Pet Psychology: Do Our Cats and Dogs Influence Us?

Rosa van der Schoor

S3310477

Department of Psychology, University of Groningen

PSB3E-BT15: Bachelor Thesis

Group 33

Supervisor: prof. dr. Russell Spears

Second evaluator: prof. dr. Annette C. Mülberger

In collaboration with: Jan (Ian) de Boer, Iida Liukkonen, Lucie Ostendorf, Annabel Restuccia, and Nikita Stienissen.

February 12, 2023

Abstract

This study investigated whether pets can influence us. It focused on cats and dogs in two scenarios: a security-based scenario (with a negative reaction from the pet towards a stranger), and a judgement-based scenario (with a positive reaction from the pet towards a stranger). It was hypothesized that pets would have an influence on our feelings towards strangers. Furthermore, it was hypothesized that dogs would have more influence in the security scenario, and cats in the judgement scenario. The last hypothesis was that pets would have more influence on owners as opposed to non-owners. Data was used from 462 participants, who filled in a vignette questionnaire. It was concluded that pets do have influence over our feelings towards strangers, which is in line with previous research. Furthermore, in the security scenario, dogs were rated more influential, but this was not significant. In the judgement scenario, dogs were significantly more influential, as opposed to the hypothesis. Lastly, owners were influenced more by the pets than non-owners.

Keywords: Pets, Cats, Dogs, Security, Judgement, Self-categorization, Social Influence

Pet Psychology: Do Our Cats and Dogs Influence Us?

Cats and dogs are the most popular pets in the world, and are often described to be humans' best friends. People take them in and care for them, as if they were family. From early childhood on, you hear about people defining themselves as either a dog-person or a cat-person and about the personality traits that they like about these pets. As these pets already seem to be such influential creatures in everyday life, could it be possible that they also have influence over us as individuals? With this present study, we aim to uncover more about this interesting topic.

To find out more about these pets and what sort of influence they could have over us, it might be useful to take a look at their origin first. Although these two pets have their popularity in common, they do have a very different background. Domestic cats are descended from African wildcats, which are individualistic animals by nature (Koyasu et al., 2020). This might also be the reason that cats, as we know them today, are seen as very independent and self-serving. The reason cats were initially domesticated was their ability to get rid of rodents, which also does not require a lot of social interaction or team work. Dogs on the other hand are descended from wolves, which are group animals with good cooperation skills by nature. This is quite similar to how people see dogs, as they are seen as social and protective. Dogs were domesticated for hunting and to be guard dogs, which is mostly in cooperation with humans (Koyasu et al., 2020). Humans and dogs therefore often work together as a team. During the years, these pets have also acquired some other interesting skills, such as finding drugs, detecting certain diseases, and even helping people improve their mental health (McConnel et al., 2019; Menchetti et al., 2020). Cats and dogs have been with us for countless years, have developed astonishing skills, and are integrated fully into our lives. It might therefore even be speaking for itself that they have a certain influence over us nowadays.

A theory that may help to explain the possible influence of pets over humans is Self-Categorization Theory. This theory is based on the fact that individuals categorize themselves into groups they think they belong to in certain situations. Categories in this theory can, for instance, be gender, age, friend groups, or families. The latter seems quite interesting when talking about pets, as Cohen (2002) pointed out that pet-human relationships can actually be quite similar to family relationships. This could imply that pets might be seen as a person's ingroup when self-categorizing. This idea of seeing yourself in the same category as another species, was also pointed out by Spears (2021). He used the example of humans trusting the appraisal of a rabbit that is fleeing from something in a forest. As the thing it is fleeing from might be a tiger, rabbits and humans then both belong to the same ingroup, namely tiger prey. Therefore, when a rabbit runs away like that, we tend to trust their judgement of the situation.

A study by Plagemann (2022) builds on this idea of interspecies self-categorizing, specifically concerning cats and dogs. In this vignette study, participants were supposed to imagine their own cat or dog, or imagine a cat or dog when they did not own one. The cat or dog would then respond to an acquaintance in a positive or negative way. After this, the participants were asked to rate their feelings towards their pet, their feelings towards the acquaintance, and the feelings of the pet towards the acquaintance. As hypothesized, it became clear from this study that the participants had more of a common understanding with dogs than with cats. This is probably due to the fact that we see dogs as social animals, so they might understand these situations better and perceive them more similarly to us. Participants in the study perceived a cat's angry reaction as fear sometimes, which may be due to them not being very big and not being pack animals. This might lead people to think less about them like protective animals in a security-based situation. Another predicted finding of the study was that the participants were more fearful of the acquaintance when a dog had a negative reaction than when a cat had a negative reaction. This might be due to the

fact that dogs are known to be used as guard dogs. Guard dogs are trained to handle certain sorts of situations where strangers get into their guarded territory. It would therefore make sense for dogs to know whether to trust someone in a security-based situation. Furthermore, pet owners were more fearful of the acquaintance when their pet was reacting negatively towards them, which is possibly because pet owners are more likely to categorize their pet as an ingroup member and trust their appraisal of a situation. Lastly, the attitudes of participants towards the acquaintance were strongly influenced by the reactions of the pets, as hypothesized. When the pets reacted positively towards a stranger, the participants' attitude was positive, and when the pets reacted negatively towards a stranger, the participants' attitude was negative. This was both more so in the case of the pet being a dog.

Plagemann (2022) provided a good starting point for further research into the social influence of pets, as there is much left to be investigated. The present study will therefore continue this research. Hereby, the first hypothesis (H1) is that pets have an influence on our feelings towards strangers.

The main focus in Plagemann's study was a security-focused scenario. As mentioned before, people have an association with guard dogs which may have led to the predicted outcome of dogs being more influential in the security-based scenario. Cats, however, do not have such a positive character trait linked to them to, although, as a previous cat owner and a cat person, I do have to disagree with that myself. This anecdote from my life will explain why: We always had at least one cat when I was growing up, which is probably why I am a cat person up to this day. Eventually, I was so used to cats being the main animals around me, I knew what to expect from them, what they expected from me, and I loved them a lot. Then, when I eventually came eye to eye with dogs later on in my life, the main thing I remember is being annoyed at their energy level, them jumping up on my legs, and them wanting a lot of attention. During the next years, I came to appreciate them more and more, but I still could

not believe people making cats out to be selfish and anti-social. My cats were nothing like that, they always lay beside me, walked with me when they could, and they were really part of my family. They cuddled me when I was sick or sad, and they walked with me to the bathroom when I was scared in the dark. This anecdote is meant to paint a different picture of cats than the stereotype, as they can in fact be seen as social and protective animals in certain situations. It would be interesting to find out whether the same results arise as in the study by Plagemann (2022), or if cats can also be seen as an influence in a security-based scenario. As it is still the most expected outcome when looking at previous research and literature, the second hypothesis (H2) is that dogs have more influence in a security scenario.

