Is Your Dog Friendly and What Kind of Dog is That? Perception of Dog Body Posture and the Influence of Breed Stereotypes and Experience with Dogs

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"Is Your Dog Friendly and What Kind of Dog is That? Perception of Dog Body Posture and the Influence of Breed Stereotypes and Experience with Dogs"

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Abstract

Dogs use both their body language and facial expressions to show how they are feeling. Individuals' (age range 19-71 years old) ability to correctly interpret a dog's emotional state through its body posture without facial expressions present was investigated using two different dog breeds (German Shepherd vs Collie) and four different postures (playful, fearful, relaxed, and aggressive). The hypothesis that people could accurately read dogs' body posture was supported, since 49% of participants received a score of 3 (correct 75% of the time) or higher. It was also predicted that when people are unsure of the posture, the dog breed will influence their interpretation. This hypothesis was not supported since there was no difference in body posture interpretations of the two breeds. Therefore, stereotypes of the dog breed did not influence interpretations of the playful, relaxed, and fearful body posture. Participants correctly labelled the aggressive body posture of the Collie more accurately compared to the German Shepherd, which was opposite of what was predicted. The aggressive body posture had the lowest confidence rating, and it was the posture participants got incorrect the most. Experience with dogs also did not influence how participants interpreted the four body postures. The results indicated that people could read dog body language regardless of their knowledge or exposure to dogs. When they are unsure of certain emotions (such as aggression), participants do not rely on the stereotypes of dog breeds to decide. Past literature has shown participants interpretations of facial expressions alone or combined with body postures and it is unclear if or how well people can interpret dog emotions by body posture alone.

Is Your Dog Friendly and What Kind of Dog is That? Perception of Dog Body Posture and the Influence of Breed Stereotypes and Experience with Dogs

Dogs have been domesticated through interactions with humans over several centuries (Morey, 2006). Both species have relied on each other for many things such as better access to food. Through domestication, dogs have learned skills that have allowed them to communicate with humans (Kaminski & Nitzschner, 2013), and to share basic emotions (Hasegawa, Ohtani, & Ohta, 2014) such as anger, fear, happiness, sadness, disgust, and surprise (Wan, Bolger, & Champagne, 2012). It has been suggested that dogs are also good at reading human body language such as pointing at an object (Kaminski & Nitzschner, 2013). Kaminski, Schulz and Tomasello (2011) found that dogs could understand when a human pointed to a bucket of food since they would search for the bucket. Some of these communicative skills relies on body language such as heading turning or bowing (Kaminski & Nitzchner, 2013), or using mutual gaze to show humans what they want (Nagasawa et al., 2015). Mutual gaze is eye contact between people and dogs that represents a form of attachment between both species (Nagasawa et al., 2015). Dog's use eye contact to communicate that they require something, such as looking at you when they are hungry or thirsty (Nagasawa et al., 2015). It is beneficial for dogs and humans to communicate and understand each other's behavior and basic emotions as it creates a positive mutual relationship where both species can understand each other (Nagasawa et al., 2015).

Recognition of Facial Expressions

Interpretations of facial expressions are important for understanding behavior in any species (Hasegawa et al., 2014). The face is the most accurate representation of someone's mental or emotional state (Todorov, Said, Engell, and Oosterhof, 2008). People rely on facial expressions of other people to determine how they are feeling and make judgments about one another. They can read these expressions quite accurately even with minimal cues (Bloom & Friedman, 2013). It is important to recognize facial expressions for communication (Nagasawa et al., 2015) and understanding how people feel in different situations. This is possible because every person exhibits emotions in a very similar way (Schirmer et al., 2013).

People can accurately identify facial expressions of dogs as well as predicting emotional states such as happiness and aggression in certain situations (Bloom & Friedman, 2013). When interacting with a dog, humans tend to look at visual cues

by observing a dog's eyes, mouth, ears, or movement of the tail (Hasegawa et al., 2014). This could be one of the reasons humans are good at understanding facial expressions, since one of the main focal points is a dog's eyes (Hasegawa et al., 2014). A study even suggested that dogs can predict if human gestures are intentional based on eye contact only (Kaminski et al., 2012).

A dog's facial expressions shows the emotions they are feeling in different situations (Kujula, Somppi, Vainio, Parkkonen, 2017). Bloom and Friedman (2013) found that 41% of the time participants could link emotions in dogs from both facial and body language based on photographs. Another study found that participants could accurately match the correct emotions such as happiness, neutral (i.e., relaxed) and threatening to different images of dogs (Kujula et al., 2017). Therefore, the current body of literature supports that people are moderately good at using facial expressions of dogs to predict emotional states.

When individuals make judgments about another person, their interpretation can be biased from the emotion perceived in the body language (Meeren, Heijnsbergen, and Gelder, 2005). Based on this, people may have biased perceptions of body language when facial expressions are not present (Meeren et al., 2005). Relying just on facial expressions for predicting behavior can lead to incorrect judgements (Lakestani, Donaldson, & Waran, 2014).

Understanding a dog's body language can provide helpful information about how a dog is feeling (Hasegawa et al., 2014). People try to understand the behavior of dogs through visual cues as they do to, interpret behaviors of other people (Hasegawa et al., 2014). In some situations, strong visual cues from body language can override facial expressions (Martinez, Falvello, Aviezer, and Todorov, 2015). A study by Clarke, Mills, and Cooper (2016) compared an image of a dog sitting compared to a dog standing and found that body postures affect our understanding of a dog's behaviour.

A dog's tail position is very important in understanding a dog's emotional expression (Hasegawa et al., 2014), since its apart of the dog's overall posture. The position and motion of a dog's tail helps humans understand if a dog is feeling friendly, aggressive, playful, or dominant (Hasegawa et al., 2014). Many individuals focus on a dog's tail and facial expressions to understand their behavior, but are incorrect in their interpretation (Hasegawa et al., 2014). Tami & Gallagher (2009) found that dogs wagged their tails if they were being friendly, aggressive, or defensive. Additionally, in a study by Lakestani et al. (2014),

people who focused on a dog's tail thought the dog was friendly when in fact it was showing aggression. When a dog's tail is high, it usually means they are angry or defensive and when their tails are tucked underneath them it means they are afraid (Tami & Gallagher, 2009). No past literature has looked at tail position and body language in predicting a dog's emotional state, with no focus on facial expressions.

