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## What statistical analysis should I use?

The following table shows general guidelines for choosing a statistical analysis. We emphasize that these are general guidelines and should not be construed as hard and fast rules. Usually your data could be analyzed in multiple ways, each of which could yield legitimate answers. The table below covers a number of common analyses and helps you choose among them based on the number of dependent variables (sometimes referred to as outcome variables), the nature of your independent variables (sometimes referred to as predictors). You also want to consider the nature of your dependent variable, namely whether it is an interval variable, ordinal or categorical variable, and whether it is (approximately) normally distributed (see What is the difference between categorical, ordinal and interval variables? for more information on this). The table then shows one or more statistical tests commonly used given these types of variables (but not necessarily the only type of test that could be used) and links showing how to do such tests using SAS, Stata and SPSS.

Number of Dependent Variables	Nature of Independent Variables	Nature of		How	How	How	How
		Dependent	Test(s)	to	to		
		Variable(s)	SAS	Stata	SPSS	to R	
0 IVs (1 population)		interval &					1_
	normal	one-sample t-test	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>	
	0 IVs (1 population)	ordinal or	one-sample median	SAS	<u>Stata</u>	SPSS	<u>R</u>
		interval					
		categorical (2	binomial test	CAC	Ctata	CDCC	<u></u>
		categories)		SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
		categorical	Chi-square	SAS	Stata	SPSS	<u>R</u>
			goodness-of-fit		<u>Stata</u>		
	1 IV with 2 levels (independent groups)	interval &	2 independent	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
		normal	sample t-test	<u>570</u>			
		ordinal or	Wilcoxon-Mann	SAS	Stata	SPSS	<u>R</u>
		interval	Whitney test	<u>ono</u>	Otata		
			Chi-square test	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
1 IV with 2 or more levels (independent groups)  1 IV with 2 levels (dependent/matched groups)		categorical Fisher's exact test	Fisher's exact	SAS	Stata	SPSS	R
			5.70	Otata	0.00	Ë	
		interval &	one-way ANOVA	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
	1 IV with 2 or more	normal					
	levels (independent	ordinal or	Kruskal Wallis	SAS	Stata	SPSS	<u>R</u>
	groups)	interval	Tudonal Traine	<u> </u>	<u>State</u>	5. 55	<u></u>
		categorical	Chi-square test	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
		interval &	paired t-test	SAS	Stata	SPSS	<u>R</u>
	1 IV with 2 levels	normal	<b>F</b>				_
	(dependent/matched	ordinal or	Wilcoxon signed	SAS	Stata	SPSS	<u>R</u>
	groups)	interval	ranks test				
		categorical	McNemar	SAS	<u>Stata</u>	SPSS	<u>R</u>
			one-way				
		interval &	repeated	SAS	Stata	SPSS	R
	1 IV with 2 or more	normal	measures ANOVA				
	levels						
	(dependent/matched		ordinal or interval Friedman test	SAS	<u>Stata</u>	SPSS	<u>R</u>
	groups)	ınterval					
	3.5		repeated	040	0111	OBSS	
			measures logistic	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
			regression				

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		interval & normal	factorial ANOVA	SAS	<u>Stata</u>	SPSS	<u>R</u>
	2 or more IVs (independent groups)	ordinal or interval	ordered logistic regression	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
		categorical	factorial logistic regression	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
		interval & normal	correlation	SAS	<u>Stata</u>	SPSS	<u>R</u>
	1 interval IV	interval & normal	simple linear regression	SAS	Stata	SPSS	<u>R</u>
		ordinal or interval	non-parametric correlation	SAS	Stata	SPSS	<u>R</u>
		categorical	simple logistic regression	SAS	Stata	SPSS	<u>R</u>
		interval &	multiple regression	SAS	Stata	SPSS	<u>R</u>
	1 or more interval IVs and/or 1 or more categorical IVs	normal	analysis of covariance	SAS	Stata	SPSS	<u>R</u>
			multiple logistic regression	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
		categorical	discriminant analysis	SAS	<u>Stata</u>	SPSS	<u>R</u>
	1 IV with 2 or more levels (independent groups)	interval & normal	one-way MANOVA	SAS	Stata	<u>SPSS</u>	<u>R</u>
2+	2+	interval & normal	multivariate multiple linear regression	SAS	<u>Stata</u>	SPSS	<u>R</u>
	0	interval & normal	factor analysis	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
2 sets of 2+	0	interval & normal	canonical correlation	SAS	<u>Stata</u>	<u>SPSS</u>	<u>R</u>
Number of		Nature of		How	How	How	
Dependent	Nature of Independent Variables	Dependent	Test(s)	to	to	to	How to R
Variables		Variable(s)		SAS	Stata	SPSS	

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<sup>&</sup>lt;sup>1</sup>Technically, it is the residuals from these analyses that should be normally distributed; it does not matter if the dependent variable is normally distributed or not.

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