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Introduction to Issue of *Experimental Economics* in Honor of Raymond C. Battalio

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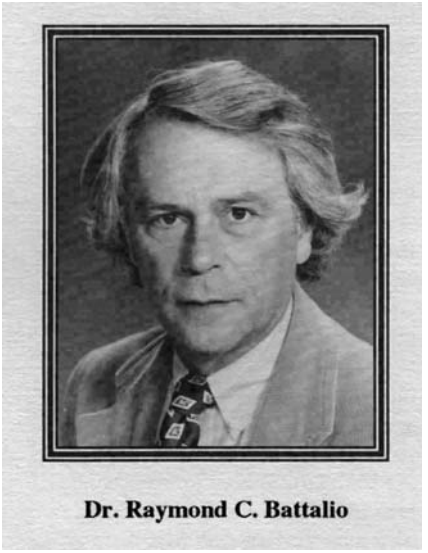
Raymond C. Battalio died on December 1, 2004, at the age of 66, after a brief and sudden illness. He was one of the pioneers in the field of Experimental Economics.



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He published extensively in both economics and psychology journals. His early studies focused on individual choice behavior of sub-humans (pigeons and rats) along with parallel studies with human subjects. He made important contributions in the areas of industrial organization, rational expectations and, in the last 15 years of his career, on coordination games. He was a founding member of the Economic Science Association, which is dedicated to the development of experimental economics, and served as its third president. He was a dedicated and innovative teacher, and he left behind a generation of both undergraduate and graduate students he influenced, as well as a number of junior colleagues, who have made important contributions in economics. Ray was a wonderful friend and colleague to those who knew him.

In April 2006 Texas A&M University, where Ray spent thirty-five uninterrupted years, hosted a conference in Ray's honor. The organizing theme of the conference was issues in coordination games, with the idea of publishing the papers presented in an issue of *Experimental Economics* dedicated to Ray's memory. Many colleagues and friends attended the conference which, in addition to the papers, offered a number of testimonials to Ray's importance as a teacher, colleague and friend.

The papers in this volume attack a wide diversity of issues in coordination games. Or put another way, the papers show how coordination games can be used as a canvass to attack a variety of issues in economics.

The first paper is one of a series of papers on coordination games that Ray and John Van Huyck collaborated on, in this case with their student Bill Rankin. This paper is illustrative of the interplay between experiments and theory designed to organize experimental results. The authors conduct an "out-of-sample test" of a model of strategic uncertainty in coordination games developed by Crawford (1995). Crawford's paper was designed to explain some of Battalio and Van Huyck's first, pioneering, experimental papers on coordination games. In conducting this new experiment the authors introduce a new experimental interface which allows a much finer approximation of a continuous action space than in earlier experiments. The interface was designed to make it less costly for subjects to explore the outcome space, helping to destabilize the inefficient mutual best response outcomes reported with coarser payoff structures.

The second paper by Cabrales, Nagel and Armenter also involves the interplay between theory and experiments. In this case the authors focus on the surprising theoretical result that even small departures from complete information ("almost common knowledge") can generate unique equilibria in coordination games, when under common knowledge there are multiple equilibria. The mechanism behind this theoretical result is that subjects can now engage in multiple rounds of deletion of dominated strategies, each of which requires sophisticated Bayesian reasoning. Based on previous experimental results the authors are skeptical of this outcome, finding that when play does converge on a unique equilibrium the underlying behavioral mechanism rests on a learning dynamic as opposed to iterated deletion of dominated strategies.

The third paper by Hess, Holt and Smith focuses on the topical issue of coordination of strategic responses to security threats. Firm security depends not only on own investment, but the investment of other firms in the network. (Think of airline baggage being transferred between different carriers.) As such there is a positive externality associated with investing in own security, regardless of other players' investment de-

cisions, a unique feature of this problem that creates new and interesting elements not present in other types of coordination games.

Cason and Mui look at the role of non-biding communication in a collective resistance game. The experiment is predicated on the presence of altruistic punishers who are willing to incur costs to punish violations of social norms even when they are not directly hurt by such violations in a one-shot game. Both ex post and private ex ante communication significantly reduces the incidence of transgressions, but public ex ante communication does not. In the latter case, since intentions are observed by the leader, responders are reluctant to indicate their intention to challenge the leader, which undermines the effectiveness of communication.

The next two papers look at the extent to which changes in financial incentives can pull a group out of coordination failure. Brandts, Cooper and Fatas focus on the relationship between cost asymmetries and leadership under the hypothesis that players with low costs of deviating toward the Pareto optimal outcome will lead the way. This paper is a sequel to an earlier paper showing that a *temporary* improvement in incentives designed to overcome coordination failure can have lasting effects after the incentives are removed (Brandts and Cooper 2006). In contrast to this last result Hamman, Rick and Weber find that incentives are effective in improving coordination while they are in place, but have no lasting impact when they are removed. They go on to identify the basis for these differences in outcomes, showing that the incentives in Brandts and Cooper applied to any improvement in outcomes compared to their all-or-nothing incentives for coordinating on the preferred outcome. Work of this sort has practical policy applications in the presence of coordination failures.

Carare, Haruvy, and Prasad explore a new class of coordination games in which the Kth player to submit an entry wins a contest. The results show that the value of K has a dramatic effect on the timing of entries so that when K is less than half the number of participants the median entry converges on zero. But with K greater than this, the median entry increases throughout the length of their sessions. They go on to explore the relevance of hierarchal thinking and learning models to organize their results.

Eckel and Wilson explore the effect of social learning and status in coordination games under the hypothesis that a commonly observed agent can have a strong influence on the equilibrium that others select. The find that play of a commonly observed agent does not, by itself, make one equilibrium more salient or focal as Schelling (1960) suggested. However, if the agent is of "high status", this player's choices have a statistically significant impact on the equilibrium played, so that "royalty" does matter.

Devetag and Ortmann survey the many experimental studies of coordination games that followed the pioneering work of Van Huyck et al. (1990, 1991) and Cooper et al. (1990, 1992) that first identified coordination failures in games with Pareto-ranked equilibria. Their focus is on those factors promoting coordination failures and successes. Their survey provides a necessary starting point for anyone wanting to explore issues in coordination games.

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