Previous research has found that dogs express how they are feeling with the use of their entire body (Hasegawa et al., 2014). For example, when dogs are showing aggression, they usually have a "large confident body posture" (Hasegawa et al., 2014). Dog's use aggressive behaviors to communicate with other dogs and people, but this communication is often misunderstood (Westgarth & Watkins, 2015). When a dog is showing playfulness, it can have a upright or bowing posture and a high tail (Tami & Gallagher, 2009).

It has been found that individuals have difficulty distinguishing between behavioral signs of aggression in dogs (Demirbas et al., 2016). This results in a higher risk for dog bites to occur (Tami & Gallagher, 2009). Also, people are more likely to get bitten by dogs they know or own, but people still believe their own dog would not act aggressively towards them (Westgarth & Watkins, 2015). Approximately 1.5% of people experience hospital visits due to dog bite injuries annually (Meints, Brelsford, & Keuster, 2018). It has also been found that there is not much support for humans' ability to accurately distinguish body postures such as aggression, fear and play (Tami & Gallagher, 2009). Participants watched a video of two dogs playing and biting and showing their teeth, and they labelled the dogs as being playful. In comparison, they also watched a video of two dogs being aggressive such as barking, tail wagging, bouncing and forward ears as being aggressive. The participants did not interpret behavior correctly (Tami & Gallagher, 2009). Bites could be prevented if people could interpret fearful or aggressive emotional states of dogs accurately (Westgarth & Watkins, 2015).

The Influence of Dog Breed Stereotypes on Perception of Emotion

In human interactions, when visual cues are ambiguous, people may rely on stereotypes to help them interpret behavior they see (Bloom & Friedman, 2013). A stereotype is a simplified representation of a certain individual or group from which we understand and expect behaviors (Clarke et al., 2016). Stereotypes usually develop when individuals gather sources of

information (can be positive and/or negative) that is shared in society. This information can result in individuals developing certain expectations about behavior, which is not always accurate.

Stereotypes influence perceptions of people's emotional states. There has been evidence from past studies that suggests gender stereotypes can influence the interpretation of emotions in both women and men (Algoe, Buswell, & DeLamater, 2000). Plant, Kling and Smith (2004) showed that gender stereotypes influenced how individuals interpreted different emotions. Participants who were told they were observing a female infant described them as more fearful, while those observing a male infant described them as being more aggressive.

People also have perceptions of dogs they encounter, often due to stereotypes of dog breeds. Individuals use similar processes to stereotype emotion. These stereotypes result in biased expectations of behavior based on the breed, regardless of the dog's actual characteristics. For example, Collies are perceived as being friendly and good family dogs (Arvelius, Eken Asp, Strandberg, & Nilsson, 2014), while German Shepherds are perceived as dangerous and unpredictable (Bloom & Friedman, 2013). However, some German Shepherds can be very friendly and not reflective of these words. Thus, stereotypes are not always accurate when trying to determine a dog's behavior or emotional states.

Many stereotypes of several different dog breeds are portrayed in the media which allow misconceptions to develop, especially when only dog bites from breeds (usually larger ones) are being reported (Clarke et al., 2016). This information can be misleading since dogs of all breeds and sizes have the potential to bite. Smaller dogs such as Dachshunds, Chihuahuas, and Beagles are more aggressive towards people compared to large dog breeds such as Japanese Akita, Bernese Mountain Dogs, and Greyhounds (Duffy, Hsu, & Serpell, 2008). These findings are interesting since many of the breeds just listed (especially the smaller ones) are generally not believed to be aggressive. However, bites from smaller breeds usually go unreported because larger dogs inflict more damage that usually require medical attention (Duffy et al., 2008).

Along with the general media, there are other sources of information on breed temperament readily available to the public which include Kennel Club breed standards and legislation (Clarke et al., 2016). The UK Kennel Club provides information about different dog breeds and the temperament/characteristics people can "expect" in each breed (The Kennel Club, 2011). People can also develop perceptions through legislations. For example, the Dangerous Dog Act (DDA) in 1991

classifies specific dog breeds as dangerous and a threat to the safety of the public (Clarke et al., 2016). These three sources of information contribute to the stereotypes and perceptions that people have of dog breeds, especially in larger and more "aggressive" breeds such as Rottweilers (Clarke et al., 2016).

There are only a few studies on personal perceptions of dog breeds. One study used a survey to see what dog breeds people perceived as being aggressive or dangerous. The breeds used were the Staffordshire Bull Terrier, Japanese Akita, American Pit Bull, Fila Brasileiro, German Shepherd, and English Bull Terrier (Clarke et al., 2016). Half of the surveys contained only pictures of the dog breeds, and the other half just contained names of the dog breed. Participants in this study rated the American Pitbull as a dangerous dog, which is most likely due to negative stereotypes associated with this breed. Also, Staffordshire Bull Terriers were incorrectly classified as dangerous because their body stature resembles an American Pitbull (Clarke et al., 2016). Therefore, when people rely on information about the breed only, they cannot accurately determine if a dog is aggressive (Delise, 2007). Clarke et al., also asked participants to rate behavioral characteristics (on a scale of 1-10) such as aggressiveness and playfulness of a fictitious dog breed called the Tiskita. Some were told it was a toy breed group, and some were told it was a terrier breed group. Based on how it looked, people categorized the terrier group as being more playful, curious, and fearless. In comparison, they categorized the toy group as being more sociable and aggressive. From these findings, we can suggest that how people perceive breed types can influence their expectations of how that dog will behave (Duffy et al., 2008). The categorization between the terrier and toy group resulted in biased perceptions. Therefore, stereotypes based on breed influence how people influence the emotional states of dogs.

Experience with Dogs and Interpretations of Body Language

Experience with dogs is related to how good someone is at interpreting emotions a dog is expressing (Demirbas et al., 2016). Tami and Gallagher (2009) defined experience as being around dogs on a regular basis, such as owning a dog, training them, or working with them. This interaction affects how an individual understands a dog's emotions because a person can make judgements based on what they have been previously exposed to. For example, if someone previously owned a friendly dog, they might perceive all dogs as being friendly if they elicit the same behaviors as their dog.