It would also be interesting to find out more about domains in which cats may be perceived as more influential, as they do not have the same history in the security domain that dogs do. As the earlier mentioned anecdote made apparent, cat personalities can be perceived in multiple ways, and each cat may even have their own personality traits. An intriguing concept would be to find out if there is a domain that cats have more influence in. Looking at the stereotypes of cats, they are thought to be selfish and anti-social. However, people also tend to be very surprised when they come to sit on their lap (Cooper, 2022). This is seen as a seal of approval from a cat, whereas people think dogs are happy to come up to almost everybody they meet. It is more special when a cat approaches a person as they seem to be more selective, so perhaps, cats are seen as good judges of character. Therefore, in this study, a closer look will be taken to see if cats are perceived as more influential in the judgement domain (H3).

Lastly, owners often see their pets as their family and in their ingroup. As people can have a similar relationship with their cats and dogs to the relationship with their family (Cohen, 2002), they tend to self-categorize with their cats and dogs. Therefore, it is

hypothesized (H4) that pet owners are more strongly affected by the pets' behaviour than non-owners.

Method

Participants and Design

For this study, we collected data from 547 participants, of whom 352 were first year psychology students of the University of Groningen. We collected data from 180 participants that were invited by the researchers. Overall, 85 responses were eliminated. Seventy responses of participants were removed because they did not finish the questionnaire. Thirteen participants were removed from failing the attention check. One participant failed the seriousness check, and thus was also removed. Yet another observation was deleted as it was a test by the authors. The final sample collected for the analysis consisted of 462 participants (344 women, 108 men, nine non-binary/third gender, one preferred not to say). The participants' ages ranged from 16 to 70 years old with a mean of $M = 23.05$ and a standard deviation of $SD = 9.71$. Data from 35 different nationalities was collected. Nevertheless, most participants were Dutch (51.3%), German (21.0%), or others (27.7%). Of all participants, 112 currently own or have owned a dog, 105 a cat, 122 both and 123 participants had never owned a cat or a dog. The study was approved by the ethics committee of the University of Groningen.

The questionnaire could be accessed online in two ways. Firstly, participants were able to enter through the SONA-system of the University of Groningen. SONA is a software developed to organise and schedule studies as well as to recruit first year psychology students as participants and to allocate participation credits. However, people could also participate by having access to a link to this questionnaire independent from the SONA-system. These participants were invited by the researchers to take part in the study. Participants who were taking part through the SONA-system were exclusively psychology students from the

University of Groningen. As compensation for participation in the study via the SONA-system, participants received 0.4 SONA-Credits. Students are required to participate in studies and receive SONA-Credits as a part of the course "Practical Introduction to Research Methods". They choose freely which studies they would like to participate in from a large number of options. If they do not want to participate in studies there is an alternative of a writing assignment for the course mentioned. Participants were able to join from both the international and Dutch tracks with the requirement of understanding English to be able to complete the survey. Other participants who took the questionnaire via a Qualtrics XM link were part of the social environment of the researchers (family, friends, colleagues, etc.). Both these sampling methods make this a convenience sample.

The study has a 2 (Pet Condition: Dog vs. Cat) x 2 (Pet Ownership: participants owning the respective Pet vs. not owning the respective Pet) x 2 (domains: Judgement [positive reaction] vs. Security [negative reaction]) quasi experimental mixed design with repeated measures on the last factor. We ran the analysis in SPSS. Based on a G*power analysis, the desired sample size for the present study is 500 (RM-MANOVA allowing for within-between interaction, power = 0.8, expected effect-size of 0.15 at $\alpha = 0.05$ [Faul et. al., 2007, 2009]).

Procedure, Group Assignment and Vignettes

The questionnaire was designed and presented on the platform Qualtrics XM, which the participants had access to via SONA or an independent link that was distributed by the researchers. Participants were provided with an informed consent form and an information sheet before starting the experiment. In this information sheet the participants were informed that the aim of the study is to examine understanding of pet behaviour. Then, the questionnaire continues on with questions about demographics and whether the participant owns or has owned a cat, dog or another pet. Based on ownership they were assigned to either

the cat or the dog condition. Two scenarios were presented, with questions following after each scenario. These questions asked participants about their feelings towards either their cat or their dog and about the people mentioned in the scenarios. Next, they were asked to answer the Inclusion of Other in the Self (IOS) Scale (Aron et al., 1992), which measures how close the participant feels to their pet. Lastly, the participants were asked about their stereotypes about cats and dogs using the adapted Pet Psychology scale (Plagemann, 2022). The study ended with a seriousness check as well as a debriefing about the goals of the present study.

Condition Assignment

In the beginning of the experiment, participants were assigned to one of two conditions. These conditions differed by the participants' ownership of a dog or a cat. If the participant owns or has ever owned a cat, they were assigned to the cat condition, and the same applies for the dog condition. In case the participant owned both a cat and a dog or neither, they were randomly assigned to one of the two conditions. If the participant did not own a cat or a dog, they were asked to imagine they own either one based on their assigned condition. Thus, condition assignment was partly random but was also dependent on the pre-existing ownership of a cat or a dog. All in all, this left us with four conditions: cat owner/cat condition (N=162), non-owner/cat condition (N=64), dog owner/dog condition (N=177) and non-owner/dog condition (N=59).

Vignettes

In both conditions, participants were exposed to two scenarios. The first scenario featured a negative reaction from the pet (the security scenario); the second featured a positive reaction (the judgement scenario). In both scenarios the participants were asked to imagine that they live together with their pet. The participants were told to imagine that they were looking for a new roommate, scheduling interviews in their apartment at two times, inviting people that are applying for the room, coming in pairs. In the security scenario, after the

people come in, the pet has a negative reaction to one person (Person B) and a neutral reaction to another (Person A). In the judgement scenario, the participants were asked to imagine another two people that came over for the viewing. Here, the pet has a positive reaction to one of the applicants (Person D) and a neutral reaction to the other (Person C). The pet's reaction was described through an explanation of its behaviour and its bodily responses to the applicants (see Appendix A for complete description of both scenarios). No other information was given about the four people to keep the focus on the pet's reaction.

Measures

This study focused on the influence that a pet's behaviour can have on our feelings towards other people.

Emotions

After each vignette we asked several questions related to the scenario. These questions were the same for both scenarios. First, questions were asked in regards to the participant's perceptions of the pet's behaviour towards the two individuals. Participants rated the pet's feelings towards each stranger on a 7-point scale from 1 "not at all" to 7 "extremely". The emotions were "Happy", "Angry", "Fearful", "Sad", "Curious", "Positive", "Negative", "Friendly" and "Hostile" (see Appendix A). This was followed by questions about the participants' feelings towards their pet ("Happy", "Disappointed", "Worried", "Embarrassed", "Curious", "Surprised", "Proud", "Angry", "Amused"). Here, they again were asked to indicate the strength of the emotions on a 7-point scale from 1 "not at all" to 7 "extremely" (see Appendix A).

