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Title

Constructing a Binomial Processing Tree through Selective Influence with Application to Immediate Serial Recall

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A simple tree model gives a good account of immediate serial recall in several experiments, for effects of pairs of factors such as serial position, list length, and proactive interference. If we suppose a tree model underlies the data, is it plausible it would be simple? In a binomial tree, every vertex has two branches. An experimental factor is said to selectively influence a vertex if it changes the probabilities associated with the branches at that vertex, and no others. Necessary and sufficient conditions are given for probabilities to be generated by two experimental factors selectively influencing two different vertices in a binomial tree. Two vertices are sequential if they are on a path together from the root to a terminal vertex. Patterns in the data distinguish whether the two vertices selectively influenced by two factors are sequential or not. If the selectively influenced vertices are sequential, their order on a path can sometimes be determined from patterns in the data. It is shown that if a suitable tree exists for two factors selectively influencing two vertices, then an equivalent relatively simple tree exists.