Week 9 lecture notes - PSYC 3435

Mar 20-24, 2017

This week, we'll talk about factorial designs

Motivation

So far, all of our experiments have had exactly **one** independent variable. What happens when you have two or more?

Example

Suppose you are interested in the effects of modality (visual versus auditory) on memory. Consider the following experiment:

- procedure: give participants a list of words to remember
- IV1: presentation mode (visual, auditory)
- IV2: test mode (visual, auditory)
- DV: score on a recognition test ("was this word in the list?")

One way to approach this is to run two t-tests on memory scores:

- Test 1: compare means for visual study and auditory study
- Test 2: compare means for visual test and auditory test

Here's some data (use JASP dataset?):

- Study mode:
  - visual study: M = 65
  - auditory study: M = 65

- Test mode:
  - visual test: M = 65
  - auditory test: M = 65
- what would we say about the results of our manipulations??
  - no effect of study mode AND no effect of test mode!

However, we might be missing something:

- what happens when we consider various combinations of our IVs?

Data:

	visual pres	auditory pres
visual test	80	50
auditory test	50	80

- what happens when we plot these?
- what story does this data tell?
- this is a textbook example of an *interaction*, and is the result of a **factorial design**

Definitions - Factorial Desins

- *factors* - another name for independent variable
  - ex: test mode
- *levels* - the values each factor can take
  - ex: test mode has two levels: visual, auditory
- an N x M factorial design has *two* factors; the first with N levels and the second with M levels
- Example: in our previous study, we had a 2 x 2 design.
- Example: consider a 2 x 4 design:

	B1	B2	B3	B4
A1				
A2				

The number of *conditions* is calculated by multiplying the numbers of levels, so a 2x4 design has 8 conditions.