Next, participants were asked to answer questions about their perception of the two strangers. These questions included two sliders about the preference between the two people. First there was the Liking slider ("Based on the given information, who would you like more?") with zero being in favour of Person A/C and 100 being in favour of Person B/D. The

same applies for the Roommate Preference slider ("Based on this scenario, which of these first 2 persons would you pick for your second bedroom?"). Next, 7-point scale bipolar questions were asked about "Trust vs. Suspicion", "Friendly vs. Unfriendly", and "At Ease vs. Threatened" and "Compatible vs. Incompatible" (see Appendix A). These questions were repeated for all four strangers.

Group Identity

As a measure of group identity, we used the Inclusion of Other in the Self Scale (IOS) (Aron et al., 1992). Participants could choose which image of two circles best represented the relationship between them and their pet. Options were given on a 7-point scale with images of circles representing the degree of closeness (see Appendix A).

Pet Psychology Scale

We used a modified version of the Pet Psychology Scale developed by Victor Plagemann (2022) to find out about the participants' stereotypes about cats and dogs. The scale consisted of 6 subscales each for cats and dogs and one item as an attention check randomly placed. The Pet-Psychology scale consisted of the following subscales: "Care for Owner", "Selfishness", "Group Mindedness", "Empathy", "Judgement", and "Security".

Table 1

Reliability of subscales of Pet Psychology scale.

	Questions	Cats Cronbach's	Dogs Cronbach's
Care for owner (1)	4	.81	.63
Selfishness (2)	5	.77	.69
Group mindedness (3)	7	.62	.63
Empathy (4)	4	.88	.77
Judgement (5)	5	.79	.64

Security (6)	5	.77	.67

An example item would be "Cats/Dogs want their owners to be happy" (Care for owner) (See Appendix A for more example items). Participants were asked to evaluate their agreement with these statements on a 7-point scale with answers ranging from "Not at All" to "Extremely".

Attention & Seriousness Check

To improve our data validity we included some items in the questionnaire to evaluate whether the participant paid attention. The last question is a seriousness check where the participants have a chance to indicate if they have taken part seriously in this study or not. It mentions that there will be no consequences if participants answer with "No" to encourage them to answer this question honestly.

Results

Assumption Checks

For analysing the results, the program SPSS was used. Before the analyses were done, some model assumptions were checked. Firstly, the Shapiro-Wilk test for normality was conducted, and it was found significant for all conditions. This means that the normality assumption was violated. This was not surprising in this study, as it was expected for participants to answer questions in the same direction, for example, we expected them to choose the person with a positive reaction from the pet over the person with a neutral reaction. Therefore, it would make more sense for it not to be a normal distribution. Secondly, the Levene's test for homogeneity was conducted and found to be non-significant, which meant there was no violation of the homogeneity assumption. Lastly, a manipulation check was carried out on a Paired Samples t-test which compared the pet emotions towards person A and B and person C and D. This manipulation check was successful for both the security and the judgement scenario. (Appendix B)

Analysis of the Group Identity Measure

For analysing the Group Identity Measure, an Univariate Two-Way ANOVA was conducted. Both main effects, Pet condition and Ownership, showed significant results (Table 2). In the Pet condition, dogs scored higher than cats, indicating that participants are more likely to form a distinctive group with dogs than cats. In the Owner condition, owners scored higher than non-owners, which indicates that participants are more likely to form a distinctive group with a pet if they own or owned one. There was no interaction effect found between Pet condition and Owner condition (Table 2).

Table 2

Group Identity Measure

Pet condition		*M*	*SD*	*F*(1,458)	*Partial η2*
Pet	Cat	4.16	0.05	7.41*	.02
	Dog	4.50	0.05	7.41*	.02
Ownership	Owner	4.52	0.03	5.85*	.013
	Non-owner	4.14	0.06	5.85*	.013
Pet*Ownership				2.24	.005

*refers to $p < .05$, ** refers to $p < .001$

Pet Psychology Scale

For the Pet Psychology Scale, there was an analysis done on the reliability of the subscales, and the significant differences in the subscales between cats and dogs. As can be seen in Table 1, the reliability of the subscales showed favourable results for cats. For dogs, the only scales that showed an acceptable reliability were "Selfishness" and "Empathy", the other four subscales showed questionable reliability results.

The differences between cats and dogs for the six subscales were analysed by means of a Paired Samples t-test. For each subscale, there was a significant difference (Table 3). For the subscales "Care for Owner", "Group Mindedness", "Empathy", and "Security", dogs scored significantly higher. For the subscales "Selfishness", and "Judgement", cats scored significantly higher.

Table 3

Pet Psychology Scale for dogs and cats respectively.

	cats		dogs			
	M	*SD*	*M*	*SD*	*t*(462)	*Cohen's D*
Care For Owner (1)	4.50	1.26	6.05	.76	-26.57**	-1.24
Selfishness (2)	4.44	1.13	3.16	.86	21.18**	.99
Group Mindedness (3)	2.99	.74	5.31	.65	-48.21*	-2.24
Empathy (4)	4.38	1.31	5.68	.82	-22.72**	-1.06
Judgement (5)	4.99	1.06	4.83	.83	2.967**	.14
Security (6)	3.82	1.06	5.74	.74	-35.09**	-1.63

*refers to $p < .05$, ** refers to $p < .001$

Hypothesis One

The first hypothesis was that pet behaviour can influence our feelings towards strangers. This hypothesis was tested by doing a Paired Samples t-test on the sliders that tested for liking and roommate preference, in both the security and the judgement scenario. For the security scenario, both sliders showed a significant result when comparing the mean to the neutral position 50 (Table 4). For the judgement scenario, the sliders also showed significant differences from the neutral position. This implies that the reaction of the pet has indeed influenced the feelings of the participants towards the stranger, as this was the only way for participants to form an opinion about them. Therefore, these results support the first hypothesis.

Table 4

Sliders comparing A&B and C&D towards the neutral point.

Scenario	Slider	*M*	*SD*	*t*(461)	*Cohen's D*
Security	Liking	20.78	19.42	-32.35**	-1.50
	Roommate	16.87	19.37	-36.75**	-1.71
Judgement	Liking	76.73	18.82	30.52**	1.42
	Roommate	77.93	19.86	30.22**	1.41

*refers to $p < .05$, ** refers to $p < .001$

Hypothesis Two

The second hypothesis was that dogs are more influential than cats in the security scenario. This was tested by doing an ANOVA on the sliders for liking and roommate preference in the security scenario. As seen in Table 5, there were no significant differences between the influence of cats and dogs on liking or roommate preference. In the dog condition, the means were lower than in the cat condition, meaning the participants in the dog condition rated the person with the negative reaction from the pet more negatively than that the participants in the cat condition rated this person. This is in the predicted direction, however, it was not significant. The second hypothesis is therefore not significantly supported by the results of the ANOVA.

Table 5

Sliders comparing A&B in Security and C&D in Judgement (split by cat and dog condition).

