

Man's (sic) Best Friend as a Social Guide: How Pets Influence First Impressions

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Abstract

Animals can influence how humans perceive and evaluate social situations, particularly through subtle behavioural cues. This study investigated whether a dog's behaviour influences its owner's first impression of a stranger through social cues, and whether this effect is moderated by contextual clarity and perceived similarity with the dog. Building on theories of social identity, we hypothesised that negative dog reactions would lead to stronger impression effects than positive ones, especially in unclear scenarios and under intuitive priming. To test this, participants read hypothetical scenarios in which a dog reacted positively or negatively to a stranger dressed in either casual clothing (unclear condition) or a uniform (clear condition). A priming task was used to activate either an intuitive or a rational perspective, designed to manipulate shared identity with the dog. Results revealed a statistically significant main effect of dog behaviour, but in the opposite direction than predicted: positive dog reactions had stronger influence than negative ones. No statistically significant main effects were found for the priming or clothing condition. However, a statistically significant two-way interaction showed that dog behaviour had the strongest influence in the positive uniform scenario. Exploratory analyses indicated that participants responded emotionally to the dog's behaviour and justified it differently depending on the scenario. These findings suggest that pet cues can shape social perceptions in nuanced, context-dependent ways.

Keywords: dog behaviour, social cues, impression formation, social identity, priming.

Man's (sic) Best Friend as a Social Guide: How Pets Influence First Impressions

Imagine walking alone in a quiet park at dusk. A stranger approaches from a distance, and before you even have time to assess them properly, your dog tenses up, ears perked, and lets out a low growl. You were not particularly alarmed before, but now a sense of unease creeps in. Is this person a threat, or are you simply reacting to your dog's behaviour? This study explored how such instinctive reactions to pet behaviour may influence the way we form first impressions of others.

In everyday life, individuals make judgments about other people by using different kinds of social cues. Whenever we meet a stranger, we will try to (unconsciously) get a sense of the situation and the person. Social influence is a major topic in psychology, typically studied in the context of human interactions (Turner et al., 1987). According to research about social identification, we are more likely to listen to those we consider part of our own group (Spears, 2021). This aligns with the self-categorization theory (Turner et al., 1987), which suggests people are more likely to adopt the behaviours of group members than the behaviours of others. While social influence is commonly examined in people, previous research has shown that influence does not only come from humans: animals may also play a role in social influence (Plagemann, 2022; Spears, 2021). According to Plagemann (2022), many pet owners view their pets as a part of their own group. Plenty of pet owners also treat their animals more like family members than companions (McConnell et al., 2016). This idea is supported by the referent informational influence (RII), which proposes that we rely on the reliable members of our group whenever we are in questionable situations (Spears, 2021). This raises questions about how shared identity is formed and how it is influenced.

Shared identity typically forms through a process of categorization and contextual factors that make a particular group membership stand out. According to the self-categorization theory, individuals classify both themselves and others into social groups based on the most

contextually relevant category at a given moment (Turner et al., 1987; Spears, 2021). These categories can be based on shared roles, experiences, goals, or even perceived perspectives. Once such a category becomes salient (for instance, being a pet owner or caring group member) individuals begin to adopt the norms, attitudes, and emotions associated with that group.

Several factors can strengthen the sense of shared identity. Emotional closeness, shared routines, and strong interdependence all contribute to perceiving someone or something as part of one's in-group. In the case of pet owners, the bond with their pet is often characterised by affection and daily (social) interaction (McConnell et al., 2016). These are similar to the indicators of human relationships. Moreover, people often anthropomorphize their pets; attributing them with emotions, intentions, and sometimes even moral character (Paul et al., 2014). Pet owners also frequently refer to themselves and their animal companion as "we" and feel a sense of belonging to a "team" (Sanders, 1990). These emotional connections and language patterns contribute to the idea that rather than simply projecting their emotions onto their pets, owners may actually view them as trustworthy sources of social information. This tendency can further reinforce the perception that the pet is not just an animal, but also a meaningful social partner. As a result, if an owner views their pet as a dependable group member, they may unconsciously use their pet's reaction as advice when forming an impression of a stranger. Studies by Plagemann (2022) and de Boer (2023) indicate that animals, especially pets, may indeed have an influence on these judgments. A pet's response to a stranger may affect how its owner views that individual, considering the strong attachment that many people have with their animals.

In addition to the role of shared identity, another factor that may shape how pet behaviour influences impressions is the way people make decisions in uncertain situations. In situations where social cues are unclear, people are often forced to make quick judgments without having access to detailed information. For example, when there is little contextual

information about a stranger, individuals may interpret subtle external signals, such as a pet's reaction, as more meaningful than they would in clear, well-defined situations where the stranger is clearly identifiable (e.g. a police officer). One way to influence perceived similarity with animals is through the use of priming styles that activate two different ways of thinking. In this context, the aim is not to measure actual reasoning, but rather to activate different perceptions of similarity between humans and animals. Specifically, intuitive thinking may align more closely with the way animals perceive and respond to subtle external cues, thereby increasing the likelihood of perceived similarity or shared identity. This supports the idea that intuitive thinking involves attending to subtle external cues in a similar manner as seen in animals that continuously monitor their environment (and possibly even group members) (Spears, 2021). Rational thinking could be seen as more distant from animal perspective, as it is often seen as a unique trait of humans, emphasising a clear separation between humans and animals. As said earlier, the theoretical distinction does not aim to compare reasoning styles in terms of quality, but rather to create a psychological context in which people may feel more or less aligned with their pet. Such alignment may influence the degree to which people interpret the pet's behaviour as socially meaningful.

While these dynamics could apply to various pets, dogs are often perceived as social and responsive to humans. Research has shown that dogs are seen as highly social and protective, while also capable of noticing potential threats (Plagemann, 2022). Their long history with humans could have made them attuned to human behaviour, which may explain why owners unconsciously pay attention to their dog's reaction in unpredictable situations (Driscoll et al., 2009). Because of this social bond with their owners, dogs are an ideal model for studying how pet reactions influence human impressions.

However, more than just pets alone can influence our behaviour. Other animals can influence human perceptions and decision-making too, whenever the situation calls for it.

According to Spears (2021), when a shared perspective or threat is interpreted, a shared identity may surpass species boundaries. A person may naturally become uneasy when they see a rabbit sprint away; wondering if there is a predator or other danger close by (Spears, 2021). Thus, people may use animal behaviour as a source of information in unfamiliar situations, even when they have no direct connection to the animal itself. This tendency to interpret animal behaviour as a sign of potential danger could mean that humans unconsciously rely on animal cues. Since owners see their pets as group members, it follows that pets could have an even greater impact on their impressions given the urge to interpret animal cues.

Although previous research has demonstrated that pets can affect their owners' perceptions (Plagemann, 2022; de Boer, 2023), the extent and the cause of this effect remains largely unclear. For example, it is unknown whether this effect is driven by a shared social identity between owner and pet, such as seeing the pet as a reliable group member or whether other contributing factors play a role. This raises important questions about when, why, and how pet behaviour shapes our social impressions of others. Therefore, this study investigated whether a dog's behaviour can influence its owner's first impression of a stranger, and whether this effect is more pronounced in unclear situations, such as meeting a total stranger, versus more neutral ones, such as encountering a police officer.

To this end, we designed a scenario-based questionnaire that manipulated three key factors: the dog's behaviour (positive vs. negative), the clarity of the social situation (clear vs. unclear), and a priming condition (intuitive vs. rational), intended to influence shared identity with the dog. This design allowed us to examine the impact of pet behaviour on social impression formation under different conditions. Based on this setup, we formulated four hypotheses. The first hypothesis states that when the dog has a negative reaction to a stranger, the dog will have a stronger impact on impression formation. This would suggest that participants interpret negative pet behaviour as a warning signal, especially in a social situation.

