🌻 Epistemic logic does not help us with reasoning about causal maps

(An example of kind-of qualitative causal logic, with a focus on groups: @castellaniCasebasedSystemsMapping])

> From (Powell et al., 2024)

Seen as models of the world, causal maps, like systems maps, are fallible but useful: We can use inference rules (which are explicitly set out in FCMs, SDs, BBNs and CLDs and are implicit in other related approaches), and in particular, transitivity rules, to make deductions about the world.

There are at least three problems of transitivity which we need to think about

1. Given that A influences B and B influences C, does A influence C?
2. Given that P believes that A influences B and P believes that B influences C, does P believe that A influence C?
3. Given that someone believes that A influences B and someone else P believes that B influences C, does someone (who? we? the people?) believe that A influence C?

So if A causes B and B causes C, causal logic might tell us the answer to 1) under what circumstances A causes C.

Seen as models of individuals' causal beliefs, we can arguably use analogous rules to make deductions about what individuals believe, or ought to believe, given what else they believe.

There is a thing called epistemic logic which is a strange shadow of causal logic. Can it help us answer 2 and 3?

But epistemic logic is a strange thing.

If a person P believes that A causes B and B causes C, epistemic logic tells us what P believes about A causing C *if they were a rational person*. Whereas, facts about what people actually do believe is a branch of psychology.

In the last decades, thinkers like Daniel Kahneman have shown that in this sense, humans are so far from rational that it does not make sense even to start off with a rationality assumption and then add some corrections.

It would be great to use causal maps to infer, given a bunch of information about different people's causal beliefs, what they believe about *other* causal connections. That would be really useful. But it is hard.

There is a much easier way to reason with causal maps which is also vital for evaluators: to reason about **evidence**.

We can reason about causal maps using a logic of evidence

References

Powell, Copestake, & Remnant (2024). *Causal Mapping for Evaluators.*
https://doi.org/10.1177/13563890231196601.