Scenario	Slider	Cat		Dog			
		M	*SD*	*M*	*SD*	*F*(1,458)	*Partial η2*
Security	Liking	22.23	17.24	19.40	21.24	2.46	.005
(A vs. B)	Roommate	17.95	17.08	15.84	21.32	1.37	.003
Judgement	Liking	73.49	19.16	79.83	17.99	13.42**	.028
(C vs. D)	Roommate	74.88	19.41	80.85	19.90	10.65*	.023

*refers to $p < .05$, ** refers to $p < .001$

To examine the results for the second hypothesis further, the bipolar scales were analysed by means of a Repeated Measures ANOVA. In Table 6 it is shown that the differences between participants in the cat condition and participants in the dog condition are significant for the subscales "Trust vs. Suspicion", "At ease vs. Threat", and "Friendly vs. Unfriendly". These results were in line with the hypothesis, as the participants in the dog condition rated the person with the negative reaction more negatively than the participants in the cat condition did. For the last subscale, "Compatible vs. Incompatible", no significant difference was found.

Table 6

Bipolar Scales for comparing Persons A and B in the security scenario.

Bipolar Scales	Person	Cat		Dog			
		M	*SD*	*M*	*SD*	*F*(1,460)	*Partial η2*
Trust vs. Suspicion	A	2.74	.97	2.62	1.14	4.88*	.01
	B	5.48	1.14	5.74	1.35	4.88*	.01
Friendly vs. Unfriendly	A	2.54	1.02	2.41	1.22	10.74**	.02
	B	4.82	.10	5.28	1.35	10.74**	.02
At ease vs. Threat	A	2.48	1.02	2.28	1.02	6.32*	.01
	B	4.69	1.2	4.89	1.23	6.32*	.01
Compatible	A	2.65	1.13	2.57	1.34	1.22	.00
vs. Incompatible	B	5.31	1.11	5.45	1.43	1.22	.00

*refers to $p < .05$, ** refers to $p < .001$

Hypothesis Three

The third hypothesis was that cats are more influential than dogs in the judgement scenario. To assess this, an ANOVA was done with the sliders for liking and roommate preference. This showed a significant difference between cats and dogs. However, contrary to the hypothesis, dogs turned out to be more influential in this domain as well. The participants in the dog condition had significantly higher means than the participants in the cat condition when looking at the judgement scenario (Table 5). These higher means stem from the participants in the dog condition rating the person with the positive reaction from the pet more positively than the participants in the cat condition rated this person. These results do not support hypothesis three.

The bipolar scales were also analysed with a Repeated Measures ANOVA for the judgement scenario (Table 7). None of the scales had significant results for the difference between participants in the cat condition and the dog condition in the judgment scenario, except for the scale "Trust vs. Suspicion", where the participants in the dog condition showed to trust the person with the positive reaction more than the participants in the cat condition did.

Table 7

Bipolar Scales for Person C and D in the judgement scenario.

Bipolar Scales	Person	Cat		Dog			
		M	*SD*	*M*	*SD*	*F*(1,460)	*Partial η2*
Trust vs. Suspicion	C	3.53	.86	3.34	1.00	4.26*	.01
	D	2.30	1.07	1.88	.984	4.26*	.01
Friendly vs. Unfriendly	C	3.32	1.09	3.07	1.15	.90	.00
	D	2.09	1.06	1.72	0.93	.90	.00
At ease vs. Threat	C	3.20	.97	2.81	1.03	.00	.00
	D	2.15	.10	1.77	.92	.00	.00
Compatible	C	3.53	1.10	3.44	1.14	2.83	0.01
vs. Incompatible	D	2.19	1.11	1.88	1.10	2.83	0.01

*refers to $p < .05$, **refers to $p > .001$

Hypothesis Four

The fourth hypothesis was that pet owners are more strongly influenced by the pet's reaction than non-owners. For this, an ANOVA was performed in both the security and the judgement scenario for the sliders for liking and roommate preference, split by ownership. In the security scenario, a significant difference was found between owners and non-owners (Table 8). The owners reported lower means than non-owners in this scenario, which means they were influenced more, as they rated the person with the negative reaction from the pet more negatively than non-owners. In the judgement scenario, owners also reported lower means than non-owners, however, this was not a significant difference (Table 8).

Table 8

Sliders comparing A&B and C&D (split by ownership).

Scenario	Slider	Owner		Non-owner			
		M	*SD*	*M*	*SD*	*F*(1,460)	*Partial η2*
Security	Liking	19.33	17.94	24.79	22.52	7.24*	.015
	Roommate	15.57	17.82	20.47	22.82	5.85*	.013
Judgement	Liking	76,71	18.84	76.77	18.86	.01	.000
	Roommate	77.36	20.31	79.49	18.56	1.04	.002

*refers to *p* < .05, ** refers to *p* < .001

The bipolar scales were also analysed with a Repeated Measures ANOVA, split by ownership. There were no significant differences found between owners and non-owners for any of the scales in the security scenario (Table 9) or the judgement scenario (Table 10).

Table 9

Bipolar Scales for Person A and B in the security scenario (split by ownership).

Bipolar Scales	Person	Owner		Non-owner			
		M	*SD*	*M*	*SD*	*F*(1,460)	*Partial η2*
Trust vs. Suspicion	A	2.63	1.03	2.82	1.13	3.27	.007
	B	5.73	1.17	5.28	1.40	3.27	.007
Friendly vs. Unfriendly	A	2.44	1.09	2.55	1.26	.003	.000
	B	5.09	1.17	4.97	1.32	.003	.000
At ease vs. Threat	A	2.37	1.14	2.39	1.08	1.81	.004
	B	4.63	1.24	4.85	1.09	1.81	.004
Compatible	A	2.57	1.25	2.72	1.22	.411	.001
vs. Incompatible	B	5.44	1.24	5.20	1.39	.411	.001

*refers to *p* < .05, ** refers to *p* < .001

Table 10

Bipolar Scales for Person C and D in the judgement scenario (split by ownership).

Bipolar Scales	Person	Owner		Non-owner			
		M	*SD*	*M*	*SD*	*F*(1,460)	*Partial η2*
Trust vs. Suspicion	C	3.38	.93	3.57	.96	.85	.002
	D	2.09	1.04	2.06	1.05	.85	.002
Friendly vs. Unfriendly	C	3.16	1.12	3.28	1.16	.27	.001
	D	1.91	1.02	1.88	1.00	.27	.001
At ease vs. Threat	C	2.99	1.03	3.05	.97	.91	.002
	D	1.93	1.00	2.03	.92	.91	.002
Compatible	C	3.45	1.13	3.59	1.09	.42	.001
vs. Incompatible	D	2.04	1.45	2.01	1.03	.42	.001

*refers to $p < .05$, ** refers to $p < .001$

Discussion

In this study, it was examined whether the behaviour of cats and dogs influences our feelings towards other people, and in what way. A closer look was taken into whether dogs are more influential in a security-based scenario, and whether cats are more influential in a judgement-based scenario, and, lastly, what influence ownership has in this topic.

By looking at the Group Identity Measure, it became clear that participants were more likely to form a distinctive group with dogs than with cats. This supports Plagemann's (2022) findings about the Group Identity Measure. This could be explained by people seeing dogs more as social and group animals. Moreover, participants turned out to be more likely to form a distinctive group with a pet if they own or owned one. This is a logical finding, given the

fact that the participants that own or owned a pet probably already formed such a group with their pet once.

