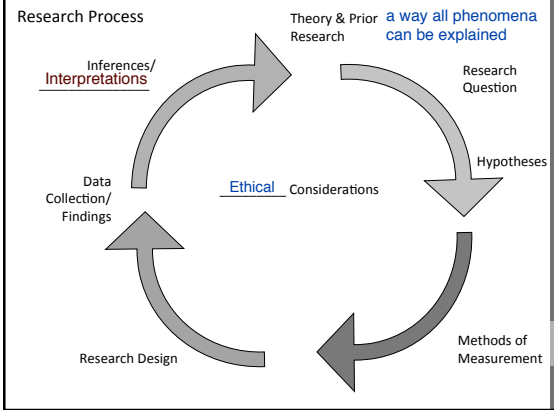
Research

"It is a good morning exercise for a research scientist to discard a pet hypothesis every day before breakfast. It keeps him young."
- Konrad Lorenz



Research Fundamentals

Theory – broad explanations for a wide range of phenomena

Hypotheses – Testable assumptions derived from theories

- Use operational definitions **explicit defining**
- Falsifiable **can be disproved**
- Used to guide collection of empirical data

★ how many times do you cry/ week
standardized Qs. that measure Depr.
Others reporting (in children)
Clinically significant impairment/ distress

Validity & Reliability

- Good studies use valid and reliable measures
- **Validity** – Measures what it's supposed to measure eg. GPA w/ a yardstick
  - **Internal Validity –** ruling out other explanations through controlling variables
  - **External Validity –** how much you can generalize this result to other subjects, situations, and populations
  - Increasing internal validity may decrease external validity
- **Reliability** - repeatability/consistency of measures (eg. std. questionnaires answers consistent across time)
- **Replication** – when a study is repeated (often by new researchers) using new subjects and similar results are found
  - **Non-replications**

ESP is real; other results show diff. info

NOT CONCORDANT!

Avoiding Biased Samples

Not practical; list may not be thorough, non-responses

- *Random samples* maintain validity and help us develop appropriate diagnostics and treatments
- *Representative samples* - does your sample represent the population?
  - proportion: transfer students, intl. students
  - TQ: Is a clinic sample representative? Why or why not?
    - vs. community sample
    - repr. of people seeking treatment
- Unbiased *samples*- initially the groups don't differ systematically
  - Don't let people choose their own treatment in studies
    - TQ: Why? Diff. opinions, SES, individual diff., etc
  - Typically attainable by **random** assignment

Preserve the integrity of the study

Case Studies

Focus is on the Individual

Advantages:

- Illustrate
  - Nature
  - Course
  - Outcomes
- Study rare conditions

unable to get more people w/ same damage

Disadvantages:

Eg. Kidnapped Genie, found w/o language abilities

- Biases Experimenter bias, idk what she's been exposed to..
- Reliability None, only 1 person
- Validity

measuring what you're supposed to measure? Don't know other factors influencing

Max was a 7 year old boy when he was first referred for psychiatric evaluation by his school principal…long-standing problems such as severe rage outbursts, loss of control, aggressive behavior, and paranoid ideation had reached crisis proportions.

Max was the product of an uncomplicated pregnancy and delivery, the only child of a professional couple. There was a history of "mental illness" in the paternal grandmother and two great aunts. Max's early development was characterized by "passivity"… he used a bottle until age 3. Verbal development was good; he spoke full sentences at 1 year. Toilet training was reportedly difficult.

-family background
-medical history
-milestones

Cantor & Kestenbaum, 1986

Max was clumsy and had difficulty manipulating toys, his tricycle, and his shoelaces. When he began nursery school, he was constantly in trouble with other children … Max "developed a passion for animals" … at age 5 Max acquired an imaginary companion, "Casper - the man in the wall" who was ever present. Max insisted that he could see him, although no one else could. Casper's voice, he said, often told him he was a bad boy.

Max's behavior was so unmanageable during the 1st and 2nd grade he was rarely able to remain in the classroom…Max described animals fighting and killing people … The psychologists noted a schizoid quality because of the numerous references to people from outer space, ghosts, and martians, as well as the total absence of human subjects… despite his high intelligence, Max was experiencing the world as hostile and dangerous.