The second hypothesis proposes that participants in the intuitive priming condition, which is designed to enhance perceived similarity or shared identity with the dog, will be more strongly influenced by the dog's reaction. The third hypothesis predicts that in a clear situation the influence of the dog will be weaker. This reduction is due to the availability of contextual information. In other words, participants are in this case more likely to use prior knowledge rather than rely on signals like pet behaviour. Finally, for the fourth hypothesis we expect an interaction effect: the strongest influence of the dog's behaviour will occur when all three factors are aligned. Specifically, the dog shows a negative reaction, the situation is unclear, and the participant is in the intuitive priming condition. This would suggest a multiplicative effect, where the combination of these variables leads to a greater impact than each factor alone.

Together, these hypotheses allowed us to explore whether animals can influence impression formation, next to how contextual and shared identity factors determine the strength of that influence. By examining this interaction between pet behaviour, situation clarity, and priming condition, this study contributed to a deeper understanding of how external, non-verbal cues shape our social world, even when they come from non-human group members.

Method

Participants and Design

This study recruited 74 first year's bachelor's students from the Faculty of Behavioural and Social Sciences at the University of Groningen. Participants were recruited through the SONA-system, a participant pool management software provided by the University of Groningen. Additionally, we collected data from 223 participants that were directly invited by the researchers through other platforms such as social media. A total of 130 responses were eliminated because the respondents either did not complete the questionnaire, took less than five minutes to respond, admitted they did not respond seriously, and/or failed the attention checks. The final sample for the analysis consisted of 167 participants. Demographic variables

such as gender and dog ownership status were recorded. Of these participants, 40 identified as male, 126 as female, and one participant preferred not to say. Of all participants, 97 own or had owned a dog, while 70 participants never owned a dog. Furthermore, 32 participants expressed their dietary preference as vegan/vegetarian.

Direct invites or the SONA-system were used to recruit participants. First-year University of Groningen psychology bachelor's students who took part in the SONA-system were compensated with (0.6) SONA credits. Both the Dutch and international tracks were eligible to participate, with the only requirement being that participants understood English, as the questionnaire was conducted in English. The study is based on a convenience sample as a result of these recruitment techniques. The study and its procedures were approved by the ethics committee of the University of Groningen.

The study employed a mixed 2x2x2 factorial design: 2 (Priming: intuitive vs. rational) \times 2 (Type of stranger encountered: uniformed vs. not) \times 2 (Dog's reaction to stranger: positive vs. negative), with the first two factors being between-subjects and the last factor within-subjects. The participants were randomly assigned to the between-subjects experimental conditions.

In the complete stranger condition, there were 45 participants in both the intuitive and rational groups, totalling 90 participants. In the uniform stranger condition, 44 participants were in the intuitive group and 33 in the rational group, totalling 77 participants. Data was analysed using SPSS to test for main and interaction effects between the experimental conditions.

Materials and Procedure

The study was administered via Qualtrics, an online survey tool that allows one to build and distribute surveys, and analyse responses. Before the study commenced, participants provided informed consent. This consent form included information about data collection, data

processing, and data handling after the study, voluntary participation, and privacy. Participants were informed about the general aim of the study, namely how people form impressions.

Subsequently, we randomly assigned them to one of the two priming conditions, rational or intuitive. This priming served to activate relevant mental representations that influenced responses in meaningful ways. In the rational primed condition, they received information on how thoughtful impression formation and decision-making can be much more accurate than relying on instinct (see Appendix A). This was used to draw attention to the cognitive differences between humans and dogs, given that dogs are unable to engage in this form of rational processing. In the intuitively primed condition, to encourage reliance on fast and automatic thinking, the participants received information highlighting the evolutionary benefits of instinct and gut feelings in impression formation and decision-making (see Appendix A). In this case, dogs and humans are considered similar, as both species rely heavily on intuitive processes for rapid decision-making. Both priming conditions were followed by a manipulation check to assess whether the participants read and properly understood the information.

Next, each participant was randomly assigned to one of two conditions: uniformed stranger or complete stranger. In both conditions, participants were presented with two scenarios. In the first scenario, the dog reacted positively to the stranger, and in the second, the dog reacted negatively. The dog's reaction served as a within-subject manipulation.

In the uniform condition, participants encountered a postal worker in the first scenario and a police officer in the second. This was considered a clear situation, as humans can easily recognize uniforms and associate them with safety figures carrying out specific roles, whereas dogs cannot. In the complete stranger condition, participants encountered two unfamiliar individuals described with a few subtle cues about clothing and appearance. This created an

unclear situation in which both the participant and the dog relied on the same limited social cues.

All scenarios were otherwise kept similar: participants imagined walking outdoors with their dog, encountering only one stranger who crossed their path, with no other people around (see Appendix A). After each scenario, participants rated their feelings toward the stranger and the dog, as well as their sharing and understanding of the dog's reaction.

Afterwards, participants were presented with questions about shared identity to measure how they may see themselves and their pet as part of a shared social group. These were followed by a further manipulation check, which served to confirm that the priming worked as intended. In the end, participants were asked about their gender, their diet (vegetarian/vegan), and dog ownership. These were followed by a strong attention check, the funnel debrief which gave participants the option to tell us what they think the study was about, and the debrief.

Measures

This study investigated whether humans could be socially influenced by dogs because of shared identity processes.

Judgment

After each vignette, several questions were asked. These questions were the same for each scenario. The first section of questions was about how participants judged the stranger. This judgment section was composed of seven questions regarding the following variables: trust, suspiciousness, friendliness, threat perception, fear, distance, and reaction justification. Participants rated their level of judgment on a 7-point scale, from 1 “not at all” to 7 “extremely” (see Appendix A).

Emotion Perception

Next, participants were asked to answer some questions about how they think the dog felt towards the stranger in the scenario they just read. These questions were the same for each

scenario. Participants were asked to rate their emotional perception of the dog's feelings on a 7-point scale from 1 "not at all" to 7 "extremely". The emotions were: "Happy", "Angry", "Fearful", "Positive", "Negative", and "Friendly" (see Appendix A).

This was followed by questions about the participant's feelings towards the dog, using the 7-point scale from 1 "not at all" to 7 "extremely". In this section, the emotions were "Happy", "Disappointed", "Worried", "Curious", "Surprised", and "Angry" (see Appendix A).

Cognitive and Affective Empathy

To assess participants' cognitive and affective empathy with their dogs, two more items were administered. Participants were asked to rate how well they understood the feelings of their dog, and the extent to which they shared their dog's feelings. Responses were again recorded on a 7-point scale ranging from 1 ("Not at all") to 7 ("Extremely") (see Appendix A). To test whether participants were paying attention, they were instructed to select "Somewhat" (corresponding to 3 on the scale).

Shared Identity

Afterwards, participants were presented with the Inclusion of Others in Self scale (Schubert & Otten, 2002) to measure their perceived level of shared social identity with their dog. Seven images with two circles were introduced. In the first image there was no overlap between the two and they were completely aligned with one another by the seventh image (see Appendix A). Participants were asked to choose the image that best describes the relationship with their actual or imagined dog, with greater overlap symbolising a stronger sense of closeness. To capture group identity further, two questions followed. "How aligned do you feel your own impressions of people are with your dog's reactions to them?" and "To what extent do you trust your dog's judgment of new people?" using the 7-point scale from 1 "Not at all" to 7 "Extremely" to assess the participants feelings/beliefs. (Non-dog owners were asked to imagine the dog.)

Attention and Seriousness Check

To test whether participants were paying attention while reading the scenarios and priming texts, control questions regarding the content were integrated (see Appendix A). Furthermore, attention checks such as “Select ‘Somewhat’” were used as well for a better assessment of seriousness. In the very end participants had to indicate whether they answered the questionnaire truthfully. To encourage an honest response it was stated that there would be no consequences for the participants and that the SONA credits would still be received.

Results

Before interpreting the results, all assumptions for the conducted main and exploratory analyses were tested. Assumption checks were also done for the newly constructed scales used in the main analyses and exploratory analyses. Details of these assumption checks, including Levene’s test for homogeneity of variances and normality assessments, are provided in Appendix B.