In the Pet Psychology Scale, stereotypes of dogs and cats were confirmed by the participants. Dogs scored higher on the more social and security-related subscales, while cats scored higher on the subscales that indicate that they are seen to be more selfish and have better judgement. These results are in line with the stereotypes that come with both animals.

In line with the first hypothesis, pets were found to have an influence on the participants' feelings towards other people. This was the case in both scenarios, as predicted. It matches the conclusion found in the research by Plagemann (2022), as that study also found a significant influence by pets on the participants' feelings towards other people. This could be due to people feeling as though the pet is their ingroup and therefore trusting their judgement about people. The stereotypes of dogs being social and guarding, and cats being good judges of character, could also play a part in this phenomenon.

As the study by Plagemann (2022) found dogs to have a stronger influence in a security-based scenario, it was expected in this study as well (H2). However, although people in the dog condition did rate the person with the neutral reaction by the dog better than the person with the negative reaction on the sliders for liking and roommate preference, surprisingly, this was not a significant difference in this study. On the bipolar scales (e.g. "Trust vs. Suspicion"), people in the dog condition did show significantly different results in the expected direction. Dogs were also rated significantly higher on the subscale for security in the Pet Psychology Scale. This hypothesis was therefore partially supported. An explanation for the support of this hypothesis is that dogs are associated with guard dogs and being social animals and therefore are thought to want to protect their ingroup from threat. When looking at the Group Identity Measure, it is also shown that people are more likely to form a distinctive bond with dogs over cats. This could be another explanation for the higher

score of dogs in the security domain, as it is more logical for a pet in someone's ingroup to want to be protective over them. This hypothesis being only partially supported could be due to people thinking that cats are good judges of character, also in security-based situations. Another explanation could be that, as mentioned before with the anecdote, people do think cats can also have an influence in such a situation, and that they might also want to protect them from threats.

The new domain on which the two pets' influence was tested, namely judgement, surprisingly showed dogs to be significantly more influential. This contradicts the third hypothesis, which stated that cats would have more influence in the judgement scenario. A possible explanation would be that dogs are seen as a better judge of character due to them being associated with guard dogs. Guard dogs supposedly know when someone is a threat to them or their owner. However, as cats scored significantly better in the judgement-related scale of the Pet Psychology Scale, this is an interesting and somewhat contradictory finding. An explanation could lie in the terminology of the Pet Psychology Scale and the judgement scenario. However, the questions in the Pet Psychology Scale were to find out whether cats and dogs were good judges of character. This matches the gist of the judgement scenario, as you would expect when one of the pets has more influence there, they would be better judges of character. Another explanation could be that the participants showed to be more likely to form a group with dogs over cats. Perhaps, this interspecies self-categorizing has more influence on people than the stereotypes that they hold. This judgement domain is a very interesting subject for further research.

The last hypothesis was that owners would be more influenced by their pets than non-owners. This was only partially supported by the results, as there was a significant difference in the security scenario, but not in the judgement scenario. Owners did seem to be slightly more influenced in the judgement scenario, but not significantly. The Group Identity Measure

did show that owners are more likely to form a distinctive bond with a pet, which could explain why they were more influenced in the security scenario. If you have formed a bond with a pet, you would think them to be more likely right about their appraisal of a situation, and to want to protect you. However, in the judgement domain, there is no protection needed. There is also no such bond with the pet needed to see them as a good judge of character, this can just be due to the stereotypes someone holds. Therefore, as owners may be influenced by their bond with their pet, non-owners could be influenced more by certain stereotypes and expectations. This might be a possible explanation for the mixed results with this hypothesis.

Limitations and Implications

The present study had some interesting findings, however, it also had its limitations. Firstly, the study did not take place in real life, but with vignettes stimulating situations. This could have had an effect on the reactions of the participants, as they respond the way they think they would in real life. However, as the vignettes are set up to stimulate the real life reactions of the pets as realistically as possible, we hope to have limited this difference in reaction by the participants as much as possible. Another limitation that came with this was that by making the reactions by the pets as realistic as possible, it was difficult to standardize them. Cats and dogs show quite different reactions when they are angry or happy, so the vignettes for the different pet conditions were not exactly the same. The decision to not keep the reactions the same was made to make the scenarios more realistic and get reactions from the participants that are closer to their real-life reactions. This is therefore also one of the strengths of the study. Lastly, there is the fact that there were two different scenarios for all participants, the first was always in the security domain, and the second was always in the judgement domain. By doing two scenarios in a repeated measures design, the participants could have been influenced by the first scenario when going through the second.

To summarize, this study found that due to self-categorization and stereotypes, people are indeed influenced by pets. Especially dogs seem to have an effect on the way we evaluate strangers in both a security-based situation and a judgement-based situation. Owners are even more so influenced by their pets, probably due to them seeing the pets more as their ingroup members. As for the possible implications of this study, there is still much more to learn about this topic, and more research to be done, as there is not much known about it yet. This makes it difficult to outline the direct implications of this study. One thing we do know now is that when looking for a room, the best way to be picked might be to impress the owner's pet!

References

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self-scale and the

structure of interpersonal closeness. *Journal of personality and social psychology,*

63(4), 596.

Cohen, S. P. (2002). Can Pets Function as Family Members? *Western Journal of Nursing*

Research, *24*(6), 621–638. https://doi.org/10.1177/019394502320555386

Cooper, S. (2022, September 3). *Lap time, nap time: Why your cat chooses to sit on you*.

PawTracks. https://www.pawtracks.com/cats/cat-napping-on-

lap/#:~:text=In%20addition%20to%20trusting%20you,praise%20coming%20from%2

0a%20cat.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using

G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research*

Methods, *41*, 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical

power analysis program for the social, behavioral, and biomedical sciences. *Behavior*

Research Methods, *39*, 175-191. https://doi.org/10.3758/BF03193146

Koyasu, H., Kikusui, T., Takagi, S., & Nagasawa, M. (2021). Corrigendum: The Gaze

Communications Between Dogs/Cats and Humans: Recent Research Review and

Future Directions. *Frontiers in Psychology*, *12*.

https://doi.org/10.3389/fpsyg.2021.645366

McConnell, A. R., Paige Lloyd, E., & Humphrey, B. T. (2019). We Are Family: Viewing Pets

as Family Members Improves Wellbeing. *Anthrozoös*, *32*(4), 459–470.

https://doi.org/10.1080/08927936.2019.1621516

Menchetti, L., Calipari, S., Mariti, C., Gazzano, A., & Diverio, S. (2020). Cats and dogs: Best friends or deadly enemies? What the owners of cats and dogs living in the same household think about their relationship with people and other pets. *PLOS ONE*, *15*(8), e0237822. https://doi.org/10.1371/journal.pone.0237822

Plagemann, V. (2022). Self Cat (or Dog) and Social Influence: Interspecies Influence and the Role of Theory of Mind.

