

Social Influences of Pets on Us Towards Strangers

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Abstract

With inspiration from Victor Plagemaan's Master thesis at the University of Groningen, we researched the influences of pets on their owners towards strangers. The stereotypes held about cats and dogs such as cats being more judgmental and dogs being more friendly are investigated using a pet psychology scale where statements of cats and dogs were mentioned and participants had to rate the statements on a seven-point scale. The group identity measure was investigated to see how the participants viewed the relationship with their pets as well. The final sample size was 462. Questionnaires constructed from Qualtrics XM were distributed to the participants. In the questionnaire participants were allocated to either the cat or dog condition based on their pet ownership, including past and present ownership. They were then told to imagine scenarios with their respective pet and if they never had a cat or dog as a pet, they were told to imagine that they have a pet according to their condition. Participants in either conditions were exposed to two scenarios. Both premises includes strangers coming over and the pets' behaviour towards them, the two scenarios were the Judgment and the Security scenario with the security scenario including negative behaviours from the pet towards the stranger and the judgment scenario including a positive reaction from the pet to the stranger. Firstly, we hypothesized that there is an influence of pet behaviour on the participants and that was shown to be true. We also hypothesize that in the security scenario, dogs were more influential due to the stereotypes we have of dogs being guard dogs which was not supported as the results were not significant, the same goes for the third hypothesis where we hypothesize that the cats would rate higher on the Judgment scenario but the opposite was found where dogs rated higher than cats and this was found to be significant. Lastly, we hypothesize owners would be more influenced by the pets reaction than non-owners, this was shown to be significant only in the security scenario and not the judgment scenario.

Social Influences of Pets on Us Towards Strangers

Our all too familiar feline and canine friends have been in many of our homes for as long as we can remember. Some of us are fonder of them than others but how well do we really know them and do our perceptions of them influence our thoughts too? The social influence in which our furry friends have had on us was questioned by a fellow student at the University of Groningen named Victor Plagemann in his master thesis (Plagemann, 2022) and our study was inspired by this paper. We evolved his work and focused specifically on the judgments and security we perceive from our pets and its social influences. The question of whether our pets have a social influence on us was sparked by Spears (2021) and was also questioned by Plagemann. An example similar to Spears's in his paper is that if you see a zebra frantically running away and seemingly fleeing, we would naturally also be influenced to run away thinking that there could have been a possibility that a lion was chasing said zebra. We trusted the instinct and reaction of the zebra due to the fact that we could very much suffer the same fate as the zebra (get eaten or attacked) if we did not run away as well therefore sharing the same category of prey with the zebra.

Social Identity

Most of us would assume that we can only share the perceptions of fellow humans. This is due to our similarities with one another. As well as, our understanding that another persons' perceptions of the world is similar to our perception of the world. This is similarly mentioned in the Asch paradigm (Asch, 1956). We believe the similarities in the perception due to our cognitive abilities as well as our theory of mind preconceived beliefs about what others can see and do. With this being said, how does it influence our perceptions of our canine and feline friends' thoughts and actions? There are more obvious and larger discrepancies between humans and animals in regards to the shared perception as well as abilities, which makes our relationship with them all the more interesting. This is also why

animal influence may be more far-fetched at first glance which makes this topic all the more fascinating. However, we cannot deny that influence is somewhat possible to a certain degree and that is what we shall be investigating. This influence could be driven by many things, one of which is the relationship we share with our pet which is often not impartial. We grow to care and love our pets and create a bond with them. Blazina and Boyraz (2011) would define this relationship by its closeness, care and companionship. We've seen this displayed time and time again by humans sacrificing themselves in all sorts of ways to save their pets and being very upset if something were to happen to them and vice versa. Research has shown repeatedly that some pet-owner relationships resemble parent-child relationships, this was proven when pet-owners were shown pictures of their pets while being attached to a fMRI machine and it was found that similar brain regions were activated when looking at their pet as when a parent would look at their child (Stoeckel et. al., 2014). The characteristics associated with human relationships are also prevalent in pet-owner relationships such as loyalty, trust, affection and acceptance (Borgi and Calli, 2016). Overall, the pet-owner relationship has very similar values as human relationships and if this is the case then it is likely group identities are formed similar to being part of families within the pet and self which is one of the testable measures in this study.