Eg. Paranoid Schizo
Rare in such young children

Cantor & Kestenbaum, 1986

Interview

Advantages:

- Semi-structured
  similar questions across clinicians
- Can probe, expand and clarify responses

can follow up : probe, expand, clarify

Disadvantages:

- Time consuming
- Subject must be willing/able to report
- Interviewer desirability bias

May answer in a way they see as desirable

"0 sex partners, mom"

Questionnaire

Advantages:

- Highly structured
- Not time consuming
- Can obtain a lot of information

Disadvantages:

- Cannot probe, expand, and clarify responses
- Subject must be willing/able to report
- Non-responders

Observation

Watch how you behave in a situation

Advantages:

- Structured or naturalistic

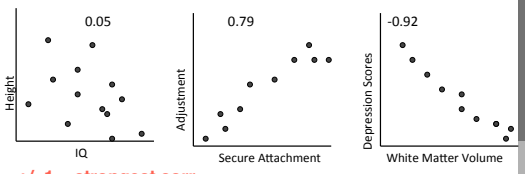
Watch children at the park vs bring them into lab

Disadvantages:

- Time consuming
- Coding system influences Demarcate each behavior
- Subjects react to observation
  -behavior changes upon being watched

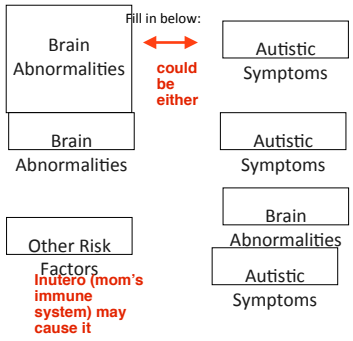
Correlational Methods

- Determine whether there is a relationship between existing variables tall vs short, depressed vs undepr.
- Both direction and magnitude matter
- No random assignment, can be used when random assignment would be unethical "Abused children condition"



+/- 1 = strongest corr
0 = none

Correlation does not imply causality:



Although there is a correlation between brain size and autistic symptoms, we do not know if (a) brain abnormalities cause autistic behaviors, (b) autistic behaviors lead to abnormal brain development, or (c) other risk factors, like exposure to toxins, cause both brain abnormalities and autism. Based on Baron-Cohen (2005) and Lawrence and colleagues (2005).

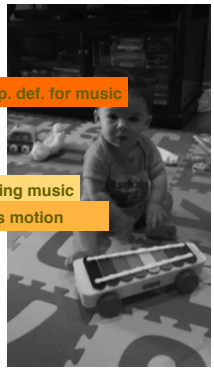
Research Designs - Experiments

- *Experiments* test cause and effect relationships between variables
  - TQ: How can we tell if something **causes** something else?
- Experimental control over variables
  - Independent *variable* – what is hypothesized to **cause** the effect
    - Conditions/Groups the experimenter assigns
  - *Dependent variable* – what "depends on" the independent variable
    - What you are measuring
    - Where the effect will be seen

Causal (internal validity - control)
-Variable A comes first -stimulus must precede effect
-Variable A and B must covary - change together
-Rule out alternative causes

Example Experiment

- *Theory:* Music makes this baby dance.
- Hypothesis: Playing this xylophone will increase the rhythmic motion of this baby.
- *Experiment:* Watch!
- What is the independent variable?
- What is the dependent variable?
- How can we improve this experiment??



Op. def. for music
Playing music
Babies motion

Remove Pos Rein (praise)
Diff. instrument
Diff. play parter
New location
Blind fold the baby (may be about the audio visual)

Example Experiment

- *Theory:* Sleep deprivation leads to impulse control problems in children.
- *Hypothesis:* Depriving children of one night of sleep will impair performance on a delayed gratification task.
- *Experiment:* Have some children stay up all night, others sleep normally and see who is able to wait longer before eating the delicious marshmallow in front of them.
- I create 2 groups of subjects
- Group 1 – twenty 10 year olds who will stay up all night
- Group 2 – twenty 10 year olds who will sleep normally
- The next day they participate in the delayed gratification phase.
- What is the independent variable? Amount of sleep
- What is the dependent variable? Time taken to to eat marshmallow
- How can we improve this experiment?

Op. def. delayed grat.

