🌻 Causal mappers believe that humans are the best detectors of causation

See also Causal mapping has been used for over 50 years in many disciplines

Causal mappers believe that humans are good at thinking in terms of causal nuggets

> From Powell, Copestake, et al. (2023

We claim: our everyday causal understanding is as primary as our perception of, say, colour and arises from more than empirical observations of associations between objects or events; our ability to infer causation goes beyond and is not primarily based on noting correlations. And for all its complexity and intuitive brilliance, it is also just as fallible as our perception of colour or size.

This reaffirms our practice as evaluators of taking the causal claims and opinions of humans (experts and non-experts) seriously (Maxwell, 2004a, 2004b); indeed, this kind of information is the bread and butter of most evaluations.

We can thank Judea Pearl for promoting the insight that if you want to thrive in this world, you have to understand causality natively. We humans make causal connections from an early age. We wouldn't survive long if we didn't.

GPT-3.5 just about understood causation. GPT-4 and more recent models understand causal connections within text very well.

Our understanding of the world is drenched with causal understanding: information and hypotheses about how things work (mostly accurate enough, sometimes not). It's really hard for us to *not* think causally: the concept of correlation is much harder to understand than the concept of causation.

Causal Inference?

Causal inference is the process of determining whether and how one event or variable brings about another.

Some writers mistakenly assume that only a controlled experiment can "really" provide a route to causal inference.

We would go so far as to say that we don't usually in any conscious cognitive sense *infer* causation -- we just see it, all the time, everywhere. We don't have to teach children to infer causation: we have to teach them to question their perceptions of causation and to distinguish causation from correlation.

Why are humans the best detectors of causation?

1. **Evolutionary Adaptation:**
   Human brains have evolved specifically to detect and act on causal relationships. Survival depends on recognizing which actions lead to which outcomes—e.g., which plants are safe to eat, which animals are dangerous, and how to use tools. This evolutionary pressure has made causal reasoning a core part of human cognition.

2. **Intuitive Causal Models:**
   From infancy, humans build mental models of the world that are fundamentally causal. Children naturally ask "why" questions and seek explanations, not just associations.

3. **Generalization and Flexibility:**
   Humans can generalize causal knowledge across domains. For example, understanding that pushing causes movement can be applied to objects, social situations, and abstract concepts. This flexibility allows humans to detect causation even in novel or ambiguous situations.

4. **Counterfactual Reasoning:**
   Humans often engage in counterfactual thinking—imagining what would happen if things were different. This is a hallmark of causal reasoning and is essential for planning, learning from mistakes, and scientific discovery.

5. **Distinguishing Correlation from Causation:**
   While humans sometimes make errors (e.g., seeing causation where there is only correlation), we are still very good at using context, background knowledge, and intervention to distinguish true causal relationships from coincidence.

6. **Social and Cultural Transmission:**
   Human societies accumulate and transmit causal knowledge across generations through language, stories, and education. This collective causal understanding is a foundation of science, technology, and culture.

7. **Observation and Pattern Recognition:**
   Humans are adept at noticing regularities and anomalies in their environment. We naturally look for patterns—such as temporal precedence (A happens before B), co-occurrence, and changes following interventions—that suggest causal relationships. Even without formal training, people intuitively apply principles like "no effect without a cause" and "causes precede effects."

8. **Intervention and Experimentation:**
   Humans frequently test their causal hypotheses by intervening in the world—changing variables and observing outcomes. This hands-on experimentation, whether in childhood play or scientific research, is a powerful tool for distinguishing causation from mere correlation.

9. **Use of Multiple Sources of Evidence:**
   Humans combine different types of evidence—temporal order, statistical regularities, mechanistic explanations, and observed interventions—to make robust causal inferences. We can weigh conflicting evidence, consider alternative explanations, and update our beliefs as new information arises.

In sum, humans are not just passive recipients of causal information; we are active causal detectives, constantly inferring, testing, and refining our understanding of how the world works. This multifaceted approach to causal inference is what makes us the best detectors of causation.

Conclusion

Causal reasoning is not just a feature of human cognition—it is its backbone. Our ability to detect, infer, and act on causal relationships is what allows us to navigate, survive, and thrive in a complex world. While formalised, controlled experiments are an incredible tool for causal inference in very particular contexts such as some areas of education and economics where multiple very similar causes are regularly followed by multiple very similar effects, if we had to stick to that kind of knowledge and that kind of context we would never be able to get out of bed in the morning, let alone get the kids to school.

Humans remain the best detectors of causation, both individually and collectively.

See also: 400 realist causation

