

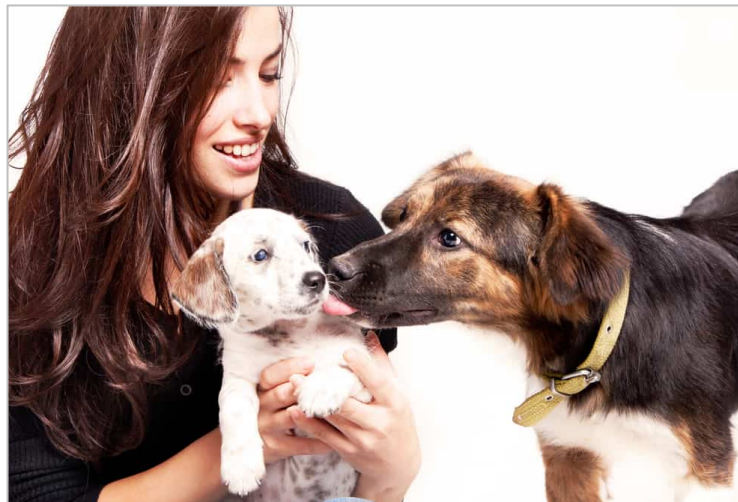
JEALOUS BEHAVIOR IN DOGS

RELEVANT JMP PLATFORMS AND STATISTICAL TECHNIQUES

Distribution : Graphical and numerical univariate summarizations
Fit Y by X : Two-Sample T-Test
Specialized Modeling : Matched Pairs

PROBLEM STATEMENT

Psychology researchers from University of Auckland designed an experiment in order to study the behavior of dogs in potential jealousy-inducing social interactions [1].



18 dogs (11 female , 7 male) were selected for the study. Each of the dogs (the subjects) experienced two test conditions. The Dog Condition was such that the subject first saw it's owner next to a realistic looking fake dog. The fake dog was then concealed from view from the subject using a barrier. The owner interacted with the fake dog (i.e., petting), though the subect dog could not directly see the fake dog that the owner was interacting with. This condition was to test if the subject dogs were potentially envisioning the interaction.

The other experimental condition (Cylinder) was such the subject dog would see their owner interacting with a fleece cylinder as if it were a dog though the subject can clearly see it is simply a non-dog object. In this condition, the fake dog was also placed such that the subject dog could see it was in the same room but their owner was not interactiing with it.

Following the two experimental conditions, a third trial was conducted (Confirmation). In this trial, the owners interacted with a fake dog that was visible to the subject dog for the entire time. This was to ensure that all the subject dogs would react enough to a visible jealousy-inducing condition, and also create a baseline of the amount of force each dog would apply in such a condition.

DATA SET

Jealous_Beavior_in_Dogs.jmp

Subject	Name of subject dog
Sex	Sex of the subject dog
Order	Order the subject dog was presented the two experimental conditions.
Dog	Maximum pulling force (Newtons) subject dog exerts on a leash in the dog experimental condition
Cylinder	Maximum pulling force (Newtons) subject dog exerts on a leash in the cylinder experimental condition.
Confirmation	Maximum pulling force (Newtons) subject dog exerts on a leash in the confirmation condition.

EXERCISES

1. Summarize the Max Pull Force in each condition (Dog, Cylinder) with a histogram, boxplot, and summary statistics. Summarize these results?
Hint: use Analyze > Distribution.
2. Conduct a Two-Sample independent t-test comparing the Average Max Pull Force between the Dog and Cylinder Condition? Is there statistical evidence of a difference between the two conditions? Why is this analysis not the best to use to compare the two conditions?
Hint: You'll need to create a new data table with all the Max Pull Force data in one column, and then have other columns indicating the Subject, Sex, Order, and Condition. Then either use the Data Filter (under the Rows menu) or choose the Hide/Exclude row states to exclude the rows in the data table corresponding to the Confirmation condition.
3. Conduct a Two-Sample paired t-test comparing the Average Max Pull Force between the Dog and Cylinder Condition? Is there statistical evidence of a difference between the two conditions? Describe that difference. What is an alternative way to do this analysis (not using paired t-test) that would result in the exact same answer (i.e., same test statistic and p-value)? Conduct that test to confirm.
Hint: You'll need to use the unstacked data table (i.e., data for the different conditions in separate columns).

4. What are some ideas for further experimentation that could help in better understanding how and why dogs exhibit jealous behavior?

COMPLIMENTARY MATERIALS

1. Bastos, Amalia P.M. ; Neilands, Patrick D. ; Hassall, Rebecca S. ; Lim, Byung C. ; Taylor, Alex H. (2021) "Dogs Mentally Represent Jealousy-Inducing Social Interactions" *Psychological Science*, Vol 32(5) 646-654.
<https://journals.sagepub.com/doi/10.1177/0956797620979149>

A brief news article from the Association for Psychological Science summarizing the research.
<https://www.psychologicalscience.org/news/releases/2021-april-dogs-jealous.html>

2-minute video describing the research including commentary from one of the researchers.
<https://www.youtube.com/watch?v=frMJ22hK0nM>

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