

# Incomplete pairwise comparison matrices and weighting methods

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## Abstract

A special class of preferences, given by a directed acyclic graph, is considered. They are represented by incomplete pairwise comparison matrices as only partial information is available: for some pairs no comparison is given in the graph. A weighting method satisfies the linear order preservation property if it always results in a ranking such that an alternative directly preferred to another does not have a lower rank. We study whether two procedures, the Eigenvector Method and the Logarithmic Least Squares Method meet this axiom. Both weighting methods break linear order preservation, moreover, the ranking according to the Eigenvector Method depends on the incomplete pairwise comparison representation chosen.

*Keywords:* Directed acyclic graph; incomplete pairwise comparison matrix; Eigenvector Method; Logarithmic Least Squares Method

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