Spears, R. (2021). Social Influence and Group Identity. *Annual Review of Psychology*, *72*(1), 367–390. https://doi.org/10.1146/annurev-psych-070620-111818

Appendix A

Questionnaire

Informed Consent & Research Information

INFORMATION AND INFORMED CONSENT FOR THE STUDY:

"Pet Psychology"

Research Code: PSY-2223-S-0065

You receive this information because you are invited to participate in a research study investigating people's understanding of their pet's behaviour and how that behaviour may shape our perceptions. **For this study, it is required that you use a desktop computer or a laptop, as only such devices ensure that the contents will be appropriately displayed. We kindly ask you not to participate using a tablet or a smartphone.**

Researchers:

de Boer, Jan Harm

Liukkonen, Iida

Ostendorf, Lucie

Restuccia, Annabel

Stienissen, Nikita

van der Schoor, Rosa

Prof. Dr. Russell Spears

Contact:

Nikita Stienissen

Email: n.stienissen@student.rug.nl

Iida Liukkonen

Email: i.v.liukkonen@student.rug.nl

Affiliation of all researchers: University of Groningen, The Netherlands

Aim of the study:

The aim of the study is to examine understanding of Pet Behavior.

Procedure:

First, you will respond to a few questions in which you are asked to provide some demographic information (e.g. your age). After that you will read short descriptions of situations involving a pet 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.

It is essential that you 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 15 minutes.

There are no risks associated with participating in this study.

Compensation: You will receive 0.4 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.

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: Nikita Stienissen (Email: n.stienissen@student.rug.nl) or Iida Liukkonen (Email: i.v.liukkonen@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-2223-S-0065).

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.

- yes

Demographics

Age	Please indicate your age. (Open Question)
Gender	Please indicate your Gender. - Female - Male - Non binary/third gender - Prefer not to say
Nationality	Please indicate your nationality. - Dutch - German - English - Other (text box)
Ownership dog	Do you own a dog now or have owned a dog? - Yes - No
Ownership cat	Do you own a cat now or have owned a cat? - Yes - No
Ownership other pet	Do you own a pet, or have you owned a pet other than a dog or a cat (for example with your family)? - Yes, a (text box) - No

Assignment to condition:

1. Dog is owned, but cat not: assignment to dog condition

2. Cat is owned, but dog not: assignment to cat condition

3. Neither is owned: random assignment

4. Both are owned: random assignment

-

Intro for conditions: For the following questions, please think of your cat/dog (based on condition). If you don't own a cat/dog (or haven't owned one), please imagine you have one.

Scenario 1: Security (negative Valence)

Description (dog condition)	Imagine you are looking for a new roommate. You're conducting interviews for the day and you first invite two people to come in for a viewing in your apartment, which you share with your dog.
	On the day of the viewing, your doorbell rings. You are on your way to open the door, where your dog is sitting next to a window. When you open the door to let the first person in, Person A reaches out to shake your hand. Your dog seems uninterested.
	A few minutes later, you hear the doorbell ring once again and allow the second person to come in. Person B reaches out to shake your hand when suddenly you notice that your dog runs in between you and Person B. It bares its teeth, starts barking and has its tail down between its legs.
	Please answer the following questions about this situation:
Description (cat condition)	Imagine you are looking for a new roommate. You're conducting interviews for the day and you first invite two people to come in for a viewing in your apartment, which you share with your cat. On the day of the viewing, your doorbell rings. You are on your way to open the door, where your cat is sitting next to a window. The first person arrives and you open the door to let them in, Person A reaches out to shake your hand. Your cat is not interested.
	After a few minutes, the doorbell rings once again and Person B arrives. You open the door and Person B reaches out to shake your hand when suddenly you notice that your cat starts hissing at Person B. Its tail is held down close to its body and the fur on its back stands up. Its ears are now turned backwards and are flat on the head.

	Please answer the following questions about this situation.
Emotions pet towards acquaintance	How do you think your cat/dog feels towards Person A in this situation? (7-point scale: not at all to extremely) • Happy • Angry • Fearful • Sad • Curious • Positive • Negative • Friendly • Hostile
Emotions pet towards acquaintance	How do you think your cat/dog feels towards Person B in this situation? (7-point scale: not at all to extremely) • Happy • Angry • Fearful • Sad • Curious • Positive • Negative • Friendly • Hostile
Emotions Participant towards pet	How do you feel towards your cat/dog in this situation? (7-point scale: not at all to extremely) • Happy • Disappointed • Worried • Embarrassed • Curious • Surprised • Proud • Angry • Amuse

Cognitive Empathy (about Person A)	Do you understand the feelings of your cat/dog? (7-point scale: not at all to extremely)
Affective Empathy (about Person A)	Do you share the feelings of your cat/dog? (7-point scale: not at all to extremely)
Cognitive Empathy (about Person B)	Do you understand the feelings of your cat/dog? (7-point scale: not at all to extremely)
Affective Empathy (about Person B)	Do you share the feelings of your cat/dog? (7-point scale: not at all to extremely)
Slider Liking	Who do you like more? (100-point slider, from A to B)
	The following questions refer to Person A.
Bipolar Scale Trustful vs. Suspicion	How does your cat/dog behaviour make you feel towards Person A (7-point scale: Trustful to Suspicious)
Bipolar Scale At ease vs. Threat	How does your cat/dog behaviour make you feel towards Person A (7-point scale: At ease to Threat)
Bipolar Scale Friendly vs. Unfriendly	Based on your cat/dog behaviour could Person A be potentially friendly or unfriendly? (7-point scale: Unfriendly to Friendly)
Bipolar Scale Compatible vs. Incompatible	Based on your cat/dog behaviour could Person A be potentially compatible or incompatible? (7 point scale: Compatible to Incompatible)

	The following questions refer to Person B.
Bipolar Scale Trustful vs. Suspicion	How does your cats/dogs behaviour make you feel towards Person B? (7-point scale: Trustful to Suspicious)
Bipolar Scale At ease vs. Threat	How does your cats/dogs behaviour make you feel towards Person B? (7-point scale: At ease to Threat)
Bipolar Scale Friendly vs. Unfriendly	Based on your cats/dogs behaviour could Person B be potentially friendly or unfriendly? (7-point scale: Unfriendly to Friendly)
Bipolar Scale Compatible vs. Incompatible	Based on your cats/dogs behaviour could Person B be potentially compatible or incompatible? (7 point scale: Compatible to Incompatible)
Slider Roommate Preference	Based on this scenario, which of these first 2 persons would you pick for your second bedroom? (100-point slider, from A to B)

Scenario 2: Judgement (positive Valence)

Description (dog condition)	Later the same day, Person C comes in for a viewing in your apartment. A few minutes later another person rings the doorbell and you invite Person D in. You show both persons the apartment. Later you go into the living room, where your dog is lying in its bed. You invite the two people to sit on your couch, to have small talk. You ask them if they want something to drink. After both answer with yes, you go to the kitchen counter to prepare the drinks. From the kitchen you can still see the room, as well as your dog. Suddenly, you notice that your dog walks by Person C and is approaching Person D, wagging its tail fast, the ears upright. Then it lays down in front of Person D, displaying their belly. Please answer the following questions about this situation

