

## Tree-Fitting Assignment (Assn 11, Spr 2020)

1) For either the sports data or the furniture data (both rated similarity, collected by Rosch, Smith, Shoben & Rips) posted in this session, fit an ultrametric tree to the data using the iterative projection method (Hubert & Arabie, 1995) offered in R's "ls\_fit\_ultrametric" routine (see method description, also see posted help file "R\_fitting\_trees\_to\_prox\_data.txt"). Finally, calculate the (squared) correlation of the model distances to the data, RSQ.

2) Again using the iterative projection method offered in R, fit an additive tree to the same data set (using "ls\_fit\_addtree"). Again calculate the (squared) correlation of the model distances to the data, RSQ.

3) Also fit an additive tree to the data using GTREE. Compare the fit of this solution to the results using the R methods. Comment.

NOTE: the format of the furniture similarity ratings file is lowerhalf, and generally it is in the form required by the GTREE program (Cortier, 1998). To read it into R, I would add zeros above the diagonal and otherwise edit the text file, then read (or type) the stimulus names in separately. For the sports data, a full-matrix version is also provided.

### REFERENCES:

Cortier, J. (1996). *Tree models of similarity and association*. Sage University papers: Quantitative Applications in the Social Sciences (#112). Newbury Park CA: Sage.

\*\*Sattath, S., & Tversky, A. (1977). Additive similarity trees. *Psychometrika*, 42, 319-345.

Hubert, L. & Arabie, P. (1995). Iterative projection strategies for the least-squares fitting of tree structures to proximity data. *British Journal of Mathematical and Statistical Psychology*, 48(2), 281-317.

Cortier, J.E. (1998). An efficient metric combinatorial algorithm for fitting additive trees. *Multivariate Behavioral Research*, 33, 249-272.