

# Why are dogs staring at us?



Dogs can use non-verbal communication in order to interact and form bonds with humans. One form of non-verbal communication that dogs use is known as gazing (Koyasu et al., 2020). Gazing occurs when a dog stares intently at someone to get their attention (Koyasu et al., 2020). Based on a study (Marshall-Pescini et al., 2013), dogs use this behaviour for referential communication when they are faced with an unfamiliar situation or impossible task. Scientists have studied these behaviours to understand what influences these behaviours and to truly understand how the behaviour evolved.

## Evolutionary development of gazing behaviour



From "Dingo" by ogwen is licensed under CC BY 2.0. Dingoes were one of the more recent ancestors of dogs and their gazing behaviour was compared with dogs to understand the differences.

Dogs were able to coexist with humans for more than 10000 years by developing communication skills with each other like gazing (Koyasu et al., 2020). Dogs descended from wolves and began to learn how to cooperate with humans (Koyasu et al., 2020). Scientists researched the evolutionary aspects of the gazing behaviour and how the behaviour developed throughout the canine domestication process.

A study used dingoes to understand more about the evolutionary timeline of gazing behaviour (Johnston et al., 2017). Dingoes were the most recent ancestors of dogs as they began to exist at least 5000 years ago (Johnston et al., 2017). The scientist observed the dingo's gaze towards their handlers and measured the duration of their gaze in a testing area (Johnston et al., 2017). These measurements and observations were compared to the dog's gaze and gaze duration (Johnston et al., 2017). This study found that a dingo's initiation of gaze was more similar to a dog's initiation of gaze (Johnston et al., 2017). However the duration of a dingo's gaze was shorter than the dog's gaze duration. These results suggested that the initiation of gazing was learned before the existence of dingoes but the ability to commit to longer gaze durations was learned after the existence of dingoes (Johnston et al., 2017). However in this experiment, the handlers spent more time touching the dingo which may have influenced their gaze behaviour (Johnston et al., 2017). Further study without touching the animals could be done to confirm the results of this study. Reading this article revealed that dingoes were the only canine studied so more studies could be done on other wild dogs such as the coyote or the red fox to better understand the evolution of gazing behaviour.

## How life experience is a factor for gazing behaviour



An example of an “impossible task” setup. Dogs will be subjected to an “impossible task” so that their gazing behaviour is being monitored. Since the dog can't retrieve the item in the container, they will gaze at someone in order to request for assistance.

One of the main factors that were found to influence the gaze behaviour in dogs was their life experiences with humans and how much they spend with humans. This was made clear when a study compared the gazing behaviour between puppies and older adult dogs when they are faced with an impossible task (Passalacqua et al., 2011). This study also compared their breeds to determine if there is a genetic factor to the behaviour (Passalacqua et al., 2011). This study found that younger dogs were more independent and that they preferred to solve the task themselves rather than communicate their need for assistance (Passalacqua et al., 2011). The older dogs gazed for longer durations at the humans which suggested that gazing behaviour does not occur from birth but was learned throughout a dog's life (Passalacqua et al., 2011). The breeds that were used for hunting and herding also gazed longer than other breed types which suggested that dogs working in jobs that require cooperating with humans influences their gazing behaviour (Passalacqua et al., 2011). These cooperation jobs consist of being able to communicate with humans in order to complete a task like hunting and herding so these dogs are taught and trained to communicate. Another reason for different breeds having different levels of gazing was that there were biological factors that impacted their gazing like hormones or genetics (Passalacqua et al., 2011).

