Lecture 2: Principles of Science

Friday, September 8, 2023

Your Teaching Fellows:

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Lectures: MWF 12:00 PM – 1:00 PM (003); 1:00 PM – 2:00 PM (004); 2:00 PM – 3:00 PM (010)

Office hours: Tuesdays 2:00 PM – 4:00 PM

Corrections and clarifications to syllabus and slides

- Exam 1: October 6th (discrepancy between calendar and assessments page) – sorry!

- Research paper due Nov 26th (as mentioned in class email)

Learning objectives

▪ By the end of this lesson, you will be able to:
  ▫ Differentiate between data- vs. non-data-driven ways of knowing
  ▫ Generate examples illustrating the limits of on non-data drive ways of knowing
  ▫ Understand the fundamental tenets of science
  ▫ Explain how the scientific method relates to critical thinking

eHarmony

- Regarding eHarmony…
    - What are you being asked to believe?
    - What evidence is being given as support for this belief?
    - Are you being given all the evidence for and against this belief?
    - Is there more than one way to interpret the evidence for this belief?
    - What additional evidence would help to evaluate these alternatives
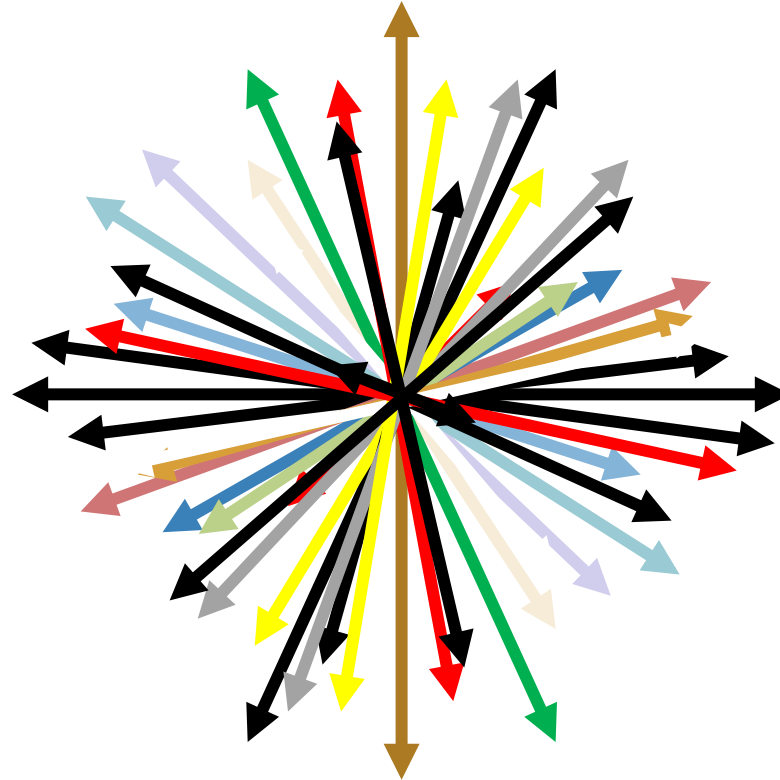   - What conclusions are most reasonable?

eharmony

#1 TRUSTED DATING A

QUALITY DATING POOL

Most importantly…

- Any published, peer-reviewed, empirical evidence given to support their claims?

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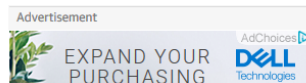
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People with Type A blood are MORE likely to catch coronavirus than those with Type O, study claims

- Scientists studied the breakdown of coronavirus patients by their blood type
- People with type A blood were significantly more likely to contract virus
- In the general population Type O blood (34%) is more common than A (32%)
- But in the infected this was reversed with Type O just 25% while Type A was 41%
- Coronavirus symptoms: what are they and should you see a doctor?

新冠病毒自檢與預防措施
一分鐘學習了解
日本和台灣醫生推薦了非常好的預防和自檢新冠病毒方法，請留意：
新冠病毒潛伏期可以長達14到27天，感染初期可能完全沒有症狀，但到病發時很多案例肺部已出現50%纖維化，病情難以控制。

台灣醫生推薦一個非常有效的自檢方法：深吸一口氣，憋住10秒鐘，如果能順利輕鬆完成而且沒有咳嗽和胸部壓迫感，恭喜您，這是代表您沒有被感染！

日本醫生推薦了非常有效的預防措施：
我們應該保持口腔和喉嚨濕潤，每15分鐘喝點水，這樣做除可保護口腔，還可以把已進入口腔的病毒細菌沖進胃裡，讓胃酸把不速之客殺滅如果我們沒有喝足夠的水，病毒會從呼吸肺部，造成極大生命威脅！

請盡量分享給家人朋友

Self-diagnosing and prevention procedure for new coronavirus

Take a minute to learn

Japanese and Taiwanese doctors recommend a very good prevention and self-diagnosing method for the new coronavirus. Please take note:

The new Coronavirus can incubate for 14-27 days, and can be asymptomatic while communicable; but once symptoms emerge, a lot of lungs show significant fibrosis.