Group Identity

One of the stereotypes of dogs is that they are more loyal or protective than cats, this is exhibited in guard dogs or guide dogs, it's very rare to find guard cats. Guide dogs can clearly differentiate between the outside world and the safety of the owner, similarly to guard dogs who can differentiate between who is a threat and who is their ingroup which is their family or owner. A guard dog can understand when the owner allows a guest or a new person in willingly, they are most likely friendly and the dog shall respond accordingly most of the time with happily greeting them. On the other hand, we have also experienced walking past

someone's home with a guard dog outside barking at us, this would be them clearly understanding that we are not in their ingroup, we are in the outgroup. There is a level of self-categorization exhibited by the dog in this sense (Turner, 1987). Depending on the scenario the dog is in, there are levels of the self that become critical or important for the dog according to the group identities. If we refer back to the scenarios, the guest in the household triggers a reaction from the dog who would be otherwise in a relaxed state, since the dog has understood that there is an outgroup possibly penetrating its ingroup household, they understand this by perceiving the guest as outgroup and a certain level of understanding of the group identity is perceived as well. The same can be said for various other animals as well as the human-animal interaction, in other words, the pet-owner interaction. As humans, we can exhibit similar traits due to our own self-categorization with our pet and therefore form a group identity with them. Simple day to day behaviours can display this acknowledgement of group identity such as the language we use. It is common for us to refer to ourselves and our pet as "we." If I were to take my hypothetical dog out on a walk, I would tell my housemate, that "We are going on a walk now." or "We are going to play in the park now." Perhaps not in every scenario we would say this, however I would argue that in most scenarios, we would use "we" to describe an action or scenario where my pet and I would do an activity together (Sanders, 1990).

Security & Judgment

We want to determine how exactly our pets would react to others in the different scenarios. Whether that would be in an attempt to protect us with a security scenario or to simply place judgment onto others in the judgment scenario. How these scenarios connect to the shared social category will be investigated. In our study, we asked participants to imagine a scenario in which their pet or imaginary pet is reacting negatively towards a guest that is coming to their home. The scenario is based on a premise where they have a spare room in

their apartment and they are looking for a roommate for the second bedroom. People come to view the house in pairs and the pet will react to one of the strangers and be indifferent about the other person. In the security scenario, the pet will react negatively towards one stranger and indifferently to the other. The participants will then be asked about how they think their pets think as well as how they themselves think about the person to whom the pet has reacted. This scenario is then repeated later in the same day for a different pair of strangers, for the judgment scenario. However, for the judgment scenario, the pets' reaction is rather positive to one stranger and once again indifferent to the other. We therefore investigate if the pets' perception has an influence on the participants reaction to the strangers. In this study, we compare cats and dogs and classify them as "Pets". The pets go through the same scenarios however with slightly different reactions depending on what is considered negative or positive given their species specific response patterns however the premise is exactly the same. The ingroup for this study would then be the participants and their pet or imaginary pet and the outgroup being the stranger. We then hypothesize that because of this ingroup belief, pets' behaviour can indeed influence our thoughts on others (H1).

Dogs vs Cats

Another hypothesis we investigate is the weight of the pets' reaction. In our day to day lives, we are exposed to stereotypes about cats and dogs such as cats being perceived to be more negative than dogs and this reflects onto owners' personalities too (Rose M. & Hannah L., 1998). For example, in television, you have characters such as Garfield who hates Mondays and is an overall negative character in terms of attitude and you have its counterpart Odie who is a very positive character in terms of attitude as well. The stereotype for cats is a more negative attitude and therefore we hypothesize that their judgment will weigh more heavily than a dog's judgment as dogs are known to be overall happier and more accepting (H3). On the other hand, we hypothesize that the dog's role in the security scenario will

weigh more heavily as it was mentioned earlier, dogs are often used as guard dogs or service dogs as they are stereotypically seen as more aware of their ingroup. Dogs are known to have an increased sense of loyalty compared to cats due to their assumed social animal status and having a stronger sense of ingroup where cats are known to be less social. So, if a dog were to growl or react negatively towards the stranger this would weigh more than a cat's negative reaction as cats are presumed to have negative reactions commonly anyway (H2).

