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Title of the presentation: An Experimental Analysis of Game Complexity.

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Abstract: An individual's choice results from interactions between the his cognitive capacities and the complexity of the task at hand. Task complexity is mainly affected by task characteristics and has been shown to influence the decision rule used and to consequently diminish the quality of the choice. In an analogous manner, it is widely accepted that complex games are somehow more difficult to play optimally. However, this idea has never been systematically studied. In this paper, the nature of "game complexity" and its relation to several game characteristics are investigated.

Game complexity, through its effect on behavior, is assumed to be positively correlated with deviations from best response. Importance of those deviations, and thus the level of complexity, is captured through several proxies: (i) normalized measures of deviations in expected payoffs; (ii) the time to choose; (iii) the parameter of the logit Quantal Response Equilibrium (McKelvey and Palfrey, 1995); (iv) the parameter of the Poisson Cognitive Hierarchy model (Camerer et al, 2002). A two-step estimation procedure is used. First, values of proxies are estimated using experimental data from 119 subjects for 60 games specifically chosen to differ in their structural characteristics. Then, the hypothesis according to which subjects' deviations from best responses are random and independent of games characteristics is tested using first-step estimates as independent variables.

Preliminary results show that several factors affect game complexity. Most significant characteristics are the existence of an equilibrium Pareto dominated by another equilibrium, the level of iterative rationality, the number of dominated actions, and rank-correlation of players' preferences over actions. In addition to elucidating what an average individual deems complex in games, this study contributes to improving the predictive power of the logit Quantal Response Equilibrium and Poisson Cognitive Hierarchy models which both extensively rely on the knowledge of their respective parameter.