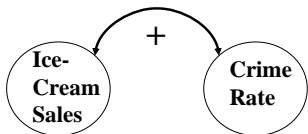
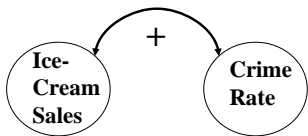


Correlation vs. _____



Months that have higher ice-cream sales tend to have higher crime rates than do months with lower ice-cream sales

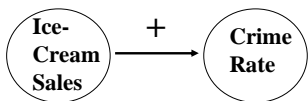
Correlation vs. _____



Explanations:

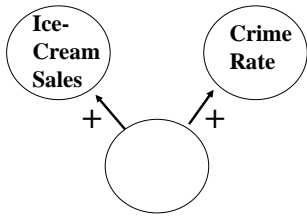
- 1 – Something in ice-cream
- 2 – Some factor that doesn't appear

Correlation vs. _____



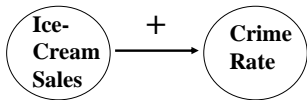
- 1 – Something in ice-cream

Correlation vs. Causation



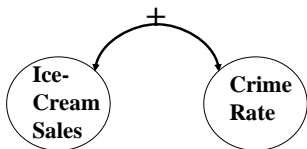
2 – Some factor that doesn't appear

Correlation vs. _____



If something in ice-cream causes people to commit more crime then...

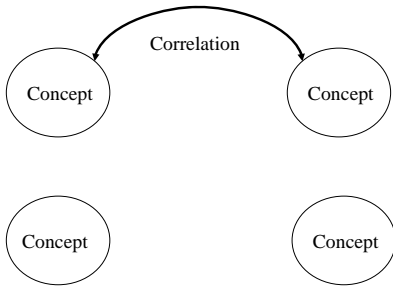
Correlation vs. _____



If the relationship is simply a _____ [with no _____] then...

Even if we could limit ice-cream sales,

Correlation versus _____



Correlation versus _____

There is a difference between correlation/association and “_____” but the distinction is frequently misunderstood.

The Important Question:

If we can _____ the value of a variable/measurement, will we see

If so, then there is a “_____” relationship.

Confusion about the term “Cause”

When researchers use the term “cause,” _____

The “common” language usage of the term usually implies:

Confusion about the term “Cause”

Some of the confusion occurs because the US

_____ speaks about “_____ cause” and attempts to determine whether a single person is

For example, if the

Confusion about the term “Cause”

Researchers generally are not interested in

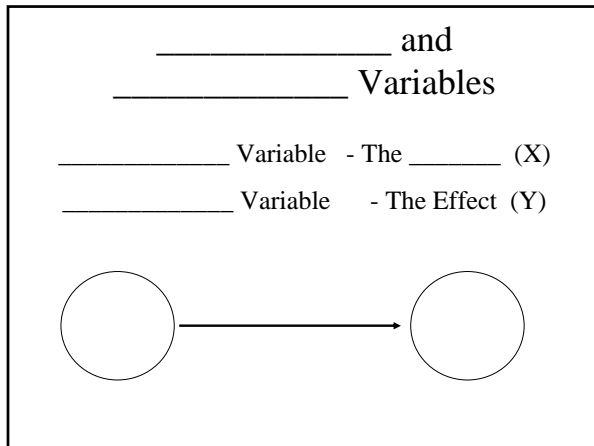
Instead, we are interested in the

So among researchers, “cause” simply refers to

“Cause” does not mean “_____” – (remember

Confusion about the term “Cause”

To avoid some confusion, some researchers use these terms instead:

