

Prelude to the Research Hypotheses Lecture

- I'm sure that you already know the central role that research hypotheses play in scientific research !!
- In fact, the whole process revolves around them ...
 - review existing literature to form hypotheses
 - develop research designs to provide relevant data
 - statistical analysis of those data to test hypotheses
 - evaluate what we've learned and repeat...

Research Hypotheses -- getting empirical research started

- ∞ It is important to understand and be able to identify the different types of research hypotheses
 - whenever planning your own research or evaluating the research of others, you have to be sure that the type of research hypothesis "matches" the way the research is conducted
- ∞ A research hypothesis is "a informed guess about behavior or the relationship between behaviors"
- ∞ We will focus on three types...
 - Attributive research hypotheses
 - Associative research hypotheses
 - Causal research hypotheses

Attributive Research Hypothesis

- ∞ states that a behavior exists, can be measured, and can be distinguished from similar other behaviors
- ∞ univariate hypothesis (one variable or behavior involved)
 - By the way -- this is the easy way to identify an attributive research hypothesis -- it only involves a single variable
- ∞ Evidence needed to support an attributive hypothesis ...
 - need to demonstrate a technique that allows properly trained researchers to reliably record and score the behavior
- ∞ This is the most basic type of research hypothesis, because if we can't measure behavior (and know what we've measured) we can't collect data, do analyses, test hypotheses about relationships between behaviors, etc.

Associative Research Hypothesis

- ∞ states that a relationship exists between two behaviors -- that knowing the amount or kind of one behavior helps you to predict the amount or kind of the other behavior
- ∞ bivariate hypothesis (two behaviors or variables involved)
 - hypotheses of this type will refer to using the value of one variable to "predict," "estimate," "foretell," or "anticipate" the value of the other variable or how variables are "related", "associated" or how particular scores on one variable "tend to" go with particular scores on another variable
- ∞ Evidence to support ...
 - show that there is a reliable statistical relationship between the two variables

Causal Research Hypothesis

∞ states that differences in the amount or kind of one behavior cause differences in amount or kind of the other behavior

∞ bivariate hypothesis

hypotheses of this type will refer how changing the value of one variable "cause," "produce", "lead to," "change," "increase," "decrease" the value of the other variable or that changes in one variable are "why" or "the results of" changes in the other variable

Evidence needed to support a causal hypothesis...

- temporal precedence ("cause precedes effect")
- demonstrate a statistical relationship
- elimination of alternative explanations (no other viable causes/explanations of the effect)

Identify each type of research hypothesis below (answers next page)

1. I think I can estimate scores on Exam 1 from performance on homework assignments.
2. My hypothesis is that using computer-based homework will lead to higher exam scores than using paper-based homework.
3. A mathematics professor has written a test that she claims can assess high school student's aptitude to learn higher mathematics
4. I think I can improve your scores on Exam 1 by grading and returning your homework assignments the next class period.
5. My hypothesis is that how many credit hours you are taking this semester is related to how many hours you work each week.
6. I think that my new Social Evaluation Apprehension Scale measures an important aspect of social anxiety.

1. I think I can estimate scores on Exam 1 from performance on homework assignments.

Associative -- 2 variables (exam 1 scores & homework performance) and "estimate" is an associative word

2. My hypothesis is that using computer-based homework will lead to higher exam scores than using paper-based homework.

Causal -- 2 variables (type of homework and exam scores) and "will lead to" is a causal phrase

3. A mathematics professor has written a test that she claims can assess high school student's aptitude to learn higher mathematics

Attributive -- 1 variable (aptitude for higher math)

4. I think I can improve your scores on Exam 1 by grading and returning your homework assignments the next class period.

Causal -- 2 variables (exam 1 scores and how quickly homeworks returned) and "improve" is a causal word

5. My hypothesis is that how many credit hours you are taking this semester is related to how many hours you work each week.

Associative -- 2 variables (credit hours and hours of work) and "is related to" is an associative phrase

6. I think that my new Social Evaluation Apprehension Scale measures an important aspect of social anxiety.

Attributive -- 1 variable (an aspect of social anxiety)