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# Human-dog communication: How body language and non-verbal cues are key to clarity in dog directed play, petting and hugging behaviour by humans

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## Highlights

- Human-dog communication may lack clarity and understanding for both species.
- Human-dog hugging/petting/playing behaviour can effect canine ontogeny negatively.
- Online video showed high incidence of stress and agonistic behaviour in dogs.
- Targeted dog behavioural education for children/adults is vital to prevent dog bite.
- Education can improve dog and human welfare creating stable enduring human-dog bonds.

## Abstract

Clarity of communication between humans, intended to convey a message, may be misunderstood, or ambiguous, depending on many influencing variables, including impaired vision/hearing, neuro-divergence, culture, native language accent and gestures. Intraspecific communication in animals has been problematic to define in absolute terms, however, species such as dogs have a robustly researched and documented repertoire of behavioural body language, signalling and vocalizations. Humans tend to exhibit human communicative gestures of affection to their

dogs, including hugging, touching, kissing and restraining them. Play is an essential element of the ontogenesis of any puppy/dog; however, it appears that intra and interspecies play in dogs differs in form, function and motivation. This study investigated, compared, and considered, the behaviours/communication which humans exhibit towards their dogs, and those exhibited by dogs towards their humans, during “play, petting and hugging behaviours”. Video-sharing platforms facilitate studying human-dog hugging, petting, and playing behaviour and comparing dogs’ non-verbal communication with the comments “like/dislike clicks” of viewers. The current study was conducted on google, investigating media sharing platforms. Study (1) “play” reviewed the 30 most popular videos, and studies (2) “hugging” and (3) “petting”, reviewed the 80 most popular videos on media platforms. Our results showed that many human behaviours may be concerning as humans tend not to necessarily understand the body language or vocalizations shown by dogs, when interacting with them. A high number of stress behaviours were observed in the dogs involved which may have occurred due to misunderstanding of the information a dog is communicating during human-dog play, petting and hugging behaviour. This can cause feelings of discomfort, anxiety, fear, distress, and confusion in a dog, which may result in a fractured human/dog bond, welfare issues for the dog, and the possibility of a dog escalating to exhibit defensive/agonistic behaviour should communication fail. The high prevalence of videos in which stress-related behaviours were identified was concerning, although the expression of a specific behaviour may sometimes depend on the kind of interaction and/or other characteristics of the dyad engaging in it. We advocate for increased education for both adults and children in canine communication, context and in co-operative ways of respecting agency in human-dog interactions.

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## Introduction

Communication between humans can be both intentional and unintentional, and may use both, verbal and non-verbal signals. Many factors may influence how messages are understood and perceived (Jones, 1998) including impaired vision/hearing, learning difficulties (Badcock and Sakellariou, 2022), neuro-divergence (Howard and Sedgewick, 2021), culture (DeVito, 2016), native/sign language, accents/customs/gestures/context (Schnapper, 1998). Thus, human-human communication may not be clear, causing misunderstandings, even insults/antipathy.

Humans tend to demonstrate affection through touching/hugging/rubbing/kissing/leaning-into/gestures and eye-contact. Hugging is considered to be a human greeting behaviour, described as indicating friendliness, with the form the hugging takes, embracing, body pressing, kissing, defining close or intimate relationships (Forsell and Åström, 2012). Hugging may include intense eye contact and caressing. This kind of communication comprises various sequences of body movements, which in addition to verbal communication, express intentions and convey, often subtle, information.

Even among humans, some forms of communication/touch between adults require consent; misunderstandings may cause offence/hurt/anger within a relationship (Anyadike-Danes et al., 2024).

A more perfunctory hug might be exchanged, between e.g., politicians as a symbolic gesture (Forsell and Åström, 2012). Gift giving between humans, can take various forms, and for varying motivations, however, relational gifting is indicative of a relationship, (Davies et al., 2010). Humans tend to make videos/photos/selfies (Sun, 2017) of family, friends, and pets, often uploading video and photos to social media platforms to share.

Defining intraspecific communication in absolute terms has been problematic, (Goodenough et al., 1993) suggest a broad definition may be “a transfer of information by a signal that evolved for the purpose, which modifies the recipient’s actions”.

