Bayesian Mechanista

There are two radical views regarding the role of mechanistic knowledge in causal inference in medicine. One view holds that inferences about the effectiveness of interventions should be based only on data from population-level studies (usually statistical evidence from randomised trials). The other view holds that such inferences must be based in part on mechanistic evidence. I argue for a middle view, and use confirmation theory to explain why the most salient arguments for both views can seem compelling. The competing views are local principles of inference, the plausibility of which can be assessed by a more general normative principle of inference. Bayesianism tells us to base inferences on both the ‘likelihood’ and the ‘prior’. The likelihood represents statistical evidence. One influence on the prior probability of a hypothesis like ‘d does x’ is mechanistic knowledge of how d does x. Thus, reasoning about such inferences by appealing to both statistical and mechanistic evidence is vindicated by our best general theory of inference.

FRIDAY, April 6th, BUCH A103  4:00 – 6:00