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THE RELATIONSHIP BETWEEN THE CONSISTENCY INDEX AND THE GOODNESS-OF-FIT OF WEIGHT TO HUMAN PERCEPTION

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Abstract:
This paper reviews the consistency among pairwise comparisons (PCs). PC is a measurement method to judge which of the two entities is preferred, which is applied to one of the most disseminated decision support systems, Analytic Hierarchy Process (AHP). Since AHP is a decision support tool quantifying human perception, the weight derived must accurately represent decision maker's perception. On the other hand, AHP requires redundant PCs, which sometimes results in violating transitivity in judgment. AHP thus defines the Consistency Index (CI) evaluating the ratio of inconsistent judgments among PCs; the size of CI is considered to be remained in a proper range, viz. less than 0.1.

This paper focuses on the relationship between how decision maker perceives the output of a PC-matrix and the size of its CI. The review is carried out through a panel survey from which appraisal of a weight vector of a PC-matrix obtained. The results imply that the size of CI may have no relation with the degree of goodness-of-fit of weight vector to decision maker's perception.

Keywords: decision support systems; consistency index; goodness-of-fit; pairwise comparison; Analytic Hierarchy Process