Description (cat condition)	Later the same day, another two people come in for a viewing in your apartment. Person C arrives first and you show them the apartment. Later you go into the living room, where your cat is laying in its bed. The doorbell rings once again and Person D arrives. You let the two people sit down on your couch. You ask them if they want something to drink. After both answer with yes, you go to the kitchen counter to prepare the drinks. From the kitchen you can still see the room, as well as your cat. Suddenly, your cat walks by Person C, ignoring them, and approaches Person D, purring and rubbing its head against their leg. Then it jumps on their lap and lays down. Please answer the following questions about this situation.
Emotions pet towards acquaintance	How do you think your cat/dog feels towards the acquaintance in this situation? (7-point scale: not at all to extremely) - Happy - Angry - Fearful - Sad - Curious - Positive - Negative - Friendly - Hostile
Emotions Participant towards acquaintance	How do you feel towards Person A in this situation? (7-point scale: not at all to extremely) - Happy - Angry - Fearful - Sad - Curious - Positive - Negative - Friendly - Hostile

|	
Emotions Participant towards acquaintance	How do you feel towards Person B in this situation? (7-point scale: not at all to extremely) • Happy • Disappointed • Worried • Embarrassed • Curious • Surprised • Proud • Angry • Amuse
Cognitive Empathy (about Person C)	Do you understand the feelings of your cats/dogs? (7-point scale: not at all to extremely)
Affective Empathy (about Person C)	Do you share the feelings of your cats/dogs? (7-point scale: not at all to extremely)
Cognitive Empathy (about Person D)	Do you understand the feelings of your cats/dogs? (7-point scale: not at all to extremely)
Affective Empathy (about Person D)	Do you share the feelings of your cats/dogs? (7-point scale: not at all to extremely)
Slider Liking	Who do you like more? (100-point slider, from C to D)
	The following questions refer to Person C.
Bipolar Scale Trustful vs. Suspicion	How does your cats/dogs behaviour make you feel towards Person C? (7-point scale: Trustful to Suspicious)

|	
Bipolar Scale At ease vs. Threat	How does your cats/dogs behaviour make you feel towards Person C? (7-point scale: At ease to Threat)
Bipolar Scale Friendly vs. Unfriendly	Based on your cats/dogs behaviour could Person C be potentially friendly or unfriendly? (7-point scale: Unfriendly to Friendly)
Bipolar Scale Compatible vs. Incompatible	Based on your cats/dogs behaviour could Person C be potentially compatible or incompatible? (7 point scale: Compatible to Incompatible)
	The following questions refer to Person D.
Bipolar Scale Trustful vs. Suspicion	How does your cats/dogs behaviour make you feel towards Person D? (7-point scale: Trustful to Suspicious)
Bipolar Scale At ease vs. Threat	How does your cats/dogs behaviour make you feel towards Person D? (7-point scale: At ease to Threat)
Bipolar Scale Friendly vs. Unfriendly	Based on your cats/dogs behaviour could Person D be potentially friendly or unfriendly? (7-point scale: Unfriendly to Friendly)
Bipolar Scale Compatible vs. Incompatible	Based on your cats/dogs behaviour could Person D be potentially compatible or incompatible? (7 point scale: Compatible to Incompatible)
Slider Roommate Preference	Based on this scenario, which of these first 2 persons would you pick for your second bedroom? (100-point slider, from C to D)

Group Identity measure:

Pictorial measure of Group Identity	The images you see below represent yourself and your pet as well as much how much you see the both of you as a group. The more the circles overlap, the closer you see your relationship with your cat/dog. Which image best represents the relationship you have with your Pet? Self Pet Self Pet Self Pet Self Pet Self Pet Self Pet

Self   Pet
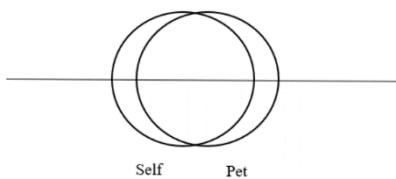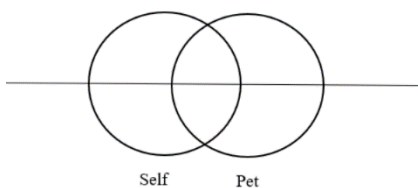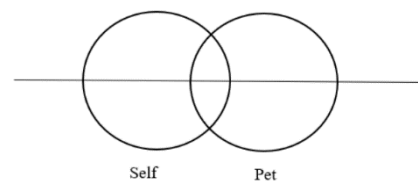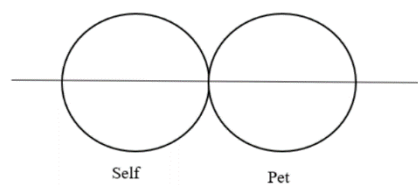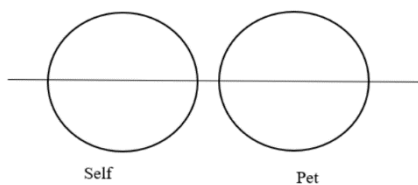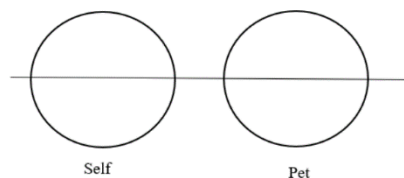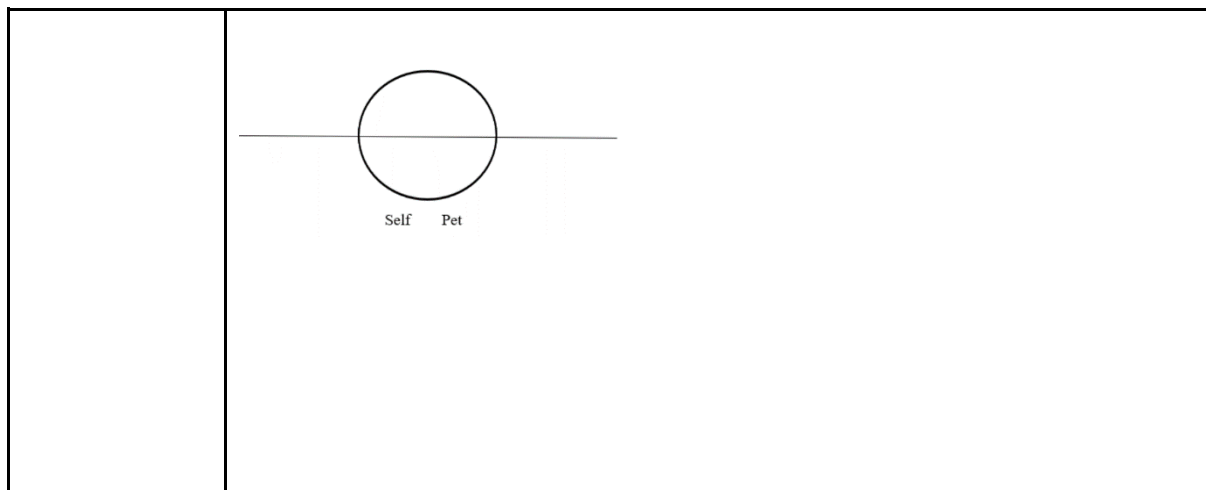
Pet psychology scale

