Paul Lazardsfeld's Criteria for inferring causal relations

1. There must be Association,
   e.g., X ←→ Y; ~X ←→ ~Y;

2. Time order must be considered, ie, the presumed cause should precede the presumed effect.

3. We must rule out plausible rival explanations.

Rules for setting up a crosstabulation.

Rule 1. Make the independent variable define the columns and the dependent variable define the rows of the table;

Rule 2. Always percentage down within categories of the independent variable.

Rule 3. Interpret the relationship by comparing across columns, within rows of the table.

Support for Y Variable by Support for X Variable

Score/Answer on X variable

Score on Y Variable		Low	High	
	Low	A	B	A+B
	High	C	D	C+D
		A+C	B+D	

Support for Y Variable by Support for X Variable

Score/Answer on X variable

	Low	High
Low	100%	0%
High	0	100

$X_1 \leftarrow\rightarrow Y$

and

$X_2 \leftarrow\rightarrow Y$

-1.0 -.8 -.6 -.4 -.2 0 +.2 +.4 +.6 +.8 +1.0

Support for Y Variable by Support for X Variable

Score/Answer on X variable

Score on Y Variable		Low	High	
	Low	A	B	A+B
	High	C	D	C+D
		A+C	B+D	

$$\Phi = \frac{AD - BC}{\sqrt{(A+B)\,(C+D)\,(A+C)\,(B+D)}}$$

Score/Answer on X variable

Score/ Answer on Y Variable		Low	High
	Low	75%	10%
	High	25	90
		(100)	(100)

Φ = .6

Score/Answer on X variable

Score/Answer on Y Variable		Low	High
	Low	50%	20%
	High	50	80
		(100)	(100)

Φ = .2

```
missing values q21 (8,9).
crosstabs
   /tables=q21 BY gender, language
   /cells=column count
   /statistics = phi.
```

Intended Vote on Marijuana Initiative by Gender

		Gender	
		Male	Female
Intended Vote on Marijuana Initiative	Yes	62.1%	48.3%
	No	37.9%	51.7%
Total		654	633

Phi = .138

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Intended Vote on Marijuana Initiative by Language of Interview

		Language	
		English	Spanish
	Yes	59.1%	16.7%
	No	40.9%	83.3%
Total		1173	114

Phi = .242

PPIC Oct 2016 Statewide Survey

```
*recode MJ measure into 0-1 values*.
recode q21 (1=1) (2=0) (8 =.5) into MJprop.
value labels MJprop 1 'yes' .5 'dk' 0 'no'.

*pure pid-wo leaners*.
if (q40c = 1) and (q40e =1) ppid =1.
if (q40c = 1) and (q40e =2) ppid =2.
if (q40c = 3) ppid =3.
if (q40c =2) and (q40d =2) ppid =4.
if (q40c =2) and (q40d=1) ppid =5.

value labels ppid 1 'strRep' 2 'Rep' 3 'Indep' 4 'Dem' 5 'strDem'.
missing values q21 (8,9).
crosstabs tables = MJpropD by ppid
  /cells = column count
  /statistics = phi ctau d chisq.
```

Support for MJ Initiative by Partisanship

		strRep	Rep	Indep	Dem	strDem
Vote Intention	No	68.9%	62.2%	38.9%	46.1%	34.2%
	Yes	31.1%	37.8%	61.1%	53.9%	65.8%
Total		177	98	427	152	386

Cramer's V = .250

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-1.0 -.8 -.6 -.4 -.2 0 +.2 +.4 +.6 +.8 +1.0

		Support for X		
		Low	Med	High
Support for Y	Low			
	Med			
	High			

$$\text{Gamma } (\gamma) = \frac{P - Q}{P + Q}$$

$$\frac{P - Q}{P + Q} = \frac{P}{P+Q} - \frac{Q}{P+Q}$$

$$\text{Tau}_b = \frac{P - Q}{\sqrt{(P+Q+X)\,(P+Q+Y)}}$$

Income by Education

	Some HS	HS grad			
	Some HS	HS grad	Some Col	Col Grad	Post Grad
>$20k	49.3%	31.8%	16.9%	8.7%	3.1%
$20-39	27.9%	29.5%	23.6%	13.7%	9.0%
$40-59	14.4%	11.0%	18.9%	15.5%	13.7%
$60-79	5.6%	7.9%	12.5%	11.5%	10.5%
$80-100	0.9%	12.3%	11.4%	18.2%	15.6%
$$100-200	0.9%	5.8%	11.1%	21.2%	27.0%
$200+	0.9%	1.7%	5.6%	11.2%	21.1%
Total	215	292	360	401	256

Kendall's tauc = .421; Somer's d = .426

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Intended Vote for MJ initiative by Selected Predictors

	tauc
Educ	.171
Income	.095
Pol interest	-.058
Vote Freq	.045
Democrat	.225

PPIC Oct 2016 Statewide Survey

Q21. Proposition 64 is called the 'Marijuana Legalization. Initiative Statute.' If the election were held today, would you vote yes or no on Proposition 64? * ethn Crosstabulation

			ethn			
			Hisp	White	other	Total
Q21. Proposition 64 is called the 'Marijuana Legalization. Initiative Statute.' If the election were held today, would you vote yes or no on Proposition 64?	yes	Count	162	382	168	712
		% within ethn	47.0%	56.9%	62.0%	55.3%
	no	Count	183	289	103	575
		% within ethn	53.0%	43.1%	38.0%	44.7%
Total		Count	345	671	271	1287
		% within ethn	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.109	.000
	Cramer's V	.109	.000
N of Valid Cases		1287	

Intended Vote on Marijuana Initiative by reported ethnicity

		ethnicity		
		Hisp	White	other
Intended Vote	yes	47.0%	56.9%	62.0%
	no	53.0%	43.1%	38.0%
Total		345	671	271

Cramer's V = .109
Source: PPIC October 2016 Statewide Survey