Topic 21 – Team decision-making

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Course in Behavioral and Experimental Economics

Motivation

The 'decision maker' is usually modeled as an individual in economics, but many real-life decisions are team decisions.

Think of (hiring) committees, executive boards, advisory boards, households, etc. deciding on job offers, monetary policy, corporate business strategy, judicial questions, household savings ...

Motivation

- (Social) Psychology has long been interested in comparing team decisions to individual decisions, but has provided rather mixed results (see Levine and Moreland, 1998, in Handbook of Social Psychology).
- Team decision making has captured vivid interest in (behavioral) economics only in recent years (see the top ten open research questions of Camerer, 2003).

Some open questions

- Do teams make different decisions than individuals – and under which circumstances?
- Which decision maker is more ‘successful‘ in strategic interaction?
- What drives team decision-making?

Preview of topic 9

- Bargaining and social preferences
  + Ultimatum game (Bornstein and Yaniv, 1998)
  + Centipede game (Bornstein et al., 2004)
- Price competition (Bornstein and Gneezy, 2002)
- Signaling game (Cooper and Kagel, 2005)
- Guessing game (Kocher and Sutter, 2005)
- Coordination games (Irlenbusch and Sutter, 2007)

Bargaining

- Bargaining often takes place between teams (think of negotiations on company mergers, peace treaties, …).
- The seminal paper that studies differences between individuals and teams in simple bargaining games is by Bornstein and Yaniv (1998).
- They use the ultimatum game by Güth et al. (1982).

The ultimatum game

- 2 players (proposer and responder) bargain how to split an amount X.
- 2 stages:
- Proposer offers s to responder, keeping X – s.
- Responder has 2 options
  - Responder accepts the offer s:
    payoffs Proposer: X-s
    Responder: s
  - Responder rejects the offer s:
    payoffs Both receive zero (0)

Bornstein and Yaniv (1998) – Design

They conduct two treatments of the ultimatum game

- Individuals**:** Both proposer and responder are individuals.
- Teams**:** Teams of three subjects each are either in the role of proposer or responder.

Per-capita incentives constant.

Team decision made after 10 minutes of discussion.
One-shot game.

Control-treatment with double-blind procedure.

Bornstein and Yaniv (1998) - Hypotheses

Three main hypotheses

1. Teams are more competitive (discontinuity-effect of Insko and Schopler, 1992).
   → Lower offers and higher rejection rates of teams.

2. Teams make less mistakes and are, thus, more rational.
   → Lower offers, but no difference in rejection rates.

3. Teams are more normative (a bit vague in the paper).
   → Identical offers, but lower rejection rates.

Bornstein and Yaniv (1998) – Results

Single-blind

Table 1. Distribution of demands (in percentage) in experiment 1 (rejected demands are highlighted).

Individuals	40	50	50	50	50	50	50	50	60	64	Mean = 51.4
Groups	50	50	50	50	**60**	60	70	70	73	75	Mean = 60.8

Double-blind

Table 2. Distribution of demands (in percentage) in experiment 2 (rejected demands are highlighted).

Individuals	46	50	50	50	50	50	60	60	68	**80**	Mean = 56.4
Groups	50	50	60	60	60	70	76	80	80	80	Mean = 66.6

- Teams offer significantly less. There are almost no rejections. → Teams are “more rational”.
- There is no significant difference between single- and double-blind.

Additional evidence on bargaining

- Cason and Mui (1997): Dictator game – Teams give *more*.
- Luhan et al. (forthcoming): Dictator game – Teams give *less*.
- Kocher and Sutter (2007): Gift exchange game – Teams choose higher wages, but less effort.
- Cox (2002) and Kugler et al. (forthcoming): Trust game – Teams give less and give back less.

Another test on “rationality” – Bornstein, Kugler and Ziegelmeyer (2004)

They test team vs. Individual behavior in two versions of the centipede game, where two players alternate in moves.