Subscale	Item name	In my view…
Care for Owner	PPS_CareOwner_C_1	Cats care for their owners (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_D_1	Dogs care for their owners (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_C_2	Cats want their owners to be happy (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_D_2	Dogs want their owners to be happy (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_C_3	Cats like their owners more than strangers (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_D_3	Dogs like their owners more than strangers (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_C_4 (Reversed)	Cats don't care about their owners (7-point scale: not at all to extremely)

Carelessness check		Pick number 3 (7-point scale: not at all to extremely)
Care for owner	PPS_CareOwner_D_4	Dogs don't care about their owners (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_C_1	Cats behaviour serves only their own needs (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_D_1	Dogs behaviour serves only their own needs (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_C_2	Cats are selfish (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_D_2	Dogs are selfish (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_C_3	Cats are manipulative (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_D_3	Dogs are manipulative (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_C_4	Cats are sly (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_D_4	Dogs are sly (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_C_5	Cats know how to get what they want (7-point scale: not at all to extremely)
Selfishness	PPS_Selfish_D_5	Dogs know how to get what they want (7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_C_1	Cats are cooperative (7-point scale: not at all to extremely)

Group mindedness	PPS_GroupMind_D_1	Dogs are cooperative (7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_C_2	Cats act on behalf of their owner (7-point scale: not at all to extremely) +
Group mindedness	PPS_GroupMind_D_2	Dogs act on behalf of their owner (7-point scale: not at all to extremely) +
Group mindedness	PPS_GroupMind_C_3	Cats prefer being in a group (7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_D_3	Dogs prefer being in a group (7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_C_4	Cats see themselves as part of a household(7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_D_4	Dogs see themselves as part of a household (7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_C_5 (reversed coded)	Cats prefer being on their own (7-point scale: not at all to extremely) +
Group mindedness	PPS_GroupMind_D_5 (reversed coded)	Dogs prefer being on their own (7-point scale: not at all to extremely) +
Group mindedness	PPS_GroupMind_C_6 (reversed coded)	Cats are independent (7-point scale: not at all to extremely) +
Group mindedness	PPS_GroupMind_D_6 (reversed coded)	Dogs are independent (7-point scale: not at all to extremely) +

Group mindedness	PPS_GroupMind_C_7 (reversed coded)	Cats like to go their own way (7-point scale: not at all to extremely)
Group mindedness	PPS_GroupMind_D_7 (reversed coded)	Dogs like to go their own way (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_C_1	Cats understand the emotions of humans (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_D_1	Dogs understand the emotions of humans (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_C_2	Cats can perceive what somebody feels (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_D_2	Dogs can perceive what somebody feels (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_C_3	Cats are affectionate (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_D_3	Dogs are affectionate (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_C_4	Cats show compassion (7-point scale: not at all to extremely)
Empathy	PPS_Empathy_D_4	Dogs show compassion (7-point scale: not at all to extremely)
Judgment	PPS_Judge_C_1	Cats show if they like someone. (7-point scale: not at all to extremely)
Judgment	PPS_Judge_D_1	Dogs show if they like someone (7-point scale: not at all to extremely)
Judgment	PPS_Judge_C_2	Cats are picky about who they like (7-point scale: not at all to extremely)

Judgment	PPS_Judge_D_2	Dogs are picky about who they like (7-point scale: not at all to extremely)
Judgment	PPS_Judge_C_3	Cats vary in their preferences about people (7-point scale: not at all to extremely)
Judgment	PPS_Judge_D_3	Dogs vary in their preferences about people (7-point scale: not at all to extremely)
Judgment	PPS_Judge_C_4	Cats are good judges of character (7-point scale: not at all to extremely)
Judgment	PPS_Judge_D_4	Dogs are good judges of character (7-point scale: not at all to extremely)
Judgment	PPS_Judge_C_5	Cats have a good intuition about people (7-point scale: not at all to extremely)
Judgment	PPS_Judge_D_5	Dogs have a good intuition about people (7-point scale: not at all to extremely)
Security	PPS_Security_C_1	Cats sense which strangers are a potential threat (7-point scale: not at all to extremely)
Security	PPS_Security_D_1	Dogs sense which strangers are a potential threat (7-point scale: not at all to extremely)
Security	PPS_Security_C_2	Cats are motivated to protect their owners (7-point scale: not at all to extremely)
Security	PPS_Security_D_2	Dogs are motivated to protect their owners (7-point scale: not at all to extremely)
Security	PPS_Security_C_3	Cats are loyal (7-point scale: not at all to extremely)
Security	PPS_Security_D_3	Dogs are loyal (7-point scale: not at all to extremely)

Security	PPS_Security_C_4	Cats are willing to take risks to protect their owner (7-point scale: not at all to extremely)
Security	PPS_Security_D_4	Dogs are willing to take risks to protect their owner (7-point scale: not at all to extremely)
Security	PPS_Security_C_5 (reverse coded)	Cats do not worry about their owner's safety (7-point scale: not at all to extremely)
Security	PPS_Security_D_5 (reverse coded)	Dogs do not worry about their owner's safety (7-point scale: not at all to extremely)

Seriousness check

| Seriousness | We would like to know if you answered this questionnaire seriously. There will be no consequences for you if you answer the following question with no. You still get your SONA-credits!

 Did you answer the questions in this questionnaire seriously?
Yes No |

Appendix B

Perceived Emotion of Pet Towards Strangers A & B and C & D

	Emotions	*M*	*SD*	*t*	*df*	*p*
Person A x B	Happy	1.77	1.49	25.63	461	<.001
	Angry	-3.76	1.84	-43.89	461	<.001
	Fearful	-3.73	1.87	-42.93	461	<.001
	Sad	-.94	1.64	-12.41	461	<.001
	Curious	-1.24	1.73	-15.43	461	<.001
	Positive	1.83	1.65	23.83	461	<.001
	Negative	-3.97	1.70	-50.18	461	<.001
	Friendly	1.64	1.64	21.40	461	<.001
	Hostile	-3.97	2.26	-37.79	461	<.001
Person C vs. D	Happy	-2.76	1.67	-35.58	461	<.001
	Angry	.36	.90	8.62	461	<.001
	Fearful	.50	1.10	9.79	461	<.001
	Sad	.35	.95	7.90	461	<.001
	Curious	-3.69	1.94	-40.91	461	<.001
	Positive	-2.88	1.71	-36.21	461	<.001
	Negative	.84	1.24	14.70	461	<.001
	Friendly	-3.17	1.77	-38.55	461	<.001
	Hostile	.25	1.27	4.22	461	<.001