

INSIGHTS INTO CANINE COMMUNICATION AND INTERSPECIFIC MISINTERPRETATIONS

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ABSTRACT

By providing background on canine olfactory, auditory and visual communication, this paper hopes to clarify common human misinterpretations of dog behaviour. Visual displays are subdivided into displays of rank (dominant and submissive), and displays of emotion (aggression and fear). Tail wagging, friendly communication, greeting behaviour in dogs, compared to the human handshake, as well as attention seeking behaviour are discussed. The influence of human selection in breeding on visual displays illustrates the effect of human interference in canine communication.

The paper does not aspire to be recognised as a critical academical investigation, or to provide documentation of original research. It merely attempts to provide insight through basic theoretical comments, supported in part by existing literature, and in part by the author's own experience.



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INTRODUCTION

Communication is a process of signal transmission (A dictionary of ethology, Immelman and Beer, 1989:51). A signal is a visual, aural, tactile or chemical message, relating to the recipient's corresponding sense. The sender transmits the signal to the recipient, who interprets it, in order to react on it. Shortly, it is a signal sent to elicit a response.

Lorenz (1967:76) states that animals have a certain number of innate movements and sounds to express feelings, and also innate ways of reacting to these signals.

If an unexpected reaction follows, an inappropriate signal may have been sent, or the signal may have been received or interpreted incorrectly. The human may send a message that the dog cannot understand, or misinterprets, or vice versa, i.e. the dog to the human. Both species do not instinctively understand the others' communication, or may not have learned the meaning of specific signals.

The one species should learn to correctly interpret the other. The human can teach the dog to respond to certain basic sounds by conditioning it, eg a "sit" rewarded by a biscuit. However, a dog has a relatively inferior mental capacity, limiting the extent to which it can learn our communications through "training" or conditioning. It is our responsibility as the "superior" species to attempt to understand canine communication. This helps prevent misinterpretations which have negative effects on inter-specific communication.

CANINE COMMUNICATION

The way that dogs communicate with each other differs in many respects from human communication. The latter relies mainly on the spoken or written word. Dogs communicate by

means of body posture, facial expression, and vocal and olfactory messages.

Lorenz (1967:77) states that in humans there are some signs which automatically transmit a mood, for instance a yawn when one is bored. There are more subtle or diminutive signs though, hardly perceptible by conscious observation. In animals these signs are instinctively transmitted and received on a very high level. In humans this capacity has degenerated as our word-language developed. This is a great cause of human misinterpretation of animal behaviour - we are reliant on what we can consciously perceive.

The dog's "receiving set" far surpasses our own analogue apparatus. This may explain the belief that they may be "telepathic" (1967:79), but it is merely that they are picking up on our subconscious signals, those we have lost the greater capacity even to be aware of sending. The dog "knows" when the owner is taking it for a walk. Apart from more obvious signs such as specific clothes and shoes, the owner's whole body language is relaxed, as opposed to being rushed and stressed before going to work, and the dog registers these signs.

To human perception, canine visual and auditory are more accessible than olfactory signals. Human beings can hear vocalisation, and follow clear visual displays in dogs. We may to some extent instinctively

sense and furthermore learn, through experience and education, the meanings thereof, and even develop a relative appreciation of this. However, we are biologically limited in sensing and thus receiving the very rich variety of olfactory signals used by dogs in communication. In not being naturally able to even pick up on these cues, we are even more hampered in appreciating the extent of meaning of this method of canine communication.

Through studies one may gain some insights into the extent of canine olfactory communication, but people interacting with dogs will not be able to benefit directly from this, as we still cannot smell these messages, and immediately respond to them. This leaves us, for the time being, reliant on what we can practically utilise in our capacity to understand canine communication, ie what we can perceive, visually, and hear. For the purpose of this paper, the visual and vocal aspects of canine communication will be concentrated on, with only brief reference to olfactory communication.

Human communication may transmit thought, memories, future plans, and abstract ideas. Our main form of communication is abstracted learned language, and does not rely primarily on elements such as body posture. However, it is debatable whether animals in general, and for the purposes of this paper, dogs in particular, have the capacity of abstract, deliberate and other forms of thought.

Whether a dog can remember, and if so, for how long, or think of future, is also contested. However, canine communication is primarily centred around conveying emotional states, and expressing attitudes to social partners. Such expressions do not need the complexity of language (The Oxford dictionary to animal behaviour, MacFarland, 1981:175).

Vocalisation, for instance, imparts information on the senders current emotional state, and as such will pre-empt any pattern of activity or behaviour that would follow, according to the reaction of the recipient to the message sent. An example would be a dog growling: it does not as such attempt to say "if you don't back off when I growl I plan to bite", but "I feel threatened" and if it continues to feel threatened (ie the intruder does not back off), its response will be either to avoid (take flight) or confront the threat (fight). If a conflict situation is not resolved by a certain message sent, received and responded to, the animal will follow with an instinctive reaction. The dog does not, therefore, communicate a deliberated intention, as it may seem to the human observer; it communicates its emotional state (subconsciously), and this signal pre-empts an instinctive reaction.

Visual signals are physical displays such as "body language", facial expression, gestures, bodily attitude (posture) and orientation. It can also be extended to markings, such as scratches on the ground, though

these, when made by the dog, serve primarily as a vehicle for olfactory signals. Again, such marks will not signify an intentional abstract symbol, as human writing may. Olfactory signals are received by the sense of smell, and any visual marks are probably coincidental, or at most serve a secondary role in drawing attention to the scent message. In popular tongue, such a message may be referred to as a personal calling card or "letter" left by the dog. This may serve as a good explanation of its function, but not of its form. It is olfactory, rather than physical or visual.