Experience with dogs has been tested in many studies, but it has had conflicting results (Demirbas et al., 2016). Demirbas et al., (2016) used an online survey that consisted of watching videos involving children and dogs, and the groups of participants included: dog owners with/without children and people who don't own dogs that do/don't have children. Each video was different situation, dog breed, and behavior (i.e., tense body posture and backward facing ears). It was found that non dog-owners were better at identifying anger from images of dogs faces compared to dog owners. Another study had similar findings, it was found that non-dog owners could also distinguish play from other behaviours (Demirbas et al., 2016). However, non-dog owners have trouble identifying confident and playful behaviors. This could be due to inability to interpret play signals correctly (Tami & Gallagher, 2009).

In contrast, Tami and Gallagher (2009) demonstrated that people with different levels of experience with dogs (i.e., dog owners, non-dog owners, veterinarians, and dog trainers) could identify most playful and aggressive behaviors from a dog's body language. Another study found that experience with dogs contributes to understanding their behavior (Bahlig-Pieren & Turner, 1999), such as accurately distinguishing between play and aggression (Correia, Ruiz, Manteca, & Fatio, 2007).

Based on the findings from several different studies, experience (i.e., owning a dog) and no experience (i.e., not owning a dog) with dogs both influences how body language is interpreted. Therefore, it is difficult to make a conclusion from previous literature about the role of experience.

Current Study

The purpose of the current research study was to determine if individuals can accurately determine the emotion of a dog based on its body posture, without the use of facial expressions. Using a Collie and a German Shepherd and four body postures: relaxed, fearful, aggressive, and playful were used to test my hypotheses. An image and a short description were provided for both dog breeds. For each body posture, the dog had a tail position that is congruent with the four body postures (i.e., up, down, neutral). It has been proposed that more research needs to be done on the entire body (i.e., both facial expressions and body language), instead of just focusing on a dog's facial expressions (Hasegawa et al., 2014).

It is unclear in the literature if people can accurately interpret dog body language or not. First, I hypothesize that people will be able to interpret a dog's emotional state through its body posture, such as when its feeling relaxed, fearful, aggressive, and playful.

This study addressed if individuals rely on stereotypes of different dog breeds if they are unsure how to interpret body posture, since this is not clear in past literature. Therefore, I hypothesize that when people are unsure (i.e., confidence level) of how to interpret a dog's body language, the stereotype of the breed will influence their interpretation. This is because people have preconceptions about the behavior of different dog breeds, mostly due to the media. I predict that participants who see the picture of the German Shepherd will interpret its body language as being more aggressive than the Collie. There is no literature that compares stereotypes of different dog breeds and its influence on interpretations of body language and emotional states.

The current study also investigated whether experience with dogs was associated with being able to accurately interpret a dog's emotional state. It is unclear in past literature whether previous experience influences interpretations. Experience was defined as owning a dog or have owned one before, while non-experience is not currently owning a dog or previously not having one. In previous research, it has been found that experience and non-experience can both influence interpretations of emotional states in dogs. Third, I hypothesize that dog owners (past or current experience with dogs) will have a higher accuracy (i.e., correct score) when interpreting which body posture is associated with each emotion, than those who have no experience (never owned a dog).

Method

Participants

A convenience sample of 97 participants (88 women, 8 men, and 1 unspecified) volunteered to complete an online survey. Participants were recruited through a Facebook social media page (refer to Appendix A). Participants were asked to read an informed consent form (refer to Appendix B). All participants were over the age of 19, unless they were a college or university student, in which case they will be considered mature minors. The age of participants ranged from 19 years old to 71 years old (M = 37.82, SD = 15.59, Md = 33.00). Most of the participants (92.8%) own a dog or have owned one in the past. 5.2% have never owned a dog, and 2% did not indicate whether they have ever owned a dog. Some participants (10.3%) worked in dog related professions such as dog grooming and all of them own a dog or had owned one in the past.

Materials

Participants read an informed consent form before they began the study (refer to Appendix B). The consent form specified that the survey would take approximately 10 minutes to complete. The survey consisted of two vignettes. Each vignette depicted an image and scenario involving a Collie or a German Shepherd (refer to Appendix C). There were four body postures with the appropriate tail position shown in each vignette: relaxed, fearful, aggressive, playful (refer to Appendix D). Participants answered questions about their perceptions of each body posture, by selecting the word they thought best described the posture and how confident they were in their decision (refer to Appendix E). A descriptive section pertaining to dog ownership (refer to Appendix F) and a demographic section was located at the end of the survey (refer to Appendix G). A final section thanked the participants for completing the study and provided contact information for the researchers (refer to Appendix H).

Procedure

A survey regarding perceptions of dog body postures was hosted by Qualtrics, a website that collects, stores, and retrieves data from participant responses. Participants were told they were answering questions based on images of dog body postures. Those interested in participating and eligible (i.e., 19 years of age or a university/college student) were given a link to

the online survey, at which point they saw the informed consent form. By clicking next on the screen, consent was assumed, and participants were presented with the survey.

Participants were instructed to observe an image and a scenario with either a German Shepherd or a Collie. These two breeds were randomized between participants, so each participant was only exposed to one breed. Each scenario also had a picture and description of four dog body postures: relaxed, fearful, aggressive, and playful. Participants answered questions about each body posture. Experience will be defined as owning a dog or have owned one before, while non-experience is not owning a dog currently or in the past. Experience with dogs will be rated using a 5-point Likert scale with 1 (no experience) to 5 (significant amount of experience). Also, if they have been exposed to dogs in their personal or professional experience (Wan et al., 2012).

The four body postures were counterbalanced so each participant saw a different order of body postures. Also, the face of the dog was eliminated so the participant was not focused on the facial expressions to interpret the emotion being displayed. When the participants were completed the survey, they were directed to another webpage that thanked them for their participation in the study.

Results

For some analyses, there was a different number of participants. Out of 119 surveys, only 97 were included. This occurred because there were missing responses that were critical for certain tests, such as missing confidence ratings.

