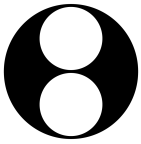

Causality Reading Group

Presented by Orbital Studies Magazine.
Meeting biweekly starting December 4th. To join us, please contact xavier@orbitalstudies.com

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Causality is deeply connected with knowledge—in a sense, to understand something is to understand its causes and its effects. Scientific explanation relies on the causal structure of the world, and so different theories of causality shape scientific fields. Complexity science is particularly interested in causality across scales. Biology is interested in both biophysical, and evolutionary forms of causation, with teleological (ends-driven) causality growing in interest.

Contemplative traditions also pursue these questions, as every cosmology has a cosmogenesis. Causal arguments are central to Catholic philosopher Thomas Aquinas' "five proofs" of God. The Buddhist doctrine of co-dependent origination blurs causes and effects into non-dual mutualities.

In this reading group we will stretch our thinking, explore texts on theories of causality from a diversity of fields, and observe how the world reveals itself when we take on these views.

Structure

For each meeting the Host will give an overview of that week's paper for 20-30 minutes, for the benefit of those who have not been able to read as closely, and then we will enter into discussion for the remaining hour. All participants are encouraged to have read the text for a higher quality discussion!

Schedule

Week 1: Causal Emergence 2.0.

Thursday December 4th, 2025 @ 11 AM EST
Host: Xavier Snelgrove

This week we'll read Erik Hoel's Causal Emergence 2.0: Quantifying emergent complexity. This is a recent paper building on Hoel's earlier interesting work on causal emergence. His work seeks to give mathematical foundations to ideas of emergence, justifying the intuition that reducing to the smallest components of a system is often not the best way to understand it. He works within an "interventionist" model of causality.

Additional reading:

- Some of his earlier work: Agent Above, Atom Below: How agents causally emerge from their underlying microphysics
- A critical take from Scott Aaronson: Higher-level causation exists (but I wish it didn't)

Week 2: Mutual Causality in Buddhism and General Systems Theory

Thursday December 18th, 2025 @ 11 AM EST
Host: Xavier Snelgrove

This week we'll read excerpts from Joanna Macy's Mutual Causality in Buddhism and General Systems Theory.

- Chapter 1: Considering Causality (p7-20)
- Chapter 3: Dependent Co-Arising as Mutual Causality (p45-64)
- Chapter 5: Mutual Causality in General Systems Theory (p91-102)

Week 3: Constructed Measures and Causal Inference: Towards a New Model of Measurement for Psychosocial Constructs

Thursday January 8th, 2026 @ 11 AM EST
Host: Zachary Schlosser

This week we'll read Tyler VanderWeele's "Constructed Measures and Causal Inference: Towards a New Model of Measurement for Psychosocial Constructs." Tyler is the Director of the Human Flourishing Program at Harvard, which recently published the first wave of their longitudinal study of over 200,000 participants in 22 geographically and culturally diverse countries to assess numerous aspects of flourishing and its possible determinants. In the paper VanderWeele argues that reflective and formative models of psychosocial constructs both "misconstrue the relation between the constructed measures and the underlying reality by

which causal processes operate," and proposes a new model of the process of measure construction. This is a critical application of causality assessment to psychometric design, particularly the design of psychometrics critical to a science of morality and computational ethical prediction

Week 4: Time Without Becoming

Thursday January 22nd, 2026 @ 11 AM EST
Host: JF Martel

> "Time Without Becoming" is a talk Quentin Meillassoux gave in London in 2008, two years after the original French publication of his book *After Finitude: An Essay on the Necessity of Contingency*, whose core argument it summarizes. Here, Meillassoux describes *correlationism*, an anti-realist trap that modern thought has found itself in since Kant, and offers a way back to the "great outdoors" of absolute reality by arguing for the utter falsity of the principle of sufficient reason, including any notion of causality. Behind our world, Meillassoux sees only "a time" that he calls *hyperchaos*, defining it simply as the necessary absence of any reason whatsoever for anything existing at all

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Appendix

Potential texts

Email xavier@orbitalstudies.com to suggest other potential texts

- Complexity Measurements and Causation for Dynamic Complex Systems
  - Book, could pick a chapter
- Mutual Causality in Buddhism and General Systems Theory
  - Book by Joanna Macy, could pick a chapter
- Mechanism and purpose: A case for natural teleology
  - Denis Walsh
  - Recommended by Alex Djedovic
  - Brings in teleological causation, and the biology perspective
- Something by Robert Rosen
  - Regarding Aristotelian 4-cause models of causation, Alex Djedovic writes: "The classic modern exposition is definitely Robert Rosen's work, but that stuff is a bit unclear, although quite generative"
- Causality by Judea Pearl
  - This is a classic, very influential in particular in ML and stats circles. An entire book, but we could do perhaps Pearl's first paper on the topic.
  - Note that Hoel's work from week 1 is in the interventionist tradition that Pearl formalizes.

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