Apart from not being able to send or receive appropriate signals, the more frequent break in communication between dogs, and between dogs and human beings, is the incapacity to correctly read or interpret them.

Though communication in animals, unlike learned language in humans, is primarily instinctive, a lack of exposure to or "practice" of it may lead to a lack in fluency. Especially the interpretation of communicative signs will be underdeveloped, even if such an "unschooled" pup may still manage to send the correct, if overexpressed, message. The importance of providing opportunity for socialisation with its own (and other) species cannot be overstated. When acquired, young pups are usually torn away from an intricate and intense social structure with their dams and litter mates. This leads to isolation at a very crucial period in the puppy's so-

cial development. Pups kept away from their own species especially during the age of 3 to 15 weeks, will be undersocialised, and will be more inclined to become aggressive towards other dogs.

Animals reared in isolation, as in studies done with monkeys (The Oxford dictionary to animal behaviour, MacFarland, 1981:173) prove that encoding of (facial) expression is possible without the opportunity for learning (such as during early socialisation), but that such signals sent will be basic and crude. Social experience is necessary to adjust these expressions to become subtle, and practised. In order to interpret these signals, social experience, especially at a sensitive young age, is even more important.

By playing with other pups, not only physical but also social skills are developed - the inherent capacity to communicate is shaped and refined. The puppy learns to deflect acts of aggression through playful trial and error activities (Fogle, 1990:84) and by becoming fluent in the signals that precede or accompany these. A pup denied this opportunity to learn through playing may retain only rudimentary instinctive communication skills. Messages and actions will be unrefined, even unacceptably pronounced and brutal - more growling than needed to communicate "back of" will be transmitted, and the message may be too forceful, leading to confrontation. Such pups will be socially inhibited or over-reactive.

In regard to human interpretation of received information (mainly through sight and sound) we tend to try to rationalise and understand, usually in terms of human behaviour, the significance of canine communication. Human behaviour, being different to animals, is not always an appropriate frame of reference. So whilst in the first place not receiving most important informative signals, those we do, may be misinterpreted.

Anthropomorphising other species is a convenient way of attempting to avoid the confrontations resulting from interspecific differences. It is certainly a hazardous approach in trying to understand canine communication. By subscribing human qualities to the dog's signalling processes and associated behaviour, misunderstandings will ensue. A dog does not behave, think or communicate like a human being - it is in essence a dog, and should be treated and respected as such.

A typical example would be the owner thinking the dog "looks guilty" after coming home and finding that the dog chewed on the furniture. The dog is not communicating a sense of guilt (a human emotion) of a past activity when the owner finds it cowering in a corner. If this dog destroyed objects in the house while the owner was gone, it has no realisation that "it has done wrong". It is certainly not feeling guilty. These are the qualities the human being wants to ascribe to it, as it is the simplest, most convenient and most obvious explanation. The

dog has merely been conditioned to the fact that the owner's response, on coming home, will be unpleasant towards it, and it is behaving submissively in trying to communicate its own fearful condition, to try and avoid being punished. If the owner then punishes the dog, it is doing the opposite of the response the dog expects to its signals, the dog gets confused, and may next time refer to fear biting, in order to avoid being punished. Instead of trying to understand what the dog is trying to communicate, the owner ignores its obviously desperate attitude, subscribes a human connotation to it, and by doing so the situation and the relationship between animal and owner deteriorates.

Dogs also learn, by being conditioned, to send specific signals to people. Such conditioning may not be consciously intended or even recognised by the owner. In some ways it may seem that the dog is learning to manipulate us, though this may very well not be intentional on the dog's part. The dog simply learns that putting a paw on a person's lap will lead to being touched. Similarly whining at the back door, or jumping up will solicit a rewarding activity.

OLFACTORY COMMUNICATION

Olfactory communication is possibly the most important method of communication between dogs. Fogle states that scent is the most impor-

tant of its "practical" senses. The dog's sense of smell is many times more acute than that of a human being; a dog has around 220 million scent receptors in its nose, we have around 5 million (Fogle, 1990:35). Dogs can smell a variety of substances at concentrations one thousand to one million times lower than humans can (Hurst, in Manning and Dawkins, 1992:49). It is difficult for us to appreciate the intricacies of this hidden "language" An old blind dog can have a relative quality of life if its sense of smell is still intact.

As this paper focuses on the practical implications of canine communication for human beings, we will not be discussing olfactory communication in detail. It is included in brief discussion for the sake of completeness.

"Marking" behaviour in animals here refers to olfactory marks. In human terms, marks as a means of communication will more likely refer to visual marks.

Pheromones are abundant in the dog's saliva, urine, faeces, vaginal and preputial secretions. The anal sacs and perianal glands also deposit these substances during defecation.

These pheromones provide information regarding the individual dog's sexual, hormonal, physiological and social status; it may even impart data on the emotional state, age and genetic relation to other dogs (Fogle, 1990:58). A pup learns to recognise its dam, and a dog detects a bitch in

oestrus. It helps identify areas of belonging such as a den or a home range to others, as well as to the animal itself.

One dog sniffing another's urine deposit or faeces, may be equivalent to reading a personal business or calling card, or two people shaking hands. It is like evaluating the strength of the handshake, whether the palms are sweaty, or the bearer is wearing a wedding ring (Fogle, 1990:58).

The pheromones, in a volatile state, are received by the vomeronasal organ, situated at the base of the hard palate. This organ is well developed and actively functional in dogs, as compared to human beings. From here it is directly transmitted to the limbic system, soliciting a specific, unconscious emotional response, such as a sexual or aggressive reaction.