Since the independent measures *t*-test below indicated there was no difference between breeds, the data was collapsed across the two breeds. To test how well participants, interpreted the body postures overall, an accuracy score was calculated to see how many body postures people interpreted correctly. Everyone received a score between 0 (*none correct*) and 4 (*all correct*). A test score of 3 was used in the one sample *t*-test to see if participants would be at least 75% accurate in their interpretations. Refer to Table 1 for percentage of participant scores.

Table 1

Percentages of Participant Scores on Interpretations of Body Posture

Score	%
0	2.1%
1	13.4%
2	35.0%
3	38.0%
4	11.3%

Note. $N = 97$

An independent measures *t*-test was used to determine whether score accuracy was influenced by breed. The t-test revealed no statistically significant difference in the number of correctly identified body postures between Collies (M = 2.56, SD = .97, n = 45) and German Shepherds (M = 2.33, SD = .90, n = 52), t (96) = 1.20, p = .589.

A one sample *t*-test was conducted to determine if participant scores significantly differed from a score of 3 (or 75%). The *t*-test revealed that there was a significant difference between scores, t (96) = 6.09, p <.001, 95% CI [0.77, 0.39]. The overall mean for the score was 2.43 which indicates that participants successfully identified less than 75% of the body postures. The overall median was 2.00, and the mode was 3.00.

Four chi-square independence analyses were used to test if breed of dog influenced participants interpretations of each posture separately. Using the data from the relaxed body posture, a chi square showed that interpretation of dog body posture was not influenced by the breed, χ^2 (1, N = 98) = .10, p= .757). That is, 75% of the participants who observed the Collie image and 72% who observed the German Shepherd image correctly interpreted the relaxed body posture.

Interpretation of the fearful dog body posture was not influenced by breed, χ^2 (1, N = 98) = 0.001, p = .987). Participants were 49% accurate in correctly interpreting fear, in both the Collie and German Shepherd condition.

A chi square showed that interpretation of the aggressive dog body posture was influenced by breed of dog, χ^2 (1, N = 98) = 4.42, p = .036. It was found that 35% of participants who were shown an image of a Collie and 17% of participants who were shown an image of the German Shepherd were correct in their interpretation of the aggressive body posture.

Participant interpretations of the playful dog body posture was not influenced by breed, χ^2 (1, N = 98) = 99, p = .453. It was shown that 89% of participants who observed the Collie image and 90% who observed the German Shepherd image correctly interpreted the playful body posture.

A 2 (dog breed: German Shepherd and Collie) x 4 (body posture: fearful, relaxed, aggressive, playful) mixed factorial ANOVA was used to analyze participant confidence ratings for each body posture. It was found that there was no statistically significant main effect of breed on confidence ratings, (F (1, 96) = 1.59, p = .210, n^2_p = .017) and interaction between body posture and breed with respect to the confidence ratings, (F (3, 96) = 1.34, p = .260, n^2_p = .028). It was found that there was a statistically significant main effect of body postures (F (3, 96) = 9.37, p < .001, n^2_p = .130). Participants were least confident in

their ratings of aggression (*M* = 3.26, *SD* = 1.02) and most confident in their ratings of play (*M* = 4.11, *SD* = .80). The means and standard deviations of participant confidence ratings are presented in Table 2.

Table 2

Overall and Average Participant Confidence Ratings of Four Body Postures by Each Breed

	Breed of dog		
Body posture	Collie	German Shepherd	Overall
Relaxed			
M	3.78	3.83	3.80
SD	1.12	0.92	1.01
n	40	52	92
Fearful			
M	3.85	3.46	3.63
SD	0.92	1.04	1.00
n	40	52	92
Aggressive			
M	3.40	3.15	3.26
SD	1.19	0.85	1.02
n	40	52	92

Playful			
M	4.20	4.04	4.11
SD	0.76	0.84	0.81
n	40	52	92

Since there was a limited number of people who did not own dogs in the study, two correlations were used instead of a t-test analysis. Correlations were conducted using accuracy score (out of 4) and experience ratings, and accuracy score and number of years experience with dogs. It was found that there was no statistically significant relationship between score and experience ratings, (r (93) = .05, p = .668) or between score and number of years owning a dog (r (96) = .17, p = .099).

Discussion

Both humans and dogs have learned skills to communicate and understand each others behavior. Dogs can understand human body language (Kaminski & Nitzschner, 2013) and they can also use eye contact to show people what they want (Nagasawa et al., 2015). People can also predict emotional states of dogs with facial expressions and body posture together (Bloom & Friedman, 2013) or just facial expressions alone (Kujula et al., 2017). Effective communication between these two species is based on understanding both body language and facial expressions of each other (Kaminski & Nitzscher, 2013). It is important to be able to interpret your surroundings and the objects (such as people or animals) in it from an evolutionary perspective. There is no evidence in past literature of individuals interpreting just a dog's body posture to recognize their emotional state.

It was hypothesized that people will be able to correctly interpret a dog's emotions through its body posture, such as when its feeling relaxed, fearful, aggressive, and playful. This hypothesis was supported, individuals can interpret dog body language. A criterion of 3 (or 75%) was used to analyse if test scores differed between participants. There was a significant difference found between test scores, 49% of participants had a score of 3 or above. Participants were good at identifying relaxed and playful postures, average at fearful postures, and poor at aggressive postures. Wan et al., (2012) found that participants in their study of observing videos of dogs (i.e., facial expressions and posture present) were more accurate in identifying a happy emotional state compared to a fearful one. Other studies have found that people are good at recognizing how a dog is feeling through facial expressions (Bloom & Friedman), but poor when it comes to body language (Tami & Gallagher, 2009). In the current study, the mode score was 3.00 and about 11% of participants received a score of 4/4 (100% accurate). No past research has proposed that participants are correct 100% of the time, even with body posture and facial expressions present (Wan et al., 2012). The current study suggests that people can interpret body postures, and facial expressions do not have to be present for different emotions to be recognized.

The second hypothesis is that when people are unsure of how to interpret a dog's body language, the breed of dog will influence their interpretation. It has been seen in past literature that stereotypes of different dog breeds result in certain expectations of behavior (such as aggression), especially for larger breeds (Clarke et al., 2016). Due to these stereotypes, it was predicted that participants would label the German Shepherd as being aggressive more accurately than the Collie for aggression. This hypothesis was not supported, stereotypes of dog breeds did not influence participant scores when they were unsure of the emotion in the body posture. There was no difference between participant accuracy scores between who received the Collie compared to the German Shepherd.

