

14th Summer Festival on Game Theory

Workshop

on

Experimental Economics and Game Theory

July 17-19, 2003

Organized by **John Kagel** (The Ohio State University)

Thursday, July 17, 2003

2:00- 2:05	John Kagel, Organizer Opening Remarks
2:05- 3:05	Frank Heinemann, Goethe-University Frankfurt Speculative Attacks and Financial Architecture: Experimental Analysis of Coordination Games with Public and Private Information
3:05-3:20	Coffee Break
3:20-4:20	Tanju Yorulmazer, New York University On the Severity of Bank Runs: An Experimental Study
4:20-4:35	Coffee Break
4:35 -5:35	John Duffy, University of Pittsburgh Sunspots in the Laboratory

Friday, July 18, 2003

10:00-11:00	Georg Weizsacker, Harvard University Limited Depth of Reasoning and Failure of Cascade Information in the Laboratory
11:00-11:15	Coffee Break
11:15-12:15	Bogachan Celen, New York University The Advice Puzzle: An Experimental Study of Social Learning Where Words Speak Louder than Actions
12:15-2:00	Lunch Break
2:00-3:00	Kate Krause, University of New Mexico Bargaining by Children
3:00-3:15	Coffee Break
3:15-4:15	Howard Rachlin, SUNY at Stony Brook A Behavioral View of The Prisoner's Dilemma
4:15-4:30	Coffee Break
4:30-5:30	Dan Levin, The Ohio State University Bayesian Updating, Reinforcement, and Complexity Aversion: A Laboratory Study

Saturday, July 19, 2003

10:00-11:00	Dorothea Kubler, Humboldt University Berlin Job Market Signalling and Screening: An Experimental Comparison
11:00-11:15	Coffee Break
11:15-12:15	David J. Cooper, Case Western Reserve University Are Two Heads Better than One? Team versus Individual Play in Signaling Games
12:15-2:00	Lunch Break
2:00 -3:00	Guillaume Frechette, Harvard Business School Collusion in Repeated Games with Imperfect Public Monitoring
3:00-3:15	Coffee Break
3:15-4:15	Muriel Niederle, Stanford University Market Culture: How Norms Governing Exploding Offers Affect Market Performance
4:15-4:30	Coffee Break
4:30-5:30	John H. Kagel, The Ohio State University Consistent Behavior in Majoritarian Bargaining

Paper Abstracts

1 Frank Heinemann, Rosemarie Nagel and Peter Ockenfels: “Speculative Attacks and Financial Architecture: Experimental Analysis of Coordination Games with Public and Private Information”

Speculative attacks can be modeled as a coordination game with multiple equilibria if the state of the economy is common knowledge. With private information there is a unique equilibrium. This raises the question whether public information may be destabilizing by allowing for self-fulfilling beliefs. We present an experiment that imitates a speculative attacks model and compare sessions with public and private information. In both treatments subjects use so-called threshold strategies that lie in between the risk dominant and payoff dominant equilibrium of the underlying complete information game. Our evidence suggests that there are no destabilizing effects due to public information. In contrary, predictability of attacks is slightly higher with public than with private information, but prior probability of attacks is also higher with public information. We also test the predictive power of refinement theories to explain actual behavior and reactions to parameter changes.

2 Andrew Schotter and Tanju Yorulmazer: “On the Severity of Bank Runs: An Experimental Study”

This paper investigates the factors that determine the severity of bank runs and points out possible policies that might help dampen them. We have demonstrated that in general the more information economic agents can expect to have about an ongoing financial crisis, i.e. the more they can expect to learn about the crisis as it develops, the more willing they are to restrain themselves in withdrawing their funds from banks once a crisis actually occurs. In addition, we show that bank insurance, even of a limited type, can also help to diminish the severity of bank runs. Finally, we see that the presence of insiders who know the quality of the bank their money is invested in, is welfare increasing in the sense that when such insiders exist, subjects tend to withdraw their money later than they would if no such insiders exist.

3 John Duffy and Eric O’N Fisher: “Sunspots in the Laboratory”

We show that extrinsic or non-fundamental uncertainty influences markets in a controlled environment. This work provides the first direct evidence of sunspot (or correlated) equilibria. These equilibria require a common understanding of the semantics of the sunspot variable, and they appear to be sensitive to the flow of information. Extrinsic uncertainty matters when information flows slowly, as in a call market, but it need not

matter when information flows quickly, as in a double auction where infra-marginal bids and offers are observable.