Anal sac secretions bear an individual scent. The smell as well as the physical appearance of these substances can vary quite drastically from one dog to another. However, an individual dog may also have variances in its own anal sac substance. A fearful bitch's secretion, for instance at the veterinary consulting rooms, will have a different smell to the same bitch's while in oestrus. Momentary and seasonal, or longer term variations can thus be expected.

Urine is rich in reproductive hormone substances in entire dogs. It provides information on the reproductive con-

dition of a bitch, and the status of the dog. Bitches in oestrus will "mark" much more than usual, and may even attempt to cock a hind leg, instead of the usual squat. Dogs cock a leg in order to deposit the urine as prominently as possible, higher up, at their peer's nose level. Male dogs may urine mark up to eighty spots in four hours, and deposit small amounts at a time. Even if the bladder is depleted, they may still attempt to mark (Fogle, 1990:59).

Another important example of olfactory communication is dogs smelling each other, especially in the perineal and inguinal areas, where the scents of the anal sacs and secretions of the sexual organs will be. This is part of the ritualised greeting of dogs, after their initial approach and introductory displays. Bradshaw and Lea (1992:245) states that the majority of interactions after the initial approach phase, consist of olfactory inspections. In the study done by them, bitches concentrated on the head area, and male dogs on the anal area.

Dogs often sniff human beings in the crotch. While embarrassing, it may serve an important function in the dog's introduction to the person.

While olfactory marking familiarises others with an individual, it may also familiarise an individual with new and "clean" (ie unmarked by other dogs) territory. Dogs often, to the disgrace of the owner, wander into the host's

living room, and nonchalantly deposit a squirt of urine on the couch.

Anxiety and fear may also accentuate the frequency of olfactory marking (urination and defecation), in the animal's attempt to feel more familiar and less stressed.

A friend's urine or faeces needs to be noted, and a rival's marks need to be overmarked. The diligent house owner may be inclined to clean these areas with household detergents containing ammonia or chlorine. This leads to another broach in communication between the two species; to our uneducated noses this may smell clean, but to a dog it smells similar to another dog's urine (containing chlorine and ammonia-like substances), and it will lead to overmarking.

Dogs often scratch the ground vigorously, especially after urination, with their hind feet. Scent is possibly also deposited in this way from sebaceous glands between the pads (Fogle, 1990:61). A secondary function of this is to provide visual "pointers" to the scented area.

"A dictionary of ethology" (Immelman and Beer, 1989:262) speaks of "self-marking" as the application of an odorous substance to the animal's own body for purposes of communication. It may be that the dog's inclination to roll in strong-smelling substances is to appear stronger (smelling) than others, or as a way to disguise the own smell, remnant from

the natural instinct to hunt unobtrusively.

VOCALISATION

Though more obvious to us, vocal communication, especially compared to olfactory, is much less pronounced in dogs. Fogle (1990:61) describes it as probably the weakest form of canine communication.

Verbal communication, more specifically than vocalisation, is a capacity almost unique to man (The Oxford dictionary to animal behaviour, MacFarland, 1989:175) and the primary mode of human communication. To dogs (ie commands such as "sit", "come" etc), even while to dogs this may not be the most effective way of communication.

Vocalisation in dogs conveys emotional states rather than specific messages (Beaver, 1981:647). The sounds animals produce are associated with characteristic states of motivation (The Oxford dictionary to animal behaviour, MacFarland, 1981:593). Whilst to a dog a growl indicates an instinctive and conflictive state of defensive arousal, we may interpret the "message" as "back off or I'll bite", a statement of deliberated action.

Voice can also help identify individuals, and their physiological and sexual status (Fogle, 1990:62). A dam recognises the voices of individual pups. Beyond puppyhood infantile

sounds such as whimpering, crying, and whining, are displayed mostly towards human beings. A cry or whimper will solicit caring or epimeletic activity from the dam. An adult animal naturally need to fend for itself, and these infantile sounds will not be utilised any more. However, domesticated dogs learn through positive conditioning that a whimper will solicit rewarding human attention, and these vocal signs may be prolonged into adulthood.

A wolf's vocal array looks different from that of a dog, due to the dog having been domesticated, and selected to fulfil different aspects in form and function than those of a wolf. Wolves seldomly bark. This underlines the theory that dogs have been selected for a more pronounced capacity to do so. This already accentuated instinctive capacity is strengthened by conditioning - a bark usually solicits a response. A dog that could bark to warn people of intruders, was, and often still is, a more desirable animal than a quiet one. Yet, at the same time, when dogs behave instinctively by barking at strange sounds, we will misinterpret their motivation, or anthropomorphise their capacity by expecting of them to be able to make a qualitative, or distinctive situational judgement on when they should bark and should be quiet, according to human values. We punish them for what we created them to do!

Punishment may take as irrational a form as irreversible and inhumane

operations such as surgical excision of the vocal chords - so that we are traumatically removing one of the communicative qualities that the animal has been bred for.

Understanding this, and the array of reasons why a dog barks, will help clear up misinterpretations of this form of canine communication.

BARKING functions for the human as an alarm. To the dog it communicates one of a variety of emotions. It may be a warning, similar to a growl, for the receiver to keep a safe or acceptable distance. It may be a call to all those within hearing (pack members, or the familiar human beings in the vicinity), to come to its assistance. If the owner rushes down in order to quieten the dog every time it barks, the dog is achieving its aim, ie it has called the person to assist. Ignoring this call will be more effective in teaching the dog to be quiet.

A dog feeling anxious, for instance when isolated from its owner, may bark, to call for (the owner's) company. If such a dog, upon the owner's arrival, is punished for this activity (due to neighbours complaints), the dog will become even more anxious in anticipation of punishment after separation on a following occasion, and subsequently bark even more. Again, a classic example of human misinterpretation of the signal.