Manipulation Check

To examine whether the priming was effective, a cross-tabulation was conducted between participants' self-reported thinking style (intuitive vs. rational) and their assigned priming condition. Although participants in the intuitive condition were more likely to report intuitive thinking, participants in the rational condition also seemed to be more likely to report intuitive thinking. However, participants in the rational condition chose the rational options relatively more often. We could argue that the direction of the pattern is in the right direction. A Pearson chi-square test also showed a significant association between priming condition and reported thinking style ($\chi^2(2, N = 166) = 5.26, p = .07$). This suggests partial success of the priming, though its strength may have varied between participants and due to other factors.

In addition, a measure of perceived shared identity was included using the overlapping circles task (Schubert & Otten, 2002), in which (dog owning) participants indicated how

closely they felt connected to their dog. A univariate ANOVA revealed no significant difference in shared identity across all conditions. Although we expected that intuitively primed participants would rate themselves as more closely connected to their dog than rationally primed participants, the means were not in the predicted direction. This suggests that the priming did not have an effect on the shared identity measure.

Another manipulation check was conducted on participants' emotional reactions to the stranger, based on whether the dog behaved positively or negatively. As expected, participants expressed more positive emotions (e.g., happiness, friendliness) in the positive dog scenario, and more negative emotions (e.g., anger, fear) in the negative scenario, supporting the effectiveness of the manipulation. For instance, anger ratings were higher in the negative condition than in the positive one, while happiness ratings showed the opposite pattern.

Main Effects

In order to test the hypotheses more precisely, two new scales were constructed. For the positive judgment scale, all negatively worded items were reverse-coded and the average score was calculated. Likewise, for the negative judgment scale, all positively phrased items were reversed and averaged. This allowed social influence to be interpreted in the same direction across conditions. The higher scores consistently reflected stronger alignment with the dog's behaviour, whether positive or negative.

Dog Reaction

According to the first hypothesis, we hypothesised that negative dog behaviour would have a stronger influence on impression formation than positive behaviour. To test this, a repeated measures ANOVA was conducted. A significant main effect was found as shown in Table 1, indicating that participants' ratings differed depending on whether the dog reacted positively or negatively. However, no significant interaction effects were found between the dog's reaction and the priming condition, nor for the three-way interaction between the dog's

reaction, the priming condition and uniform condition, suggesting that the effect of the dog's behaviour was relatively robust and did not significantly differ by priming or scenario type.

Table 1

Repeated Measures ANOVA: Main and Interaction Effects on Impression Ratings

Effects	df	F	p	Partial η^2
Dog reaction (main effect)	1, 163	11.98	< .001	.07
Dog reaction × Priming Condition	1, 163	0.03	.86	.00
Dog reaction × Clothes Condition	1, 163	21.27	<.001	.12
Dog reaction × Priming × Clothes	1, 163	0.17	.73	.00

Note. Impression ratings served as the dependent variable.

When looking at the mean impression rating for the dog's reaction and the negative and positive scenarios, a pattern emerged that contradicts the original hypothesis. Participants gave significantly higher impression ratings in the positive condition ($X = 4.98$) than in the negative condition ($X = 4.52$), suggesting that the dog's friendly behaviour led to more favourable judgments. This may suggest that people are more influenced by positive dog behaviour when forming social judgments, contradicting the expectation that negative cues would be more impactful.

Priming

Additionally, we hypothesised that participants primed to think intuitively would be more strongly influenced by the dog's behaviour when meeting the stranger. To assess this, a

between-subjects analysis was conducted focusing on the priming condition. However, no significant main effect of priming on impression ratings was found ($F(1, 163) = 0.97, p = .33$). The mean impression rating for participants in the intuitive priming condition was $X = 4.80$, compared to $X = 4.70$ in the rational priming condition. Although the mean difference was in the hypothesised direction, it was small and did not reach statistical significance. These results indicate that the priming manipulation did not generate a sufficiently strong sense of shared identity to influence participants' interpretation of the dog's behaviour.

Situational Clarity

We hypothesised that the dog's behaviour would have a stronger influence on impression formation in the unclear (stranger) condition than in the clear (uniform) condition. A repeated measures ANOVA showed no significant main effect of on impression ratings ($F(1, 163) = 0.46, p = .50$). The mean impression rating in the stranger condition was $X = 4.78$, while in the uniform condition it was $X = 4.72$, indicating only a minimal difference. This minor effect provides no support for the hypothesis that the dog's behaviour has more influence in unclear situations. Although the mean difference trends in the predicted direction, it is possible that variation within the uniform condition (e.g., between a police officer and a postal worker) may have obscured potential effects.

Interaction Effect

We examined whether a three-way interaction existed between dog reaction, clothing condition, and priming condition, with the expectation that being in the intuitive condition would increase responsiveness to dog behaviour, particularly in uncertain (stranger) scenarios. However, the repeated measures ANOVA revealed no significant three-way interaction ($F(1, 163) = 0.20, p = .65$). Given that priming did not have a significant main effect in earlier analyses, the absence of a three-way interaction is not unexpected.

However, when examining the two-way interaction between dog reaction and clothing condition separately, a significant interaction was found as shown in Table 2. This suggests that the type of scenario unclear (complete stranger) vs. clear (uniform) influenced the way participants responded to the dog's behaviour.

Table 2

Two-Way Interaction between Dog Reaction and Clothes Condition on Impression Ratings

Effect	df	F	p	Partial η^2
Dog reaction \times Clothes Condition	1, 163	21.27	< .001	.12

Note. Follow-up means are reported in a separate table (see Table 3).

Specifically, a clear pattern in the uniform condition was seen as shown in Table 3: participants gave notably higher impression scores following a positive dog reaction than a negative one. This indicates a much stronger influence of positive behaviour when the social role of the stranger was clear and potentially trustworthy. This could also reflect a difference: a negative dog reaction to a seemingly trustworthy person like a police officer may have appeared invalid or confusing, whereas a friendly response to a postal worker seemed appropriate. Participants may have relied on the clear social context to judge whether the dog's behaviour was appropriate or not. This suggests that scenario clarity may be more important than first thought, even though it does not validate the full three-way interaction as expected.

Table 3

Mean Impression Ratings by Dog Reaction and Clothes Condition

Clothes Condition	Dog Reaction	M	SE
Stranger	Positive	4.71	0.11

Stranger	Negative	4.86	0.12
Uniform	Positive	5.24	0.12
Uniform	Negative	4.19	0.13

Note. Means represent impression ratings based on dog reaction (positive/negative) and clothing condition (uniform vs. complete stranger).

Exploratory Analyses

In addition to testing the main hypotheses, several exploratory analyses were conducted to further investigate how social cues influence impression formation. These analyses include participants' emotional reactions toward the dog and their justification for the dog's behaviour.

Justification of Dog Behaviour

First, we examined how participants justified the dog's behaviour across different conditions. A repeated measures ANOVA revealed a significant main effect for justification of dog behaviour ($F(1, 163) = 11.98, p < .001$), indicating that participants evaluated positive and negative dog reactions differently in terms of justification. Additionally, a marginal significant interaction was found between justification and clothing condition ($F(1, 163) = 3.55, p = .06$), suggesting a possible moderating role of situational clarity in how participants interpreted the dog's reaction. A between-subjects ANOVA further revealed a significant effect of priming condition on justification ($F(1, 163) = 6.23, p = .01$). Participants in the intuitive condition ($M = 4.01$) reported higher levels of justification than those in the rational condition ($M = 3.54$). These findings suggest that the priming manipulation affected participants' justification ratings of the dog's behaviour. It may reflect openness to external social cues or a stronger sense of alignment with the dog's perspective. These findings offer partial support for the idea that perceived similarity influences how animal behaviour is interpreted in social contexts.