Animals have evolved species-specific communication systems, with clear signalling, which convey information between conspecifics, with recognisable effects on the other’s behaviour. Interspecific communication also occurs, of course. Dogs have a relatively large repertoire of behaviour (Abrantes, 1997, Csányi, 2006, Krauss and Maue, 2022,

Miklósi, 2007), inheriting their communication systems from wolves as they existed behaviourally and morphologically, when divergence occurred. Canine communication entails the use of ears, face, muzzle, teeth, body, coat, paws, and tail, all in addition to odours, all in combination with vocalisations (Lord et al., 2009). However, misunderstandings can occur between puppies/dogs of differing breeds due to morphological differences which have challenged some breeds' ability to signal clearly.

Canine-communication has recognised structures and intentional behaviours (Horowitz, 2009). Dogs exhibit pawing, sniffing, licking, muzzle/scruff-mouthing, running, barking, play-fighting, mounting, object-play, chasing, wrestling, and play-jumping. Importantly, these behaviours may be punctuated by "play-bows", observed in various contexts, including prior to engaging in play and during play, acknowledging intent. Thus, communicative signalling, causes one dog's behaviour to be influenced by another (Shettleworth, 1998), in a non-ambiguous manner.

Communication plays a role in nurturing bonds, and a key role in avoiding overt aggression. The "ladder-of-aggression" (Shepherd, 2002) describes least overt, "calming signals" to overt aggression, which may escalate in intensity and threat if initial signals are ignored. Calming signals or appeasement behaviours (Mariti et al., 2014, Mariti et al., 2017, Rugaas, 2006, Shepherd, 2002), recognised as indicators of stress include: turning head away, blinking, lip/nose licking, freezing, play-bow, yawning, licking human, ears back, panting, biting, staring, lying down, growling and barking. Mariti et al. (2017) found a higher incidence of calming signals between unfamiliar dogs, and de-escalation of aggressive behaviour in response to calming signals. Additionally, Mariti et al. (2012) found that an owner's ability to recognise stress in their dogs varied dependent on multiple factors.

Humans exhibit affectionate behaviours towards their dogs, and may hug/hold/carry them, restrain them on their lap, play/tease them with food/toys, kiss them on the nose/muzzle/face or stare/gaze at their eyes (Dwyer et al., 2006, Reisner, 2003). As with human families and friends, they tend to treat them relationally, including them in family photos/videos/selfies.

Some physical interactions that humans enjoy when communicating/interacting with dogs may not always be perceived as pleasant by dogs, such as behaviour associated with physical closeness/proximity or intimacy. When dogs put their paws on another dog (analogous with human behaviours towards hugging/petting/playing), it may intimidate, causing deference, however, it should be interpreted congruent with other simultaneous physical interactions and body language, and with the preceding behaviours. It does not indicate affection/desire for social contact/hugging; nor is licking a human's mouth an indication of love/kissing (Cavalli et al., 2020, Overall, 2013).

Kuhne et al. (2014) investigated emotional states in dogs who were being petted on different body parts, by both familiar and unfamiliar people. They found that petting a dog on its paw, back, using a hand to cover its muzzle and holding the dog on the ground or by the collar may risk the human-animal bond. Additionally, emotional state (measured by heart rate variability) differed depending on whether a familiar or unfamiliar person petted the dog.

Canine body language that is often perceived as amusing by humans includes: yawning and lip-smacking, which are recognized as calming signals and have been observed in research when assessing animal welfare (Palestrini et al., 2010). Non-verbal communication is a channel of interaction that humans and animals share, human body language occurring often on a subconscious level.

Play inherited proclivity, is distinguished by a combination of traits. It is typically considered to be voluntary, pleasurable, distinct from other behaviour, and of a make-believe quality (Bekoff and Byers, 1981, Bekoff, 1984, Bekoff and Allen, 1998, Fagen and George, 1977, Norbeck, 1974). Many definitions of play suggest that the goals of play are non-utilitarian (Bekoff and Byers, 1981). As benefits may be instantaneous or a future investment, there is a distinction between immediate, unconscious, or subconscious goals.

Play is believed to form a part of behavioural ontogeny (Bekoff and Byers, 1981) and appears to be essential to the development of many young animals. Function may differ dependent on species/age/sex and has been shown to

provide necessary exercise in young animals (Fagen and George, 1977) and to confer physiological advantages; as bones/muscle strengthen, cardiopulmonary capacity and efficient movement increase (Bekoff and Allen, 1998). During play, animals engage motor patterns that may be used in other contexts, such as, predatory/defensive/agonistic/courting/mating behaviour (Landsberg and Denenberg, 2014), developing motor-skills, enhancing problem-solving skills, building social cohesion, co-operation, interactive use of motor and perceptual skills; hypothesised as learning or practising skills requisite for adult survival. Play may be modified by learning experience involving both inter/intra species (Bekoff and Byers, 1981). Normal motor patterns will develop within young animals without play; however, play enhances skill and proficiency.