Many dogs bark when excited. During such moments, should the owner

shout in order to quieten it, ("Be quiet", in human language), the dog will interpret these loud yelling noises as another excitable bark, ("Let's all bark together, its much more fun!" in canine lingo) and will become more motivated to bark. Should the owner understand, and interpret the situation correctly, keeping quiet and ignoring the dog's call to respond, will be the solution.

Giving a dog any form of attention when barking will generally stimulate the activity. A dog learns this, through conditioning, and it becomes a very powerful motivator. Opening the door to let it out, talking to it to try and soothe its excitement, or even more negative attention such as shouting and physical punishment may be attention-reinforcers of the behaviour.

The traditional saying of " A barking dog won't bite" could also be a mis-interpretation of canine communication. One needs to evaluate the context. A confident and motivated offensive aggressor most likely will not bark. A barking dog is most often less confident, and would choose to avoid confrontation, so it is warning the receiver to back off. If the latter does not, and approaches closer, the dog may bite. If the sender (defensive dog) is blocked from being able to back off away from the perceived threat (the offensor or receiver), it may have no option left, as it cannot take flight, it must fight. It is thus clearly not wise to approach a barking

dog on the strength of your belief in this saying.

Compulsive or stereotypical barking may be performed by chronically stressed or understimulated dogs. It could be seen as a form of displacement activity and can be regarded as abnormal behaviour. It is unlikely to have a communicative function.

HOWLING is performed more by the dog's wild relative, the wolf. In dogs it may be more prominent in certain breeds, such as hounds, in pack-like situations. It can become more pronounced if reinforced, for instance by human solicitation, when the human howls in mimicry, or as response to certain types of musical sounds. One dog starting to howl in a neighbourhood may soon find others joining in, in allelomimetic fashion, through mutual stimulation or mimicry. The receiving individual dogs may very likely not have had any motivation to howl of their own accord.

A YELP is elicited by a sudden, unexpected physical stimulus, such as pain. It is spontaneous, and usually non-repetitive. It often supersedes a withdrawal response, away from the stimulus.

Dogs may learn to moan or GROAN when experiencing a pleasurable stimulus, such as being stroked by the owner. Fogle (1990:63) states that this only occurs in relation to human beings, ie intraspecific communication.

A GROWL is usually a threat. The opponent/approacher should back off, or a confrontation will follow. Dunbar (1994,5:25) indicates that it can also be a threat, signify frustration, a lack of confidence, a learned helplessness, an invitation to play, or a learned communication. This underlines that any single signal, such as growling, should never be viewed in isolation, or be rigidly interpreted, but should be read in the total context. A dog exercising a play-bow. While growling, is most likely not readying for an attack! If the owner of this latter dog punishes it for growling, it is obviously misinterpreting the dog's communications, confusing the dog by reacting in an antagonistic instead of a friendly way, and will lose the trust of the pet.

We communicate to dogs mainly through vocalisation. Whilst dogs may learn to associate certain words with certain actions, they respond primarily, instinctively to the tone of the voice. Though not as well developed, relatively, as their olfactory sense, canine hearing generally is much superior to that of a human being. In communicating to dogs people may fare better talking softly, and concentrating on tone rather than on the meaning of the word. "Come Here!" shouted at the top of your voice will not be read as an attractive invitation to participate in social intimacy by the dog. Even using another, meaningless word, or saying, "go away" in a soft and gentle voice, may have much better results.

Visual communication

Beaver (1981:647) states that the language of dogs differs to that of man in that it is primarily a language of body postures.

To human eyes this is the most obvious form of canine communication, and for this reason it will be discussed in more detail, and under separate situational headings. However, the dog's visual sense is less developed than its olfactory, and possibly even its auditory senses. Especially if the sender is some distance away, it is much more reliant on chemical (olfactory) and also, but to a lesser extent vocal (auditory) signals to correctly interpret another dog's signals.

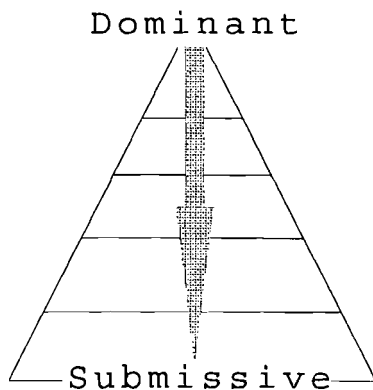
As already suggested, marks such as scratches in the ground may be seen as a form of visual communication. However, we will concentrate on the more pertinent forms such as physical displays; facial expression and "body language" or posture.

"Body language" is a term used by lay people. Strictly speaking, dogs don't have the capacity to speak a language. A language is not inherent, and needs to be learned (Lorenz, 1967:76). It is not universal, but specific to certain cultural groups. In the spoken form we recognise, it implies having certain anatomical structures to form the words/units, which dogs do not have. It must be able to accommodate infinite creative constructions, abstract ideas, things and events distant in time and place (The Oxford dictionary to animal behav-

our, MacFarland, 1981:332). It relies on the capacity of the speaker to understand abstracted concepts, and to be able to refer back and to events in the future. Most of these qualities cannot be applied to canine "body language", or canine verbal or general communication. In terms of specific physical displays, "body postures" would be a better term to use.

Communication in animals is primarily involved with expressing attitudes towards social partners (in domestic companion animals not necessarily a sexual partner, often rather another companion animal in the same household, or humans in its milieu). It regulates these social relations (The Oxford dictionary to animal behaviour, MacFarland, 1981:175).

In regulating social relations, the hierarchical structure of the canine pack will be expressed.