Pet owners would of course also have a higher connection to their pet and therefore a better understanding of animals overall compared to someone who has not owned pets before, or in this case, someone who has not owned a cat or a dog before. Having some experiences with cats myself, I do not think the stereotype of cats being a non-social and negative pet holds fully true however many of the people I know who have had no experiences with cats believe the stereotype more strongly than I do and the same can go for dog-owners. To study this, we will collect data corresponding to how participants feel about their pet or imaginary pet using a pet psychology scale in different dimensions ranging from the scenarios mentioned earlier which is "Judgment" and "Security" as well as "Selfishness", "Group Mindedness", "Empathy" and "Understanding of humans" and "Care for owner" for both cats and dogs. So finally, we hypothesize pet-owners will be more strongly affected by the pets behaviour than non-pet owners (H4).

Method

Participants and Design

For this study, we collected data from 547 participants, of which 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 B 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 B). 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.

		Cats	Dogs
	Questions	Cronbach's	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 B 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

SPSS was used for the analysis of the results. A manipulation check is first checked by means of Pairs Samples t-test. A comparison of pet emotions towards Persons A and B as well as Persons C and D was carried out resulting in a successful manipulation for the above mentioned security and judgment scenarios (See Appendix A). A significant amount of participants voted for Person A in the security scenario and the same for Person D in the Judgment scenario. Model assumptions of normality and homogeneity is then checked using the Shapiro-Wilk test and as expected, no normality assumption was violated due to significance being found for all conditions. Levene’s test was conducted to check the homogeneity assumptions and no significance was found therefore resulting in no violation of homogeneity being observed.

Group Identity

A univariate two-way ANOVA was used to analyze the Group Identity measure and significant results was found for Pet condition and Ownership which are the main effects. Between these effects, no interaction affects were found. Participants were found to be more likely to form distinctive groups with dogs as compared to a cat due to Dogs scoring higher in the Pet Condition (Table 2). Participants were more likely to form distinct group identities

with a Pet if they owned one as indicated by Pet Owners scoring higher than non-owners in the Ownership condition (Table 10).

Table 2

Group Identity measure

Pet condition		<i>M</i>	<i>SD</i>	<i>F</i> (1,458)	<i>Partial η</i> ²
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

The reliability was first checked and favourable results were shown for cats in the various pet psychology subscales and conversely reliability for dogs were shown to be only acceptable for the subscales of “Selfishness” and “Empathy”, the other scales were considered to be questionable (Table 3). To further compare this, a paired sample t-test was used to find significant difference between dogs and cats conditions for the various pet psychology subscales and significant differences were found for all of the subscales (Table 2). Subscales “Selfishness” and “Judgment” were scored higher for cats whereas “Care for Owner”, “Group Mindedness”, “Empathy” and “Security” were scored higher for dogs.

Table 3

Pet Psychology Scale for dogs and cats respectively.

	cats		dogs		<i>t</i> (462)	<i>Cohen's D</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 $p < .001$

Pets' behaviour influences our feelings towards other people.

A Paired Samples t-test was used to measure the first hypothesis being the influences of pet behaviour towards people. A test is first conducted on the sliders testing liking for Persons A and B being in the security scenario and resulted in significant differences and a neutral position of 50 was used as a baseline comparison mid-point (Table 4). The other slider testing for preference of roommate also reported a significant difference in the security scenario. Similar in the judgment scenarios, the liking and preference slider for Persons C and D reported significant differences from a neutral position of 50. With all this, every slider was found significant and our hypothesis was supported that there is influence of pet behaviour towards our feelings of people.