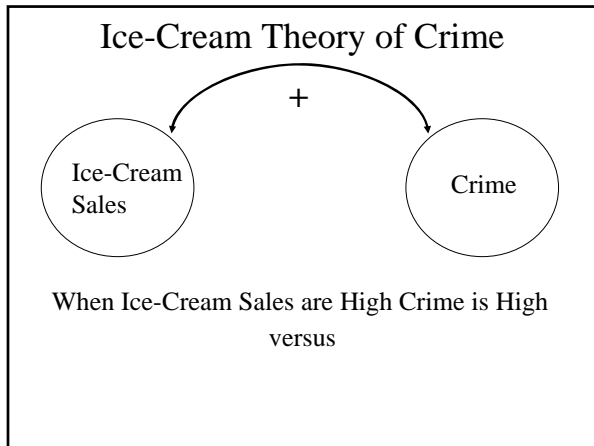


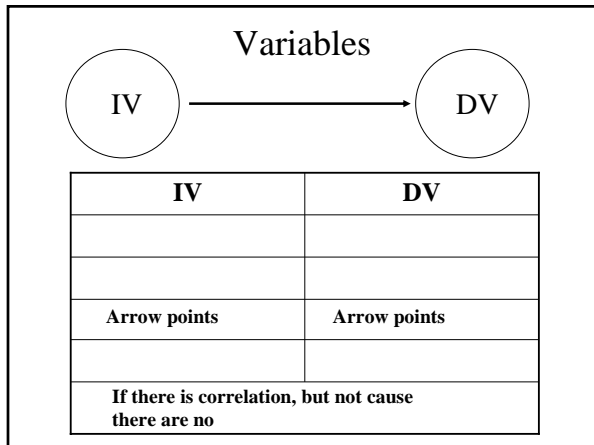
_____ Variable

- The Thing the Researchers
- Also Called the

_____ Variable

- The Thing that
- Also Called the
- How High or Low the _____ Variable is
“_____” on the _____ Variable

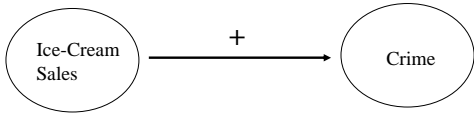




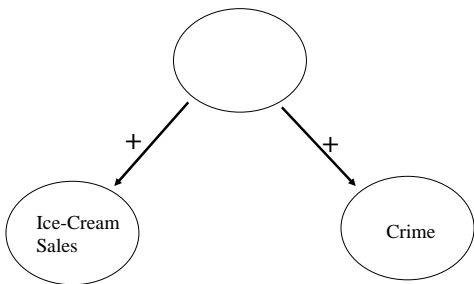
Correlation and _____

Correlation by Itself Does not Indicate _____

Spuriousness (_____ Cause)



_____ Relationship

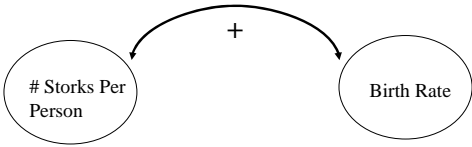


Correlation

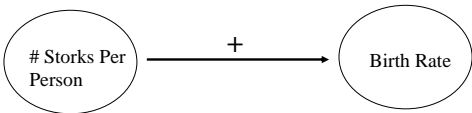
This is a true relationship:

The More Storks there are per Person in a Neighborhood, the Higher the Birth Rate

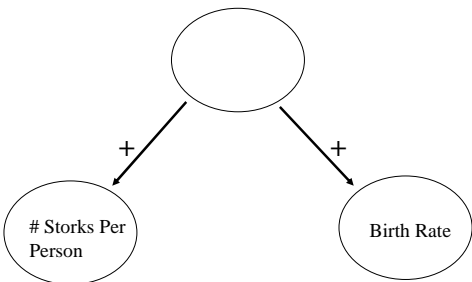
Correlation



Spuriousness (False Cause)



True _____ Relationship

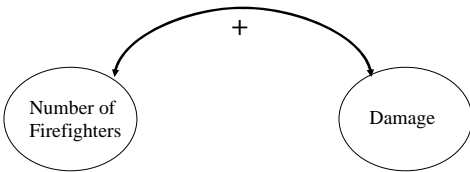


Spuriousness (_____ Cause)

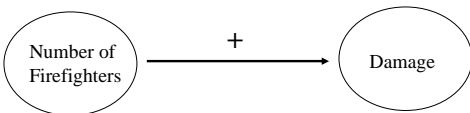
This is a true statement:

