw cubes
- eat during day

v) Touch:

- well developed

All these senses should be considered in all our dealings with dogs.

CANINE COMMUNICATION

When dogs communicate they use multiple means simultaneously.

i) Sight

- stare-direct eye contact
- stare avoidance
- watch each other's body language
- watch human body language

ii) Sound:

- indicate emotional state
- bark
- whine
- howl
- growl

iii) Smell:

- scent marking
- pheromones are signalling chemicals that are excreted to transmit information to members of the same species
- urine
- faeces
- anal glands
- skin

iv) Body Language:

- indicate emotional state, eg, fear to aggression
- tail
- body posture
- facial expressions

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