# 使用Prism-7绘制统计图

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更新于2023-05-01,主要是文字排版上的更新,内容基本保持不变。



前一段时间,简单学习了一下使用Prism画统计图,包括相关、单因素方差分析和双因素方差分 析。

2023-05-01 当初学习Prism的原因是觉得可视化效果还不错,现在都是用R画图,R更方便、更强大、不花钱。

## 二、下载并安装Prism 7

Prism是收费的软件,试用期30天。



## 三、两个变量间的相关关系

1. 打开Prism 7, 左侧有六种数据组织形式可供选择,选择XY; 右侧选择数据的类型,变量X选择Numbers,变量Y选择Enter and plot a single Y value for each point; 最后点击Create。

New table & graph	1 Title	
Column Grouped		? Learn more
Contingency Survival Parts of Whole Existing file Open a File LabArchives	Enter/import data: X: Numbers Numbers with error values to plot horizontal error bars Dates Elapsed times Y: Enter and plot a single Y value for each point Enter 2 © replicate values in side-by-side subcolumns	
Clone a Graph Graph Portfolio	Enter and plot error values already calculated elsewhere Enter: Mean, SD, N	
	Use tutorial data: Linear regression - Compare slopes Nonlinear regression One phase exponential decay Dose-response - X is log(dose) Interpolate unknowns from a linear standard curve Correlation Entering dates into the X column Entering elapsed times into the X column More tutorial data	
Prism Tips	Canc	el Create

#### 2. 导入两个变量所对应的两列数据,可以使用复制粘贴的方式,也可以是使用Import选项。

File	Clipboard		Analys	is	Change	Import		
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🕨 🚞 Famil	У		_		х	Group A	Group B	Group C
Searc	ch results		L	1	变量1	变量2	Title	Title
🔻 🚞 Data '	Tables			8	х	Y	Y	Y
📑 tes	st		1	Title	31.59	2	1	
🔻 🚞 Info			2	Title	46.30	30	)	
🔁 Pro	oject info 1		3	Title	28.62	29	9	
Resul		4	Title	23.66	34	1		
Graph		5	Title	13.79	30	)		
🛃 🛃 tes	st		6	Title	29.77	;	3	
Layou	uts		7	Title	35.84	23	3	

3. 点击Analyze,在弹出的对话框里选择Linear regression。之所以选择Linear regression而不 是Correlation,是因为前者可以产生一条拟合曲线(详见Prism官方文档)。

File	Sheet	Undo Clipboard	Analysis		Change	Import	Draw Write	
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Searc	h results		变量1	变量2	Title	Title	Title	Title
🔻 🚞 Data	Tables	0	Y	v	v	v	V	V
Ti tes	st			A	nalyze Dat	а		
▼ 🚔 Info		Built-in analys	ie.	<u>^</u>				
🔞 Pro	ject info 1	Dunc-In analys	10					
Resu	ts	Which analysis	?	lata sets?				
🔻 🚞 Grapi	ıs	▼ Transform,	Normalize			✓ A:变量2		
e ter	at a state of the	Transform	n					
	uto.	Transform	n Concentration	s (X)				
Layou	ns	Normaliz	е					
		Prune rov	vs					
		Remove I	paseline and colu	umn math				
		Transpos	e X and Y					
		Fraction	of Total					
		▼XY analyse						
		Nonlinea	r regression (cur	ve fit)		When you analy	ze tables or grap	hs with
		Linear re	gression			more than one of	data set, use this	space
		Fit spline	/LOWESS			to select which	ruata set(s) to ar	aryze.
		Smooth,	differentiate or in	ntegrate c	urve			

4. 选择Results,可以查看回归分析的结果,比如p值为0.039,小于0.05,说明这两个变量间存 在显著的线性相关关系。

🔞 Project info 1	3	Y-intercept	32.95 ± 3.698
Results	4	X-intercept	128.1
Linear reg. of test	5	1/slope	-3.89
Graphs	6		
dest 🖉	7	95% Confidence Intervals	
Layouts	8	Slope	-0.5013 to -0.01292
	9	Y-intercept	25.33 to 40.56
	10	X-intercept	79.03 to 2007
	11		
	12	Goodness of Fit	
	13	R square	0.1583
	14	Sy.x	7.455
	15		
	16	Is slope significantly non-zero?	
	17	F	4.703
	18	DFn, DFd	1, 25
	19	P value	0.0398
	20	Deviation from zero?	Significant

5. 选择Graphs,查看生成的图像。双击图中任意位置,在弹出的对话框里可以进一步修改图的 形式。



# 四、一个分类变量不同水平的比较

- 1. 假设该分类变量具有三个水平。
- 2. 点击New,选择New Data Table With Graph来添加新的数据表,在弹出的对话框中选择 Column;输入数据选择Enter replicate values, stacked into columns;最后点击Create。



XY	Column tables have one grouping variable, with each group defined by a column
Column	
Grouped Contingency Survival Parts of Whole	A     B       Control     Treated       Y     Y       1
Existing file Clone a Graph	Enter/import data: Enter replicate values, stacked into columns Enter paired or repeated measures data - each subject on a s Enter and plot error values already calculated elsewhere Enter: Mean, SD, N