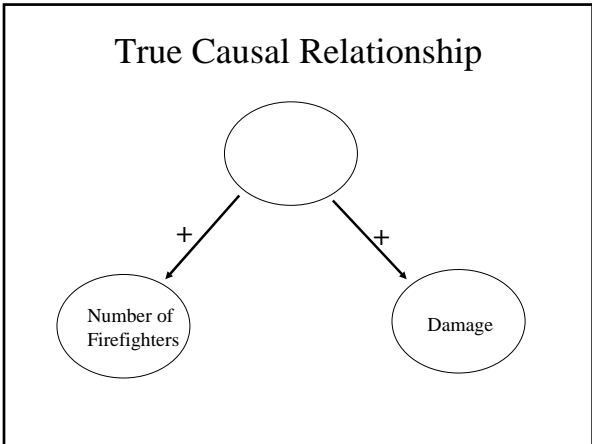
- The more firefighters there are at a fire, the more damage will occur to the building.

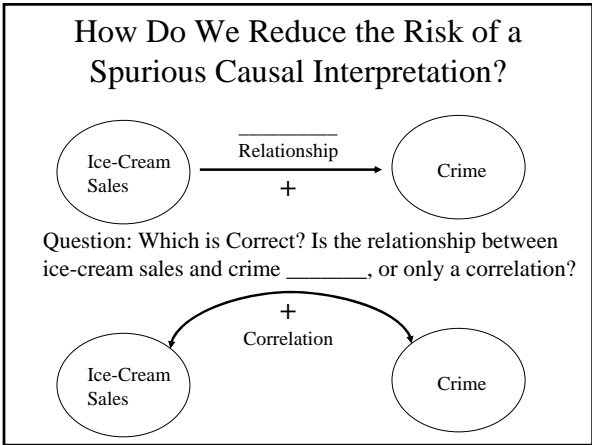
Correlation



Spuriousness (_____ Cause)







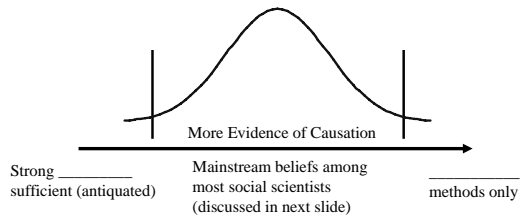
Practical Problem with Determining _____

We usually cannot directly observe a _____

So, we usually must _____ whether or not a relationship is _____ or not based upon _____

There are different opinions about these _____ (i.e., how much _____ do we need)

Opinions about Determining Causation



What Most Social Scientists Believe is Required to Infer Causation

- 1)
- 2) _____ (_____) Order
The “_____” Must Come Before the _____ (_____)
- 3) Elimination of
“No _____” (No _____ Causes)
- 4) _____ Explanation
(Not Always Mentioned)

_____ Order

Sometimes we simply _____ through logic

For Example:

- If we were interested in whether people who are strongly attached to their parents during childhood subsequently are happier as adults in their marriage...
- Attachment to one’s parents during childhood clearly

_____ Order

_____ Helps Provide Evidence of _____ Order

For Example:

- Time 1 – We Measure Math Achievement among an Adolescent Sample
- Time 2 – Half of the Adolescents Start a New Math Class
- Time 3 – We _____ Math Achievement

If we find a relationship between participation in the class and an increase in math achievement we also know that the participation

The Elimination of _____
is Sometimes Difficult

We must consider other

Three Strategies:

- 1) Eliminate almost all potential
- 2) Eliminate some potential
- 3) “_____” or _____ using

The Elimination of _____
is Sometimes Difficult

- Possibility 1 - Examine large, randomly assigned groups in an
 - 100 adolescents are randomly assigned to either an ice-cream-eating group or an ice-cream-abstaining group
 - Because of _____, we would expect each group to be approximately equal on all _____ that might affect the _____ and thus lead to a

The Elimination of Alternative Explanations is Sometimes Difficult

- Possibility 1 - Examine large, randomly assigned groups in an experiment
 - If the ice-cream eating group actually started to _____ than the other group, we would be safe in assuming that the ice-cream was
 - If not, we might conclude that something is

The Elimination of Alternative Explanations is Sometimes Difficult

- Possibility 1 - Examine large, randomly assigned groups in an experiment
 - We could do the same thing with the firefighting example
 - If we randomly assigned different numbers of firefighters to _____ and if large numbers of _____ was still associated with _____, then we might conclude that _____. If not, the association is not likely