Observed across species including humans, dogs, parrots, primates, equines and even bees (Samadi et al., 2022), across age categories from neonates to elderly, play features prominently in a puppy's ethogram and is observed in adult and elderly dogs, occurring socially, intra/interspecifically, and non-socially with objects/toys (Hall, 1998).

Adult play may appear superfluous but has been theorized as possibly enhancing skill proficiency. Role playing or fun interactions observed in "cared for dogs" may burn energy and satisfy an inherent breed specific motivation and is considered an indication of positive welfare. Additionally, it may arise from behavioural neoteny which varies across breeds (Landsberg and Denenberg, 2014).

Some studies suggest that a single conceptual framework can be applied to both canine intraspecific and dog-human play interactions; others suggest that dog-human play may compensate for a deficiency in intraspecific play, as dog-human play exhibits the same behavioural patterns. Yet, others suggest that intraspecific social play may be structurally different from interspecific play (Aldis, 2013, Loizos, 2017).

Rooney et al. (2000) showed that having opportunities to engage in intraspecific play does not reduce or satisfy the motivation for dog-human play; the structure of dog-human object-oriented play differs to its intraspecific counterpart, specifically the motivation to possess an object and to interact with the partner differ, indicating that these play types are not homogeneous. Dogs' playfulness, in social contexts, may have been selected during domestication as an adaptive trait to facilitate the formation of emotionally based bonds between dog and owner (Rooney et al., 2000). Play frequency and form may indicate the quality of dog-owner relationships.

However, during human-dog play many interpretations of the implicit functions of specific elements of play behaviour, may be misinterpreted by humans and dogs. The aim of this study was to investigate, compare and consider, the behaviours/communication which humans exhibit towards their dogs, and those exhibited by dogs towards their humans, during "play, petting and hugging behaviours."

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## Section snippets

### Data treatment and statistical analyses

Study (1) "play" reviewed the thirty most popular videos during the research period, and studies (2) "hugging" and (3) "petting", reviewed the 80 most popular videos during the research period. The origin of the data and videos are described in Table 1. The popularity of a video was indicated by the number of likes that the video received. The viewers indicated their appreciation of a video, which showed behaviour, at a point in time. It is unknown what transpired prior to or post the video...

### Results

The behaviour recorded in most videos was "blinking" (present in 126/190 videos), which was shown in significantly fewer "play" videos (3/30) than in "hugging" (64/80) and "petting" (59/80) ones (both  $ps < .001$ ).

Table 3, describes the human-dog and dog-human behaviours observed in hugging, petting and play videos...

## Discussion

Our pilot studies show many causes for concern as humans tend not to necessarily understand the body language or vocalizations exhibited by dogs, when interacting with them. One of the main functions of human-dog play is creating and strengthening the bond between species, however our results revealed a high number of stress behaviours or calming signals (Mariti et al., 2014, Rugaas, 2006) observed in the dogs involved which may have occurred due to misunderstanding of the information a dog...

## Conclusion

Miscommunication arises in human-dog relationships, creating risks to the welfare of both, and negatively affecting the human-dog bond. Our studies show a lack of awareness of the meaning or interpretation of canine signaling and communicative behaviours. Poor socialisation, inappropriate handling, and inappropriate exposure to people, may negatively affect a dog's ability to learn human communication. Additionally, humans need to understand and recognise communication exhibited by their dogs,...

## Limitations

This research had a number of limitations.

The numbers of videos coded differed between the three groups, future investigation should have equal data for each group.

The way in which the data were coded prevented us from gathering more fine-grained scores of the videos, such as the length of time humans tried to interact, and their response to stress signals. As the videos were short fragments, of a point in time, only that section was visible, therefore in some situations such as bite, videos...

## CRedit authorship contribution statement

**Elizabeth Ann Walsh:** Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Lieve Lucia Meers:** Writing – original draft, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **William Ellery Samuels:** Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Dorien Boonen:** Project administration, ...

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper....

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F. Kuhne

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