

3.03 The retrospective matched controls design: propensity score matching (PSM)

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Midlands and Lancashire
Commissioning Support Unit

Overcoming the curse of dimensionality

An important advance was made in 1983 with the introduction of the propensity score, defined as the probability of receiving the treatment given the observed covariates.¹

The propensity score facilitates the construction of matched sets with similar distributions of the covariates, without requiring close or exact matches on all of the individual variables.

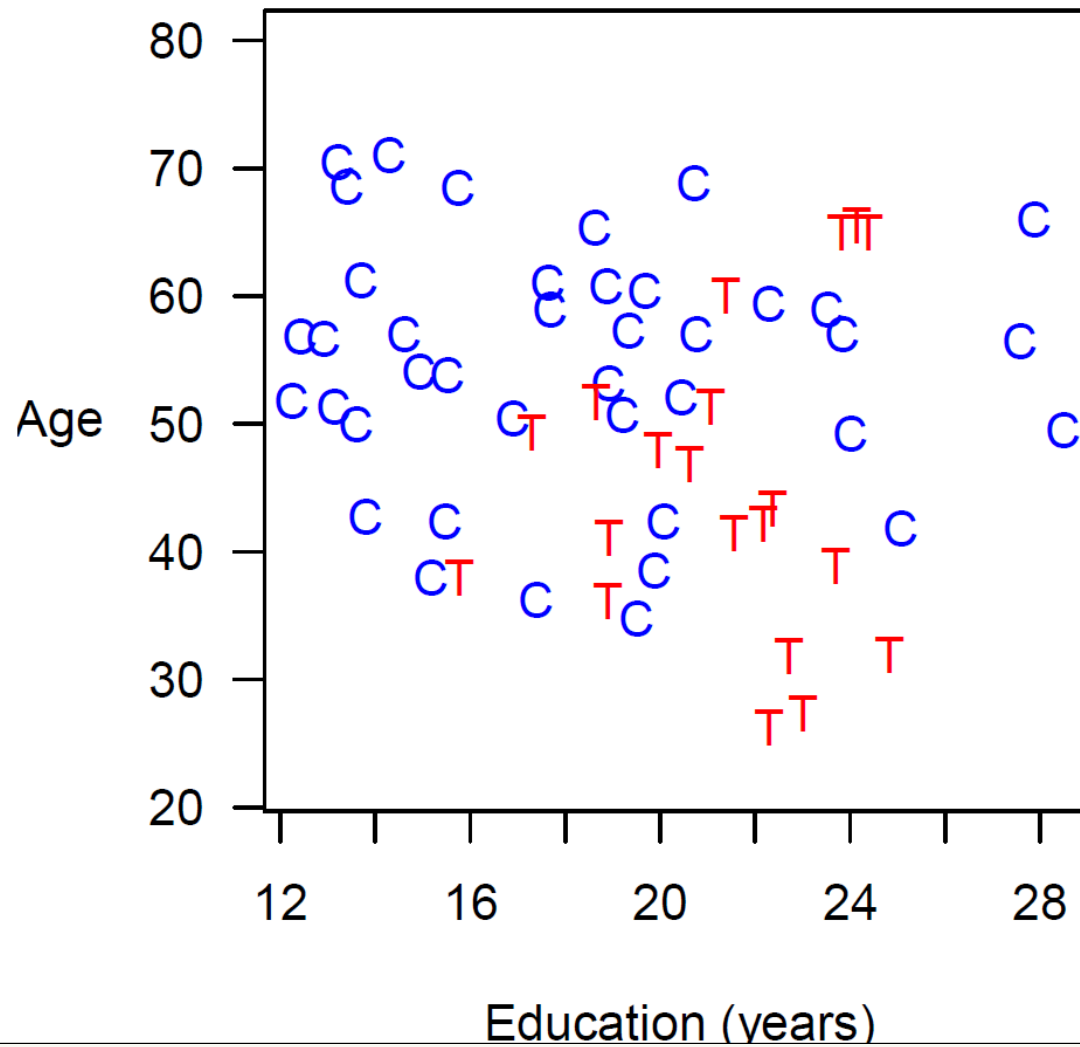
Propensity score matching is a very popular approach for research studies in many fields.