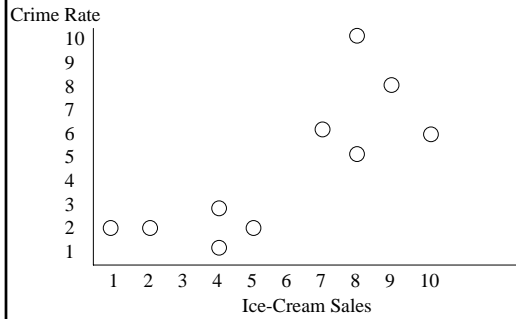
The Elimination of _____ is Sometimes Difficult

Possibility 2 - Use a narrow or

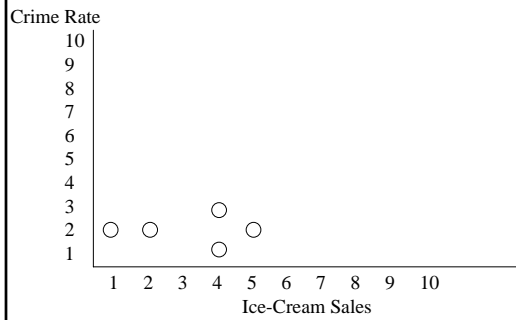
- Examine the relationship between crime and ice-cream sales only

Problems: Can only account for

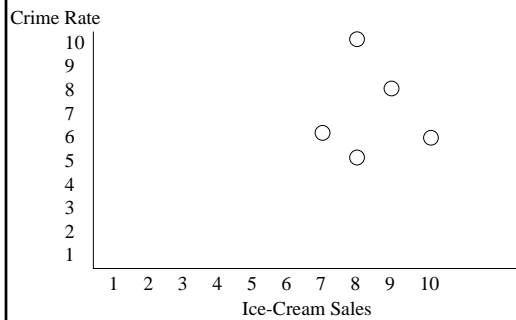
Relationship between Ice-Cream Sales and Crime (X/Y Graph)



Relationship between Ice-Cream Sales and Crime (X/Y Graph)



Relationship between Ice-Cream Sales and Crime (X/Y Graph)



The Elimination of _____ is
Sometimes Difficult

- Possibility 3 – Use “_____” Variables
 - Account for (eliminate) _____ by including
 - Logically and mathematically similar to possibility 1 and 2

The Elimination of _____ is
Sometimes Difficult

- Possibility 3 – Use “_____” Variables
 - 3a Use
Examples:
 - 3b Use less complex “_____” _____ methods – examine the relationship between the IV and the DV

Problems with both: Can only account for

Complex _____

Example: What is the effect of education on marital happiness?

Table 1. Effects of Education, Age, and Gender on Marital Happiness

Variable	Effect (“relationship”)
Education	.3
{ Age	.2
Male	.5

Interpretation (simplified): The “correlation” between education and marital happiness for

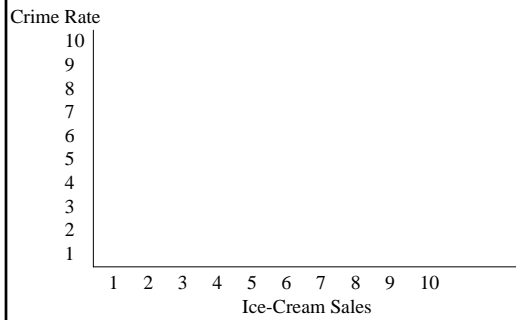
Interpretation continued: If Age, Education, and Gender are the _____ that _____ difference in marital happiness, and if we can assume that _____, then this relationship is

“ _____ ” Control Methods

The Relationship between Ice-Cream Sales and Crime Rates

Ice-Cream Sales	Crime Rate
8	5
7	6
9	8
8	10
10	6
4	3
5	2
1	2
2	2
4	1

Relationship between Ice-Cream Sales and Crime (X/Y Graph)



Relationship between Ice-Cream Sales and Crime (No _____ Variables)

Ice-Cream Sales	Average Crime Rate
High (above 6)	
Low (below 6)	