The inreasing-sum centipede game

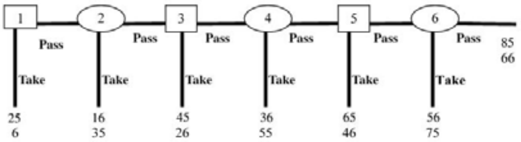


Fig. 1. The increasing-sum Centipede game. Player 1’s decision nodes are denoted by squares, and Player 2’s by circles. The upper payoff at each terminal node is the payoff of Player 1.

Bornstein et al. (2004)

The constant-sum centipede game

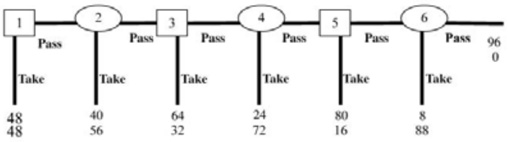


Fig. 2. The constant-sum Centipede game: Player 1's decision nodes are denoted by squares, and Player 2's by circles. The upper payoff at each terminal node is the payoff of Player 1.

Bornstein et al. (2004) – Design

Two treatments

- Individuals**:** Both players are individuals.
- Teams**:** Both players are teams of three subjects. Constant per-capita incentives, and free-form communication.

One-shot game.

Standard equilibrium is to “Take” at first node.

Bornstein et al. (2004) – Results

Table 1
Frequency of games ending at each decision node in the increasing-sum game

Node	1	2	3	4	5	6	7	∅ **node**
Individuals	0	0	1	1	12	1	3	**5.22**
Groups	0	0	3	7	5	3	0	**4.44**

$p < 0.01$

Table 2
Frequency of games ending at each decision node in the constant-sum game

Node	1	2	3	4	5	6	7	∅ **node**
Individuals	3	6	5	4	0	0	0	**2.56**
Groups	4	11	2	1	0	0	0	**2.00**

$p < 0.05$

Bornstein et al. (2004) – Results

Social psychology offers some explanations for the earlier exit of the game by teams (called “groups” in Bornstein et al., 2004).

Among them are

- Stronger concerns for own payoffs in teams
- Less identifiability in teams
- More competitiveness of teams because they expect other teams to be more competitive.

Team decision-making from a different angle – Bornstein and Gneezy (2002)

The previous papers – and the final ones – compared individual and team decision-making where the payoffs in teams were identical across members.

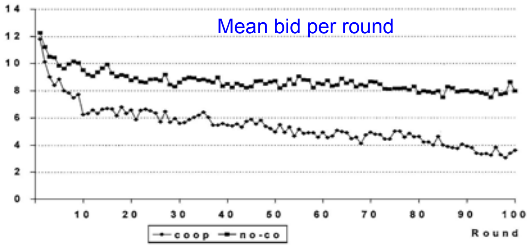
Yet, it seems natural to ask what happens to team decisions if a team’s decision may yield different payoffs for its members, hence when conflict is possible.

Think of two conglomerates of firms competing against each other (in building a new airplane, for instance). Then there might be internal conflicts within a conglomerate.

Bornstein and Gneezy (2002) – Design

- They study duopolistic price competition.
- Teams consist of 3 members (10 cohorts of 12 subjects).
- Team composition changes in each of 100 rounds.
- Two teams compete in prices.
- Each team member submits an integer bid from {2, …, 25}.
- The team with the smaller sum of bids wins the game and earns its sum of bids. The losing teams earns nothing.
- Two treatments
  - + Non-cooperative. Each member receives his bid.
  - + Cooperative. Equal division of sum of bids.

Bornstein and Gneezy (2002) – Results



Cooperative team decisions lead to lower bids → less free-riding on other team members. Internal conflicts in non-cooperative condition have impact on competition.

Signaling games – Strategic play

Consider a situation where a monopolist faces a possible entrant. The entrant does not know the monopolist's cost type (either high or low), but can only observe the monopolist's choice of quantities. What shall the monopolist do? Which signal should he send, and how should the possible entrant react?

Such a situation has been modeled as an "entry limit pricing game" by Milgrom and Roberts (1982).

Cooper and Kagel (2005) have observed individual and team play in such a game.