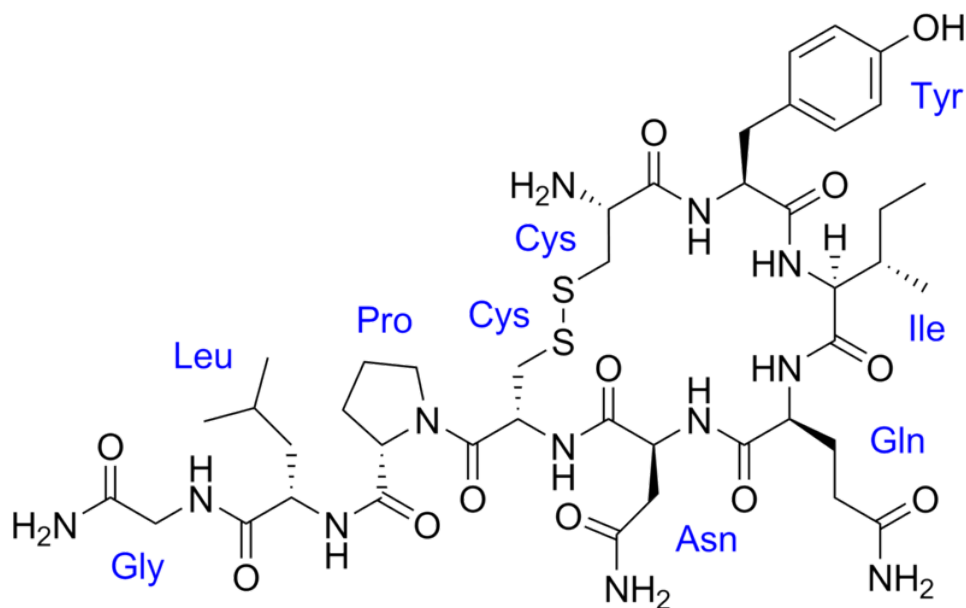
Another reason that life experience plays a factor for gazing behaviour is because dogs that interact with humans more throughout their lives develop stronger gazing behaviours. Studies have confirmed that dogs that have lived with other humans like pet dogs have stronger gazing behaviours than dogs that live in kennels (D'Aniello and Scandurra 2016). Their gazing behaviours are compared by having them face an impossible task which has food that is inaccessible to them but they can see the food (D'Aniello and Scandurra 2016). Stronger gazing behaviour is seen in dogs that live with humans as they gaze longer at humans more than the kennel dogs which have fewer human interaction (D'Aniello and Scandurra 2016). The reason why living with humans strengthens a dog's gazing behaviour is because the gazing behaviour is meant to be a method of non-communication with humans. If a dog's lifestyle consists of limited interaction with humans, dogs will not need to use a behaviour as they will barely communicate with humans.

The people that dogs interact with more were usually the type of people that dogs would gaze at more. A study compared the gazing behaviour between dogs who participated in animal-assisted interventions and pet dogs (Cavalli et al., 2019). The animal-assisted intervention dogs gazed more towards strangers than the pet dogs (Cavalli et al., 2019). The reason why this occurred was because the animal-assisted dogs had jobs involving interaction

with all kinds of people for the purpose of therapy or education. Since these dogs interacted with strangers more than their caretakers, their gaze would be more focused on strangers (Cavalli et al., 2019).

Some future studies could be done based on these results and observations in order to better understand gazing behaviour. For example, the studies that were done that had compared dogs living with humans with dogs that had limited interaction with humans used golden and Labrador retriever dogs (D'Aniello and Scandurra 2016). These types of dog breeds were known to be sociable dogs so using dog breeds that were known to be less sociable could be used to determine if there were any differences from the previous studies. Another future study could compare the gazing behaviour within the animal-assisted intervention dogs as there are many different types of jobs within that group.

### Biological factors influencing gazing behaviours



The molecule structure of oxytocin. Oxytocin is a well known social hormone and it is studied in dogs to determine if it is a factor that influences gazing behaviour. Attribution: Edgar181, Public domain, via Wikimedia Commons

Previous studies found that a dog's experience with humans was not the only factor that influenced gazing behaviour (Passalacqua et al., 2011). There were also biological factors that were found to play a role in influencing gazing behaviour in dogs. Some of these factors would include hormonal factors and genetic factors.

Researchers used oxytocin to determine if it had any impact in the way a dog would gaze at people (Dzik et al., 2020). Oxytocin was studied since this hormone was known to play a role in social bonding and reproduction. Overall the researchers found that administering oxytocin would increase by a slight amount (Dzik et al., 2020). However when comparing the oxytocin administered intact and neutered dogs, they found that administering more oxytocin would cause the intact dogs to gaze more than the dogs that were neutered (Dzik et al., 2020). With that in mind more studies should focus on determining why intact dogs are influenced by oxytocin more than neutered dogs (Dzik et al., 2020). Other hormones found to be associated with social behaviours should also be studied like arginine vasopressin to determine if it had an influence on gazing.

Another biological factor that was found to influence gazing behaviour was seen in genetics. A study studied two genetic regions in chromosome 26 to understand their influence on gazing and if they changed during canine domestication (Persson et al., 2018). The authors found that wolves and dogs had genetic variation at these regions which showed change during domestication (Persson et al., 2018). Authors also found that one region was associated with physical contact variables like the gaze duration and the other region was found to be associated with behavioural variables like the gazing frequency (Persson et al., 2018).

Life experience is a big factor that comes into play when it comes to a dog's gazing behaviour. However, these studies show that biological factors such as hormones and genetics also play a role in gazing.

## Overall thoughts

Throughout history dogs have cooperated with humans and formed bonds with them in order to improve survival (Koyasu et al., 2020). With this coexistence, dogs are able to develop a non-verbal communication method known as gazing (Koyasu et al., 2020). These studies that are done on the gazing behavioural are meant to fulfil the goal of understanding the behaviour and to understand the factors that influence the behaviour. Life experience plays a big factor for the behaviour while genetics and hormones also play a factor (Passalacqua et al., 2011). However, by reading through the articles, other genes and hormones can be studied to determine their impact on the behaviour. Also only one canine animal was used in a study (Johnston et al., 2017) so more canine species can be studied to explain more about how gazing evolved.

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