Table 4

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

Scenario	Slider	<i>M</i>	<i>SD</i>	<i>t</i> (461)	<i>Cohen's D</i>
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 $p < .001$

Dogs are more influential in the security scenario

Dogs being more influential in the security scenario is the second hypothesis. The sliders of Preference and Liking were once again used from the security scenario but with a multivariate ANOVA (Table 5). No significant difference was found for the differences in dogs or cats influences on both Persons A and B for both sliders (Table 5). Both sliders indicated that there were lower means in the dog condition as compared to the cat condition which align with the second hypothesis.

Table 5

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

Scenario	Slider	Cat		Dog		<i>F</i> (1,458)	<i>Partial η</i> ²
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 $p < .001$

The questionnaires also included bipolar scales which was analysed with Repeated Measures-ANOVA. Significant differences was found on multiple scales including “Trust vs. Suspicion”, “At Ease vs. Threatened” when comparing Person A and B in both pet conditions (Table 6). In contrast to that, the “Compatible vs. Incompatible” scale showed no significant difference was found on both conditions between Person A and B. These Bipolar scales shows opposing interpretations for example, when you’re not threatened, you would be at ease, that is why we have scales with “At Ease vs. Threatened” and “Trust vs. Suspicion”. This is to investigate how the participants are interpreting the scenarios.

Table 6*Bipolar Scales for comparing Persons A and B in the security scenario.*

Bipolar Scales	Person	Cat		Dog		<i>F</i> (1,460)	<i>Partial</i> η^2
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 vs. Incompatible	A	2.65	1.13	2.57	1.34	1.22	.00
	B	5.31	1.11	5.45	1.43	1.22	.00

*refers to $p < .05$, ** refers to $p < .001$ **Cats are more influential in the judgment scenario**

In this third hypothesis, we hypothesize that cats could be more influence in the judgment scenario as compared to dogs. A multivariate ANOVA is once again used to analyze the Liking and Preference sliders for Persons C and D. A significant difference was found between the pets conditions however with dogs being more influential due its reportedly higher means in the judgment condition in comparison to the cat condition (Table 5). Furthermore, a Repeated Measures-ANOVA was used to analyze the bipolar scales and no significant results were found on all scales except for one, that being “Trust vs. Suspicion” in the Judgment scenario. With that, no support for the third hypothesis was found (Table 7).

Table 7*Bipolar Scales for Person C and D in the judgement scenario.*

Bipolar Scales	Person	Cat		Dog		<i>F</i> (1,460)	<i>Partial</i> η^2
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 vs. Incompatible	C	3.53	1.10	3.44	1.14	2.83	0.01
	D	2.19	1.11	1.88	1.10	2.83	0.01

*refers to $p < .05$, **refers to $p > .001$ **Pet owners will be more influenced than non-owners by the pets' behaviour.**

In this last hypothesis, we attempt to determine if pet owners will be more influenced than non-owners by the pets' behaviours. A multivariate ANOVA was used to analyze the sliders for Liking and Preference with a separation by ownership, this is repeated for both scenarios however only significant differences for the Security scenario with pet owners reporting lower means than non-owners. Conversely, in the Judgment scenario, no significant differences were found with pet owners reporting only slightly lower means compared to non-owners (Table 8).

Table 8*Sliders comparing A&B and C&D (split by ownership).*

Scenario	Slider	Owner		Non-owner		<i>F</i> (1,460)	<i>Partial</i> η^2
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 $p < .001$

With a Repeated Measures-ANOVA, the bipolar scales were analyzed with a split for ownership yielding no significant differences for all scales in both the Security and Judgment scenario (Table 9 and 10).

Table 9*Bipolar Scales for Person A and B in the security scenario (split by ownership).*

Bipolar Scales	Person	Owner		Non-owner		<i>F</i> (1, 460)	<i>Partial</i> η^2
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 vs. Incompatible	A	2.57	1.25	2.72	1.22	.411	.001
	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		<i>F</i> (1,460)	<i>Partial</i> η^2
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
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 vs. Incompatible	C	3.45	1.13	3.59	1.09	.42	.001
	D	2.04	1.45	2.01	1.03	.42	.001

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

Discussion

Our attempt to find the influences of pets' behaviour on our thoughts about people was rather successful. There were significant results for the influences of pet behaviour on people's thoughts of strangers. In the Security scenario, the lower means for Person A versus B shows that the pets' negative behaviour influenced their owner or imaginary owner to be less likely to choose the stranger as a roommate and liked them less as well as indicated by both sliders. The same was found for Person C versus D with higher means showing that the pet or imaginary pet owners showed higher liking and preference for the stranger when the pets' behaviour was also positive. Participants did respond more strongly in the security scenario indicating more suspicion.