(1) Rosenbaum P, Rubin D. The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika*. 1983;70(1):41. doi: 10.2307/2335942

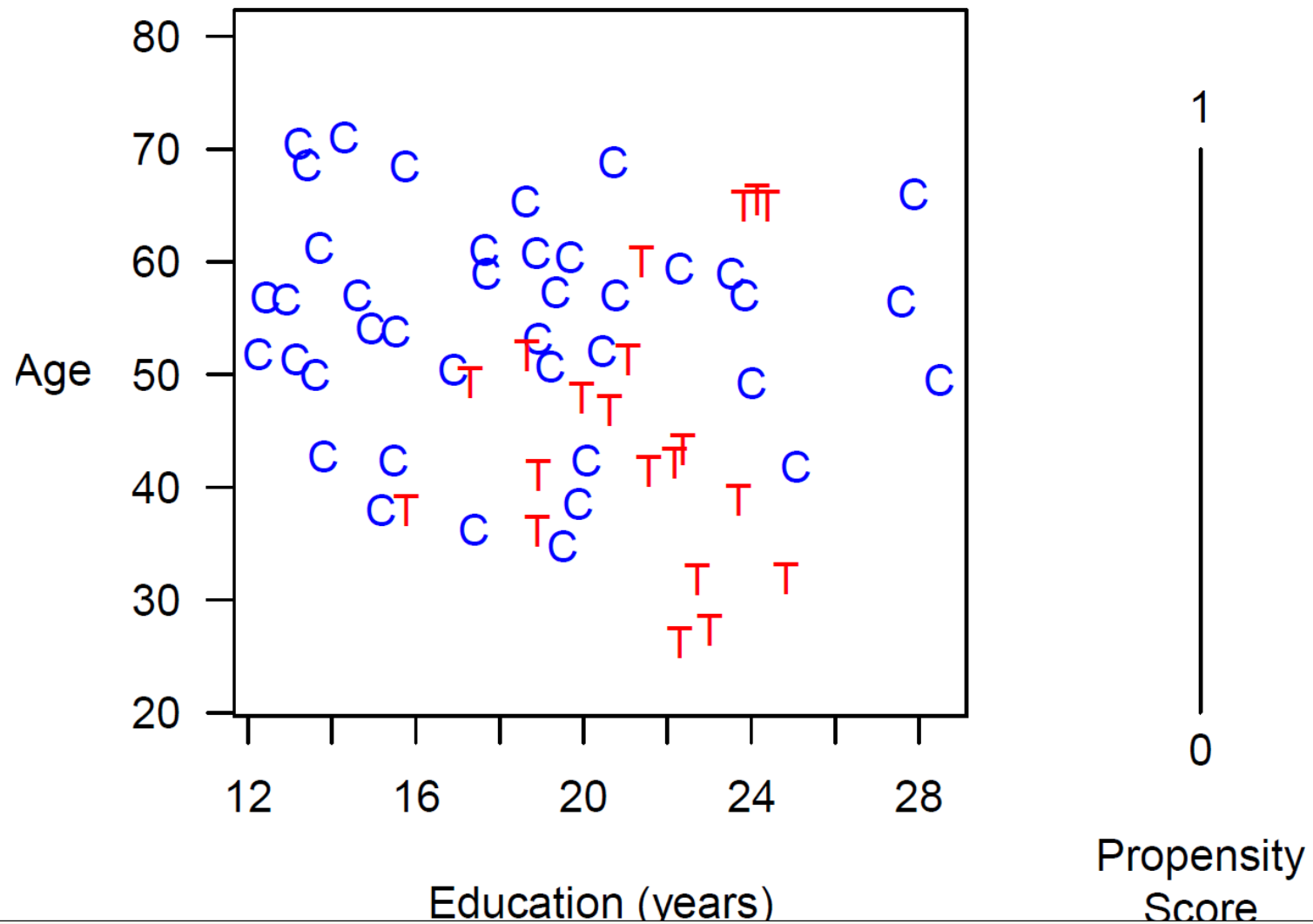
Steps in matching methods

1. Define 'closeness' (distance measure for determining whether an individual is a good match for another)
2. Implement a matching method (for a given measure of closeness)
3. Assess quality of matched samples
4. ... iterate
5. Estimate the treatment effect (for a given matched sample)