The range of visual displays vary from submissive to dominant postures, in regard social position. In relation to a conflict situation, dogs display attitudes from fearful to aggressive. One will encounter combinations of these, for instance, a dominantly aggressive dog, or a non-aggressive dominant dog, and similarly a fearfully submissive dog, or a non-fearful submissive dog (see next page for diagram).

Display of rank

A dominant or "Alpha" dog will have the strongest leadership qualities, and would rank highest. From here the rest of the pack will follow in different strata of ranking, through to the most submissive. Fogle (1990:163) recognises in wolves also "subdominant" members, ranking just below the dominant leader. Such animals are more subdued, contentedly tagging along, but are not generally actively submissive.

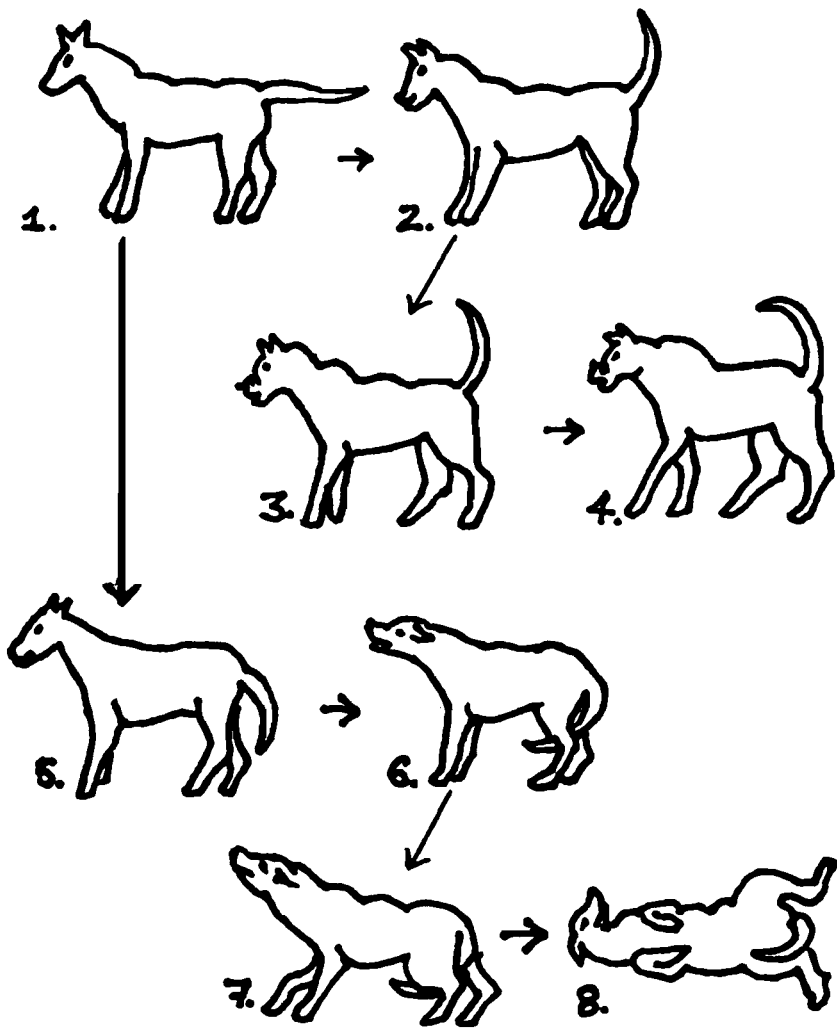
Where more than one dog co-exist in the same territory, and in the case of companion animal dogs a household, the same arrangement will be strived for. It is often the household with many dogs where the ranking will be clearly defined, as the dogs will tend to form a more definite canine social structure, separate or independent from their interaction with the humans. With fewer dogs in a household, the interaction between dog and people will be more accentuated, and the natural tendency for settling rank

amongst the dogs may be interfered with by the human beings.

This social order is maintained through communication. Prominent or more subtle (and therefore often unnoticeable to the human eye) displays ensure that each member of the pack announces their own rank, and accept that of the other. This behaviour can even be considered a ritualised form of communication. This prevents fights happening, and ensures a harmonic co-existence. However, human interaction with a different social and communication code, may confuse and upset this balance.

"The Oxford dictionary to animal behaviour" (MacFarland, 1981:165) states that if it is to the sender's advantage that other animals take its behaviour into account, natural selection will ensure adaptive accentuation of informative actions, so that it becomes more effective. This may lead to "ritualization", enhancing the act's conspicuousness and unambiguity as a signal. Posture, movement and facial expression are examples of such signals becoming (ritualised) displays.

"Intention movements", or incomplete movements are one of the types of movements most suitable for ritualization (The Oxford dictionary to animal behaviour, 1981:84). A dog bares its teeth before it bites. If its opponent flees and a fight does not ensue, it is to the benefit of both parties, as no damage will be done to either. It helps ensure their survival.



(After Fogle, 1990: 64-65)

- 1 Relaxed
- 2 Alert, dominant display
- 3-4 Aggression display - initial to advanced stage (before actually attacking)
- 5-8 Stages of submissive displays, increasing in intensity from left to right.

The clearer the signal of bared lips, and the better the recipient receives and decodes the better the communication. Natural selection would favour this. (Human selection, unfortunately, does not always take this into account). In this instance of intention movement, selection would be for exaggerated teeth-baring movements, the lips drawn further back than necessary to bite. So a non-signal (a movement of intent) has become a signal - thus the evolution of a ritualised process (13:84).

Dominance displays

The dominant dog is confident, and its whole body communicates this. It may leave olfactory messages more prominently, possibly more frequently than other dogs. When meeting another dog it will approach it confidently from ahead. It will initiate and keep visual contact by staring at the other dog. It will greet with an upright, alert posture. Its ears will be pricked forward, its head held proud on a high neck. Its tail will be up, possibly wagging moderately - neither slow nor fast. It will move on stiff and extended legs. It will sniff the other dog, first nose to nose, and if the meeting continues without interruption, the other's inguinal and peri-anal regions, to familiarise itself with the other's genital and anal scents.