However, we also hypothesize that dogs will be more influential in the Security scenario than cats but no significant difference was found. This could be due to our preconceived stereotypes we have of cats and dogs as mentioned prior, with most people associating dogs with more security characteristics such as having guard dogs or guide dogs. In the Judgment scenario, we hypothesize the opposite with cats having more influence however dogs were found to be more influential once again being against predictions. In the pet psychology scale, dogs rated higher than cats in the "Security" subscale. Cats also rated higher on the "Judgment", "Selfishness" and "Empathy" subscales. Which strengthens the stereotype that most people generally think of when it comes to the characteristics of cats and dogs whether or not they are true.

The non-owner vs. owner distinction was proven to be significant as owners are less persuaded by the stereotypes of cats and dogs that we commonly see on media or talk about. In table 10, we observe that pet-owners are indeed more likely than non-owners to form a distinct group with their pets as they have or had a bond with a cat or a dog before and are perhaps more aware of the nature of owner-pet relationship. This also shows that the pet

owners do view animals and pets differently and look at the stereotypes from a different perspective, further shining light on how untrue some of these stereotypes are.

Implications and Further Research

The medical field have been using dogs to help with some of our needs such as service dogs for the blind. Most recently, cats have been allowed to be officially registered as “emotional support animals” in the United States to help with people’s emotional needs or concern (N., 2023). With further research, this niche topic could potentially help in mental health care and help medical professionals as well as psychologists heal patients mentally and emotionally (Ferrell, 2023). The bond between some pet owners and their pets are strong with some willing to spend a lot of money to ensure their pet is safe and healthy. Some people get genuinely upset and heartbroken when their pet is harmed. We could investigate this strong bond further and potentially use it as another treatment tool for rehabilitation and healthcare. There are some clinics using pets in family therapy (Walsh, 2009) due to either their strong ingroup feelings or seeing their pet as a family member as well which leads us to believe that the possibilities are vast and high.

Some police or ambulance teams have used dogs to detect either drugs or during earthquakes, they have used dogs to attempt to find people buried under rubble or buildings (*Canines’ Role in Urban Search & Rescue*, 2020) due to dogs high sense of smell and hearing. Not only can animals help us emotional, they are great assets to have in areas where humans lack such as the keen sense of smell that was just mentioned. In the police force, it is not uncommon for officers to adopt or keep the dog after the dog has retired due to the bond that has been created during the time where the animal was actively on duty. Dogs would often get grand send off’s during their last shift or have a tribute paid to them during their last day and people would often be seen crying as well. This shows that the relationship with animal and human should not be underestimated and should be further investigated so that we

can have an incredible additional asset in not only our lives but on a larger scale as well and for some, new friends in their lives.

Limitations

The reliability of the questions had relatively low Cronbach's alpha which could indicate better design of questions in future studies and perhaps using a pre-test to measure the usefulness of the questions prior to the release of the full questionnaire. A variety of questions were asked however not all components of the questionnaire was used.

Part of the sample was a convenience sample as indicated in the methods section, which reduces the generalizability, this part of the sample was also specific to first year psychology students which have very specific lifestyles compared to people at different stages of their lives. For example, students are more often not so financially stable and have stressful lives, their living situation is also often in student houses or rented apartments. This lifestyle may not be generalizable to everyone. First year students doing studies to earn credits could also have forced or misguided motivation to take part in our study. On the other hand, part of our sample was derived from sharing the Qualtrics link to our study manually to friends and family which could lead to researcher bias as our close friends and family may have a stronger bias towards the researchers in this study. This also leads to a skewed sense of motivation. People who are not in the sphere of research or university or have not had much opportunity to do studies may not understand the proper protocols to doing the study and get confused with attention and seriousness check as indicated by conversations had amongst them after the questionnaire was completed. Future studies could account the generalizability by attaining more randomized data and giving clearer instructions in the questionnaire. It is not completely lost as the sample did succeed in obtaining participants from many countries around the world due to the first-year students being in the international track and students being from all around the world as well as the researchers sharing the link

to their friends and family from each of our hometowns being from all around the world, culturally, we have a good level of diversity.

