

CSD 598 - Winter 2026

Getting started and Epistemology

Pertti Palo and Shanda Duggleby Wenzel

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Land acknowledgement

The University of Alberta, its buildings, labs and research stations are primarily located on the territory of the Néhiyaw (Cree), Niitsitapi (Blackfoot), Métis, Nakoda (Stoney), Dene, Haudenosaunee (Iroquois) and Anishinaabe (Ojibway/Saulteaux), lands that are now known as part of Treaties 6, 7 and 8 and homeland of the Métis. The University of Alberta respects the sovereignty, lands, histories, languages, knowledge systems and cultures of all First Nations, Métis and Inuit nations.

Other preliminaries

- ▶ "The most important thing in our lives".
- ▶ Thank you for your gift of time.

Who are these people?



- ▶ Pertti Palo
- ▶ I have a Masters engineering, a Licentiate in maths, and a PhD in Phonetics.
- ▶ I speak fluent phonetician, engineer, mathematician, and statistician.
- ▶ My super power is quantitative methods: both recording and analysis.

Who are these people?



- Shanda Duggleby Wenzel
- Proud mom of awesome humans
- M.SLP (2002), 20+ years as a clinician
- Soon-to-be PhD (hopefully 2027...?)
- Qualitative research

Who are you then?

- ▶ What's your name?
- ▶ What's your relevant background?
- ▶ What brings you here?
- ▶ What is your thing in life?

Let's plan the course together

Tentative schedule, part 1

These are all subject to changing depending on your input.

13th Jan This is today. We'll go through how the course works and talk a bit about epistemology.

20th Jan Data exploration: descriptive statistics and data visualisation.

27th Jan Speed run of CSD 501.

3rd Feb Reporting statistics, potential pitfalls of methods from 501.

10th Feb Linear mixed models and how all models are (kinda) the same model.

17th Feb Reading week. No lecture.

24th Feb Bayesian statistics and how our tools guide our questions.

Tentative schedule, part 2

These are all subject to changing depending on your input.

3rd Mar qualitative research

10th Mar qualitative research

17th Mar transformative paradigm

24th Mar practical suggestions, e.g., organizing yourself for research

31st Mar practical suggestions, e.g., preparing and submitting an ethics

7th Apr summary / catch up / other

Possible other topics speed run of other fun stats tools

including AI, data and analysis planning, what to do with bad data, can data be too good, inter-rater issues.

How to pass this course with flying colours

These (also) are all subject to changing depending on your input.

Short reflection essays.

Jan 20, by end of Reflection on your expectations and goals for the course.

Feb 24, by end of Reflection on quantitative research

Mar 31, by end of Reflection on qualitative/transformative research

Consider rubric from CSD 505. Whichever one you do best is the one that counts as your grade.

Critical evaluation of an article.

Apr 7, by end of Either you pick or we pick. (Ours will be short.)

Learning outcomes

- ▶ What do we want them to be?

An important note on notes

Note on note taking

- ▶ It's a good idea to keep a record of your developing understanding and especially of the questions you have.
- ▶ It's also a good idea to keep a record of any anomalies (or lack thereof) in data gathering because that makes analysis easier.
- ▶ Notebooks are good and there are way more possibilities out there beyond a regular composition notebook, which is a very solid choice though.
- ▶ Knowledge management systems such as Obsidian, Notion, Logseq and others can also be very useful, but might be more difficult and distracting to use during data recording.
- ▶ These also apply to this and any other course, which is why this topic is here.

Epistemology and Ontology

Definitions - one take

Epistemology "is the branch of philosophy that examines the nature, origin, and limits of knowledge. [...] Epistemologists study the concepts of belief, truth, and justification to understand the nature of knowledge. To discover how knowledge arises, they investigate sources of justification, such as perception, introspection, memory, reason, and testimony."

Ontology "is the philosophical study of being. [...] To articulate the basic structure of being, ontology examines the commonalities among all things and investigates their classification into basic types, such as the categories of particulars and universals. [...] Systems of categories aim to provide a comprehensive inventory of reality by employing categories such as substance, property, relation, state of affairs, and event."

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.

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.

References

- Wikipedia (2025). Epistemology. *Wikipedia*.
- Wikipedia (2026). Ontology. *Wikipedia*.