Emotional Reactions towards Dog

Further analysis focused on emotions directed at the dog itself, rather than the stranger. A repeated measures ANOVA showed a significant main effect for anger towards the dog ($F(1, 163) = 34.36, p < .001$), with participants reporting more anger when the dog reacted negatively. Notably, a near-significant three-way interaction was found between anger directed towards the dog, clothing condition, and priming ($F(1, 163) = 3.58, p = .06$), suggesting that emotional responses to the dog may vary depending on both scenario type and thinking style. Mean comparisons showed that in the intuitive condition, participants were angrier at the dog in the negative reaction condition, both for stranger and uniform scenarios. Surprisingly, in the rational condition participants showed a surprisingly sharp increase in anger in the negative uniform condition, indicating that expectations of trustworthiness may have led to stronger disapproval (of the dog's reaction) when those expectations were violated.

For the emotion happiness towards the dog, a strong main effect was also found ($F(1, 163) = 129.83, p < .001$). Participants were consistently happier with the dog when it reacted positively, across both stranger and uniform scenarios. A marginally significant interaction between happiness and clothing condition was found ($F(1, 163) = 3.56, p = .06$), with slightly stronger emotional reactions in the uniform context, suggesting that the social role of the target may also influence how dog behaviour is evaluated emotionally.

Finally, a between-subjects ANOVA examining the effects of priming and clothing condition on emotion ratings revealed a significant main effect of clothing ($F(1, 163) = 4.75, p = .03$). Participants in the uniform condition reported higher emotional responses overall ($M = 3.82$) compared to those in the stranger condition ($M = 3.41$), suggesting that the social role of the person being judged influenced how participants responded to the situation.

Empathy Measures

To further explore participants' responses to the dog's behaviour, two empathy-related scales were analysed: cognitive empathy (i.e., understanding the dog's emotions) and affective

empathy (i.e., sharing the dog's emotions). A repeated measures ANOVA revealed a significant main effect for cognitive empathy ($F(1, 163) = 10.18, p = .002$), indicating that participants generally reported understanding their dog's emotional state. The interaction between cognitive empathy and clothing was not statistically significant ($F(1, 163) = 3.06, p = .08$), although it approached the conventional significance level. Participants appeared to understand positive dog behaviour slightly better than negative behaviour in the stranger condition ($X = 3.72$ vs. $X = 3.52$), and this difference was even more pronounced in the uniform condition ($X = 4.17$ vs. $X = 3.48$). These findings suggest that participants may find positive dog reactions easier to interpret, particularly when the social context is clearer.

For affective empathy, a significant main effect was found ($F(1, 163) = 11.23, p = .001$), suggesting that participants reported a general tendency to emotionally resonate with their dog's reactions. Emotion sharing scores were higher for negative dog reactions than for positive ones ($X = 3.12$ vs. $X = 2.64$). A significant interaction was observed between affective empathy and clothing condition ($F(1, 163) = 6.25, p = .01$). In the stranger condition, this difference was more pronounced between the negative and positive scenario ($X = 3.33$ vs. $X = 2.50$), while in the uniform condition the difference was smaller but still present ($X = 2.91$ vs. $X = 2.79$). These results suggest that in unclear settings, participants may experience a stronger emotional alignment with their pet's negative signals.

Discussion

This study investigated whether a dog's reaction influences its owner's first impression of a stranger. Four hypotheses guided this research. First, we expected that a negative dog reaction would lead to a stronger impact on impression formation than a positive one. Second, we hypothesised that participants in the intuitive priming condition would be more strongly influenced by the dog's reaction, due to increased perceived similarity or shared identity. Third, we predicted that in a clear context, the influence of the dog would be weaker. Finally, we

proposed an interaction effect, expecting the strongest influence when a negative dog reaction occurs in an unclear situation and under intuitive priming.

Overall, the results provided limited support for the hypotheses. While there were trends in the expected directions, most effects did not have statistical significance. Despite the fact that the main effect of dog reaction on impression formation was significant, it did not align with our expectations: positive dog behaviour had a greater influence on participants' ratings than negative behaviour. This contradicts the initial expectation that negative pet behaviour would function as a stronger social cue. This unexpected finding highlights the complexity of the relationship between pet behaviour and human perception and suggests that this influence may not be as straightforward as originally assumed. One possible explanation might be that friendly dog behaviour simply felt more natural or expected to participants, which may have made the stranger seem safer or more likeable. In this case, the dog's behaviour worked as a kind of social reassurance, strengthening the overall positive impression. On the other hand, a negative reaction from the dog may have been more inconsistent with how dogs are typically perceived. As a result, participants may have ignored it or blamed the dog instead of the stranger. A positive reaction may simply stand out more, creating a stronger contrast and thus a stronger impression. This pattern suggests that positive pet behaviour may be particularly effective in shaping impressions, although further research is needed to better understand the mechanisms behind this effect.

No significant main effects were found for the priming condition or scenario clarity (clothing condition) alone, and the hypothesised three-way interaction did not reach significance. This indicates that the manipulation via priming and situational (lack of) clarity did not increase the influence of dog behaviour. However, a two-way interaction between dog reaction and clothing condition was significant. Dog behaviour had the strongest effect in a positive scenario with the postal worker (uniform condition). As discussed earlier, the dog's

behaviour could have worked as a kind of social reassurance, strengthening the overall positive impression. This reaction may have stood out because it goes against human expectations. Dogs often bark at postal workers, which could have made the influence stronger. The unexpected friendliness could be interpreted as more meaningful. On the other hand, participants may have discounted the dog's behaviour in the condition with the police officer, since it was negative. Given that police officers are typically perceived as trustworthy authority figures, a growl or bark may have been seen as inconsistent or inappropriate, reducing its influence on impression formation.

Exploratory findings also revealed meaningful patterns. The priming manipulation did not significantly influence the judgments of participants, but it did influence how they justified the judgments of the dog. Participants in the intuitive condition gave higher justification scores than those in the rational condition. This may suggest that the intuitive priming condition may have enhanced participants' empathy to the dog's behaviour, potentially by increasing perceived similarity or emotional connection.

In other exploratory findings, it was found that participants were significantly angrier at their dog when it responded negatively, and especially so when that behaviour violated expectations, such as reacting negatively to a person in uniform. Furthermore, participants expressed more happiness when the dog reacted positively, consistent across both stranger and uniform conditions. These results suggest that people not only judge others based on pet behaviour, but also judge the pet's behaviour itself, especially when it conflicts with social norms.

Empathy-related findings add further nuance. Although the empathy measures did not produce statistically significant effects, several trends were observed. Participants gave higher scores of understanding in response to positive dog reactions, particularly in the uniform scenario. In contrast, sharing the dog's feelings was more common when the dog reacted

negatively, particularly in the stranger scenario. These findings suggest that emotional understanding and sharing are influenced by different factors, such as situational context and whether the emotion is positive or negative.

Limitations and Future Directions

This study had several limitations. First, the sample may have affected the results. Many participants were removed because they did not finish the questionnaire. Participants from the SONA system may have shown lower levels of attention or engagement than those from the convenience sample, since SONA participants need to gather credits to pass their first-year course, participation may have been mostly driven by credit collecting rather than genuine interest. This is further supported by response time patterns: SONA participants often completed the questionnaire extremely quickly or unusually slowly, whereas convenience sample participants showed more consistent response times. These differences may have introduced noise in the data and reduced the ability to detect subtle effects.

Second, the hypothetical scenario design and use of self-report measures limit the ecological validity of the findings. Participants were not observing real dogs or strangers, nor were they responding in real-time. It is possible that this gap affected how realistically they interacted with the scenarios. The interaction of variables like situational clarity, priming condition, dog reaction and perceived shared identity may have been too complex to capture using a quantitative survey alone. Because self-report questionnaires were used in this study, the results might not translate well to interactions in real life, where situational cues and spontaneous responses are more important. Future studies should consider using behavioural or observational designs in naturalistic settings to improve validity.

Third, the predictions may not have been sufficiently refined to detect meaningful patterns such as the two-way interaction between dog behaviour and clothing condition. While the three-way interaction was hypothesised, the findings suggest that more precise theorising

around the role of contextual cues may have led to better alignment between the design and the observed effects. For example, the design might have benefited from explicitly anticipating the possibility that certain cues (such as positive dog behaviour in socially ‘safe’ contexts) could enhance rather than reduce influence. Future research should consider developing more nuanced hypotheses that reflect the interaction between scenario type, perceived safeness, and the social meaning of animal behaviour better.