Signaling games – Strategic play

Strategic play in such a game takes place through limit pricing, which means to choose larger quantities than would prevail in the absence of asymmetric information.

Cooper and Kagel were interested in testing how the "type of decision-maker" affects strategic play in such games.

Basic game

- Monopolist (M)
  - Type: high cost (MH) or low cost (ML) with equal probability
  - Chooses output level →
- Possible entrant (E)
  - Knows probability of ML or MH
  - Receives signal through chosen output level
  - Enters the market or not (IN or OUT)

Monopolist‘s payoffs

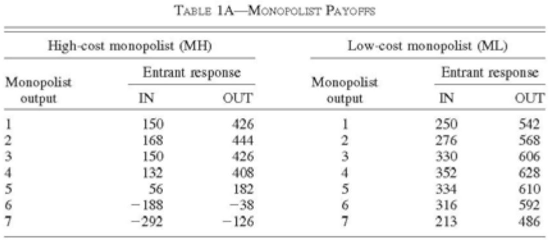


TABLE 1A—MONOPOLIST PAYOFFS

High-cost monopolist (MH)			Low-cost monopolist (ML)		
Monopolist output	Entrant response		Monopolist output	Entrant response	
	IN	OUT		IN	OUT
1	150	426	1	250	542
2	168	444	2	276	568
3	150	426	3	330	606
4	132	408	4	352	628
5	56	182	5	334	610
6	−188	−38	6	316	592
7	−292	−126	7	213	486

- Monopolists prefer OUT over IN.
- MLs prefer generally higher outputs than MHs. (Myopic best choice would be 4 for ML, and 2 for MH.)
- “6” and “7” are dominated choices for MH. Thus, choosing “6” may distinguish an ML from an MH.

Entrant‘s payoffs

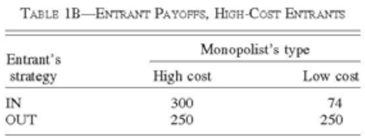


TABLE 1B—ENTRANT PAYOFFS, HIGH-COST ENTRANTS

Entrant's strategy	Monopolist's type	
	High cost	Low cost
IN	300	74
OUT	250	250

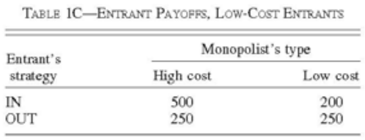


TABLE 1C—ENTRANT PAYOFFS, LOW-COST ENTRANTS

Entrant's strategy	Monopolist's type	
	High cost	Low cost
IN	500	200
OUT	250	250

Entrants have either high costs (top) or low costs (bottom). Costs are exogenously determined.

Predictions for the game

For high-cost entrants (the expected value of OUT is larger than the expected value of IN) there are both pooling and separating equilibria.

- In the pooling equilibria both types of monopolists choose any quantity from “1” to “5”, and the entrant stays OUT.
- In the separating equilibria the MLs choose “6”, and MHs choose “2”, since they cannot benefit from imitating an ML. The entrant enters against MH, but stays out against ML.

For low-cost entrants (IN has higher expected value as OUT) only the separating equilibria from above remain.

Cooper and Kagel (2005) – Design

They run three conditions

- Only high-cost entrants.
- Only low-cost entrants.
- First high-cost entrants and then low-cost entrants (crossover-treatments to examine transfer learning).

All conditions are run both with

- Individuals.
- Teams of two subjects who can communicate via chat. In case of no agreement on quantity within 3 minutes, one member is determined as “leader” who can decide.

Cooper and Kagel (2005) – Hypotheses

Hypothesis 1: There will be more strategic play of teams than of individuals.

Strategic play is defined as MHs choosing “3” to “5”, and MLs choosing “5” to “7”. These levels are above the myopic best choice of “2” for MHs, and “4” of MLs.

Hypothesis 2: The level of strategic play of teams will meet or beat a truth-wins norm.

Let p (P) be the probability of an individual (team) playing strategically, then teams beat the truth wins-norm if

$P \geq 1 - (1 - p)^2$.