The specific body postures and participant confidence ratings were analyzed using chi-square tests. It was found that there was no bias in accuracy scores between the playful, relaxed, and fearful body postures for both breeds. However, there was a bias found in the aggressive body posture between the Collie and German Shepherd. A bias is usually based on personal thoughts and experiences, especially when situations are ambiguous (Huppert, Foa, Furr, Filip, & Mathews, 2003). In comparison, stereotypes are expectations of behavior/emotions that develop in group settings (Clarke et al., 2016). Past literature suggested there can be a bias between interpreting emotions with different dog breeds (Clarke et al., 2016).

Participants were not confident in their ratings of the aggressive body posture, so Collies (35%) were labelled more accurately as aggressive compared to German Shepherds (17%), when participants were unsure of the emotion in the body posture. The aggressive body posture was identified incorrectly most often out of the four postures. Participants also had the lowest confidence ratings for the aggressive posture. Approximately 29% of participants interpreted aggression correctly, while about 71% did not answer it correctly. Most participants mislabelled aggression as being surprised (26.9%). Therefore, participants were not accurate in interpreting aggression (body posture showed raised fur, a high tail, and stiff-legged stance) through body postures only. Past research is limited in how accurate people are in interpreting body language of dogs without facial expressions (Correia et al., 2007) when it comes to comparison of different breeds. The current study shows that regardless of the breed shown, people can still be accurately in recognizing a dog's emotion through body posture only.

A study by Bloom and Friedman (2013) showed that participants are accurate in identifying photographs with aggressive dog faces. Another study found that 92% of its participants correctly identified aggressive behavior (Lakestani et al., 2015). This is interesting since the current study used drawings of body posture alone, and participants identification of aggression was poor. No past literature has analyzed if people could interpret drawings alone of dogs without their face present. A possible explanation could be if different drawings or descriptions of the body posture were used, it could have resulted in participants labelling aggression more correctly.

Therefore, the current study suggested that people correctly identify the aggressive body posture in Collies when they are not confident their decision is right. These findings were opposite of my predictions. Since there are stereotypes that Collies are friendly (Arvelius et al., 2014) and German Shepherds are dangerous (Bloom & Friedman, 2013), these results are surprising. Usually when dogs are perceived as being dangerous, they are perceived as being aggressive. A possible explanation could be participants could have been previously exposed to an aggressive Collie or non-aggressive German Shepherd. Another explanation could be participants could have never previously seen a dog with aggressive behavior. This shows that stereotypes of breeds are not always believed by people, nor are stereotypes always correct. People may perceive behaviors of different breeds based on their own experience in the past, not through stereotypes.

The third hypothesis is that the experience an individual has with dogs influences how they will interpret a dog's body posture. Experience is defined as owning a dog or have had a dog in the past. A *t*-test could not be conducted as initially planned since there was not enough participants who do not own dogs (i.e., currently or in the past) in the sample. Correlations showed that there was no significant relationship between correct score and amount of experience with dogs. In other words, experience with dogs such as owning one did not influence how participants interpreted the body postures in the study. Additionally, there was no significant relationship found between correct score and experience ratings. Studies have proposed that owning a dog resulted in a higher accuracy in recognizing different behaviors (Lakestani et al., 2015). Also, another study found that 60% of dog owners were able to correctly recognize their own dogs behavior (Wan et al., 2012). However, it has been suggested that non-dog owners can identify when a dog is feeling playful better than dog owners (Demirbas et al., 2016). This finding agrees with the current study that experience is not required to interpret a dog's body posture. Therefore, past literature suggests that experience and no experience with dogs both influences how people read dog body language. However,

it is important to note that these past studies had a good sample of both dog owners and people who did not own dogs for comparison.

Participants were quite confident in their interpretations of the playful body posture. No significant relationship was found between interpretations of the playful body posture and breed of dog. Therefore, the breed of dog did not influence participants being correct or not when analyzing the playful posture. About 91.4% of participants answered play correctly (89% Collie, 90% German Shepherd), while 8.6% participants answered it incorrectly. Overall, the current study suggests that individuals are very good at interpreting when a dog is feeling playful by just looking at its body language alone. These results support past literature that found that people can read playful body language (Lakestani et al., 2015).

Participants were also confident in their interpretations of the relaxed posture, since 75% interpreted the relaxed body posture correctly. With the relaxed body posture, the breed of dog did not influence whether participants could identify if a dog is relaxed or not based on body posture. Overall, individuals are good at knowing when a dog is feeling relaxed. There is no past literature that tested how individuals perceive relaxed body postures on dog body posture only.

Approximately 49% of participants correctly identified the fear posture (47% Collie, 50% German Shepherd). Most participants who incorrectly identified the fear posture identified it as aggressive (37.5%). A possible explanation for fear being mistaken for an aggressive body posture is dogs can become aggressive when they are frightened (Wan et al., 2012). Past studies have shown that participants were better at identifying aggression emotions compared to showing fear when both facial expressions and dog posture was analyzed (Lakestani et al., 2015).

In the current study, 14.4% of participants thought the aggressive body posture was playfulness. A previous study found that participants who viewed aggressive dog behavior such as showing teeth, barking, and biting as being playful (Tami & Gallagher, 2009). When people cannot tell when a dog is showing aggressive behavior, they may believe a dog is approachable and then the risk of being bitten increases. A previous study found that many dog bite incidents happen because people do not understand dog behavior well (Overall & Love, 2001). Therefore, it is very important to know when a dog is eliciting aggressive feelings, emotions, or behaviors.

One limitation of the current study is that most participants owned or had owned a dog and only a few that did not. As a result, the generalizability of results may be limited due to the lack of non-experienced participants. Past studies have suggested that non-dog owners have difficulty knowing when a dog is feeling confident or playful (Tami & Gallagher, 2009). A study with a good sample of both dog owners and people who do not own dogs would be ideal since past literature suggests that both experience and non-experience can affect interpretations.

