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Why counterfactual risk analysis works – and how to make it work better

... history is a lively abode, full of surprises.
Erik Larson[1]

History is written by winners
Jesper Hoffmeyer[2]

Events pass, beliefs attend

A counterfactual is some fact that differs from consensus.[3] From a semiotic perspective, a counterfactual is a fact, presumed held, *and possibly acted on*, by a group of individuals. Counterfactual analysis thereby provides an estimate of alternative history and possible future, both of which enhance risk identification.[4]

Counterfactual also comes by other terms, *what-if, if-only*? The function of counterfactual reasoning helps people identify causes in the past and form intentions for the future; it also enables people to experience and process emotions such as regret or relief.[5] Ever the opportunists, game developers have applied counterfactual concepts in regret minimization to improve predictions by algorithms.[6]

A counterfactual can materialize by the action of a believer(s) constructing an event, much as with the construction of social reality.[7] Yet a counterfactual is singular and superficial; singular usually being a unique event, and superficial, the result or manifestation of a belief system, not the belief *per se*. By focusing on the underlying belief system, a single counterfactual acts like a clue, exposing a manifold process of risk that may yet materialize in future contexts owing to the on-going presence of the beliefs.[8]

A useful biological analogy is the allele, one of a number of alternative forms of the same gene occupying a given position in a chromosome. Alleles may be recessive or dominant. If

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[1] Erik Larson, *The splendid and the vile* (2020:XII)
[2] Hoffmeyer, J. (2011). The natural history of intentionality. a biosemiotic approach, p4. Retrieved, https://www.informationphilosopher.com/presentations/Biosemiotics/images/Hoffmeyer.pdf
[3] The counterfactual is usually attributed to a minor group, consensus to a major (power) group.
[4] Woo (2016), Schoemaker (2020)
[5] Bryne (2013)
[6] Zinkevich (2007)
[7] Searle (1995). See also, causal social construction and subjective causality.
[8] Nagy (2024), Popieluch (2021)

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dominant a particular phenotypic trait is expressed, otherwise not. The point is the allele remains in the genome, to be enacted in future generations given the appropriate context.

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