4 Dorothea Kubler and Georg Weizsacker :“Limited Depth of Reasoning and Failure of Cascade Information in the Laboratory,”

We examine the robustness of information cascades in laboratory experiments. Apart from the situation in which each player can obtain a signal for free (as in the experiment by Anderson and Holt, 1997, American Economic Review), the case of costly signals is studied where players decide whether or not to obtain private information, at a small but positive cost. In the equilibrium of this game, only the first player buys a signal and makes a decision based on this information whereas all following players do not buy a signal and herd behind the first player. The experimental results show that too many signals are bought and the equilibrium prediction performs poorly. To explain these observations, the depth of the subjects' reasoning process is estimated, using a statistical error-rate model. Allowing for different error rates on different levels of reasoning, we find that the subjects' inferences become significantly more noisy on higher levels of the thought process, and that only short chains of reasoning are applied by the subjects.

5 Bogachan Celen, Shakar Kariv, and Andrew Schotter: “The Advice Puzzle: an Experimental Study of Social Learning Where Words Speak Louder than Actions,”

This experimental paper studies how individuals learn by observing the behavior of predecessors (Social Learning) as well as from their advice (Word-of-Mouth Learning). What we find is a truly puzzling result that we call the advice paradox. This paradox can be stated as follows: subjects in a laboratory social learning situation played with and without advice appear to be more willing to follow the advice given to them by their predecessor than to copy their action, despite the fact that both pieces of information should, in equilibrium, be equally informative (in fact, identical). The consequence of this advice paradox is that in experiments with advice subjects tend to herd more than they do in experiments where they can only view their predecessor's action. Remarkably, these herds tend to select the correct action and, hence, advice tends to be efficiency increasing when compared to experiments where subjects can only observe their predecessor's action.

6 William T. Harbaugh, Kate Krause, Steve Leday:“Bargaining by Children”

We study the development of bargaining behavior in children ages seven through 18, using ultimatum and dictator games. We find that bargaining behavior changes substantially with age and that most of this change appears to be related to differences in

preferences for fairness, rather than bargaining ability. Younger children make smaller ultimatum proposals than do older children. Even young children are quite strategic in their behavior, making much smaller dictator than ultimatum proposals. Boys claim to be more aggressive bargainers than girls do, but they are not. Older girls make larger dictator proposals than do older boys, but dictator proposals differ more by height than by sex. We argue that the existence of systematic differences in bargaining behavior across age and sex supports the argument that culture is a determinant of economic behavior, and suggests that people acquire this culture during childhood.

7 Howard Rachlin:“A Behavioral View of The Prisoner's Dilemma”

Altruism and egoism in prisoner's dilemma games may be viewed as conflicting patterns of overt behavior rather than as the resultant of one or another internally generated strategy. This view is elucidated through experiments employing human and sub-human participants.

8 Gary Charness and Dan Levin:“Bayesian Updating, Reinforcement, and Complexity Aversion: A Laboratory Study”

We examine decision-making under risk and uncertainty in a laboratory experiment. It is well known from experimental studies in psychology and economics that subjects often fail to use Bayesian updating, on the presumption of expected-utility maximization. The heart of our design is directed at studying how one's propensity to use Bayes' rule is affected by whether this rule is aligned with reinforcement or clashes with it. We create a decision problem where a successful outcome sometimes reinforces the same decision as a Bayesian updating but sometimes reinforces the opposite action. There are striking patterns of behavior: When Bayesian updating and reinforcement models make the same predictions, nearly all people respond as expected. However, there is a mixture of behavior when these predictions clash, with almost 50% of all decisions in violation of the Bayes updating rule. We also find a pronounced tendency toward 'complexity aversion', as people tend to make costly initial choices that mitigate or eliminate uncertainty/complexity in a subsequent decision.