High-cost entrants – Results

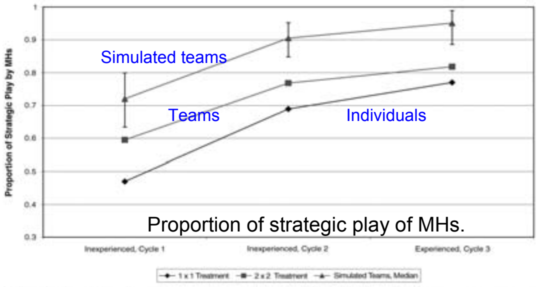


FIGURE 3. COMPARING THE DEVELOPMENT OF STRATEGIC PLAY FOR MHs IN 2 × 2 WITH 1 × 1 SESSIONS IN GAMES WITH HIGH-COST ENTRANTS

- Teams in the role of MH act a bit more strategically (*p* < 0.1 in cycle 1), but a truth wins norm is not reached.

Low-cost entrants – Results

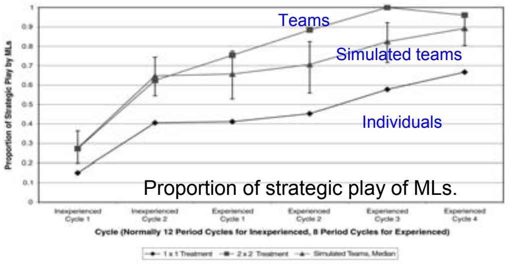


FIGURE 6. COMPARING THE DEVELOPMENT OF STRATEGIC PLAY FOR MLs IN 2 × 2 WITH 1 × 1 SESSIONS IN GAMES WITH LOW-COST ENTRANTS

Notes: Vertical axis shows frequency of MLs choosing outputs 5–7. Horizontal axis shows cycle of play. Bars give the 90-percent confidence interval for the truth-wins standard.

- Teams in the role of ML act significantly more often strategically (*p* < 0.05 in all cycles).

Cooper and Kagel (2005) – The crossover treatments

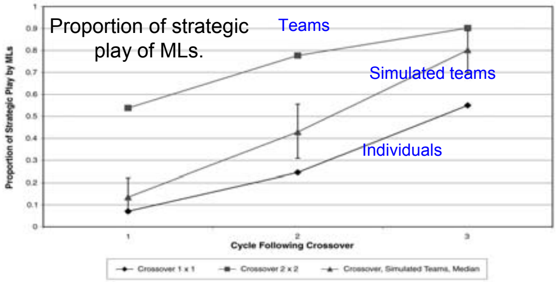
Monopolists start facing high-cost entrants (for 2 cycles, i.e. 24 periods, in inexperienced mode, and 1 cycle, i.e. 8 periods, in experienced mode).

Then there is a switch to low-cost entrants (for another 3 cycles, i.e. 24 periods).

This crossover treatment allows examining the transfer of knowledge acquired in a specific strategic situation to a similar one.

In particular, it allows to analyse whether teams are better in learning transfer. The answer is clearly “Yes” (contrary to the authors’ Hypothesis 3).

Crossover treatment – Results



Proportion of strategic play of MLs.

Teams

Simulated teams

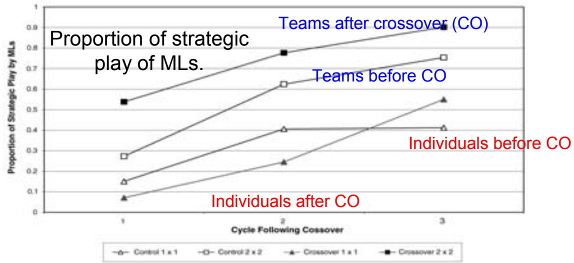
Individuals

Figure 8. Comparing the Development of Strategic Play for MLs in 2 × 2 with 1 × 1 Sessions *following* the Crossover to Games with Low-Cost Entrants

Notes: Vertical axis shows frequency of MLs choosing outputs 5–7. Horizontal axis shows cycle of play. Bars give the 90-percent confidence interval for the truth-wins standard.

