Shadish, Clark & Steiner. (2008). “Can Nonrandomized Experiments Yield Accurate Answers? A Randomized Experiment Comparing Random and Nonrandom Assignments” Journal of American Statistical Association 103(484): 1334-1344. <https://doi.org/10.1198/016214508000000733>

The Shadish, Clark, and Steiner piece examines the vocabulary and math scores of students who are given either additional vocabulary or math training. The goal is to see if the treatment actually improves their scores on either a math or vocabulary test, and if so by how much. This example only looks vocabulary training on test scores before and after. There are many problems as students self-selected into the different trainings. As can be seen the two groups are not equal. Information is taken in order to create the groups as if equal, using inverse propensity score methods is just one way.

List of variables:

|  |  |
| --- | --- |
| **Treatment variable** |  |
| vm | Treatment indicator for vocabulary (v) or mathematics (m) training | |
|  |  |
| **Outcomes** |  |
| mathall | Mathematics posttest (measured after the completion of the training) | |
| vocaball | Vocabulary posttest (measured after the completion of the training) | |
|  |  |
| **Baseline covariates by domain (measured before treatment selection)** | |
| *Proxy-Pretests* |  | | |
| vocabpre | Vocabulary Pretest (36-item Vocabulary Test II; Educational Testing Service, 1962, 1993)) | | |
| mathpre | Mathematics Pretest (15-item Arithmetic Aptitude Test; Educational Testing Service, 1962, 1993)) | | |
| *Prior Academic Achievement* | | | |
| actcomp | ACT Comprehensive Score | | |
| hsgpaar | High School GPA | | |
| collgpaa | College GPA | | |
| *Topic Preference (Preference for Math or Literature)* | | | |
| numbmath | Number of Prior Mathematics Courses | | |
| likemath | Like Mathematics | | |
| likelit | Like Literature | | |
| preflit | Preferring Literature over Mathematics | | |
| majormi | Math-Intensive Major | | |
| mars | Mathematics Anxiety Rating Scale (25 items; Faust, Ashcraft & Fleck, 1996) | | |
| *Psychological Predisposition* | | | |
| pextra | Extroversion (10 items; big 5 personality factors, Goldberg, 1999) | | |
| pagree | Agreeableness (10 items; big 5 personality factors; Goldberg, 1999) | | |
| pconsc | Conscientiousness (10 items; big 5 personality factors; Goldberg, 1999) | | |
| pemot | Emotionality (10 items; big 5 personality factors; Goldberg, 1999) | | |
| pintell | Intellect/Imagination (10 items; big 5 personality factors; Goldberg, 1999) | | |
| beck | Beck Depression Scale (13 items; Beck & Beck, 1972) | | |
| *Demographics* |  | | |
| cauc | Race/Ethnicity: Caucasian (dummy) | | |
| afram | Race/Ethnicity: African-American (dummy) | | |
| other | Race/Ethnicity: Other ethnicity (dummy) | | |
| age | Age | | |
| male | Sex: male (dummy) | | |
| married | Marital status: married (dummy) | | |
| momdegr | Mother’s Education (presumably measured with low reliability) | | |
| daddegr | Father’s Education (presumably measured with low reliability) | | |
| credit | College Credit Hours | | |