9 Dorothea Kubler, Wieland Muller, and Hans-Theo Normann:“Job Market Signalling and Screening: An Experimental Comparison,”

We analyze the Spence education game in its original signalling version as well as in a set up with screening by the employers. In the signalling game, workers make a binary choice whether or not to invest in education and employers compete for the worker through wage bids. In the screening variant, employers make wage bids first and workers

can then decide whether to invest or not. We also analyse the effects of employer competition by implementing treatments with two and three employers.

Our results indicate that good types of workers earn higher wages and invest more often than bad types in signalling and screening games. Both types of workers earn higher wages with screening contracts than with signalling while there is no significant difference between investment rates in the signalling and screening version of the game. Moreover, competition increases the wage payments in the signalling game. Finally, the employers' profits are higher when employing a good type than when employing a bad type of worker, and a worker earns a higher profit as a good type than as a bad type. To sum up, there is separation of types in all treatments, but it is not perfect, and the wage spread is lower than predicted.

10 David J. Cooper and John H. Kagel:“Are Two Heads Better than One? Team versus Individual Play in Signaling Games”

The experiments reported in this behavior compare the behavior of individuals with decisions made by two person teams. Using a signaling game environment, we examine whether teams learn to play strategically more rapidly than individuals and whether teams are more able to apply what they have learned in one game to another related game. We consistently find that teams play more strategically than individuals. Unlike cognitive psychologists, we find that teams generate positive synergies among the members, beating a difficult “truth wins” criterion. There is a clear inverse relationship between the difficulty of learning to play strategically in the individual sessions and the impact of the team treatment on the emergence of strategic play. This is particularly striking for the treatment in which subjects are asked to generalize across games: experiments with individuals show negative transfer while those with teams exhibit positive transfer. Examining the dialogues between teammates, we identify the ability to put oneself in your opponent's shoes as the key step in learning to play strategically.

11 Masaki Ayogi and Guillaume Frechette:“Collusion in Repeated Games with Imperfect Public Monitoring.”

This paper studies players' ability to collude in a repeated oligopoly game in the presence of noisy public signals. It presents a theory on the range of symmetric equilibrium payoffs described as a function of the noise level in the public signals, and then tests the theory in laboratory experiments. It is found that subjects' payoffs (i) decrease as the noise level increases, and (ii) are lower than the theoretical maximum for small noise levels, but exceeds it for large noise levels. The paper also examines the strategies played by the subjects and tests for the use of a specific class of strategies including the trigger and tit-for-tat strategies.

12 Muriel Niederle and Alvin E. Roth“Market Culture: How Norms Governing Exploding Offers Affect Market Performance”

Many markets have organizations that influence or try to establish norms concerning when offers can be made, accepted and rejected. Examining a dozen previously studied markets suggests that markets in which transactions are made far in advance are markets in which it is acceptable for firms to make exploding offers, and unacceptable for workers to renege on commitments they make, however early. However, markets differ in many ways other than norms concerning offers. Laboratory experiments allow us to isolate the effects of exploding offers and binding acceptances. In a simple environment, where uncertainty about applicants' quality is only resolved over time, we find inefficient early contracting when firms can make exploding offers and applicants' acceptances are binding. Relaxing either of these two conditions causes matching to take place later, when more information about applicants' qualities is available, and consequently results in higher efficiency and fewer blocking pairs. This suggests that elements of market culture may play an important role in influencing market performance.

13 Guillaume R. Frechette, John H. Kagel and Massimo Morelli:“Consistent Behavior in Majoritarian Bargaining”

Alternate-offer bargaining models and demand bargaining models make very different predictions in terms of ex-ante and ex-post distribution of payoffs, as well as about the role of the order of play. This paper shows, with experimental data, that bargaining behavior is not as sensitive to the different bargaining rules as the theoretical predictions. A behavioral rule of thumb emerges in both classes of games, and makes the outcomes of the two types of games converge. With experienced subjects some different behaviors emerge, but nowhere close to the differences predicted by the theories. Given that legislative bargaining in the American congress or in special committees is characterized by homogeneous weights (one-man/one-vote because of low party discipline) whereas the European parliaments coalitional bargaining involve heterogeneous weights (heterogeneous bargaining power of parties), we study bargaining behavior with and without heterogeneous bargaining power, and subjects respond to differences in bargaining power in a way consistent with our behavioral hypothesis. The fairness effects leading to almost even splits in ultimatum games do not play any role when subjects play these bargaining games.