Another limitation of the current study is participants who own a dog or have owned a dog may not have owned a Collie or a German Shepherd. A past study found that 60% of dog owners could interpret their own dog's behavior and how it was feeling quite accurately (Wan et al., 2012). This is very different from identifying a behavior from a drawing of a body posture of an unknown dog.

Another limitation of the current study is participants who own a dog or have owned a dog may not have owned a Collie or a German Shepherd. A past study found that 60% of dog owners could interpret their own dogs' behavior and how it was feeling quite accurately (Wan et al., 2012). This is very different from identifying a behaviour from a drawing of a body posture of an unknown dog. The drawings could have been from a breed they did not own or are unfamiliar with, which could have affected their interpretation of the four body postures.

One last limitation is the drawings, or the descriptions of the aggressive and fearful body postures used in the current study could have been unclear to some participants. The drawings/descriptions of the playful and relaxed posture seemed easy to understand since people were good at interpreting them. This was opposite for the aggressive and fearful posture. Most participants that answered the aggressive posture incorrectly said it was surprised (26.9%), while those who answered the fearful posture incorrectly said it was aggressive (37.5%). It could be a possibility that different drawings or descriptions could have resulted in more accurate scores on interpretations.

Future studies could investigate how comfortable individuals would be in approaching a dog with a relaxed, aggressive, fearful, or playful body posture. The question that could be asked is "How comfortable would you be in approaching this dog?" and then participants would be shown drawings of each body posture. The study could describe an unsafe scenario with a dog and then show the aggressive and fearful posture, and a safe scenario with the dog involving the playful and relaxed

posture. This could allow people to understand how approachable a dog is, by understanding when its unsafe to approach (i.e., aggressive or fearful) or safe to approach (i.e., feeling relaxed or playful).

Previous research has suggested that people cannot really tell when a dog is feeling aggressive (Demirbas et al., 2016), like the current study. For instance, dogs can be wagging their tail when they are feeling angry (Tami & Gallagher, 2009). This could result in individuals approaching dogs in unsafe situations, which can increase the risk of being bitten (Tami & Gallagher, 2009). Potential studies like the one above could help people better understand when to interact with a dog or not.

Future studies could also investigate how age or gender of participants influences the interpretation of dog body postures and interaction with dogs. Past literature has shown that gender has influenced how people interpret emotional states and behaviors (Plant et al., 2004). Females tend to know more about dog behavior as opposed to males (Reisner & Shofer, 2008).

Age and gender data were collected in my current study; but there was a limited number of male participants compared to females. It was shown in past literature children and adults interpret dog body language differently (Lakestani et al., 2014). Children are more likely to view dogs as being friendly (Lakestani et al., 2014), while adults can tell the difference on some occasions, but not all. It would be interesting to investigate whether there are gender differences with dog interpretations in future research.

Future studies could also analyze how the size of the dog influences how people interpret dog emotions without the use of facial expressions. In the current study, the two dogs used for analysis are larger breeds (Collie and German Shepherd). Therefore, the results cannot be generalized to smaller dog breeds. In general, people view larger breeds as being more aggressive and dangerous than smaller breeds (Duffy et al., 2008), but people rate smaller breeds as more aggressive than larger dogs (Clarke et al., 2016). It would be interesting to see how participants would interpret relaxed, fearful, aggressive, and playful emotions in small dogs.

Another future study idea could be to use different dog breeds for the analysis to see if that influences participants scores. In the current study, people did not view German Shepherds as aggressive as predicted. It would be a good idea to ask participants what breeds they view as aggressive or dangerous and then design a study based on those responses.

In conclusion, the study contributed in showing that individuals could interpret if a dog were feeling aggressive, relaxed, sad, or playful based on body posture only without the presence of facial expressions. With body postures only, individuals are good at interpreting playfulness and relaxation, and moderately good at interpreting fear. However, individuals do have trouble determining whether a dog is aggressive or not by its body posture. A possible explanation could be people are so used to seeing a dog showing teeth, growling, or barking when its feeling aggressive, it is hard to distinguish this with just seeing its body posture.

Stereotypes of dog breeds did not influence participants interpretations of dog body postures. It was found there was no bias in responses between playful, relaxed, and fearful body postures but Collies were perceived as being more aggressive than German Shepherds (Bloom & Friedman, 2013). When combined with the result that participants were not confident in their ratings of the aggressive posture, it suggests that Collies were viewed as more aggressive when participants were unsure of the meaning of the body posture. The study also contributed to whether experience or no experience with dogs influenced participants interpretations of body posture. There was no relationship found between accuracy scores (correct score out of 4) and experience. Therefore, experience with dogs is not related to correctly identifying body postures. However, if there had been more participants that had never owned a dog, there might have been an effect of experience. Lastly, previous experience with dogs such as owning one, have owned one, or working in a dog-related profession did not influence interpretations of dog body posture.

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Appendix A

Recruitment Message for Facebook/Messenger

As part of the requirements for my Honours Thesis for Psychology at Grenfell Campus (Psyc 4959), I am conducting a research study on investigating how people perceive body language without a dog's facial expression. It is a quick online survey and should take 10 minutes to complete. Participants are at least 19 years of age or be a university or college student. It would be greatly appreciated if you would take the time to fill out the on-line questionnaire and help me gather data, I need to complete my study. If you are interested in participating, please click on the link provided or copy and paste the link to your web browser. If you know others who might be interested in participating, please share this message to your profile or forward this message directly to them. If you have any further questions, you can email myself, Cassidy Manuel at cjlm36@grenfell.mun.ca. Thank you!

Appendix B

Online Informed Consent Form for Undergraduate Students

The purpose of this informed consent form is to ensure you understand the nature of this study and your involvement in it. This consent form will provide information about the study, giving you the opportunity to decide if you want to participate.

Researchers: This study is being conducted by Cassidy Manuel as a part of the course requirements for Psychology 4951/4959, Honours Thesis at Grenfell Campus, Memorial University of Newfoundland. It is under the supervision of Dr. Sandra Wright.

Purpose: This study is designed to investigate how people perceive dog body language without a dog's facial expression. The results will be used to write a honours thesis as part of the course requirements for Psychology 4951/4959 and will be presented at the Nick Novakowski Student Research Conference in April 2020. The study may also be published in the future.