- After the crossover, teams play much more strategically than individuals.

Transfer – Results



Proportion of strategic play of MLs.

Teams after crossover (CO)

Teams before CO

Individuals before CO

Individuals after CO

Figure 9. Cross-Game Learning: Comparing the Development of Strategic Play for MLs in the Crossover Treatment (data from Figure 7) with Play in Games with only Low-Cost Entrants (data from Figures 4 and 5)

Notes: Vertical axis shows frequency of MLs choosing outputs 5–7. Horizontal axis shows cycle of play.

- After the crossover, teams play *more* strategically, but individuals *less*. → Better learning transfer in teams.

Some insights from the team dialogues

Analyzing the team dialogues (one of the novel parts of this paper for an economics audience!) reveals that strategic play and learning in the crossover-games depend critically on teams discussing how the strategic situation is viewed from the entrant's perspective! Putting yourself in the shoes of the entrant reveals the possibility of pooling or separating equilibria.

(One note on limitation: It would be desirable to have access also to individuals' stream of thinking to compare it to the team dialogues. However, …)

Team behavior in the guessing game

The guessing game

- *N* decision makers simultaneously choose a real number from the interval **[0, 100].**
- The winner is the decision maker whose number is closest to **2/3 of the average number**.
- The game's unique **equilibrium** is to choose **zero**.

Hypotheses

(based on information load theory; Chalos and Pickard, 1985)

1. Convergence to equilibrium
- Teams apply more steps of reasoning and pick lower numbers than individuals.

2. Relative performance
- Teams win more often than individuals when competing against each other (or are teams prone to the 'curse of sophistication'?)

3. Influence of team size
- Larger teams should be more successful and converge faster to the equilibrium.

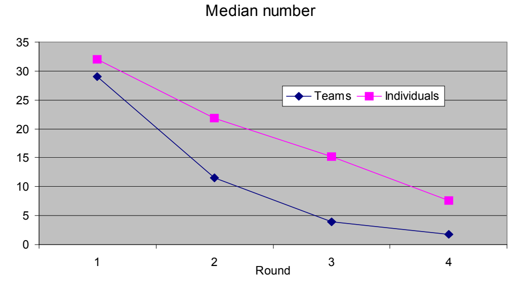
Kocher and Sutter (2005) – Design

Experiment 1

- Teams compete against teams (2 sessions; *N* = 35 in total)
- Individuals compete against individuals (2 sessions; *N* = 35 in total)

- 4 round
- Winner takes all (about 10 Euro)
- Feedback on all numbers.
- Paper and pen in large classes

Kocher and Sutter (2005) – Convergence to equilibrium



Teams choose significantly lower numbers, except for round 1.

Relative performance in the guessing game (Kocher, Strauß and Sutter 2006, GEB)

Part I:

N = 3 individuals play the game once → no feedback

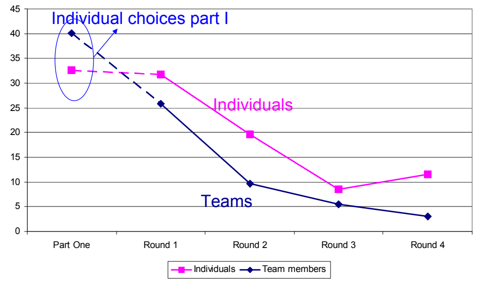
Self-selection phase:

Subjects can decide whether to play alone or in a team of three subjects (about 60% want to play in a team)

Part II:

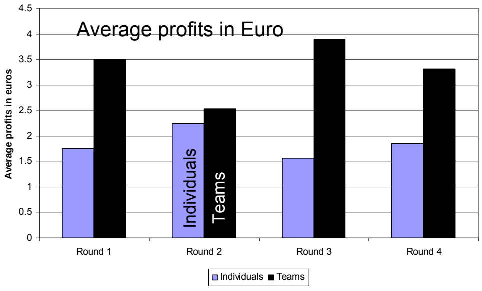
2 individuals and 1 team paired for 4 rounds → regular feedback on others' numbers

Kocher et al. (2006) – Results



Team members choose significantly higher numbers in part I (as individuals), but significantly lower numbers in part II (as teams).

