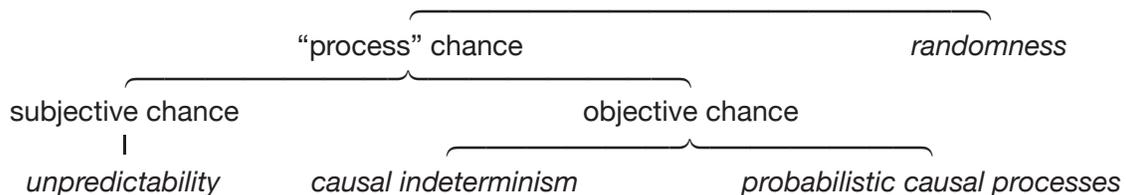


Four Conflated ‘Chance’-Like Concepts in Evolutionary Theory

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- **Main Thesis:** We ought to be more careful with our use of ‘chance’ (and related concepts) in evolutionary theory.
- **Two goals:**
 - We can distinguish four (at least) concepts in the vicinity of ‘chance’ that are clearly distinct *whatever* one’s interpretations of objective chances and probability might be.
 - We can show that the conflation of these four concepts *causes problems for real arguments*.
- **Four ‘chance’-like concepts:**



- We describe them with **three distinctions:**
 - “process” chance vs. randomness
 - subjective chance vs. objective chance
 - causal indeterminism vs. probabilistic causal processes
- So this gives us four notions of chance that, I claim, don’t rely on any heavyweight interpretations of chance or probability – they should be unobjectionable to almost any parties to this (or any) debate.

- **Case Study:** Brandon & Carson, 1996, “The Indeterministic Character of Evolutionary Theory” (*Philos Sci* 63:315)
- Whatever sort of ‘chance’ we might find in evolutionary theory, for B&C, comes from genetic drift. But they never say the same thing twice about drift.
 - *Conflated:* “drift clearly is a stochastic or probabilistic or indeterministic phenomenon” (324)
 - *Objective:* “if one is a realist ... then one should conclude that [evolutionary theory] is fundamentally indeterministic” (336)
 - *Subjective:* “the inferences we can make” about drift (322), what drift “can predict” or “cannot predict” (323)
 - Their argument, as much as there is one, claims that no “hidden variables” determine the course of genetic drift.
- **Response:** Graves, Horan, & Rosenberg, 1999, “Is Indeterminism the Source of the Statistical Character of Evolutionary Theory?” (*Philos Sci* 66:140)
 - Of course there are hidden variables controlling evolutionary theory (or at least there could be): they come from physics and chemistry.
 - So B&C must be begging the question.
- **Reinterpretation:** What if B&C is about probabilistic causal processes?
 - Brandon elsewhere develops a causal reading of drift.
 - This reading can be used to make sense of the hidden variables argument.
- So B&C conflate at least three ‘chance’-like concepts (unpredictability, probabilistic causation, indeterminism) – and their argument only makes any sense if we assume they mean probabilistic causation.
- And GHR conflate at least two in their response (indeterminism, probabilistic causation) – and if we reinterpret B&C using probabilistic causal processes, GHR’s critique fails to engage with its target.
- **Conclusion:**
 - We can draw three distinctions that should hold regardless of one’s interpretations of chance and probability.
 - These distinctions result in four ‘chance’-like concepts.
 - These four concepts, then, are persistently conflated in widely-cited, current literature.
 - Further, the conflation makes these arguments entirely *fail to engage* with one another.