

Cannabis and Health

Module 3

Lecture 3: How To Evaluate Evidence

What is the evidence for your beliefs about cannabis?

- Experience
 - It worked for my anxiety!!
 - It makes me SUPER paranoid...
- Intuition
 - It's natural so I feel good about it...
- Authority
 - Jeff Sessions said it's as bad as heroin!

Personal Sources vs. Empirical Evidence

- Personal sources of information are inherently biased
- Goal of the this module is to understand why EMPIRICAL EVIDENCE is superior

Personal Sources vs. Empirical Evidence

- What do experience, intuition and authority all have in common?
- They have no comparison group (CONTROL GROUP)
- Why do we need a control group?



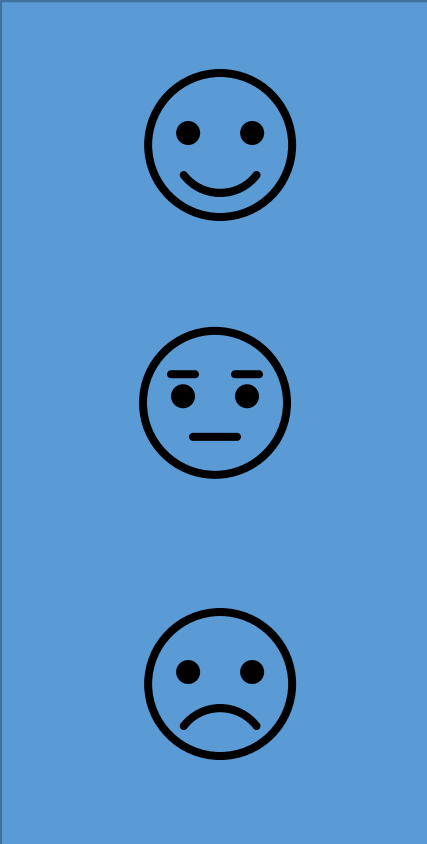
Amanda has been experiencing pain in her lower back and it's interfering with her daily activities. Her intuition tells her that she should try cannabis to help with her pain...

- Amanda eats a cannabis edible every day for three weeks and her pain goes from a consistent 8 on a 10 point scale to a 4. She feels great!
- Can Amanda conclude cannabis is the cause of her reduction in pain?
- Why or why not?



Why a Control Group is important...

	Cannabis	
Pain Reduced		40
Pain Not Reduced		10
Percent with reduced pain		75%
	Cannabis	
Pain Reduced		25
Pain Not Reduced		25
Percent with reduced pain		50%
	Cannabis	
Pain Reduced		10
Pain Not Reduced		40
Percent with reduced pain		25%



Why a Control Group is important...

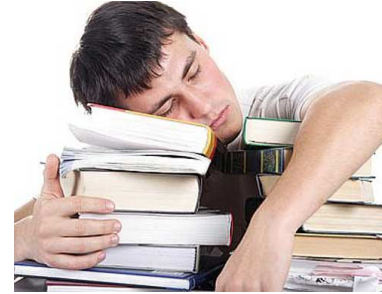
	Cannabis	No Cannabis
Pain Reduced	40	40
Pain Not Reduced	10	10
Percent with reduced pain	75%	75%

	Cannabis	No Cannabis
Pain Reduced	25	10
Pain Not Reduced	25	40
Percent with reduced pain	50%	25%

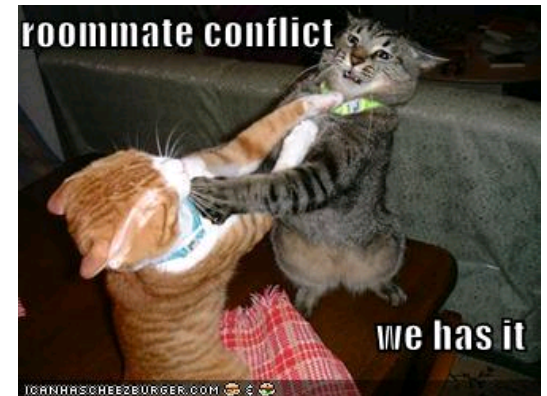
	Cannabis	No Cannabis
Pain Reduced	10	5
Pain Not Reduced	40	45
Percent with reduced pain	25%	10%



Experience is Confounded



The Teacherless Classroom



What is a confound?

- **Confound: an alternative explanation for your finding**
- In research, is there anything other than the manipulated variable that might have caused the results?
- In Amanda's "study", is there anything other than cannabis that might have caused her pain to lessen over time?

Research vs. Intuition

- Intuition is biased in two important ways because we are MOTIVATED PERCEIVERS
- Thinking the “easy” way
 - The good story
 - The present/present bias
 - Availability heuristic
- Thinking what we want
 - Cherry picking the evidence
 - Confirmation bias

The Good Story



Distant Mothers Are to Blame for Their Child's Autism.

In the 1950s and 1960s, the prevailing theory for why some children developed the condition had to do with poor parenting. Ignored by their parents, these children turned instead to the comfort of their inner selves.

- Makes sense, right?

The Present/Present Bias



- A girl I know took LSD. She was happy.
 - What about the girl who took LSD and wasn't happy? (LSD present/ happiness absent)
 - Or the girl who didn't take LSD and was happy? (LSD absent/ happiness present)
 - Or the girl who didn't take LSD and wasn't happy? (LSD absent/ happiness absent)
- Remember you need to explore the results for multiple people and in both the experimental AND control condition

The Availability Heuristic

- The availability heuristic: things that come easily to mind guide our thinking
- Which are deadlier? Sharks or horses?
 - http://www.youtube.com/watch?v=2_wkv1Gx2vM

Cherry picking the evidence

- Global warming can't be real; it snowed every week of the spring semester.
- He definitely likes me; he always texts me back when I text him.
- I don't have a drinking problem; I never drink before 10 am.

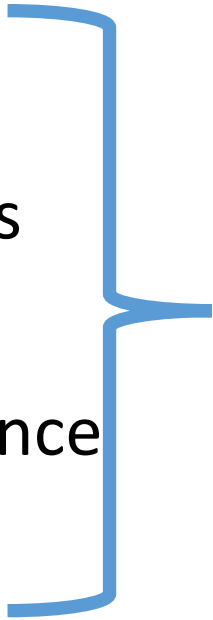


Confirmation Bias

- Who are the people most likely to watch MSNBC?
- Who are the people most likely to watch Fox News?

Biases of Intuition

- The good story
- The present/present bias
- Availability heuristic
- Cherry picking the evidence
- Confirmation bias



Carefully conducted
research attempts to
AVOID these biases

Trusting Authority

- Define “authority” ...
 - A woman who “plays a doctor on TV”?
 - Your big brother?
 - Fox News? Or MSNBC?
- Are peer reviewed empirical studies a good “authority”?

Watch out for bias from “authority”

- Authorities can also cherry-pick the evidence to support their own position.
- Authorities can base their advice on their own experience and intuition.
- Authorities may be citing unreliable research.
- Always ask “What is the evidence?” If the authority can cite reliable peer-reviewed scientific evidence, less possibility of bias.

Summary

- Good evidence comes from empirical research studies that
 - utilize a large, representative sample
 - include a control/comparison group
 - have strong internal and external validity (next module)
 - have been through the process of peer review
- Your goal is to be an informed consumer of the evidence

Discussion

- But what happens if there are no empirical studies? Do you act on information that may be biased? Put yourself in the shoes of a cancer patient who has heard that cannabis will mitigate extreme pain in the hands and feet that are caused by chemotherapy. If cannabis reduces pain, can she conclude it is effective?