Task Requirements: You will be asked to read a vignette, view drawings of dog body postures and complete a survey regarding the dog's body posture. There are no right or wrong answers as we are only interested in your opinion. You may omit any questions you do not wish to answer. By participating in this study, you acknowledge that you are at least 19 years or a college/university student.

Duration: The questionnaire will take approximately 10 minutes to complete.

Risks and Benefits: There are no obvious risks or benefits involved with your participation in this study. If answering any of the questions makes you uncomfortable, please feel free to omit them. If you are in a participating psychology class at Grenfell Campus, you may receive a course credit for your participation in this study as stipulated by your instructor.

Confidentiality: Your responses and anonymous as no IP addresses will be collected. All information will be analyzed and reported on a group basis. Thus, individual responses cannot be identified by the researchers.

Right to Withdraw: Your participation in the research study is totally voluntary and you are free to stop participating at any time. To withdraw from this study, please close your browser. However, once you complete the survey and submit it, it cannot be removed because there is no identifying information collected and therefore, I cannot link individuals to their responses to remove them.

Data Storage: All information will also be held on a password protected computer for a minimum of 5 years per Memorial's policy.

Contact Information: If you have any questions or concerns about the study, please feel free to contact myself, Cassidy Manuel, at cjlm36@grenfell.mun.ca or my supervisor, Sandra Wright, at swright@swgc.mun.ca after April 2020 or you may also attend the Nick Novakowski Student Research Conference in April 2020.

If you have ethical concerns about this research, such as your rights as a participant, please contact Chairperson of the Grenfell Campus Research Ethics Board at gcethics@grenfell.mun.ca. This study has been approved by an ethics review process in the psychology program at Grenfell Campus, Memorial University of Newfoundland and has been found to be in compliance with Memorial University's ethics policy.

By proceeding to the next page, you acknowledge that you are 19 years of age and/or a college or university student and I have been informed of, and understand, the nature and purpose of the study, and I freely consent to participate.

Appendix C

Vignette 1

Imagine you are sitting on a bench in a public park and somebody walks past you with a Collie on a leash. The person stops to interact with another person who is also out for a walk with their dog, but they have stopped to take a rest.

You notice that the Collie has the following body posture when it interacts with the other dog

(insert image of the dog body posture and description here- refer to Appendix D).

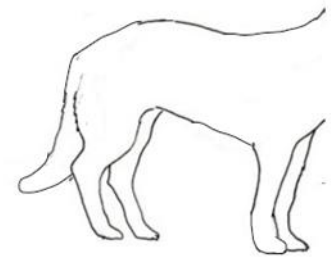
Vignette 2

Imagine you are sitting on a bench in a public park and somebody walks past you with a German Shepherd on a leash. The person stops to interact with another person who is also out for a walk with their dog, but they are stopped to take a rest.

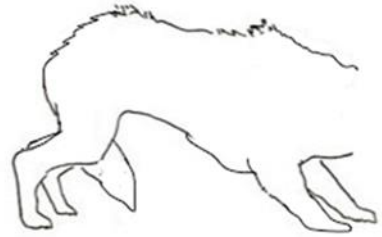
You notice that the German Shepherd has the following body posture when it interacts with the other dog (insert image of the body posture and description here- refer to Appendix D).

Appendix D

Body Posture



Description: The dog's tail is hanging down, and all four paws are placed with equal weight on the ground.



Description: The dog's tail is down, its body is lowered to the ground.

Description: The dog's tail is raised and higher than the height of the back. It has a stiff-legged stance and body is leaning slightly forward.

Description: The dog's tail is up, and its front end is lowered by bent forepaws.

Appendix E

Survey Questions

Please choose one word below that best describes the body posture:

- Aggressive
- Sad
- Contempt
- Playful
- Disgusted
- Surprised
- Fearful
- Guilty
- Relaxed

How confident are you in your assessment?

- Not confident at all
- Slightly confident
- Somewhat confident
- Fairly confident
- Completely confident

Is there another word from the list above that you think also describes the body posture? If yes, please write it in the spaces below. If not, continue to the next question.

If you provided a second word to describe the body posture above, how confident are you in your assessment?

- Not confident at all
- Slightly confident
- Somewhat confident
- Fairly confident
- Completely confident

Appendix F

Descriptive Information

What part of the body did you focus on the most when deciding which word *best* described the body posture (choose one)?

- Tail
- Legs
- Back
- Shoulders
- Neck
- Fur

Have you previously owned a dog?

- Yes
- No

If yes, what breed(s) did you own?

Do you own a dog now?

- Yes
- No

If yes, what breed(s) and how many?

_____

How long have you had your dog(s)?

_____

Please rate your previous experience with dogs on a 5-point Likert Scale with 1 (none) and 5 (significant amount)

- None
- A little
- Fair amount
- Large amount
- Significant amount

Have you ever worked for any of the following jobs? (Please check all that apply)

- Veterinarian
- Veterinarian assistant
- Dog trainer
- Dog boarder
- Dog sitter/walker
- Dog groomer

If you answered yes to any of the professions above, how many years did you work in the profession?