Kocher et al. (2006) – Results



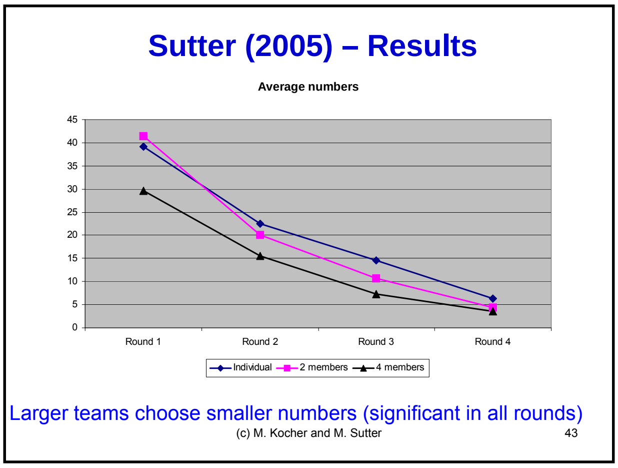
Teams earn significantly larger amounts

Kocher et al. (2006) – Self-selection

- Subjects select into teams because of the (ex post correct!) expectation of earning higher profits in teams.
- Subjects' main motive for individual decision-making is a preference for deciding alone, without the need for compromise and discussion.
- Individual decision-makers correctly guess (after the experiment) that teams won more money, however they indicate to be as happy with their role as team members do.
- Thus, subjects are willing to pay a price for their preference to decide alone.

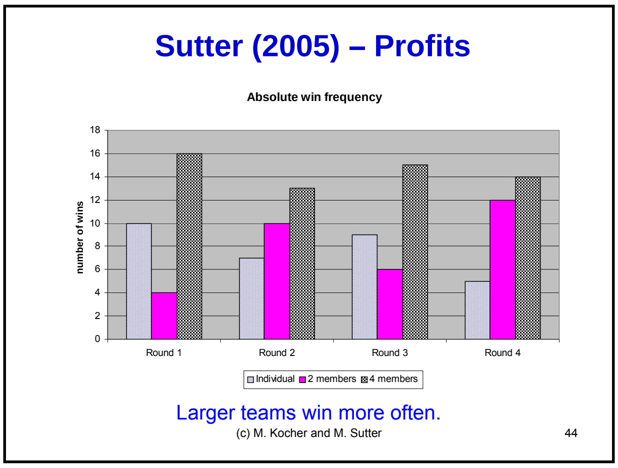
Sutter (2005, EL) – Influence of team size

- No study has ever considered more than two 'sizes' of decision makers.
- However, team size may affect (the quality of) decision making (see information load theory).
- 3 different decision makers interact for 4 rounds
  - 1 individual
  - 1 team with 2 members
  - 1 team with 4 members



Sutter (2005) – Results

Larger teams choose smaller numbers (significant in all rounds)



Sutter (2005) – Profits

Larger teams win more often.

Teams in coordination games

Surprisingly, so far there have only been (experimental) studies that investigate the coordination behavior of individuals, whereas the behavior of teams has not been examined (see the excellent survey of Devetag and Ortmann, 2007).

However, team decision-making and coordination across teams is a widespread phenomenon. For instance, Knez and Simester (2001) illustrate in a very nice field study the need for coordination among teams at Continental Airlines to manage on-time departures and arrivals.

