Variable Values: Causal Economy and Proportionality in Medicine

Causal selection, or choosing the right cause for the job, is an important and interesting task for epidemiologists, clinical researchers, and philosophers of medicine. On a relatively minimal notion of causation, such as the interventionist account (Woodward 2003), we can admit many causes of the same disease. Because of this, Woodward (2010), Franklin-Hall (2015), Valles (2018) and others rightly ask: among causes of the same effect, which causes should we prioritize in our explanations of disease? One way to approach this problem is as a choice among causal variables.

In this vein, two candidates have been offered as objective guides to causal selection: proportionality and the causal economy account. Proportionality, the appropriate granularity or degree of abstraction, is supposed to tell us something about the right level of explanation with which to describe a cause (Yablo 1992; Woodward 2010). Given some effect of interest, the choice of some most proportional level of abstraction is supposed to be an empirical, rather than a pragmatic, matter. Similarly, the causal economy account recommends selecting causal variables by maximizing the ratio of cost, in terms of details to be included, to benefit, in terms of the extent to which the candidate variables secure the stability or robustness of the effect of interest (Franklin-Hall 2015, 423). Causal economizing is alleged to offer an objective guide to the selection of "narrow" causes from among the innumerable causal determinants of, or influences upon, some effect of interest.

Both proportionalists and causal economists advocate a contest model for causal variable selection: we compare causal variables and choose the variable(s) that best satisfy the norm. Even if we do not choose a single unique winner of such contests, we choose from the candidate variables on hand. I argue that this means that both proportionality and causal economy are properly subject to underconsideration concerns (Stanford 2006). Underconsideration amounts to the concern that the winner of an explanatory contest may be the best of a bad lot. Underconsideration is a matter of epistemic risk (Biddle and Kukla 2017). Underconsideration concerns are particularly salient in the health sciences, where our knowledge of complex causal structures is often incomplete.

Because of this, discussions of both proportionality and causal economy obfuscate an important role for nonepistemic values in causal variable choice in medicine. I illustrate this using the example of sex as a biological variable in explanations of patterns of COVID-19 mortality (Shattuck-Heidorn et al. 2020). Since neither guide to causal selection is value-free, my account offers an opportunity to engage with what these values are, or ought to be. This has important implications for our thinking about the transparency and trustworthiness of inquiry in the health sciences.

References:

Biddle, Justin B., and Rebecca Kukla. 2017. "The Geography of Epistemic Risk." In *Exploring Inductive Risk: Case Studies of Values in Science*, edited by Kevin C. Elliott and Ted Richards. Vol. 1. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780190467715.003.0011.

Franklin-Hall, Laura R. 2015. "Explaining Causal Selection with Explanatory Causal Economy: Biology and Beyond." In *Explanation in Biology*, edited by Pierre-Alain Braillard and Christophe Malaterre, 11:413–38. History, Philosophy and Theory of the Life Sciences. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-017-9822-8_18.

Shattuck-Heidorn, Heather, Meredith W. Reiches, and Sarah S. Richardson. 2020. "Opinion | What's Really Behind the Gender Gap in Covid-19 Deaths?" *The New York Times*, June 24, 2020, sec. Opinion. https://www.nytimes.com/2020/06/24/opinion/sex-differences-covid.html.

Stanford, P. Kyle. 2006. *Exceeding Our Grasp: Science, History, and the Problem of Unconceived Alternatives*. Oxford University Press.

Valles, Sean A. 2018. *Philosophy of Population Health Science: Philosophy for a New Public Health Era*. Routledge.

Woodward, J. 2003. *Making Things Happen: A Theory of Causal Explanation*. Oxford: Oxford University Press.

———. 2010. "Causation in Biology: Stability, Specificity, and the Choice of Levels of Explanation." *Biology & Philosophy* 25: 287–318.

Yablo, Stephen. 1992. "Mental Causation." *The Philosophical Review* 101 (2): 245–80. https://doi.org/10.2307/2185535.