Conclusion

We found that indeed there is an influence of pet behaviour towards human thoughts and our perception of others. Along with our stereotypes towards cats and dogs, we should not look at our canine and feline friends at face value and assume their personality and characteristics, they could very well be good companions and some even risk their financial resources just to keep them around. This can prove to be useful as humans start using animals for emotional support and guidance. Even cats can legally be emotional support animals and this being backed by a therapist. The importance of human-animal relationships are distinct and important, there has been many instances of friends and family crying or being extremely distressed upon a death of their pet or upon hearing news that their pet is very sick. Most recently, a famous youtuber and vlogger who goes by the name of PewDiePie, was public about the death of his 17 year old pug called Maya. He mentioned that he was out of commission and was unable to function within the first days of hearing the news. The owner-pet relationship is an incredibly strong relationship that we should keep exploring more of and could prove to be useful in the future even in the medical field to help people heal or carry out their day-to-day routine.

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

	Emotions	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
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

Appendix B – Questionnaire Distributed to Participants***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:

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Liukkonen, Iida

Ostendorf, Lucie

Restuccia, Annabel

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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. <ul style="list-style-type: none"> • Female • Male • Non binary/third gender • Prefer not to say
Nationality	Please indicate your nationality. <ul style="list-style-type: none"> • Dutch • German • English • Other (text box)

Ownership dog	Do you own a dog now or have owned a dog? <ul style="list-style-type: none">• Yes• No
Ownership cat	Do you own a cat now or have owned a cat? <ul style="list-style-type: none">• 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)? <ul style="list-style-type: none">• 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)	<p>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.</p> <p>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.</p> <p>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.</p> <p>Please answer the following questions about this situation:</p>
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Description (cat condition)	<p>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.</p> <p>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.</p> <p>Please answer the following questions about this situation.</p>
Emotions pet towards acquaintance	<p>How do you think your cat/dog feels towards Person A in this situation? (7-point scale: not at all to extremely)</p> <ul style="list-style-type: none"> • Happy • Angry • Fearful • Sad

	<ul style="list-style-type: none"> • Curious • Positive • Negative • Friendly • Hostile
<p>Emotions pet towards acquaintance</p>	<p>How do you think your cat/dog feels towards Person B in this situation? (7-point scale: not at all to extremely)</p> <ul style="list-style-type: none"> • Happy • Angry • Fearful • Sad • Curious • Positive • Negative • Friendly • Hostile
<p>Emotions Participant towards pet</p>	<p>How do you feel towards your cat/dog in this situation? (7-point scale: not at all to extremely)</p> <ul style="list-style-type: none"> • Happy • Disappointed • Worried • Embarrassed

	<ul style="list-style-type: none"> • Curious • Surprised • Proud • Angry • Amuse
Cognitive Empathy (about Person A)	<p>Do you understand the feelings of your cat/dog?</p> <p>(7-point scale: not at all to extremely)</p>
Affective Empathy (about Person A)	<p>Do you share the feelings of your cat/dog?</p> <p>(7-point scale: not at all to extremely)</p>
Cognitive Empathy (about Person B)	<p>Do you understand the feelings of your cat/dog?</p> <p>(7-point scale: not at all to extremely)</p>
Affective Empathy (about Person B)	<p>Do you share the feelings of your cat/dog?</p> <p>(7-point scale: not at all to extremely)</p>
Slider Liking	<p>Who do you like more?</p> <p>(100-point slider, from A to B)</p>
	<p>The following questions refer to Person A.</p>