If challenged by the opponent, it may communicate its authority by manipulation of its scruff and mouth or muzzle. A bitch, for instance, reprimands an unruly pup by gently but firmly biting its scruff or enclosing her jaws around its muzzle.

Mounting the other dog, usually not in the typical sexual orientation from behind, but rather from the side, could also be a display of dominance. It may stand over an opponent. It must be remembered that all these displays are not necessarily signals of active aggression, and whilst doing so, a dog may actually be moving along the ritualised patterns in trying to avoid a fight. If the opponent won't accept these signs of authority, the sender must then react by either becoming actively confrontational, ensuing in an aggressive fight, or by backing off itself.

Submissive displays

A dog that naturally has a low social status, or who is confronted and yielding to a more dominant dog, will indicate this by looking non-threatening. The submissive non-confident will present the opposite posture to that of the confident, dominant dog. Whereas the latter will appear bigger in order to reinforce its status, the submissive dog will appear smaller. This ensures that the opponent does not read its messages as a challenge, that may lead to an attack, thus ensuring its survival. It usually remains stationary, or immobile at least for a short period (Beaver, 1981:648). It will avoid visual contact with the more dominant animal by either not initiating it, or looking away. It will lower its

head and neck. If it does approach the opponent, it will not do it head on, but sideways, but more frequently it will stand to be approached by the other. It will lower its tail. The ears will not be pricked forward, but will be folded back slightly. The tail may wag, rapidly.

The dog may "grin" submissively (Fogle, 1990:120), possibly without showing teeth. Beaver (1981:649) refers to the "mimic grin", a submissive greeting grin, that occurs in certain lines of breeds. This grin is displayed with lips drawn up to show teeth, whilst avoiding eye contact. (A threatening grin usually is done with eye contact, unless the dog is displaying fear submission). A "greeting grin" is shown with the corners of the lips, and ears drawn back. This grin shows no or little teeth. Again, as illustrated here, the owner should not rigidly read bared teeth as offensive. It can have innocent and opposite meanings.

The dog may stand lower on its legs, and from there possibly go into a crouch, first going down on the hind legs, then the front, from where it may roll over onto its back and present its belly. To the human observer this may seem a symbolic yielding, displaying the most vulnerable parts (the belly and underside of the neck), to us apparently saying: "I am obviously no threat and trust your authority fully".

Some dogs may urinate submissively. Such behaviour should not be

punished by the owner - the dog will read it as increased dominance, and will attempt to be even more submissive - which may lead to aggravation of the urination.

Beaver describes the diverted gaze as the most common gesture of passive submission. Continued direct eye contact from the other party communicates a message of continued threat, for instance an aggressive dog or person watching the dog with undivided interest. This will cause extreme submission.

The friendly and confident submissive dog may revert to play.

Displays of emotion - Aggression and fear

In response to a conflict ("?") situation, the main options are either to confront the situation (fight, or to be confrontationally aggressive - offensive), or to avoid it (flight, or to escape, to avoid the situation).

If the latter animal is prevented ("X") from escape, for example when on a lead, or cornered, its option to back out is taken away, and it will have no choice but to fight.

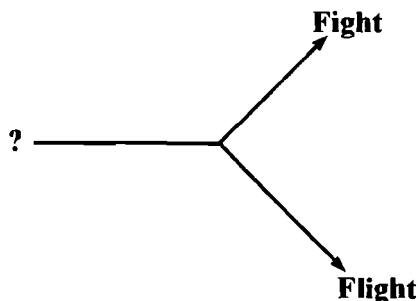
Again, this is a simplified, basic representation. There are many more possible modes of action in response to a conflict situation, such as "freeze", submit, and displacement of action.

The term "conflict situation" refers to what the subject views as a conflict. Meeting up with an unfamiliar dog, or confronting an unfamiliar situation, such as having to cross a noisy street for the first time, may not be viewed by the human as a crisis, but to the undersocialised or incomprehensive dog it may seem so.

Aggressive displays

An aggressive (dominant and offensive) dog may initially appear, to the unschooled eye, to be very like the dominant, non-aggressive dog, before advancing to more overt signs such as growling and bared teeth. The person may misinterpret it as friendly, and reaching out a hand or attempting interaction in such instances will lead to an aggressive confrontation. This may sometimes explain the so frequently reported cases of "attacks without warning". Actually the signs were there, it was just not heeded.

Some dogs, however, do have a less clear display of intent, as discussed



elsewhere.

Dogs biting through fear may also be misread, and seen as "biting without warning", the person for instance trying to stroke a very submissive dog.

The aggressively dominant dog displays a stiff and elevated posture. It stares at its opponent, ears erect and forward, teeth bared but with open lips drawn forward, not "smiling" or drawn back. It may growl.

By being poised stiffly it would tend to "appear bigger". The apparent increase in size is accentuated by pilo-erection of especially the hair on the shoulders and neck ("raising its hackles"), to intimidate the opponent even more. Again, the fine distinction between the aggressive and dominant dog may not be apparent to human eyes. A dominant but inoffensive dog may employ the same techniques in order to avoid active confrontation.

Human interference may in another way, cause the unsuspecting dog an apparent increase in size. By lifting the tiny pet-dog into a lap, the owners are reversing the natural status communicated by apparent size. Suddenly the big dog feels threatened by the smaller dog, and has to go to further extremes to settle rank, possibly by fighting. Conversely the smaller dog may feel more confident, not only being on the same or higher level (apparently physically bigger), than the other, but by sensing the

physical back-up support of the owner, on whose safe lap it sits.