_____

Appendix G

Demographic Information

Age _____

Gender

- Male
- Female
- Another gender
- No gender

Appendix H

End of Study

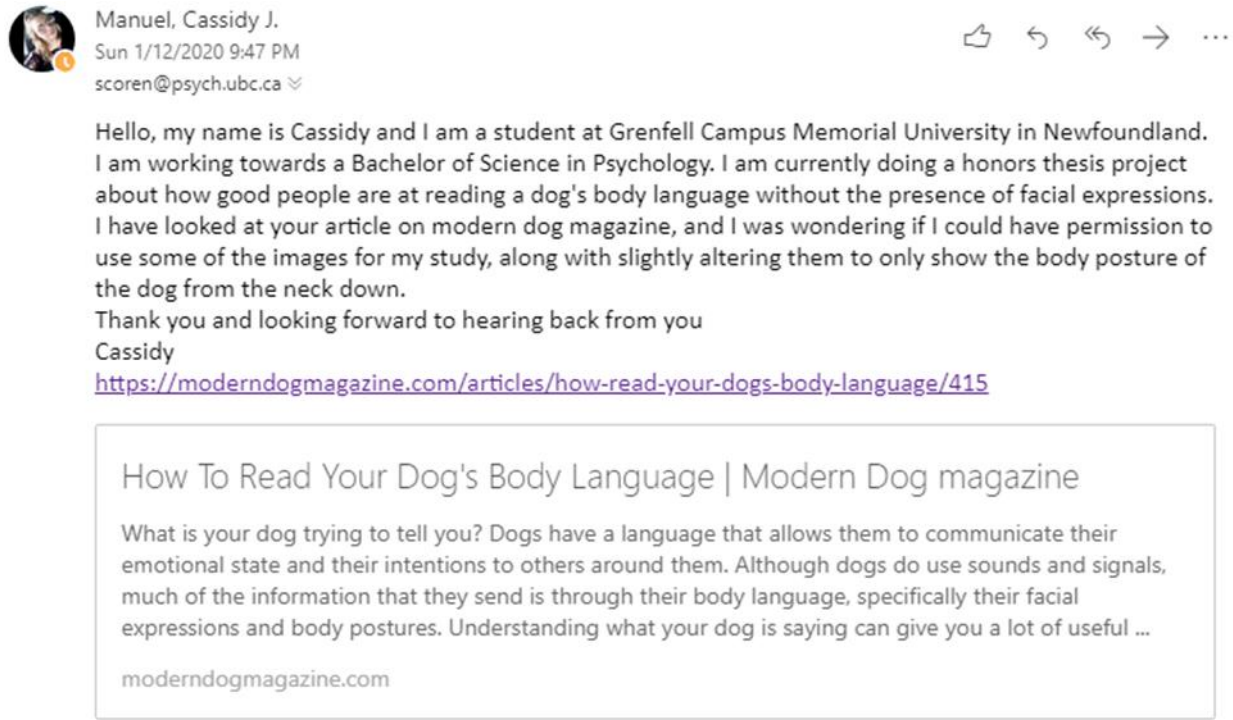
Thank you for completing the survey. This study was designed to examine your perception of dog body posture and if the breed of dog (Collie vs. German Shepherd) and experience with interacting with dogs influenced that perception. This study has been approved by an ethics review process in the psychology program at Grenfell Campus, Memorial University of Newfoundland and has found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about this research, such as your rights as a participant, please contact the Chairperson of the Grenfell Campus Research Ethics Board at gcethics@grenfell.mun.ca

If you would like to know the results of the study, please contact either Cassidy Manuel at cjlm36@grenfell.mun.ca or Dr. Sandra Wright at swright@grenfell.mun.ca after April 2020.

Appendix I

Permission to Use Drawings

For the body posture images in my survey, I have received permission from Stanley Coren to use and slightly alter the images for use in my study. Attached is the snips of the emails receiving permission.



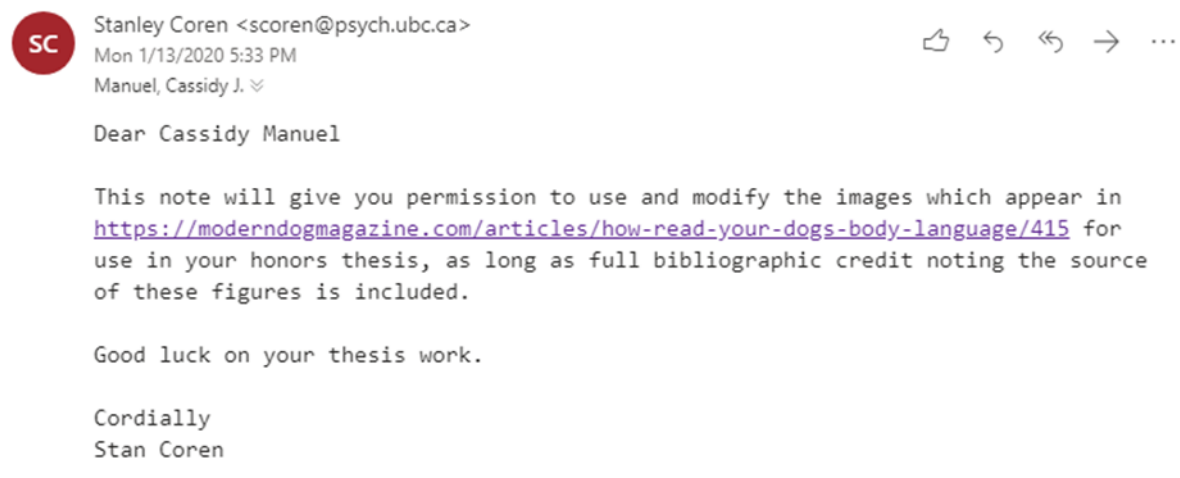
Manuel, Cassidy J.
Sun 1/12/2020 9:47 PM
scoren@psych.ubc.ca

Hello, my name is Cassidy and I am a student at Grenfell Campus Memorial University in Newfoundland. I am working towards a Bachelor of Science in Psychology. I am currently doing a honors thesis project about how good people are at reading a dog's body language without the presence of facial expressions. I have looked at your article on modern dog magazine, and I was wondering if I could have permission to use some of the images for my study, along with slightly altering them to only show the body posture of the dog from the neck down.
Thank you and looking forward to hearing back from you
Cassidy
https://moderndogmagazine.com/articles/how-read-your-dogs-body-language/415

How To Read Your Dog's Body Language | Modern Dog magazine

What is your dog trying to tell you? Dogs have a language that allows them to communicate their emotional state and their intentions to others around them. Although dogs do use sounds and signals, much of the information that they send is through their body language, specifically their facial expressions and body postures. Understanding what your dog is saying can give you a lot of useful ...

moderndogmagazine.com



Stanley Coren <scoren@psych.ubc.ca>
Mon 1/13/2020 5:33 PM
Manuel, Cassidy J.

Dear Cassidy Manuel

This note will give you permission to use and modify the images which appear in https://moderndogmagazine.com/articles/how-read-your-dogs-body-language/415 for use in your honors thesis, as long as full bibliographic credit noting the source of these figures is included.

Good luck on your thesis work.

Cordially
Stan Coren