

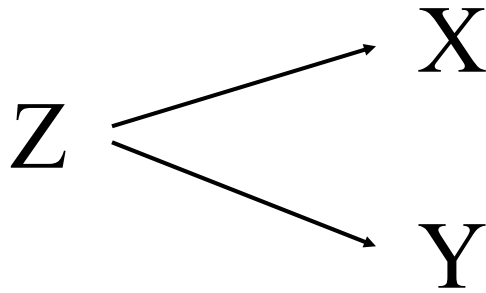
## Elaboration Paradigm

- Purpose: to understand nature of observed relationships
- Test: for spuriousness
- Move: from bivariate table to trivariate table
- Evaluate for possible outcomes: replication, explanation, interpretation, specification

## Elaboration Paradigm

<u>Partial relationships compared with original</u>	<u>Test variable is:</u>	
	<u>Antecedent</u>	<u>Intervening</u>
Same relationship	Replication	
Less or none	Explanation	Interpretation
Split (one is same or greater, other is less or none)	Specification	

Explanation:



Interpretation:



## Rules for creating tables

- ✓ Percentage down (in the direction of causality)
- ✓ Dependent variable on the side
- ✓ Independent variable(s) on the top
- ✓ Compare across
- ✓ Watch for small Ns in columns
- ✓ Collapse on theoretical grounds

## Elaboration Paradigm

Percentage receiving Ph.D. by marriage in grad school (hypothetical)		
	<u>Got married in grad school</u>	
<u>Got Ph.D.</u>	<u>Yes</u>	<u>No</u>
Yes	65.0	80.0
No	<u>35.0</u>	<u>20.0</u>
Total	100.0	100.0
N	(200)	(200)

## Elaboration Paradigm

Percentage receiving Ph.D. by marriage in grad school (hypothetical)		
	<u>Got married in grad school</u>	
<u>Got Ph.D.</u>	<u>Yes</u>	<u>No</u>
Yes	65.0	80.0
N	(200)	(200)

*Succinct table reduces redundancy*

## Elaboration Paradigm

Percentage receiving Ph.D. by getting married by sex (hypothetical)				
	<u>Sex</u>			
	<u>Men</u>		<u>Women</u>	
<u>Got Ph.D.</u>	<u>Married</u>	<u>Didn't marry</u>	<u>Married</u>	<u>Didn't marry</u>
Yes	80.0	80.0	50.0	80.0
No	<u>20.0</u>	<u>20.0</u>	<u>50.0</u>	<u>20.0</u>
Total	100.0	100.0	100.0	100.0
N	(100)	(100)	(100)	(100)

## Elaboration Paradigm

Percentage receiving Ph.D. by getting married by sex (hypothetical)				
	<u>Sex</u>			
	<u>Men</u>		<u>Women</u>	
<u>Got Ph.D.</u>	<u>Married</u>	<u>Didn't marry</u>	<u>Married</u>	<u>Didn't marry</u>
Yes	80.0	80.0	50.0	80.0
N	(100)	(100)	(100)	(100)

Make it succinct!

## Elaboration Paradigm

What happens to the original relationship within categories of the test variable?

## Elaboration Paradigm

<u>Percent delinquent by suitability of supervision</u>		
	<u>Suitability of supervision</u>	
	<u>Suitable</u>	<u>Unsuitable</u>
% Delinquent	30.3	83.7
N	(628)	(375)

Source: Eleanor Maccoby 1960 data (reprinted in Travis Hirschi and Hanan Selvin, 1967, *Delinquency Research: An Appraisal of Analytic Methods*, New York: Free Press, p. 240)

## Elaboration Paradigm

<u>Percent delinquent by suitability of supervision by mother's employment</u>						
	<u>Housewife</u>		<u>Occasionally Employed</u>		<u>Regularly employed</u>	
	<u>Suitable</u>	<u>Un-suitable</u>	<u>Suitable</u>	<u>Un-Suitable</u>	<u>Suitable</u>	<u>Un-Suitable</u>
% Delinquent	31.9	84.6	31.5	88.8	19.5	77.3
N	(457)	(149)	(89)	(116)	(82)	(110)

Source: Eleanor Maccoby 1960 data (reprinted in Travis Hirschi and Hanan Selvin, 1967, *Delinquency Research: An Appraisal of Analytic Methods*, New York: Free Press, p. 240)

## Elaboration Paradigm

<u>Percentage delinquent by mother's employment</u>			
	<u>Housewife</u>	<u>Occasionally employed</u>	<u>Regularly employed</u>
% Delinquent	44.9	63.9	52.6
N	(606)	(205)	(192)

Source: Eleanor Maccoby 1960 data (reprinted in Travis Hirschi and Hanan Selvin, 1967, *Delinquency Research: An Appraisal of Analytic Methods*, New York: Free Press, p. 240)