People may also appear threateningly big. If for instance a person wears a coat with turned up collar, the dog may feel scared or confronted. A dog unfamiliar with people of big stature, for instance a lonely widower's, may feel threatened by the apparent aggressive display exhibited by an unfamiliar looming male house visitor greeting it in a "growly" voice. Comparatively, a very confident dog may try to exert its dominance over a soft spoken, small person, for instance by mounting displays.

Fearful displays

A fearful (submissive and defensive) dog may appear much like the friendly submissive dog, but its posture will revert to the extremes of submissive display and may combine these signals with displays of fear aggression.

It will crouch down with arched back or present its abdomen, tail tucked in tight against the belly ears pressed tightly against its head. It may growl and bare its teeth. Usually, the opponent reads its signs of submission and accept them, so that the situation is resolved. However, the confrontation may continue, for instance the opponent not heeding to its submissive signals, such as an under-socialised dog not interpreting the submissive dog's displays correctly, an owner misunderstandingly trying to

punish it while submitting, or a veterinary surgeon who, often due to the nature of the work, has no choice but to examine it in such a situation. The cornered dog may become defensively aggressive. This is probably the most dangerous dog to deal with, because its actions may be totally unpredictable, as it easily reverts to a state of panic.

Tail wagging as a form of communication and misinterpretations

As so many of us have been misled to believe, a tail-wagging dog is not necessarily a friendly dog. Several illustrations have already been discussed in this paper. The traditional "friendly" wagging is an exuberant activity of excitement. Tail wagging in other contexts can be seen as a common form of displacement activity. An animal confronted with a novel or conflict situation will often wag its tail, an activity filling in the pause during which the brain is assessing the situation, and an (instinctive) decision is made on the reaction to follow. When being greeted by an owner (even after brief separation), stranger or another dog, the animal is momentarily indecisive. If confident and friendly the wag will be relatively rapid, and the rest of the posture will underline its harmless intentions.

Again, the activity must not be read in isolation, but in the context of the situation and the total posture of the

animal. A dominant dog may display a stiff, erect tail of which only the top is wagging, relatively slow. A large, slow swish indicates an offensive attitude, and a tailtip rapidly vibrating, stress. A submissive dog may wag a lowered tail rapidly, interpreted by us as symbolic appeasement.

The influence of human selective breeding on visual displays

In visual communication, the dog utilises its whole body as a unit (posture), as well as specific parts, from head through scruff to tail, and the face: the eyes, ears, muzzle, lips. However, during domestication and through selective breeding many of these features got altered, so that these forms could not comply to its original intended function. Human selection for certain features or qualities, has led to neglect of others, or has been superficial, in selecting for pure aesthetic reasons, whilst forgetting to consider the capacity of the organ to fulfil its original function.

Dogs bred for very thick or long haired coats, to protect against environmental factors, or just to please the human eye, may lose the capacity to clearly "raise their hackles", as it is physically impossible for such long and relatively heavy hair to visibly stand up during piloerection, or to the extent it does, it will be obscured by the masses of hair overlying it. A very short coat's display of piloerection may also not be effective, as it may be too subtle to be noticed.

Other examples include eyes covered by hair, causing a breakdown in communication not only through the message of intent, (staring at the opponent) is not perceived by the recipient, but physically restricting the sender's capacity to receive returning messages. Dogs with hair covering the eyes may have a reduced visual capacity, especially in receiving visual stimuli from the peripheral aspect of their optical fields, popularly referred to as "tunnel vision" amongst canine clinical ethologists. Brachycephalic dogs, such as Boxers, with eyes set to the front of the skull, may have similar problems due to lesser peripheral vision. Some dogs are so uniformly covered by long hair, that it may be difficult for the human eye to distinguish between head and tail end at a distance; imagine confusing the wrong end for the non-biting one when approaching a wary dog!

Especially dogs bred for scent work, to track prey or smells on the ground, the tendency had been to select towards long, floppy ears, in theory to help channel scents up to the nose. Such dogs' ears are incapable of being obviously manoeuvred.

Some breeds, like the British Bulldog, have been bred to have short tails, while other breeds are traditionally docked. In viewing such animals, one misses out on very important communicative clues offered by the tail. Brachycephalic dogs with extremely foreshortened noses cannot

transmit proper cues such as a curled lip or wrinkled muzzle. Examples:

Whilst selective breeding have physically confused the possibility of transmitting signals in some breeds, others have been bred to show very little sign of warning before attack. Fighting breeds, and some guard dog breeds, will attack without warning, in part to ensure their own survival by the element of surprise. Fogle (1990:66) describes Rottweilers as poor body signallers, moving from contentment to anger without a change in their body posture. The dog can switch from a docile looking animal to an aggressive animal in a single moment.

The implication, especially in potentially aggressive confrontations, can be disastrous - very often dogs would avoid fights by a set of very obvious visual displays. If these cannot be transmitted or received properly, a fight will ensue, possibly against the intent of both parties. Similar situations may arise between a dog and a well-intentioned human being.

Attention-seeking communication

This form of communication is very much a learned one, and more inclined to be directed to the owner. (Though some examples may have real or apparent prototypes or analogies in inherent behaviour, the majority of these will have developed through operant conditioning).

A dog is alerted when hearing a noise. It barks to call for support. The owner comes to investigate, and opens the door for it. After a few of these episodes, the dog learns that barking will lead to a door being opened. It now barks at times simply to get access to the garden, for different reasons, or even just to get some interaction from the owner.