<p>Bipolar Scale</p> <p>Trustful vs.</p> <p>Suspicion</p>	<p>How does your cat/dog behaviour make you feel towards Person A</p> <p>(7-point scale: Trustful to Suspicious)</p>
<p>Bipolar Scale</p> <p>At ease vs.</p> <p>Threat</p>	<p>How does your cat/dog behaviour make you feel towards Person A</p> <p>(7-point scale: At ease to Threat)</p>
<p>Bipolar Scale</p> <p>Friendly vs.</p> <p>Unfriendly</p>	<p>Based on your cat/dog behaviour could Person A be potentially friendly or unfriendly?</p> <p>(7-point scale: Unfriendly to Friendly)</p>
<p>Bipolar Scale</p> <p>Compatible vs.</p> <p>Incompatible</p>	<p>Based on your cat/dog behaviour could Person A be potentially compatible or incompatible?</p> <p>(7 point scale: Compatible to Incompatible)</p>
	<p>The following questions refer to Person B.</p>
<p>Bipolar Scale</p> <p>Trustful vs.</p> <p>Suspicion</p>	<p>How does your cats/dogs behaviour make you feel towards Person B?</p> <p>(7-point scale: Trustful to Suspicious)</p>
<p>Bipolar Scale</p> <p>At ease vs.</p> <p>Threat</p>	<p>How does your cats/dogs behaviour make you feel towards Person B?</p> <p>(7-point scale: At ease to Threat)</p>

<p>Bipolar Scale Friendly vs. Unfriendly</p>	<p>Based on your cats/dogs behaviour could Person B be potentially friendly or unfriendly? (7-point scale: Unfriendly to Friendly)</p>
<p>Bipolar Scale Compatible vs. Incompatible</p>	<p>Based on your cats/dogs behaviour could Person B be potentially compatible or incompatible? (7 point scale: Compatible to Incompatible)</p>
<p>Slider Roommate Preference</p>	<p>Based on this scenario, which of these first 2 persons would you pick for your second bedroom? (100-point slider, from A to B)</p>

Scenario 2: Judgement (positive Valence)

<p>Description (dog condition)</p>	<p>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.</p> <p>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.</p>
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	<p>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.</p> <p>Please answer the following questions about this situation</p>
Description (cat condition)	<p>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.</p> <p>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.</p> <p>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.</p> <p>Please answer the following questions about this situation.</p>

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) <ul style="list-style-type: none">• 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) <ul style="list-style-type: none">• Happy• Angry• Fearful• Sad• Curious• Positive• Negative• Friendly• Hostile

<p>Emotions Participant towards acquaintance</p>	<p>How do you feel towards Person B in this situation? (7-point scale: not at all to extremely)</p> <ul style="list-style-type: none"> • Happy • Disappointed • Worried • Embarrassed • Curious • Surprised • Proud • Angry • Amuse
<p>Cognitive Empathy (about Person C)</p>	<p>Do you understand the feelings of your cats/dogs? (7-point scale: not at all to extremely)</p>
<p>Affective Empathy (about Person C)</p>	<p>Do you share the feelings of your cats/dogs? (7-point scale: not at all to extremely)</p>
<p>Cognitive Empathy (about Person D)</p>	<p>Do you understand the feelings of your cats/dogs? (7-point scale: not at all to extremely)</p>

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)

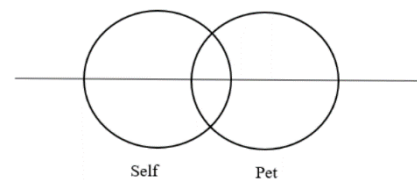
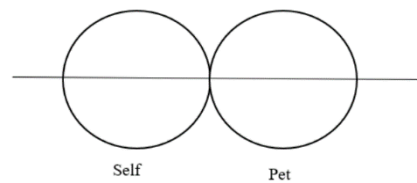
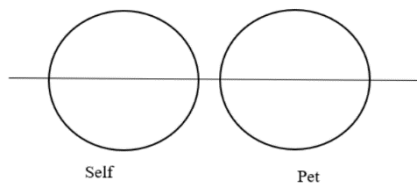
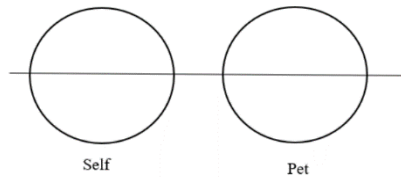
	The following questions refer to Person D.
Bipolar Scale Trustful vs. Suspicion	How does your cats/dogs behaviour make you feel towards Person D? (7-point scale: Trustful to Suspicious)
Bipolar Scale At ease vs. Threat	How does your cats/dogs behaviour make you feel towards Person D? (7-point scale: 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)

