CSD 598 - Winter 2026

Descriptive statistics and data visualisation

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Reminder: Epistemology and Ontology

Definitions

Epistemology "is the branch of philosophy that examines . . . "

Ontology "is the philosophical study of being. . . "

See Wikipedia (2025; 2026)

Causality

- We all know - or should know - by now that correlation does not imply causation.
- But what is causality?
  - David Hume has said that causality can not be proven empirically because we can not know if the world changes at a fundamental level.
  - Immanuel Kant has replied to this that causality is not a feature of the universe, but rather a way or tool of reasoning.
  - In addition, some phenomena in quantum physics break causality empirically. And in the general theory of relativity we can not say what the order of two events occurring is because it depends on the point of observation.
  - And this could all be wrong, but it's unlikely (or seems unlikely given the evidence).
- Unless this was not news, it should make one think. And that's what I'd like to encourage in any case.

Causality and other tools

- It is not enough to know how to use a tool, we should also understand enough of its workings that we know
  - the limits of our understanding
  - the limits of the tool
- Statistics is a tool. Like causality.

Reminder: Questions and thoughts to keep you thinking

- What do we assume to be true when using statistics?
- What do we assume to be true when doing empirical research?
- Does (can) one experiment refute generations of knowledge?
- Science is (also) an oral tradition.
- Science relies heavily on (somewhat formalised) storytelling.

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References

Wikipedia (2025). Epistemology. *Wikipedia*.

Wikipedia (2026). Ontology. *Wikipedia*.