A puppy nudges the owner, possibly by bumping accidentally. The owner strokes it. The pup learns that nudging leads to a positive reward. (The speculation may be that the pup nudges the person as it would nudge the mom's teat, and milk, the reward, follows. Similarly a pup may paw the owner, speculatively as it would paw a teat).

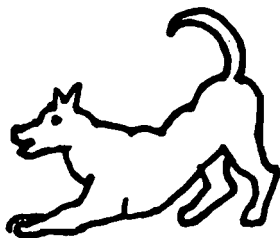
Friendly communication and invitations to play

Beaver (1981:647) classifies friendly communications into three categories: passive submission, active submission, and play. Like submissive displays, friendly postures tend to decrease the size of the dog and thus its apparent "threat" to others.

Passive submission displays the diverted gaze, lowering of head, neck, ears and tail, crouching and even rolling over. Licking and paw raising may solicit interaction. A mimic grin may be displayed.

During active submission the dog will run towards the person in greeting, upon which it will then divert its gaze and hold still. The body position may then be lowered. Submissive urination may occur. A greeting grin may be displayed.

A desire to play will be indicated by the "play bow"



The "play bow"

In adult dogs, one primary position will be exhibited. Crouching on front limbs whilst remaining standing on its hind, chest down, and rump up, front feet stretched forward, is the "classical" play bow. It may be accompanied by a "play grin", described by Beaver (1981:649) as a more intense form of the greeting grin, with eyes partially closed and the ears often forward. Marc Bekoff (1977:1098) observed similarity in both duration and form of the canid play bow in infant wild canids, such as wolves, coyotes and dogs, as well as in adult free-ranging dogs. He indicates that the role of this context-specific social signal in the communication of play intention has become a

stereotyped display. In order to reduce ambiguity of meaning, and to clearly override any possibility of being mistaken for an aggressive display, the play signal has to be totally different from any other.

"Intention movements", preparatory to specific actions, such as the play bow, may thus also be seen as forms of communication.

Greeting behaviour in dogs and the human hand-shake

When encountering an unfamiliar dog for the first time, or two acquainted dogs meeting after a period of separation, certain patterns of behaviour can be observed. It is especially here, in greeting behaviour, that the term "ritualised" forms of communication can be applied.

Bradshaw and Lea (1992) observed components of behavioural interactions between pairs of dogs meeting in public open spaces in the United Kingdom. The observations were done from a neutral distance. Most of these interactions were non-aggressive, with no interference from the owner.

The majority occurred in fixed patterns with relatively predictable sequences. Generally the initiating dog would approach, and then "orientation" (low intensity signals establishing dominance) takes place. One dog (usually the recipient) may retreat at this stage, but usually an

olfactory inspection would then take place. The initiator may circle the recipient, who would usually remain stationary. Head to head olfactory inspection is usually followed by head to tail (anogenital), and the initiator will be the more active sniffer. Head to flank (inguinal), and urination and subsequent inspection thereof, may also occur. The recipient may sit down, to prevent olfactory inspection by the initiator. (The authors state that it is usually the subordinate animal that is reluctant to be sniffed).

Other possible interactions may follow, such as play initiation and play, or running together. One dog may also ignore the other, or retreat at any stage, or roll over, allowing full anogenital inspection by the other.

Fox (1987) suggests that the inguinal sniffing is a ritual "handshake", and that it could be mimicked by humans in familiarising an unknown dog with them in a pleasant and non-threatening way.

Many human beings, albeit a culturally formed habit, greet each other with a handshake. It may be interpreted as a gesture of trust, placing the right, usually the strong and protective hand, in the care of a stranger. (Whilst doing so, both parties gain unspoken information, such as the strength of the handshake, the condition of the hands. Dogs, however do not appreciate this culturally acquired human meaning. Their instinctive reaction to a hand being stuck out to them would be that of

alarm, and they would react correspondingly.

This is another example of interspecific communication disasters. The person sends the message "Oh you're such a pretty dog I want to touch you", and reaches out a hand, usually from head on, bending over the dog whilst staring in the dog's eyes. The dog receives a message of challenge and threat - its personal space is being violated by a total stranger looming dominantly over it - it may be equivalent to a knife being stuck out to it, rather than the intended friendly handshake.

Greeting an unfamiliar but friendly dog should be done in a non-threatening way - the dog should be allowed to approach at its own time, or the person could move closer, slowly, and from the side instead of head on. All gestures should be slow and calm. Avoid eye contact. Instead of bending over the animal, squat on your haunches.

Once the dog has accepted your close presence, an attempt to touch its body, around the chest region, could be made from the side. Only once this has been accepted with obvious friendliness, could one attempt to touch the head.

Most well socialised dogs learn quickly that a hand stuck out is not a threat, but signals something positive (a pleasurable ruffle of ears, or a biscuit being given). However, if not mutually familiar with each other's

friendly intentions, the dog should not be greeted by the human handshake.

CONCLUSION

Some humans may have a vague instinctive sensibility to receive and interpret canine signals, but generally it takes learning, through experience, or through education, to be able to correctly interpret these. In our domestic milieu, which invariably includes domesticated animals, most of us have some form of regular canine contact.

Learning this new "language", and acquiring the skills to correctly interpret them, and respond accordingly, ensures better interspecific communication, in which we, as beings with the superior mental capacity, should take the leading role.

This would seem the opposite to the traditional one-sided view that the dog, the "lesser" species must be trained to understand our words, as in "sit", "stay", heel. If we can develop our capacity to correctly receive and interpret canine signals, it will, by providing better communication between us and our dogs, avoid misunderstandings and unwanted behavioural interactions. This will ensure a better co-existence, increasing the quality of life for the dog, and in return for the human being. Understanding canine communication will strengthen the bond that exists between human beings and dogs.

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