Notes on Evans & Didelez (2023)

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This document collects my notes on Evans and Didelez (2023). They propose a new parameterization of the distributions of interest, termed **frugal parameterization**, which consists of three pieces: the joint distribution of the treatment and covariates $p_{ZX}(z, x)$, the causal distribution of interest $p^*_{Y|X}(y|x)$, and a dependence measure between the outcome and the treatment conditional on the covariates $\phi^*_{YZ|X}$. In sequential treatment models (see Evans and Didelez, 2023, Figure 2), this parameterization can avoid the so-called **g-null paradox** (Robins and Wasserman, 1997).

Comments/Questions:

- Their example R2 is similar to problem 29.1 in Ding (2023).

Further reading: Robins and Wasserman (1997), McGrath et al. (2022).

References

Ding, P. (2023). A first course in causal inference.

Evans, R. J. and Didelez, V. (2023). Parameterizing and Simulating from Causal Models. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, page qkad058.

McGrath, S., Young, J. G., and Hernán, M. A. (2022). Revisiting the g-null paradox. *Epidemiology (Cambridge, Mass.)*, 33(1):114.

Robins, J. M. and Wasserman, L. (1997). Estimation of effects of sequential treatments by reparameterizing directed acyclic graphs. In *Proceedings of the Thirteenth Conference on Uncertainty in Artificial Intelligence*, UAI'97, page 409–420, San Francisco, CA, USA. Morgan Kaufmann Publishers Inc.