## Elaboration Paradigm

<u>Percent delinquent by suitability of supervision by mother's employment</u>						
	<u>Housewife</u>		<u>Occasionally Employed</u>		<u>Regularly employed</u>	
	<u>Suitable</u>	<u>Un-suitable</u>	<u>Suitable</u>	<u>Un-Suitable</u>	<u>Suitable</u>	<u>Un-Suitable</u>
% Delinquent	31.9	84.6	31.5	88.8	19.5	77.3
N	(457)	(149)	(89)	(116)	(82)	(110)

Source: Eleanor Maccoby 1960 data (reprinted in Travis Hirschi and Hanan Selvin, 1967, *Delinquency Research: An Appraisal of Analytic Methods*, New York: Free Press, p. 240)

## Elaboration Paradigm

<u>Percent delinquent by church attendance (hypothetical)</u>		
	<u>Church attendance</u>	
	<u>Regular/often</u>	<u>Seldom/never</u>
% Delinquent	44.0	56.0
N	(150)	(150)

## Elaboration Paradigm

<u>Percent delinquent by church attendance by age</u>				
	<u>&lt;=14 years</u>		<u>&gt;=15 years</u>	
	<u>Regular/ often</u>	<u>Seldom/ never</u>	<u>Regular/ often</u>	<u>Seldom/ never</u>
% Delinquent	33.0	33.0	67.0	67.0
N	(100)	(100)	(50)	(100)

## Testing hypotheses

Raw data: predicting traffic accidents

<u>Sex</u>	<u>Miles driven</u>	<u>Traffic accidents</u>	<u>N</u>
Women	Few	Many	20
Women	Few	Few	180
Women	Many	Many	80
Women	Many	Few	20
Men	Few	Many	5
Men	Few	Few	45
Men	Many	Many	160
Men	Many	Few	40

## Testing hypotheses

Hypothesis:

“Men are more accident prone than women”

$$X = ?$$

$$Y = ?$$

## Original bivariate relationship

<u>Percentage of traffic accidents by sex (hypothetical)</u>		
<u>Accidents</u>	<u>Men</u>	<u>Women</u>
Few	34.0	66.7
Many	<u>66.0</u>	<u>33.3</u>
Total	100.0	100.0
N	(250)	(300)

## Trivariate relationship

<u>Percentage of traffic accidents by miles driven by sex (hypothetical)</u>				
	<u>Sex</u>			
	<u>Men</u>		<u>Women</u>	
<u>Accidents</u>	<u>Few</u>	<u>Many</u>	<u>Few</u>	<u>Many</u>
Few	90.0	20.0	90.0	20.0
Many	<u>10.0</u>	<u>80.0</u>	<u>10.0</u>	<u>80.0</u>
Total	100.0	100.0	100.0	100.0
N	(50)	(200)	(200)	(100)

## Refinements to elaboration paradigm: suppressor and distorter variables

- Suppressor variable (relationship emerges):
  - bivariate = no relationship
  - trivariate = positive or negative relationship
- Distorter variable (relationship switches):
  - bivariate = positive relationship
  - trivariate = negative relationship  
(or negative to positive)

## 3 dimensional tables: basic table

<u>Percentage believing abortion should be available by education and religion</u>								
	<u>Education</u>							
	<u>&lt;=8 yrs.</u>		<u>9-11 yrs.</u>		<u>H.S. grad</u>		<u>College+</u>	
<u>Abortion belief</u>	<u>Cath.</u>	<u>Prot.</u>	<u>Cath.</u>	<u>Prot.</u>	<u>Cath.</u>	<u>Prot.</u>	<u>Cath.</u>	<u>Prot.</u>
Should Be available	31.0	29.0	33.0	36.0	33.0	43.0	31.0	51.0
N	(90)	(287)	(96)	(250)	(89)	(256)	(75)	(225)

### 3-D table: statistical interaction

Percent believing abortion should be available by education and religion				
	<u>Education</u>			
<u>Religion</u>	<u>&lt;=8 yrs.</u>	<u>9-11 yrs</u>	<u>H.S. grad</u>	<u>College+</u>
Catholic	31.0 (90)	33.0 (96)	33.0 (89)	31.0 (75)
Protestant	29.0 (287)	36.0 (250)	43.0 (256)	51.0 (225)

### Additive relationship (hypothetical)

	<u>Education</u>			
<u>Religion</u>	<u>&lt;=8 yrs.</u>	<u>9-11</u>	<u>H.S. grad</u>	<u>College+</u>
Catholic	30.0	35.0	45.0	65.0
Protestants	40.0	45.0	55.0	75.0

## Statistical interaction

Question to ask:

“Does the effect of one variable (X) on another (Y) remain the same for all groups of the third (Z) variable?”