Taiwanese doctors recommend a very effective self-diagnosing technique: Take a deep breath and hold it for 10 seconds. If you can easily do it without coughing or feeling pressure in your chest, then congratulations, you haven't caught the virus!

Japanese doctors recommend a very effective prevention technique: We need to maintain moisture in our oral cavity and throat. Drinking water every 15 minutes can protect your oral cavity, and also flush the virus in your mouth down into your stomach, where it gets killed by your stomach acid. If we don't drink enough water, the virus will enter the trachea and attack the lungs, becoming a huge threat to our lives!

Please spread this as widely as you can to your friends and family

Responses

Games do cause violent behaviour:	Games do not cause violent behaviour:
- Violent games desensitize people to violence - Gamers who play violent games may want to live out fantasies in real life	- Something else is probably at play, not a direct link (lots of people play violent games are not violent) - Some people may be predisposed to violent behaviour - Violence predates video games (see gladiators D:)

How do we know what we know?

Ways of Knowing

Scientific method

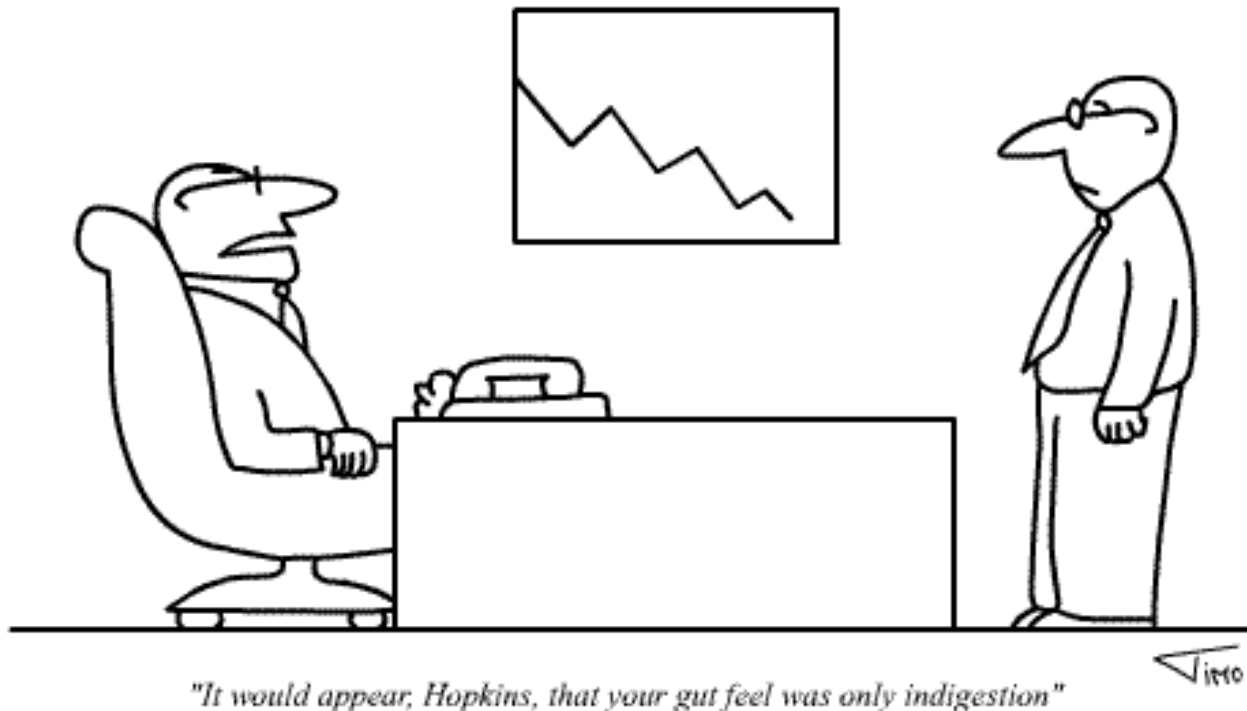"Unscientific" (non-data-driven) methods

Logic

Experience

Folk wisdom/ common sense

Authority

Intuition

Intuition

- Unquestioning acceptance of own judgment

"It would appear, Hopkins, that your gut feel was only indigestion"

Caption: *"It would appear, Hopkins, that your gut feel was only indigestion"*

Intuition

- Pros:
  - More quickly and easily access knowledge
  - Allows us to understand values that are important to us

- Cons:
  - Difficult to analyse and critique
  - Subject to prejudices and misconceptions

Authority

- Knowledge based on information from "credible other"

Authority

- Pros:
  - Minimises need to acquire knowledge on our own
  - Many people of authority have legitimate credentials to be considered "authority"

