Psychology 2200

Developmental Psychology I: Fundamentals

Research Strategies

learning objectives

- describe the basic goals and strategies of the University of Winnipeg "Eco-Kids on Campus" program
- define 'reliability' and 'validity' and explain how to determine them
- describe the correlational and experimental designs
- explain what a correlation coefficient (*r*) represents
- explain what an effect size (*d*) represents
- design a study that would test the effectiveness of some of the components of the Eco-Kids on Campus program

Eco-kids On Campus

- **objective**: improve the future of inner city kids
  - increase # students graduate from high school
  - increase # of students who enrol in university
- **strategy**: 10 week program
  1. parent involvement
  2. field trips
  3. science on campus
  4. graduation ceremony

measurement reliability

graduation

student-report

Did you graduate from high school?

☐ yes ☐ no

parent-report

Did your son/daughter graduate from high school?

☐ yes ☐ no

made-up data

		student-report: yes	student-report: no
parent-report	yes	81	14
	no	35	19

measurement reliability

graduation

student-report

Did you graduate from high school?

☐ yes ☐ no

parent-report

Did your son/daughter graduate from high school?

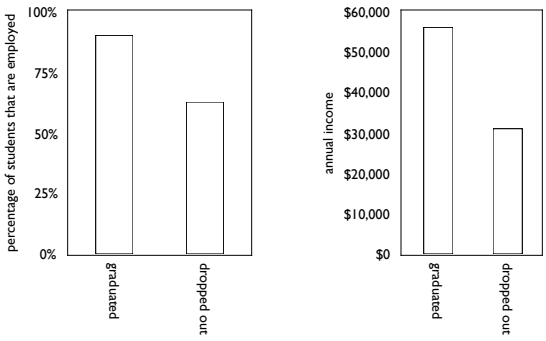
☐ yes ☐ no

made-up data

		student-report: yes	student-report: no
parent-report	yes	81	1
	no	2	34

validity

graduation as measure of "brighter" future



measurement reliability

graduation

- **reliability**: Is a measurement consistent or repeatable?
  - e.g., consistency between parent- and child-report re: graduation
- **validity**: Is a measure actually measuring what it is supposed to measure?
  - e.g., is graduation from high school associated with a brighter future?
  - to be valid, must first be reliable

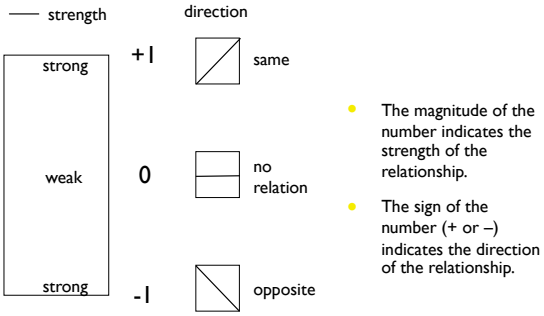
study designs

- **correlational**
  - measure two variables to see if they are associated (correlated)
- **experimental**
  - manipulate one variable (called independent variable)
    - randomly assign people to be in one of several conditions
  - and measure a second variable (called dependent variable) to see if it is different between conditions

correlational design

- Do the people who stay in the program the longest (when they are 12) the same people who make the most money when they are 40?
- measure two variables
  - number of weeks in the program at age 12
  - annual salary at age 40
- plot the two variables on a scatterplot

correlation coefficient, *r*



- The magnitude of the number indicates the strength of the relationship.
- The sign of the number (+ or –) indicates the direction of the relationship.

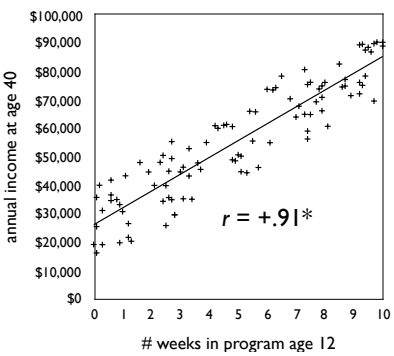
correlations

interpretation

- correlation: ***r*-value** (range = -1 to +1)
  - .1 < |*r*| < .3 = "small"
  - .3 < |*r*| < .5 = "medium"
  - .5 < |*r*| = "large"
- ***p*-value (range = 0 to +1)**
  - statistic that indicates *whether* a trend is attributable to chance
    - when $p < .05$, trend is significant - delineated with *
    - when $p > .05$, trend is not significant (just chance)

let's pretend these are the real numbers

Can we conclude that the program causes income at age 40 to increase?
Why or why not?
A. yes
B. maybe
C. no

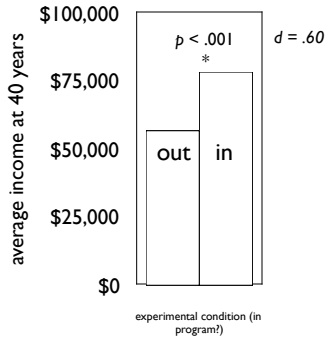


experimental design

- **correlational design**
  - allows you to draw conclusions about the real world effects
  - does not allow conclusions about what is causing what
- **experimental design**
  - does not allow for conclusions about the real world effects
  - does allow for conclusions about causation
  - **experimenter manipulates independent variable**: in program at age 12 or not
  - IMPORTANT: randomly assign kids to be in program or not
- then measure **dependent variable**: annual income at age 40

dependent variable

income at age 40



experiments

interpretation

- effect size: ***d*-value** (range = -infinity to +infinity)
  - .2 < |*d*| < .5 = "small"
  - .5 < |*d*| < .8 = "medium"
  - .8 < |*d*| = "large"
- ***p*-value (range = 0 to +1)**
  - same as before

Could it work better?

group discussion

Questions

Could the program help more children without increasing costs and with the same positive outcomes for the children?
How?
What data would give you good reason to be confident about it?

- **Eco-Kids on Campus**
  - 10 week program
    1. parent involvement
    2. field trips
    3. science on campus
    4. graduation ceremony