3. 按照前面相同的方式导入数据,每一列对应一个水平。

Family	_	Group A	Group B	Group C
Search results		组1	组2	组3
Data Tables		Y	Y	Y
itest	1	22.829207	35.801875	31.585788
test2	2	42.355198	31.516130	46.300218
▼ 🚔 Info	3	27.931319	52.721799	28.619778
Project info 1	4	65.411830	33.345878	23.656930
Results	5	48.732954	33.519964	13.786178
Linear reg. of test	6	70.872426	37.842976	29.773806
Graphs	7	23.206359	40.257686	35.838818
🛃 test	8	25.506785	62.792040	28.083636
E test2	9	68.551150	37.657456	30.284352
Layouts	10	57.946033	37.359484	34.154222

4. 点击Analyze,在弹出的对话框中选择Column statistics。因为我已经用其他软件做了组间比 较,这里我只需要计算统计量用于图示。

1	Which analysis?	Analyze which data sets?
	▼ Transform, Normalize	✓ A:组1
	Transform	✓ B:组2
	Transform Concentrations (X)	✓ C:组3
	Normalize	
	Prune rows	
	Remove baseline and column math	
	Transpose X and Y	
	Fraction of Total	
	▶ XY analyses	
	▼ Column analyses	
	t tests (and nonparametric tests)	
	One-way ANOVA (and nonparametric)	
	Column statistics	
	Frequency distribution	

### 5. 在Results选项下面可以查看分析结果。

▼ 🚞 Info	3	Minimum	22.83	14.2	3.906
Project info 1	4	25% Percentile	40.82	31.1	18.1
Results	5	Median	50.64	35.8	29.77
Linear reg. of test	6	75% Percentile	65.41	52.72	35.84
Col Stats of test2	7	Maximum	97.13	74.96	58.13
Graphs	8				
E test	9	Mean	52.65	39.83	28.75
li test2	10	Std. Deviation	18.39	15.81	12.33
	11	Std. Error of Mean	3.538	3.044	2.373

6. 在Graphs选项下查看生成的图像。双击图中任意位置,在弹出的对话框里可以进一步修改图 的形式。



### 五、两个分类变量不同水平的比较

- 1. 假设一个分类变量具有三个水平,另一个分类变量具有两个水平,共有6种不同的组合。
- 2. 点击New,选择New Data Table With Graph来添加新的数据表,在弹出的对话框中选择 Grouped;输入数据选择Enter \* replicate values in side-by-side subcolumns,其中\*表示 不同组合下的样本数,如果不同组合下样本数不同,选择最大值;最后点击Create。

XY		Grouped tables have two grouping variables, one defined by columns and the ot
Column		rows
Grouped		Table format A B
Contingenc	y	Grouped Control Treated
Survival		A:Y1 A:Y2 A:Y3 B:Y1 B:Y2 B:Y3
Parts of Who	ole	2 Femal Male Female
Existing file Clone a Gra	ph	Enter/import data: Enter and plot a single Y value for each point Enter 20 C replicate values in side-by-side subcolumns
		Enter: Mean, SD, N

3. 根据不同组合情况导入样本数据。默认情况下,数据将按照列的方式导入(粘贴),这里数 据需要按行的方式导入。

Family	Т	able format:										Grou	ip A			
Search results		Grouped										组	A			
🗎 Data Tables		6	A:Y1	A:Y2	A:Y3	A:Y4	A:Y5	A:Y6	A:Y7	A:Y8	A:Y9	A:Y10	A:Y11	A:Y12	A:Y13	A:Y14
iii) test	1	组1	23.473111	20.205795	15.089644	35.110219	23.341929	29.079971	21.609639	32.471355	27.604222	37.271313	21.207082	25.841778	45.25173	31.232119
test2	2	组2	28.750776	21.172945	35.174770	41.416422	20.761990	28.460893	42.219604	30.340326	40.497366	60.692365	26.754967	24.780658	28.39526	36.768981
test3	3	Title														

4. 点击Analyze,在弹出的对话框中选择Row means with SD or SEM,原因如前所述。

Which analysis?	Analyze which data sets?
▼ Transform, Normalize	✓ A:组A
Transform	✓ B:组B
Transform Concentrations (X)	✓ C:组C
Normalize	
Prune rows	
Remove baseline and column math	
Transpose X and Y	
Fraction of Total	
▶ XY analyses	
Column analyses	
▼ Grouped analyses	
Two-way ANOVA	
Three-way ANOVA	
Row means with SD or SEM	
Multiple t tests - one per row	

#### 5. 在Results选项下面可以查看分析结果,可以得到每种组合下的均值、方差和样本数。

Family		Chata		Α			В			С		
Search results		tow Stats		组A			组B		组C			
🚔 Data Tables		8	Mean	SD	N	Mean	SD	N	Mean	SD	N	
iii) test	1	组1	27.881	7.569	20	26.214	7.294	20	21.351	5.516	20	
test2	2	组2	35.345	11.191	20	36.552	11.749	20	35.600	7.283	20	
iii test3	3											
🚔 Info	4											
Project info 1	5											
Results	6											
🖄 Linear reg. of test	1											
Col Stats of test2												
Row Stats of test3	0											

6. 在Graphs选项下查看生成的图像。双击图中任意位置,在弹出的对话框里可以进一步修改图的形式。



# 五、将图像导出为不同格式

使用Export选项,可以将生成的图像导出为不同的格式,比如PDF格式。

