Dataset A

One of my favorite activities, especially when trying to do brain-melting things like writing statistics books, is drinking tea. However, I notice if I drink too much I get a headache and my writing suffers. Here are some data that measured the number of cups of tea drunk and cognitive functioning in 15 people (high numbers indicate better functioning). Should I stop drinking so much tea?

Cups_of_Tea	Cognitive_Function
2	60
4	35
3	31
4	33
2	44
3	41
5	22
5	31
2	55
5	38
1	57
3	45
3	40
4	34
1	65

Correlations

		Number of Cups of Tea Drunk Per Day	Cognitive Function Score (Max = 80)
Number of Cups of Tea Drunk Per Day	Pearson Correlation	1	-.870
	Sig. (2-tailed)		.000
	N	15	15
Cognitive Function Score (Max = 80)	Pearson Correlation	-.870	1
	Sig. (2-tailed)	.000	
	N	15	15

Dataset B

A marketing manager tested the benefit of soft drinks for curing hangovers. He took 15 people and got them drunk. The next morning as they awoke, dehydrated and feeling as though they'd licked a camel's sandy feet clean with their tongue, he gave five of them water to drink, five of them Lucozade (a very nice glucose-based UK drink) and the remaining five a leading brand of cola. He measured how well they felt (on a scale from 0 = I feel like death to 10 = I feel really full of beans and healthy) two hours later (this variable is called well). Which is the better hangover cure?

drink	well
Water	5
Water	5
Water	6
Water	6
Water	3
Lucozade	8
Lucozade	8
Lucozade	10
Lucozade	8
Lucozade	7
Cola	4
Cola	3
Cola	2
Cola	3
Cola	2

ANOVA

How Well Does The Person Feel?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	73.733	2	36.867	32.529	.000
Within Groups	13.600	12	1.133		
Total	87.333	14			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: How Well Does The Person Feel?

Tukey HSD

(I) Drink	(J) Drink	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Water	Lucozade	-3.200*	.673	.001	-5.00	-1.40
	Cola	2.200*	.673	.017	.40	4.00
Lucozade	Water	3.200*	.673	.001	1.40	5.00
	Cola	5.400*	.673	.000	3.60	7.20
Cola	Water	-2.200*	.673	.017	-4.00	-.40
	Lucozade	-5.400*	.673	.000	-7.20	-3.60

*. The mean difference is significant at the 0.05 level.

Dataset C

Students have heard that following the Keto diet will pay big dividends and result in lost weight. Several students decided to try this out eating nothing but keto bars and liquid fat. The results show weight after one month (called Month1). The amounts are in weight. Should they continue this diet?

Start	Month1
63.75	45.52
62.98	54.55
65.98	62.58
107.27	85.66
66.58	45.85
120.46	110.52
62.01	64.58
71.87	63.25
83.01	75.25
76.62	68.25

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Weight at Start (kg) - Weight after 1 month (kg)	10.45334	7.66715	2.42456	4.96860	15.93809	4.311	9	.002

Dataset D

To test how different teaching methods affected students' knowledge Professor Zillstein took three statistics modules and taught the same material. For one module he wandered around with a large cane and beat anyone who asked bad questions (punish). In the second he encouraged students to discuss things that they found difficult and gave anyone working hard candy (reward). In the final course he neither punished nor rewarded students' efforts (indifferent). Dr. Zillstein then measured the students' exam marks (percentage). He hypothesized that the punish approach would be the best means to produce high marks.

GROUP	EXAM
Punish	50
Punish	45
Punish	48
Punish	47
Punish	45
Punish	49
Punish	50
Punish	54
Punish	57
Punish	55
Indifferent	63
Indifferent	55
Indifferent	54
Indifferent	49
Indifferent	65
Indifferent	46
Indifferent	53
Indifferent	67
Indifferent	58
Indifferent	50
Reward	71
Reward	67
Reward	68
Reward	62
Reward	65
Reward	58
Reward	63
Reward	69
Reward	70
Reward	61

ANOVA

Exam Mark

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1205.067	2	602.533	21.008	.000
Within Groups	774.400	27	28.681		
Total	1979.467	29			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Exam Mark

Tukey HSD

(I) Type of Teaching Method	(J) Type of Teaching Method	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Punish	Indifferent	-6.00000*	2.39506	.047	-11.9383	-.0617
	Reward	-15.40000*	2.39506	.000	-21.3383	-9.4617
Indifferent	Punish	6.00000*	2.39506	.047	.0617	11.9383
	Reward	-9.40000*	2.39506	.002	-15.3383	-3.4617
Reward	Punish	15.40000*	2.39506	.000	9.4617	21.3383
	Indifferent	9.40000*	2.39506	.002	3.4617	15.3383

*. The mean difference is significant at the 0.05 level.

Data sets were derived from:

Field, A. (2017). *Discovering statistics using IBM SPSS statistics* (5th edition). SAGE Publications.