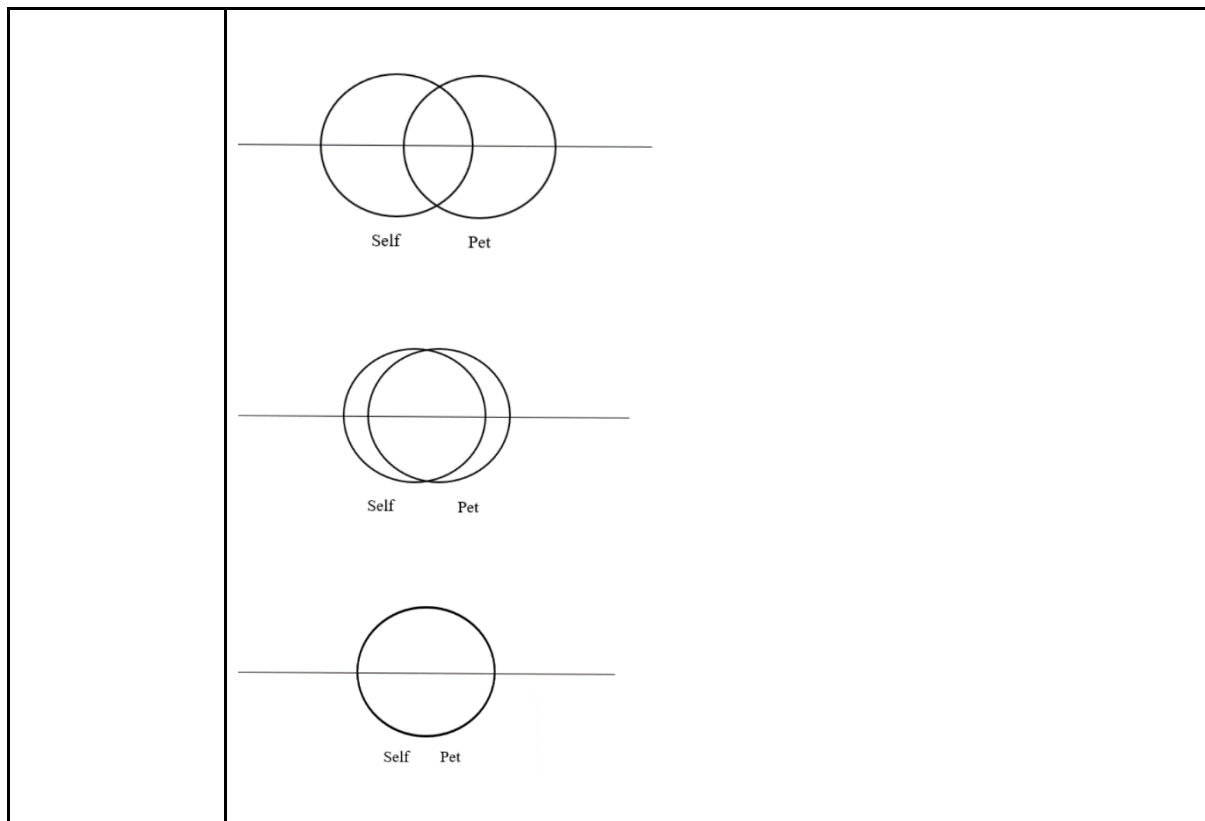
Group Identity measure:

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?





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	<p>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!</p> <p>Did you answer the questions in this questionnaire seriously?</p> <ul style="list-style-type: none"> • Yes • No
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