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## Right-left asymmetry of the eigenvector method: A simulation study

Institute of  
Operations  
and Decision  
Sciences

European Journal of Operational Research

### Abstract:

The eigenvalue method, suggested by the developer of the extensively used Analytic Hierarchy Process methodology, exhibits right-left asymmetry: the priorities derived from the right eigenvector do not necessarily coincide with the priorities derived from the reciprocal left eigenvector. This paper offers a comprehensive numerical experiment to compare the two eigenvector-based weighting procedures and their reasonable alternative of the row geometric mean with respect to four measures. The underlying pairwise comparison matrices are constructed randomly with different dimensions and levels of inconsistency. The disagreement between the two eigenvectors turns out to be not always a monotonic function of these important characteristics of the matrix. The ranking contradictions can affect alternatives with relatively distant priorities. The row geometric mean is found to be almost at the midpoint between the right and inverse left eigenvectors, making it a straightforward compromise between them.

### Journal ranking:

SJR 2022: D1, Alp 2022: 89

Full text