Fourth, the priming manipulation may not have been strong enough to induce the intended sense of shared identity with the dog. While a small effect was observed on justification scores, participants across all conditions gave similar responses, suggesting that the priming may not have clearly established the intended sense of connection with the dog. If participants did not fully adopt the perspective presented in the priming, its impact on social influence may have been limited. Future research could consider more immersive or identity-focused priming methods to manipulate this connection.

Lastly, although exploratory results pointed toward shared identity between dog and owner, this variable was not directly manipulated in the study. Future work should explore identity salience more directly, through different experimental priming or perceived similarity with the pet.

Theoretical and Practical Implications

This study contributes to research on social influence and the role of pets in impression formation. Although not all hypotheses were supported and in the expected direction, the results align with the idea that pet behaviour can act as a social cue under specific conditions. The finding that positive dog behaviour can significantly shape human judgments highlights the importance of considering pets as active social agents. This is particularly interesting, as the stronger influence of positive cues contradicts the assumption that threat cues would dominate during intuitive priming.

The observed effect of priming on justification but not on impression ratings suggests that the manipulation may have influenced how participants interpreted the dog's behaviour without altering their overall evaluation. This difference may reflect increased sensitivity to social cues in contexts of perceived similarity and highlights an important direction for future research on social impressions.

Practically, understanding how pet behaviour affects social impressions could be relevant in fields such as animal-assisted therapy, police work, or training programmes. The results of this study also showed the impact also focus on the impact of sampling procedures and participant engagement in psychological studies, as unmotivated or inattentive participants can affect the validity of subtle experimental effects.

Conclusion

In conclusion, this study provides valuable insight into how a dog's behaviour may shape impression formation. The main finding, that positive dog behaviour had a stronger impact than negative behaviour, was unexpected, yet informative. It suggests that pet cues may be more influential in reinforcing positive social evaluations than in signalling danger. While priming and scenario clarity did not show strong effects, the significant two-way interaction between dog behaviour and clothing condition indicates that contextual cues may shape how pet behaviour is interpreted. Exploratory results further suggest that shared identity, emotional responses, situational (lack of) clarity and the assigned priming condition may all play a role in how pet cues are processed. Given the reliance on self-report survey data, the generalisability of these findings to real-world social interactions remains limited. Although some data point towards the hypothesised pattern, more research is needed to provide well-founded claims. Future studies should use stronger manipulations, real-world tasks, and randomly assigned samples to explore how pets might guide human social evaluations, even without saying a word.

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Appendix A

Informed Consent & Research Information

For participants that were not recruited via the SONA system, the information about SONA was removed in the informed consent form.

Information and Informed Consent for the Study:

"A walk on the Wild Side? How we Judge Strangers"

Research Code: PSY-2425-S-0277

You received this information because you are invited to participate in a research study investigating people's understanding of their pet's behavior and how that behavior may shape our perceptions. **For this study, it is recommended that you use a desktop computer or a laptop, as those devices ensure that the contents will be appropriately displayed, but it is also possible to participate via a mobile phone.**

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Aim of the study:

The study aims to better understand impression formation.

Procedure:

First, you will be provided with information on impression formation. After that you will be presented with two scenarios and answer a few questions about these situations (e.g. what you would feel in those situations). It is crucial to the successful completion of the study that you read the short descriptions of the situations completely and carefully. In the end you are asked to provide some demographic information (e.g. your gender).

You should complete this study in one go (without interruptions) when you are on your own. We kindly ask you to respond to all questions by providing the answer that best represents your opinion, thoughts, or feelings. There are no right or wrong answers.

This study takes approximately 25 minutes.

There are no risks associated with participating in this study.

Compensation:

You will receive 0.6 SONA Credits for participating in this study.

Participation is voluntary:

Participating in this study is completely voluntary. It is your choice whether to participate or not. You have the right to decline to participate and withdraw from the research at any time without having to provide any reasons. Withdrawing from this research does not entail any negative consequences.

Types of data collected

This is a list of sensitive measures you will encounter in this survey. Note that you can always skip any question you do not feel comfortable answering or leave the study at any time.

Personal data

Directly identifiable personal data:

- location data (i.e., IP addresses)

Indirectly identifiable personal data:

- SONA Number, Gender, Dog Ownership, Dietary Lifestyle

Your privacy and personal data:

The data that will be collected during this study will be treated confidentially. Data processing takes place for education/training purposes, to write a Bachelor thesis. The data will only be handled by the Researchers. Your SONA number will be recorded in this study to allow compensation. Information that could identify you as a person, such as your SONA number, will be removed after assigning you the credit and won't be shared with other researchers. Thus, only anonymized data might be disseminated such that your anonymity is guaranteed. This means that research data that may be published, for example in scientific journals, cannot identify you.

In sum: as soon as you have received your credit we will remove the SONA identifier so that your data are no longer practically traceable to you (i.e. as far as possible anonymous).

More information:

If you have any questions about this research, you can contact the researchers: Emma Boye (e.l.boy@student.rug.nl), Sherida van Leeuwen (s.van.leeuwen.7@student.rug.nl), Anne Mae Brand (l.a.brand.1@student.rug.nl), Daniela Longo (d.d.longo@student.rug.nl), Guus van Dijken (g.a.van.dijken.1@student.rug.nl), Maria Begall (m.c.begall@student.rug.nl). If you have any complaints about this research, you can contact the Ethics Committee of the Psychology department of the University of Groningen via ecp@rug.nl mentioning the research code PSY-2425-S-0277.

By participating in this research, you indicate that you are doing this on a voluntary basis. You also consent to the use of your data for the purposes that have been mentioned here.

If you have read the above and agree to participate in the study, please answer “Yes” to begin the study. If you do not consent or want to withdraw, you can quit the questionnaire without any consequences.

- o Yes

Assignment to Conditions:

Every participant has been randomly assigned to either the intuitive or rational priming condition.

Priming Conditions Intuition and Rational

Intuition Condition

Please read the following text in depth. Afterwards, we will ask you some questions about it.

For thousands of years, the ability to respond quickly to dangers was essential to human existence. Delays may have resulted in death for our forefathers, who did not have the luxury of time when they heard a rustle in the bushes. While those who paused to assess the situation frequently became prey, those who fought or bolted out of instinct had a much higher chance of surviving. Our decisions are still influenced by this deeply rooted impulse. According to research in cognitive neuroscience (Kahneman & Klein, 2009), gut instincts are not random; rather, they are the consequence of the brain's quick processing of minute contextual information, frequently more quickly than conscious thought permits. Studies on high-stakes occupations like firefighters, soldiers, and doctors have demonstrated that in crucial situations, quick, instinctive decisions frequently beat lengthy, deliberate ones. Similarly, research on thin slices of behavior (Ambady et al., 2000) shows that people form first impressions within seconds, based on subtle but telling cues such as body language and tone of voice. These brief excerpts of expressive behavior can reveal emotions, personality traits, and social dynamics—often before we are consciously aware of them. Gut instincts allow us to make rapid and effective judgments about others, particularly in unpredictable or high-pressure situations. This way, gut instinct quickly helps us determine whom to trust, or whom to avoid.

As psychologist Daniel Kahneman once famously stated: “Hesitation is a relic of luxury. In moments of uncertainty, our instincts are often our most powerful and reliable guides.” Trusting one's gut instinct has always been a vital survival skill, whether one is managing contemporary social relationships or evading predators in the wild.

- o I have read the text thoroughly

Rational Condition

Please read the following text in depth. Afterwards, we will ask you some questions about it.

One of humanity's best attributes is its ability for careful thought. Humans, in contrast to other animals, possess the valuable capacity to stop, think, and make thoughtful judgments.