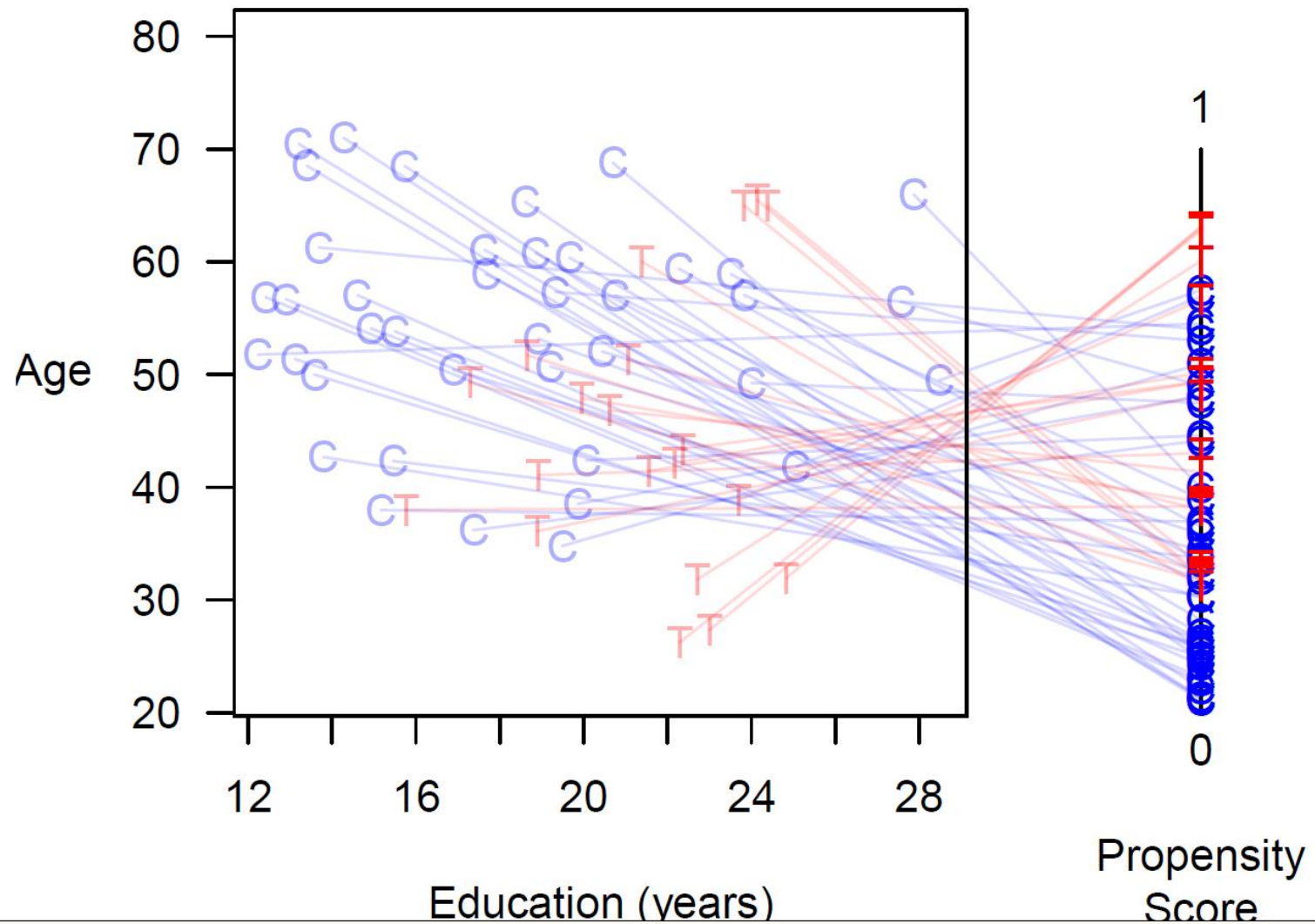
Propensity Score Matching



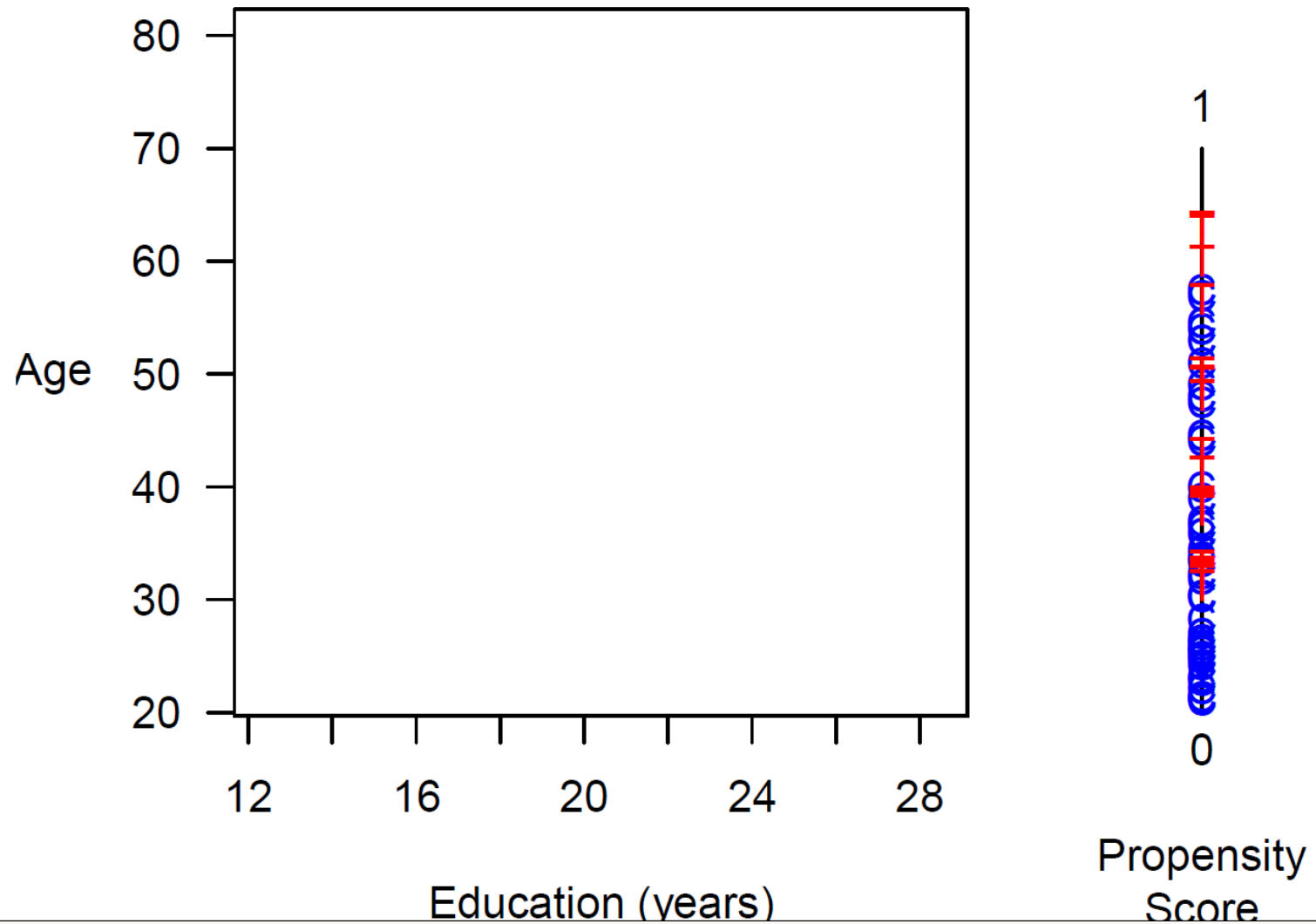
