

"Collective bounded rationality: theory and experiments"

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Abstract: Cognitive hierarchy models have been developed to explain systematic deviations from equilibrium behavior observed in lab experiments for certain classes of games. This paper introduces the Endogenous Cognitive Hierarchy Model, which better explains the behavioral heterogeneity of strategies in information aggregation situations for which the standard cognitive hierarchy model provides unreasonable prediction. As in previous models, each player in the endogenous cognitive hierarchy model is assumed to best-respond to other players while holding a belief induced by a cognitive hierarchy. Contrary to the previous models, however, players are allowed to consider the presence of opponents at their own level of cognitive hierarchy. This extension is shown to eradicate the incompatibility of cognitive hierarchy models in classes of games they are not tested on before. We employ the current model in explaining behavior in information aggregation situations that can be described as a Condorcet Jury Model. Particularly, we analyze theoretically the differences regarding asymptotic efficiency and show furthermore that the endogenous cognitive hierarchy model improves upon standard Nash equilibrium approach as well as previous cognitive hierarchy models in explaining behavior in the lab through our experimental design with continuous signal structure under compulsory voting.