

We review a current and popular class of cognitive models called multinomial processing tree (MPT) models. MPT models are simple, substantively motivated statistical models that can be applied to categorical data. They are useful as data analysis tools for measuring underlying or latent cognitive capacities, and as simple models for representing and testing competing psychological theories. We formally describe the cognitive structure and parametric properties of the class of MPT models, and provide an explicit statistical characterization of this class. Following this, we provide a comprehensive review of the applications of MPT models to a variety of substantive areas in cognitive psychology, including various types of human memory, visual and auditory perception, and logical reasoning. We then address a number of theoretical issues relevant to the creation and evaluation of MPT models, including model development, discrete-state assumptions, and the relation between MPT models and other mathematical models. In the conclusion, we consider the current role of MPT models in Psychological research and possible future directions.