Propensity Score Matching



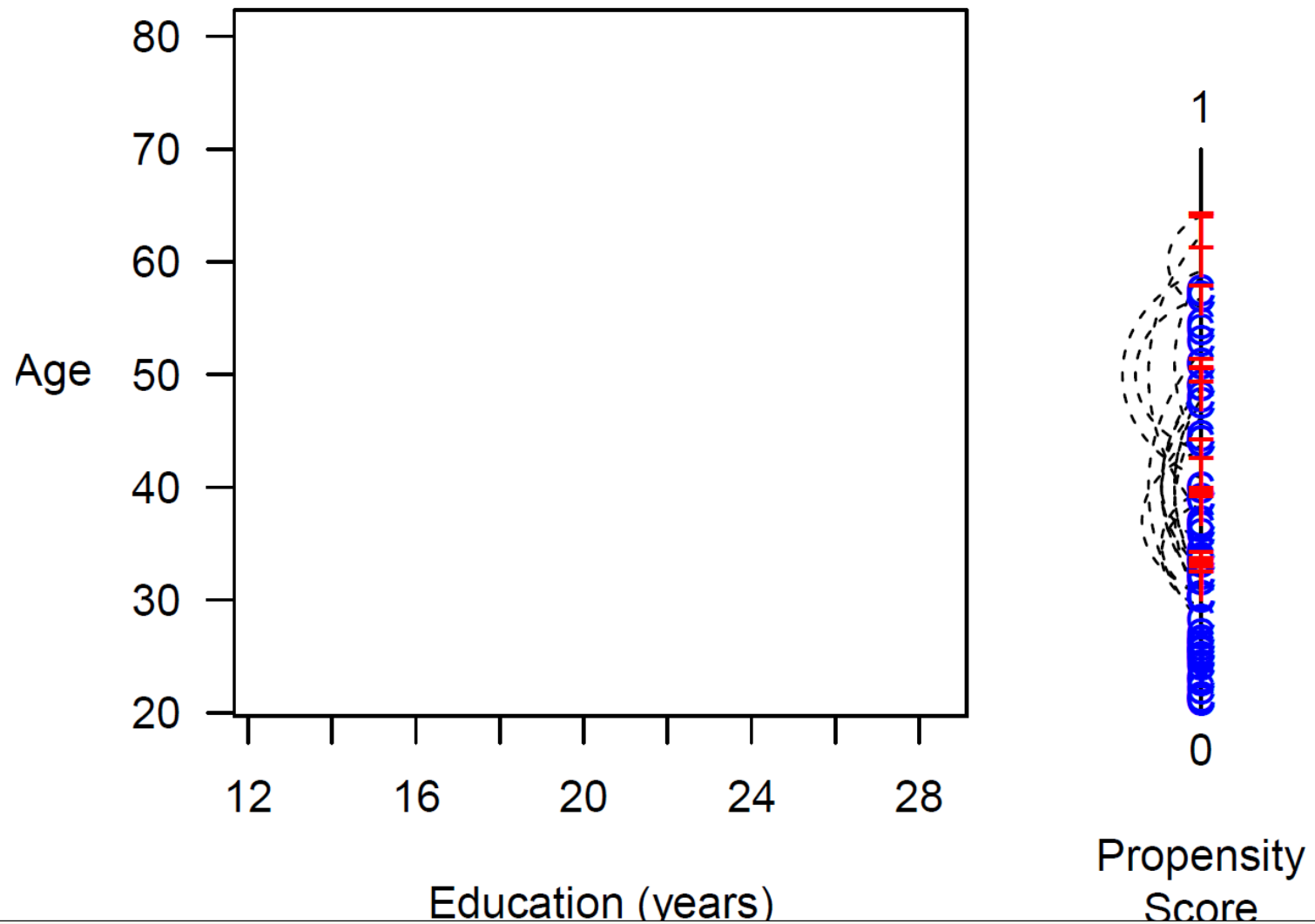
Propensity Score Matching



Propensity Score Matching



Propensity Score Matching



Propensity Score Matching