Cognitive psychology research continuously demonstrates that people who take the time to consider a problem make more accurate and trustworthy decisions than those who only follow their instincts. According to research in cognitive neuroscience (Kahneman & Klein, 2009), gut instincts can help in decision-making, but their accuracy depends on the context. While they allow for quick judgments, they can be misleading in unpredictable situations or when individuals lack experience. This is particularly evident in research on thin slices of behavior (Ambady et al., 2000), which shows that first impressions, though often intuitive, are shaped by emotional biases, automatic associations, and incomplete information. As a result, relying solely on instinct can lead to quick but biased conclusions and stigmatization of others. Whether in everyday interactions or high-stakes decisions, those who take the time to question their initial reactions and process additional information tend to make more well-reasoned and unbiased judgments.

As psychologist Daniel Kahneman once explained: “A split-second reaction can save your life—but a well-reasoned decision can change the world. The greatest minds in history weren’t the fastest thinkers, but the ones who questioned their first instincts.” By engaging in deliberate reasoning, we can minimize errors in judgment and ensure that our decisions are not just quick—but correct.

- o I have read the text thoroughly

Weak Manipulation Check

Both priming conditions were presented with the same questions.

What did Kahnemann in his famous quote say:

- o “A split-second decision can save your life, but a well-reasoned decision can change the world: (...)”
- o “Hesitation is a relic of luxury. In moments of uncertainty, our instincts are often our most powerful and reliable guides.”
- o "Decisions are nothing more than a reflection of the sun's position and the silent influence of the stars—a fleeting judgment written in the cosmos."

According to the text, you just read research on thin slices of behaviour shows that.....

- o people form first impressions within seconds, based on subtle but telling cues which lead to accurate and effective judgments.
- o people form impressions of new people solely by measuring them against the familiar traits and behaviours of those we've encountered before.
- o people form first impressions, based on emotional biases and automatic associations, which lead to quick but inaccurate judgments.

Research in cognitive neuroscience suggests that....

- o quick judgments, can be misleading in unpredictable situations or when individuals lack experience.

- o gut instincts are not random; rather, they are the consequence of the brain's quick processing of contextual information.
- o quick judgments, are based solely on relying on rules and norms.

If the participant has one or more answers wrong, they will be presented with their assigned text once again:

You are presented with the text again because one or more answers were not right. Please read the text carefully and try again. **See priming condition texts above**

Introduction to the Scenarios

All texts are the same for the intuition and rational conditions. Every participant was first presented with a positive scenario and then a negative one.

In all scenarios and conditions, the questions at the end are the same. However, they are differently coded in the data to distinguish between conditions.

Description scenario (intuition and rational condition; stranger condition; positive)	<p><i>Please read the following text in depth.</i></p> <p>You are out for an early morning walk with your dog, following a narrow dirt trail through the woods. The sky is just beginning to lighten, and the surroundings are quiet. There are no people around—the city still seems to be asleep, and the woods feel empty.</p> <p>As you walk along the narrow path, you notice a tall man approaching from the opposite direction. He is dressed casually in jeans and a jacket, walking at a relaxed pace.</p> <p>As the man gets closer, your dog suddenly perks up. Its ears stand tall, its tail starts wagging, and it gently pulls forward on the leash, as if eager to greet him. As the man passes by, your dog sniffs the air, wags its tail more enthusiastically, and even takes a small step toward him, showing clear signs of friendliness.</p> <p>The man briefly glances down before continuing on his way. Your dog watches him for a moment before returning its focus to the walk, still appearing relaxed and content.</p>
Description scenario (intuition and rational condition; stranger condition; negative)	<p><i>Please read the following text in depth.</i></p>

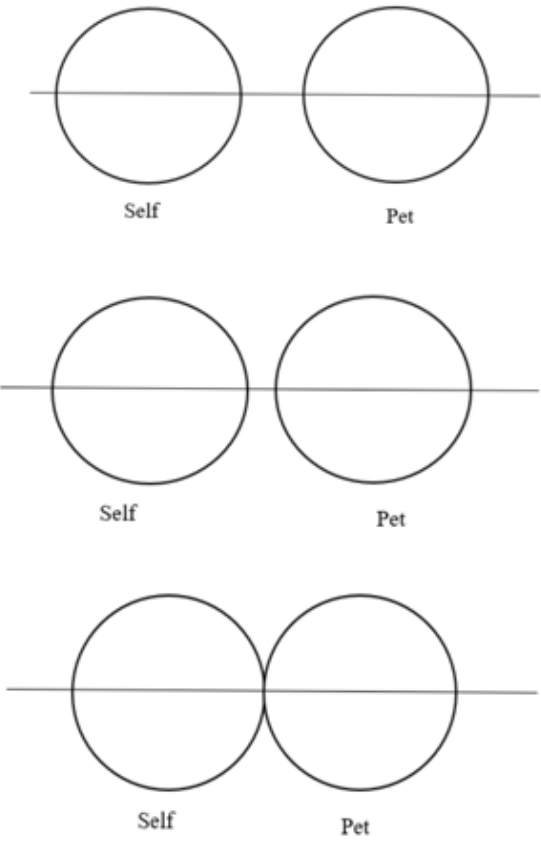
	<p>You are outside with your dog, taking your usual walk in the park. It's early evening, and the sun is setting, there are no people in sight - it's getting quiet.</p> <p>As you walk along a narrow path, you notice a tall man approaching from the opposite direction. He is dressed in casual clothing, walking at an even pace towards you.</p> <p>As the man gets closer, your dog suddenly stops in its tracks. Its ears flatten, and its tail tucks tightly between its legs. Its body stiffens, and a low growl rumbles in its chest. As he passes, your dog bares its teeth and lets out a sharp bark, pulling backward on the leash as if hesitant to continue forward.</p> <p>The man briefly glances down, his expression neutral, his pace unchanged. But your dog remains tense, its eyes fixed on him until he disappears further down the path. Even after he's gone, your dog still seems on edge, looking back occasionally in the direction he went.</p>
<p>Description scenario (intuition and rational condition; uniform condition; positive)</p>	<p><i>Please read the following text in depth.</i></p> <p>You are out for an early morning walk with your dog, following a familiar route through an urban green space. The sky is just beginning to lighten, the surroundings are quiet. There are no people around- the city still seems to be asleep and empty.</p> <p>As you walk along a path along a line of trees, you notice a uniformed postman a little way ahead with a bag slung over his shoulder. He walks towards you at a steady pace.</p> <p>As the postman gets closer, your dog suddenly perks up. Its ears stand tall, its tail starts wagging, and it gently pulls forward on the leash, as if eager to greet him. As he passes by, your dog sniffs the air, wags its tail more enthusiastically, and even takes a small step toward him, showing clear signs of friendliness.</p>

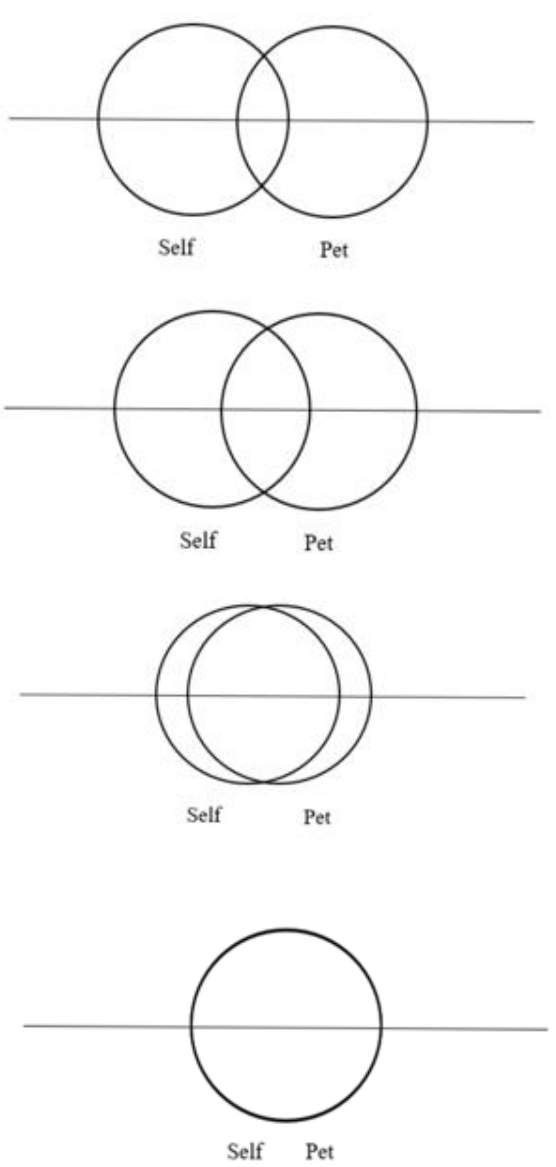
	<p>The postman briefly glances down before continuing on his way. Your dog watches him for a moment before returning it's focus on the walk, still appearing relaxed and content.</p>
<p>Description scenario (intuition and rational condition; uniform condition; negative)</p>	<p><i>Please read the following text in depth.</i></p> <p>You are outside with your dog, taking your usual walk in the park. It's early evening, and the sun is setting, there are no people in sight - it's getting quiet.</p> <p>As you continue along a narrow path, you notice a uniformed police officer approaching from the opposite direction at a steady pace.</p> <p>As the officer gets closer, your dog suddenly stops in its tracks. Its ears flatten, and its tail tucks tightly between its legs. Its body stiffens, and a low growl rumbles in its chest. As he passes, your dog bares its teeth and lets out a sharp bark, pulling backward on the leash as if hesitant to continue forward.</p> <p>The police officer briefly glances down, his expression neutral, his pace unchanged. But your dog remains tense, its eyes fixed on him until he disappears further down the path. Even after he's gone, your dog still seems on edge, looking back occasionally in the direction he went.</p>

