

**Saaty, Thomas L.**

**Axiomatic foundation of the analytic hierarchy process.** (English) Zbl 0596.90003  
*Manage. Sci.* 32, 841-855 (1986).

Summary: This paper contains an axiomatic treatment of the Analytic Hierarchy Process (AHP). The set of axioms corresponding to hierarchic structures are a special case of axioms for priority setting in systems with feedback which allow for a wide class of dependencies. The axioms highlight: (1) the reciprocal property that is basic in making paired comparisons; (2) homogeneity that is characteristic of people's ability for making comparisons among things that are not too dissimilar with respect to a common property and, hence, the need for arranging them within an order preserving hierarchy; (3) dependence of a lower level on the adjacent higher level; (4) the idea that an outcome can only reflect expectations when the latter are well represented in the hierarchy. The AHP neither assumes transitivity (or the stronger condition of consistency) nor does it include strong assumptions of the usual notions of rationality. A number of facts are derived from these axioms providing an operational basis for the AHP.

**MSC:**

[91B08](#) Individual preferences

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