equate: Observed-Score Linking and Equating in R

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Linking and equating are statistical procedures used to convert scores from one measurement scale to another. These procedures are most often used in testing programs that involve multiple test forms, where adjustments are made for form difficulty differences when creating a measurement scale that is common across forms. Linking and equating methods are traditionally distinguished by the type of scores they are applied to, whether observed scores or scores from an item response theory model. Methods are also distinguished by the study design under which measurements are taken. The R package *equate* (Albano, 2014) is free, open-source software for conducting observed-score linking and equating under single-group, equivalent-groups, and nonequivalent-groups designs with one or more anchor tests.

The *equate* package estimates identity, mean, linear, and equipercentile equating functions (Kolen & Brennan, 2014); general linear functions (Albano, 2015); circle-arc functions (Livingston & Kim, 2009); and composites of these. Equating methods include nominal-weights (Babcock, Albano, & Raymond, 2012), Tucker, Levine observed-score, Levine true-score, Braun/Holland, frequency estimation, and chained equating. Plotting and summary methods are also provided, along with methods for multivariate loglinear presmoothing and for (parametric) bootstrap error estimation.

The *equate* package is available for Linux, Mac, and Windows within the statistical environment R (R Core Team, 2015). Source and binary versions of the package and user manual are distributed free via the comprehensive R archival network, online at <https://cran.r-project.org/>. The latest development version of the package can be obtained online at <https://github.com/talbano/equate> or by emailing the author at albano@unl.edu.

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