Emotion of participant towards stranger	<p>Please answer how you would feel towards the stranger in this situation. (7 point scale: not at all to extremely)</p> <ul style="list-style-type: none"> ○ Would you trust the stranger? ○ Would you be suspicious of the stranger? ○ Would you perceive the stranger to be friendly? ○ Would you feel threatened by the stranger? ○ Would you be afraid of the stranger? ○ Would you keep your distance from the stranger? ○ Would you think your dog's reaction to the stranger is justified?
Emotion of dog towards stranger	<p>How do you think your dog feels towards the stranger in this situation? (7 point scale: not at all to extremely)</p> <ul style="list-style-type: none"> ○ Happy ○ Angry ○ Fearful ○ Positive ○ Negative ○ Friendly
Emotion of participant towards dog	<p>How do you feel towards your dog in this situation? (7 point scale: not at all to extremely)</p> <ul style="list-style-type: none"> ○ Happy ○ Disappointed ○ Worried ○ Curious ○ Surprised ○ Angry
<p>Understanding and or sharing feelings of dog (cognitive and affective empathy)</p> <p>Attention check</p>	<p>Please answer the following questions regarding your dog's feelings. (7 point scale: not at all to extremely)</p> <ul style="list-style-type: none"> ○ Do you understand the feelings of your dog? ○ Select "Somewhat" ○ Do you share the feelings of your dog?

Shared Identity Measures

Every participant received questions about shared (group) identity.

Introduction text	<p>People who have a dog often develop a close bond with them. In this sense, they may see themselves and their pet as part of a shared social group (e.g., “me and my dog”). The images below represent different levels of closeness in a human-pet relationship, with greater overlap symbolizing a stronger sense of closeness. Thinking about the dog in the scenarios – whether your actual dog or the hypothetical one – how would you best describe your relationship? In other words, how strongly do you and your dog feel like a team?</p>
Pictorial measure of shared (group) identity	<p>Please choose the image that best describes your relationship with your dog.</p> <div style="text-align: center;">  <p>The diagrams illustrate three levels of perceived closeness between a person (Self) and a pet (Pet) using Venn diagrams. Each diagram consists of two circles, one labeled 'Self' on the left and one labeled 'Pet' on the right, both bisected by a horizontal line. 1. The first diagram shows two completely separate circles with no overlap. 2. The second diagram shows two circles with a small, partial overlap. 3. The third diagram shows two circles with a large, significant overlap, representing a strong sense of shared identity.</p> </div>

	 <p>The diagrams show four different ways to represent the relationship between 'Self' and 'Pet' identity using Venn diagrams. Each diagram has a horizontal line passing through the center of the circles.</p> <ul style="list-style-type: none"> Diagram 1: Two separate circles, one labeled 'Self' and one labeled 'Pet'. Diagram 2: Two overlapping circles, one labeled 'Self' and one labeled 'Pet'. Diagram 3: Two overlapping circles, one labeled 'Self' and one labeled 'Pet', with a different overlap pattern. Diagram 4: A single circle labeled 'Self' and 'Pet'.
Measure of shared (group) identity	<p>(7 point scale: not at all to extremely)</p> <ul style="list-style-type: none"> ○ How aligned do you feel your own impressions of people are with your dog's reactions to them? ○ To what extent do you trust your dog's judgment of new people?

Strong Manipulation Check

When you formed an impression of the two strangers in the previous scenarios which of the following best describes your approach?

- ☐ I relied mostly on my gut feeling.
- ☐ I tried to take time to analyze the facts before deciding.

How did you answer the questions?

- ☐ Very quickly, it felt natural.
- ☐ I had to think carefully before deciding.

Demographics

Gender	Please indicate your gender. <ul style="list-style-type: none"> <input type="radio"/> Female <input type="radio"/> Male <input type="radio"/> Non Binary/Third-Gender <input type="radio"/> Prefer not to say
Dog ownership	Do you currently own a dog or have you owned a dog? <ul style="list-style-type: none"> <input type="radio"/> No <input type="radio"/> Yes
Common reaction dog towards stranger (only presented when dog ownership is answered positively)	If you have a dog, does it commonly react... (Scale point slider, from -5 to 5) <ul style="list-style-type: none"> <input type="radio"/> Negative to strangers <input type="radio"/> No common patterns <input type="radio"/> Positive to strangers
Dietary information	Are you vegan/vegetarian? <ul style="list-style-type: none"> <input type="radio"/> No <input type="radio"/> Yes

Attention Check

The second question was only presented to participants that were recruited via SONA

Regarding the two scenarios you read please indicate whether you were alone with the stranger and your dog

- ☐ Yes
- ☐ No

To protect the quality of our data, please answer whether you answered all the questions truthfully, there are no consequences if you answer no and you will still receive your SONA credits.

- ☐ Yes
- ☐ No

Appendix B

Positive and Negative Judgment Scales Assumption Checks

Table 4

Reliability Analysis of Judgment Scales

Scale	Number of Items	Cronbach's α
Positive Judgment Scale	6	.85
Negative Judgment Scale	6	.87

Note. Reliability analyses indicated high internal consistency.

Table 5

Item-Total Statistics for the Positive Judgment Scale

Item	Item-Total Correlation	Cronbach's α if Item Removed
Judgment Trustworthy	0.62	.83
Judgment Liking	0.49	.85
Judgment Suspicious	0.70	.82
Judgment Threatening	0.76	.81
Judgment Keep Distance	0.63	.83
Judgment Afraid	0.66	.82

Note. Cronbach's alpha for the full positive judgment scale was .85. Items are about whether participant thought someone was trustworthy, suspicious, threatening, etc.