- Cons:
  - Authorities may be wrong, or use intuition, experience, or folk wisdom
  - "Authority" may be due to *perceived* cues of credibility (e.g. attractiveness, popularity)

Common Sense/Folk Wisdom

- Appealing to what one expects everyone else to know

Common Sense/Folk Wisdom

- Pros:
    - There is an explanation for every situation
    - A short, mutually understood way of communicating more complicated idea

- Cons:
    - Often contradictory, rendering them meaningless
    - Cannot be refuted or falsified

Experience

- Relying on personal experience to make decisions

|Sumaryanto Bronto||Javanesse Old Smoker|2006||

Experience

- Pros:
  - May be representative of collection of all possible experiences
  - Vivid examples that are easy to remember

- Cons:
  - May not be representative of collection of all possible experiences
  - Cannot account for alternative explanations

How do we know what we know?

Ways of Knowing

Scientific method

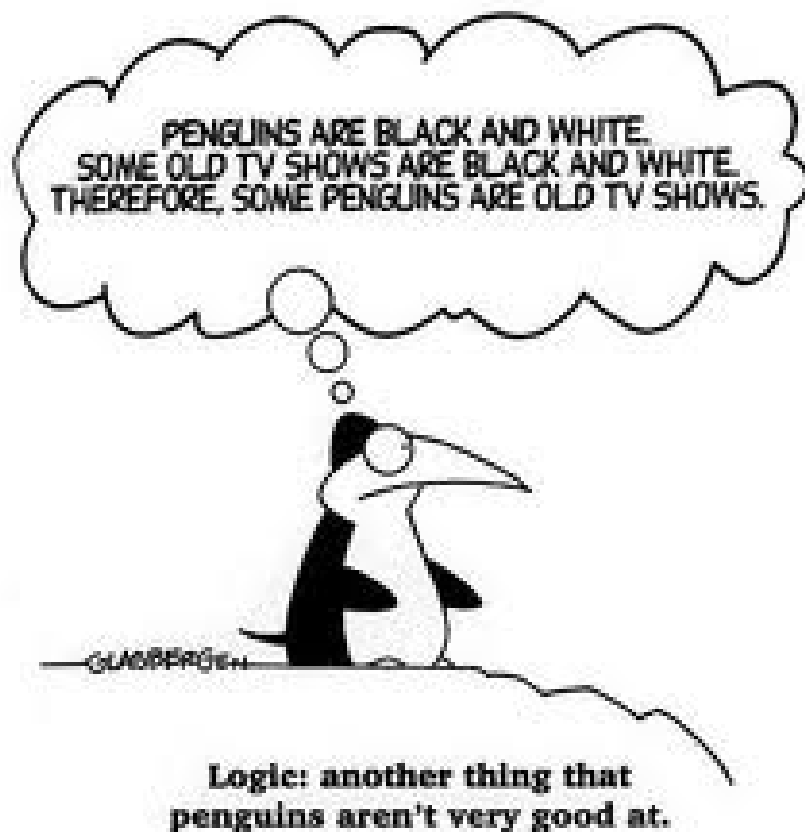"Unscientific" (non-data-driven) methods

Logic

Experience

Folk wisdom/ common sense

Authority

Intuition

Logic

- Knowledge derived from rules of logical thinking

Logic: another thing that penguins aren't very good at.

Bubble: *"Penguins are black and white. Some old TV shows are black and white. Therefore, some penguins are old TV shows."*

Caption: *"Logic: Another thing that penguins aren't very good at."*

Logic

- Pros:
  - Leads to internally consistent reasoning and decisions
  - Easy to analyse and critique

- Cons:
  - Logical reasoning may be based on incorrect premises or information, or other logical fallacies
  - What may be logically consistent may actually differ from what occurs in the world

Activity

- Come up with one time that you or someone you know relied on
  - Authority OR
  - Intuition OR
  - Folk wisdom/common sense OR
  - Logic…

- …to make a decision or judgment – whether it went right or wrong!

Responses

Games do cause violent behaviour:
- Violent games desensitize people to violence
- Gamers who play violent games may want to live out fantasies in real life

Games do not cause violent behaviour:
- Something else is probably at play, not a direct link (lots of people play violent games are not violent)
- Some people may be predisposed to violent behaviour
- Violence predates video games (see gladiators D:)

Critical Thinking & Science

- Research methods give us a common language and set of tools to guide and encourage critical thinking

- Not the *only* way of knowing...
  - ...but it's the way by which all scientists abide (Indigenous ways of knowing and research, discussed later in term)

- Psychological science relies on the scientific method, and is data-driven

Getting to know a bit about you

- Go to http://bit.ly/217students to fill out:
  - Name
  - What do you hope to learn in this class?
  - What question(s) and/or expectation(s) do you have about this class?
  - Why did you choose psychology as your major?*
  - What are you most excited about regarding PSYC 217?
  - What are you most worried about regarding PSYC 217?
  - What's your favourite song (in any language)?*