Baseline for w/o sleep;
Something more relevant for 10 y/o
~~have sub. choose a preferred treat~~
Replicate
Rule out hunger
SES - not sensible for those kids to leave till later

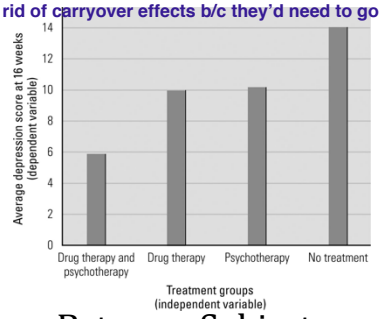
Experimental Subjects

- Within -subjects experiments – the different conditions are applied to each subject
  - TQ: What are the advantages of a within-subjects design? Why don't we always do this kind of experiment?
- Between -subjects experiments – different conditions are applied to different subjects
  - Each subject receives only one condition
  - **Random assignment needed**
- Was the stay-up-all-night study a within-subjects or between-subjects experiment? Why?

Compare each child w/ themselves
Each sub. goes thru >1 condition - Baseline
Balancing effects

Disadvantages:
practice effect/repetition effect
carryover effect - inf. of previous attempt
apriori conditions:
can't step in the same river twice
you have changed not the river

Eg.
Can't get rid of carryover effects b/c they'd need to go to apriori conditions



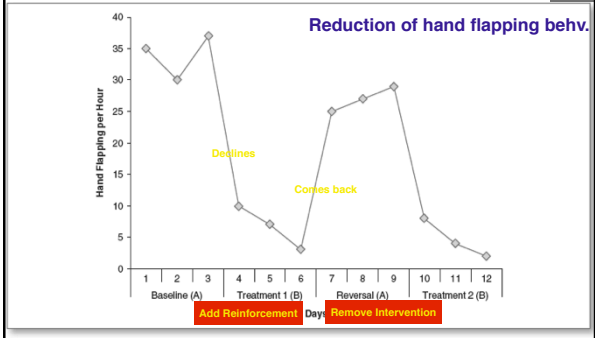
Between Subjects

★

Time series studies

- Reversal designs
- Multiple baseline designs

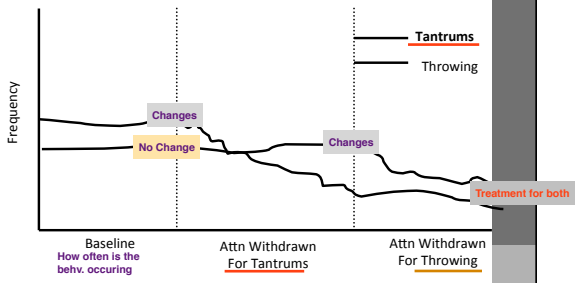
Reversal designs



Note: In this study, the therapist collects baseline data on the child's hand flapping (A) and then provides reinforcement contingent on keeping hands at side (B). In the reversal phase (second A), reinforcement is removed, resulting in an increase in hand flapping. Finally, reinforcement is reapplied (second B) to again reduce the behavior.

Multiple behaviors you want to change

Multiple Baseline Designs

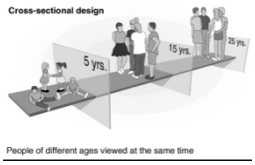


TQ: What are the benefits of a multiple baseline over a reversal design?

Must stop treatment to show it's working in Reversal Design (impos. for medicine, may be unethical)
Good evidence to show only intervention is causing improvement

Cross-sectional and longitudinal designs

Between Subjects ALWAYS

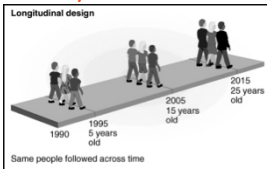


Measures behavior b/w subjects

Quick to do

Differences may be due to generational variables

Within Subjects ALWAYS



Measures developmental change; can describe course

Longer, more expensive, dropouts, repeat testing

TQ: Is a cross-sectional study within or between subjects? What about a longitudinal study?

Nature & Distribution

How common disorders are

- **Epidemiological research** – study of incidence, prevalence and co-occurrences of childhood disorders
- **Incidence rates** – number of NEW cases of a disorder in a specific period (RISK)
- **Prevalence rates** – ALL cases observed at a specific point in time (WIDESPREAD)
- **Lifetime prevalence** – number or proportion of cases of a disorder diagnosed at any time in life

-20% will have Depression at some point in their life

Ethics

Eg. Skygee - syphilis study

- Institutional Review Boards to prevent abuses
- Informed consent (parent) and Assent (minor)
- Voluntary participation
- Privacy
  - Confidentiality & anonymity
- Do no harm & do good
  - Risk-Benefit ratio

Cold pressure task: other hand holding significant other longer times