Table 6

Item-Total Statistics for the Negative Judgment Scale

Item	Item-Total Correlation	Cronbach's α if Item Removed
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Judgment Trustworthy	0.61	.85
Judgment Liking	0.48	.87
Judgment Suspicious	0.69	.84
Judgment Threatening	0.71	.84
Judgment Keep Distance	0.75	.83
Judgment Afraid	0.76	.83

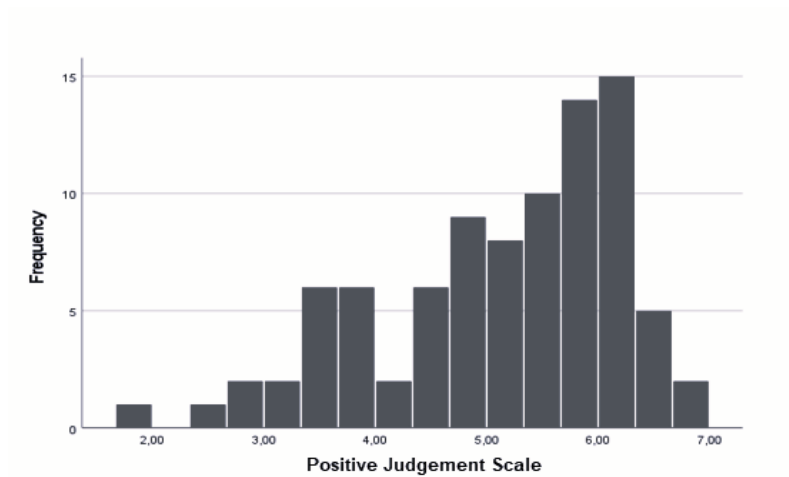
Note. Cronbach's alpha for the full negative judgment scale was .87. Items are about whether participant thought someone was trustworthy, suspicious, threatening, etc.

Table 7

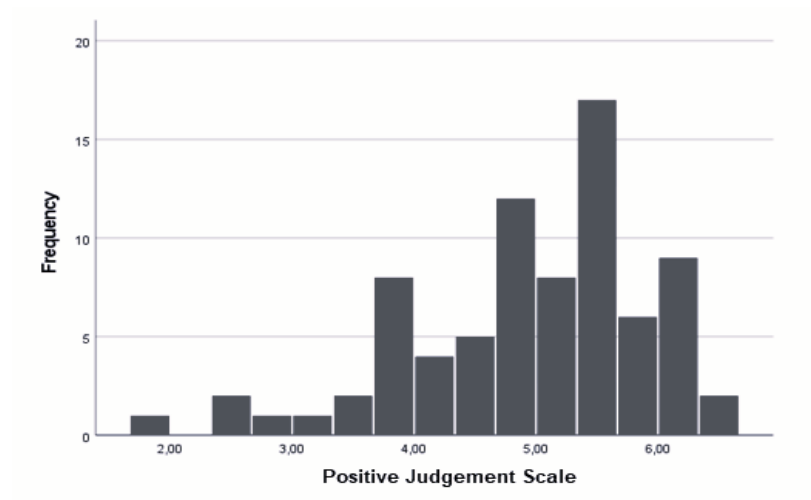
Shapiro–Wilk Test of Normality by Priming Condition

Scale	Condition	Statistic	df	p
Positive Judgment	Intuition	.94	89	< .001
Positive Judgment	Rational	.94	78	.002
Negative Judgment	Intuition	.98	89	.32
Negative Judgment	Rational	.98	78	.42

Note. Normality violations were observed for the positive judgment scale only. Histogram inspection confirmed skewness in the positive condition.

Figure 1*Histogram Normality Distribution Intuition Condition*

Note. Mean = 5.03, standard deviation = 1.07, N = 89. The skew shows non-normality.

Figure 2*Histogram Normality Distribution Rational Condition*

Note. Mean = 4.87, standard deviation = 0.97, N = 78. The skew shows non-normality.

Table 8*Shapiro–Wilk Test of Normality by Clothing Condition*

Scale	Condition	Statistic	df	p
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Positive Judgment	Stranger	.97	90	.02
Positive Judgment	Uniform	.92	77	<.001
Negative Judgment	Stranger	.98	90	.09
Negative Judgment	Uniform	.98	77	.29

Note. Normality violations were observed for the positive judgment scale only.

Assumption Check Main Analysis

Table 9

Levene's Test for Homogeneity of Variance (Judgment Scales)

Scale	Statistic	df1	df2	p
Positive Judgment	2.71	3	163	.05
Negative Judgment	1.05	3	163	.37

Note. The significant result on the positive judgment scale indicates that the assumption of equal variances was violated. This aligns with earlier assumption checks where the positive judgment scale was skewed.

Exploratory Analyses Assumption Checks

Table 10

Levene's Test for Homogeneity of Variance (Justified Dog Behaviour)

Scale	Statistic	df1	df2	p
Justified Behaviour (positive condition)	0.79	3	163	.50

Justified Behaviour (negative condition)	0.06	3	163	.98
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Note. Assumption of equal variances is not violated for either justification ratings, supporting the reliability of the between-group comparisons.

Table 11

Shapiro–Wilk Test of Normality on Priming and Clothes Condition (Justified Dog Behaviour)

Scale	Condition	Statistic	df	p
Justified Behaviour (positive condition)	Intuition	.94	89	<.001
	Rational	.93	78	<.001
Justified Behaviour (negative condition)	Intuition	.95	89	.001
	Rational	.94	78	.002
Justified Behaviour (positive condition)	Stranger	.95	90	<.001
	Uniform	.91	77	<.001
Justified Behaviour (negative condition)	Stranger	.95	90	<.001
	Uniform	.94	77	.002

Note. The significant results indicate violations of normality across all conditions for both the positive and negative justification variables. This suggests that the distributions were significantly skewed.

Table 12

Levene's Test for Homogeneity of Variance (Emotional Response Towards Dog)

Scale	Statistic	df1	df2	p
Angry Response (positive condition)	0.41	3	163	.75
Angry Response (negative condition)	2.24	3	163	.09

Happy Response (positive condition)	0.10	3	163	.96
Happy Response (negative condition)	1.81	3	163	.15

Note. The results show no violations of homogeneity for either the positive or negative dog condition on both scales.

Table 13

Shapiro–Wilk Test of Normality on Priming and Clothes Condition (Emotional Response Towards Dog)

Scale	Condition	Statistic	df	p
Angry Response (positive condition)	Intuition	.40	89	<.001
	Rational	.42	78	<.001
Angry Response (negative condition)	Intuition	.66	89	<.001
	Rational	.66	78	<.001
Happy Response (positive condition)	Intuition	.91	89	<.001
	Rational	.94	78	<.001
Happy Response (negative condition)	Intuition	.88	89	<.001
	Rational	.83	78	<.001
Angry Response (positive condition)	Stranger	.42	90	<.001
	Uniform	.40	77	<.001
Angry Response (negative condition)	Stranger	.66	90	<.001
	Uniform	.67	77	<.001
Happy Response (positive condition)	Stranger	.93	90	<.001
	Uniform	.90	77	<.001
Happy Response (negative condition)	Stranger	.85	90	<.001

Uniform	.88	77	<.001
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Note. The test results reveal violations of normality across all conditions and both scales, suggesting the data are not normally distributed.

Table 14

Levene's Test for Homogeneity of Variance (Empathy Measures)

Scale	Statistic	df1	df2	p
Cognitive Empathy (positive condition)	1.23	3	163	.30
Cognitive Empathy (negative condition)	0.68	3	163	.57
Affective Empathy (positive condition)	0.55	3	163	.65
Affective Empathy (negative condition)	1.94	3	163	.13

Note. The test results indicate that none of the assumptions are violated for either the understanding (cognitive empathy) or sharing (affective empathy) items.

Table 15

Shapiro-Wilk Test of Normality on Priming and Clothes Condition (Empathy Measures)

Scale	Condition	Statistic	df	p
Cognitive Empathy (positive condition)	Intuition	.92	89	<.001
	Rational	.94	78	<.001
Cognitive Empathy (negative condition)	Intuition	.93	89	<.001
	Rational	.94	78	.001
Affective Empathy (positive condition)	Intuition	.89	89	<.001
	Rational	.88	78	<.001

Affective Empathy (negative condition)	Intuition	.93	89	<.001
	Rational	.92	78	<.001
Cognitive Empathy (positive condition)	Stranger	.93	90	<.001
	Uniform	.93	77	<.001
Cognitive Empathy (negative condition)	Stranger	.93	90	<.001
	Uniform	.92	77	<.001
Affective Empathy (positive condition)	Stranger	.89	90	<.001
	Uniform	.88	77	<.001
Affective Empathy (negative condition)	Stranger	.93	90	<.001
	Uniform	.91	77	<.001

Note. The test results indicate that the assumption of normality is not met for both of the empathy variables and across all conditions.