_____ Variables
**Let's Re-Examine the Relationship between
 Ice-Cream Sales and Crime Rates**

	Ice-Cream Sales	Crime Rate
	8	5
	7	6
	9	8
	8	10
	10	6
	4	3
	5	2
	1	2
	2	2
	4	1

“_____” Control for Weather

Hot Weather

Ice-Cream Sales	Average Crime Rate
High (9 or above)	
Low (Below 9)	

Cool Weather

Ice-Cream Sales	Average Crime Rate
High (Above 3)	
Low (Below 3)	

Interpretation: There is no

Correlation and _____

Neither a simple correlation nor a causal statement is an _____

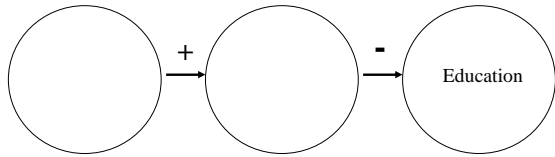
...but knowledge about a correlation, even if not _____ and even if it doesn't provide an _____ can be useful to make a _____

For Example:

Correlation:

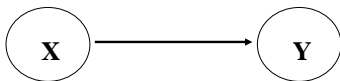
Explanation:

An _____ Variable Helps
Provide Explanation



_____ Effect

Direct Effect

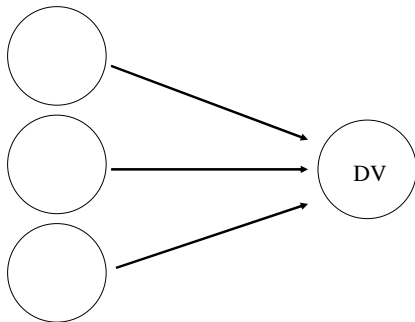


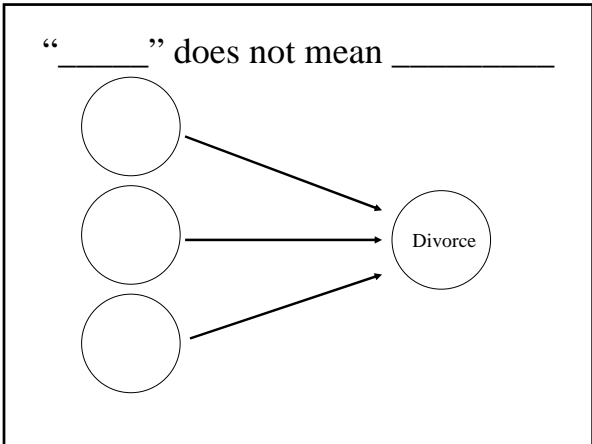
_____ Effect

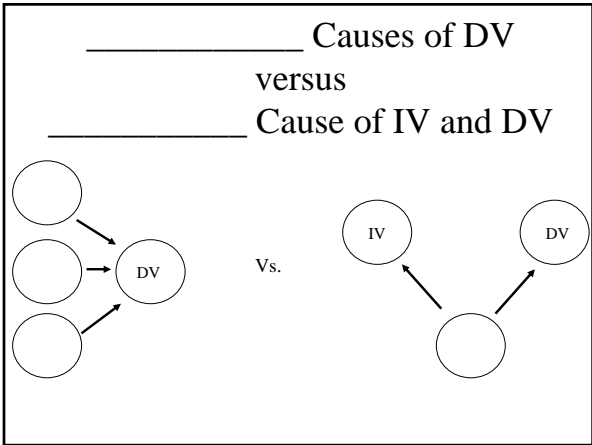


Here W is called a

“_____” does not mean _____







Cause and _____

Important!

“Cause” is different from “_____”
but these terms are often confused

Social Science Theory and Research
does not Typically Address “_____”

They Address “_____”

- Assigning _____ and _____

Cause

- E.g., If X is high than Y is more likely

_____ Example

**By Differentiating “Cause” from “_____”
Someone Could believe in All of these Statements:**

- An increase in firearm availability
- A decrease in the price of firearms will
- If parents locked up their firearms
- If someone commits a crime with a firearm,
- Although firearm availability increases

A Hard One to Understand

Cause versus _____

- The more a baby cries, the
- People who
