Are people who like dogs more extraverted than people who like cats?

We are comparing people who like dogs to people who like cats. Thus, the pet variable will be the grouping variable in PASW and the levels of the pet variable will be the subscripts in H_0 and H_1. μ corresponds to how extraverted these groups are. Extraverted will be the test variable in PASW.

Step 1 (Write H_0 and H_1; give α):

H_0: $\mu_{dog} - \mu_{cat} \leq 0$	This is everything that H_1 is not and nothing that H_1 is
H_1: $\mu_{dog} - \mu_{cat} > 0$	This corresponds to the question "Are people who like dogs more extraverted than people who like cats"
$\alpha = .05$	Unless otherwise stated, we set α (the probability of making a Type I error; the probability of rejecting H_0 when it is true) to .05

Step 2 (Determine the critical t):

You need to know α, df, and the number of tails.

$\alpha = .05$	
$df = (n_1 - 1) + (n_2 - 1)$	The values of n1 and n2 can be found on the PASW output in the Group Statistics output in the column labeled N. $df = (20 - 1) + (7 - 1) = 25$
1-tailed	This is only one way to reject H_0 – if μ is larger than 0
tcritical = 1.708	This value is positive because H_1 contains a > sign

Step 3 (Determine $t_{observed}$):

1. Open PASW
2. Load the class data set
3. From the PASW Statistics Data Editor, click on the Variable View tab in the lower left
4. Click in the cell at the intersection of the Pet variable row and the Values column
5. Click on the ellipses (…) button that appears
6. From the dialog box, note that 1 = "Cat" and 2 = "Dog"
7. Click on OK to close the Value Labels dialog box
8. Click on Analyze
9. Click on Compare Means
10. Click on Independent Samples T Test
11. Drag the Extravert variable into the Test Variable(s) box
12. Drag the Pet variable into the Grouping Variable box
13. Click on Define Groups…
14. In H0, the mean extraversion score for people who prefer dogs is given first. Since "Dog" has a value of 2 (see step 6), enter 2 in the Group 1 box.
15. In H0, the mean extraversion score for people who prefer cats is given second. Since "Cat" has a value of 1 (see step 6), enter 1 in the Group 2 box.
16. Click on Continue
17. Click OK

18. Determine whether we should use the Equal Variances Assumed row or the Equal Variances Not Assumed row. Look at the Significance (Sig.) of Levene's Test for Equality of Variances. If that value (.516) is less than or equal to α, then use the Equal Variances Not Assumed row. Otherwise, use the Equal Variances Assumed row. We will use the Equal Variances Assumed row as .516 is larger than .05.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
I am an extravert	Equal variances assumed	.433	.516	.890	25	.382	.486	.546	-.639	1.610
	Equal variances not assumed			.829	9.367	.428	.486	.586	-.833	1.804

19. The observed value of t is in the column labeled t. Because we are assuming equal variances, $t_{observed}$ = 0.890. It has 25 degrees of freedom (from the df column)

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Step 4 (Decide whether to Reject H_0 or Fail to Reject H_0):

Because $t_{observed}$ (0.890) is not in the tail cut off by $t_{critical}$ (1.708), we fail to reject H_0. That is, based on this sample data, there is insufficient evidence to suggest that people who prefer dogs are more extraverted than people who prefer cats.

r^2:

$r^2 = t^2 / (t^2 + df)$

$= 0.890^2 / (0.890^2 + 25)$ These values are from step 19 above

$= .0307$

Writing the Results:

We need the descriptive statistics from the output:

Group Statistics

	Prefer cat or dog	N	Mean	Std. Deviation	Std. Error Mean
I am an extravert	Dog	20	3.20	1.196	.268
	Cat	7	2.71	1.380	.522

Include the mean and standard deviation for each group. Include the inferential statistics:

The extraversion of people who prefer dogs (M = 3.20, SD = 1.20) is not reliably greater than the extraversion of people who prefer cats (M = 2.71, SD = 1.38), $t(25) = 0.890$, $p > .05$, $r^2 = .03$.