

AS3 (Assignment 3, Unit 5): Independent and Dependent t-tests on SPSS

Please write your answers in red 😊

Jones and Smith's advertising company wish to know if cartoons on cereal boxes cause children to attribute higher taste ratings to the cereal. The advertising company hires a psychologist to conduct a study before developing a sales plan for the cereal. The psychologist randomly selects 24 participants for a pilot study. She randomly assigns the sample so that 12 participants eat the cereal with the cartoon on the box while the other 12 participants eat the cereal without a cartoon on the box. All participants then rated the taste of the cereal. Here are the ratings:

<u>Without Cartoon</u>	<u>With Cartoon</u>
3	3
4	4
7	8
5	7
8	8
8	8
4	9
7	4
5	7
6	6
6	8
7	4

1. What is the researcher's hypothesis?

_____Cereals with cartoons on the box are associated with higher taste ratings compared to cereals without cartoons on the box for children. _____

2. What is the null hypothesis?

___There is no significant difference in taste ratings between cereals with cartoons on the box and cereals without cartoons on the box for children. _____

3. Exactly what mean differences are you comparing here?

_____The mean differences being compared in this study are the taste ratings of cereals between two groups: one group where the cereal boxes have cartoons on them (With Cartoon) and the other group where the cereal boxes do not have cartoons on them (Without Cartoon). _____

4. What is the dependent variable? the taste ratings of the cereal given by the participants.

5. What is the independent variable? the presence or absence of cartoons on cereal boxes.

6. Please analyze the data with the appropriate hypothesis test on SPSS and cut and paste your SPSS results here:

The screenshot shows the SPSS Output window for a T-Test. The left sidebar lists the output components: Title, Notes, Active Dataset, Group Statistics, Independent Sam, and Independent Sam. The main window displays the following tables:

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1.00	12	5.8333	1.64225	.47408
	2.00	12	6.3333	2.05971	.59459

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
VAR00001	Equal variances assumed	1.417	.247	-.658	22	.259	.518	-.50000	.76045	-2.07707	1.07707
	Equal variances not assumed			-.658	20.960	.259	.518	-.50000	.76045	-2.08162	1.08162

Independent Samples Effect Sizes

		Standardizer ^a	Point Estimate	95% Confidence Interval	
				Lower	Upper
VAR00001	Cohen's d	1.86271	-.268	-1.069	.539
	Hedges' correction	1.92937	-.259	-1.033	.520
	Glass's delta	2.05971	-.243	-1.044	.569

a. The denominator used in estimating the effect sizes.
 Cohen's d uses the pooled standard deviation.
 Hedges' correction uses the pooled standard deviation, plus a correction factor.
 Glass's delta uses the sample standard deviation of the control group.

IBM SPSS Statistics Processor is ready | Unicode:ON | Classic

Based on your SPSS results that you pasted above, please answer the following questions:

7. Please write your “statistical statement”: $t(22) = -0.658, p > .05$ _____

8. Did you reject or fail to reject the null hypothesis? fail to reject the null hypothesis _____

9. Please write your results in a “literature” or “research study” format:

The mean for cereal boxes without cartoons on it was $M = 5.8$ with a $SD = 1.64$. The mean for the cereal boxes with cartoons was $M = 6.3$ with a $SD = 2.05$. The data failed to reach significance.

A researcher hypothesizes that arousal levels will be affected by meditation. The sample participates in formal meditation classes for 3 weeks, before and after which arousal is measured.

Subject	BEFORE MEDITATION	AFTER MEDITATION
1	72	91
2	162	155
3	145	152
4	183	190
5	123	134
6	167	157
7	76	99
8	112	104
9	124	143
10	137	156

1. What is the researcher’s hypothesis?

Arousal levels are significantly affected by formal meditation classes, leading to a difference in arousal levels before and after the meditation program. _____

2. What is the null hypothesis?

There is no significant difference in arousal levels before and after formal meditation classes. _____

3. What is the dependent variable? arousal levels,

4. What is the independent variable? meditation treatment, specifically the formal meditation classes that the participants undergo for 3 weeks.

5. What is the appropriate hypothesis test?

paired samples t-test

6. Please analyze the data using the appropriate hypothesis test on SPSS and cut and paste your SPSS results here:

The screenshot shows the SPSS T-Test output window. The left sidebar lists the output components: T-Test, Title, Notes, Paired Samples Statistics, Paired Samples Correlations, Paired Samples Test, and Paired Samples Effect Sizes. The main window displays the following tables:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	VAR00001	138.1000	10	31.27104	9.88877
	VAR00002	130.1000	10	36.76487	11.62607

Paired Samples Correlations

	N	Correlation	Significance One-Sided p	Two-Sided p
Pair 1 VAR00001 & VAR00002	10	.945	<.001	<.001

Paired Samples Test

		Mean	Std. Deviation	Paired Differences		t	df	Significance	
				Std. Error Mean	95% Confidence Interval of the Difference Lower			Upper	One-Sided p
Pair 1	VAR00001 - VAR00002	8.00000	12.49000	3.94968	-9.3480	16.93480	2.025	.037	.073

Paired Samples Effect Sizes

		Cohen's d	Std. Error of the Effect Size	95% Confidence Interval	
				Lower	Upper
Pair 1	VAR00001 - VAR00002	12.49000	.641	-.059	1.311
	Hedges' correction	13.66707	.585	-.054	1.198

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

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7. Based on your SPSS results, do you reject or fail to reject the null?

Fail to reject the null

8. Please write the “statistical statement” for your SPSS results:

t(9)=2.025, p>.05_____

9. Please write your results in a “literature” or “research study” format:

The mean arousal level before meditation was $M=130$ with a $SD =36.76$. The mean arousal level after meditation was $M=138$ with a $SD = 31.27$. Our data was not significant. Our data does not support that meditation had an effect on arousal levels, $t(9)=2.025, p>.05$