Irlenbusch and Sutter (2007) – Design

- 2 weakest-link games (alias minimum-games)
- 4 average-opinion games (alias median-games)

- 5 decision makers constitute a “group”: either 5 individuals or 5 teams á three subjects (chat communication)
- 20 periods with partner-matching

- Feedback: Minimum/Median in particular period
- Computerized (Fischbacher, 2007)

- Average duration: 45-65 minutes
- Average payoff: 9€, plus 2.5€ show-up fee

The weakest-link game *WL-GAME*

Table 1: Payoffs in weakest-link game *WL-GAME*

Smallest number chosen in your group

Your number	**7**	**6**	**5**	**4**	**3**	**2**	**1**
7	130	110	90	70	50	30	10
6		120	100	80	60	40	20
5			110	90	70	50	30
4				100	80	60	40
3					90	70	50
2						80	60
1							70

Payoff-dominance: “7” Risk-dominance: “1”

The weakest-link game *WL-RISK*

Table 2: Payoffs in weakest-link game *WL-RISK*

Smallest number chosen in your group

Your number	**7**	**6**	**5**	**4**	**3**	**2**	**1**
7	130	0	0	0	0	0	0
6		120	0	0	0	0	0
5			110	0	0	0	0
4				100	0	0	0
3					90	0	0
2						80	0
1							70

Payoff-dominance: “7” Risk-dominance: “1”

The average-opinion game *AO-GAME*

Table 3: Payoffs in average-opinion game *AO-GAME*

		Median number chosen in your group						
		7	**6**	**5**	**4**	**3**	**2**	**1**
Your number	**7**	130	115	90	55	10	-45	-110
	6	125	120	105	80	45	0	-55
	5	110	115	110	95	70	35	-10
	4	85	100	105	100	85	60	25
	3	50	75	90	95	90	75	50
	2	5	40	65	80	85	80	65
	1	-50	-5	30	55	70	75	70

Payoff-dominance: “7” Risk-dominance: “3”

The average-opinion game *AO-PAY*

Table 4: Payoffs in average-opinion game *AO-PAY*

		Median number chosen in your group						
		7	**6**	**5**	**4**	**3**	**2**	**1**
Your number	**7**	130	0	0	0	0	0	0
	6	0	120	0	0	0	0	0
	5	0	0	110	0	0	0	0
	4	0	0	0	100	0	0	0
	3	0	0	0	0	90	0	0
	2	0	0	0	0	0	80	0
	1	0	0	0	0	0	0	70

Payoff-dominance: “7” Risk-dominance: n.a.

The average-opinion game *AO-RISK*

Table 5: Payoffs in average-opinion game *AO-GAME*

		Median number chosen in your group						
		7	**6**	**5**	**4**	**3**	**2**	**1**
Your number	**7**	70	65	50	25	-10	-55	-110
	6	65	70	65	50	25	-10	-55
	5	50	65	70	65	50	25	-10
	4	25	50	65	70	65	50	25
	3	-10	25	50	65	70	65	50
	2	-55	-10	25	50	65	70	65
	1	-110	-55	-10	25	50	65	70

Payoff-dominance: n.a. Risk-dominance: “4”

The average-opinion game *SEPARATRIX*

Table 6: Payoffs in *SEPARATRIX*

Your number

your number	Median number chosen in your group													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1	45	49	52	55	56	55	46	-59	-88	-105	-117	-127	-135	-142
2	48	53	58	62	65	66	61	-27	-52	-67	-77	-86	-92	-98
3	48	54	**60**	66	70	74	72	1	-20	-32	-41	-48	-53	-58
4	43	51	58	65	71	77	80	26	8	-2	-9	-14	-19	-22
5	35	44	52	60	69	77	83	46	32	25	19	15	12	10
6	23	33	42	52	62	72	82	62	53	47	43	41	39	38
7	7	18	28	40	51	64	78	75	69	66	64	63	62	62
8	-13	-1	11	23	37	51	69	83	81	80	80	80	81	82
9	-37	-24	-11	3	18	35	57	88	89	91	92	94	96	98
10	-65	-51	-37	-21	-4	15	40	89	94	98	101	104	107	110
11	-97	-82	-66	-49	-31	-9	20	85	94	100	105	110	114	119
12	-133	-117	-100	-82	-61	-37	-5	78	91	99	106	**112**	118	123
13	-173	-156	-137	-118	-96	-69	-33	67	83	94	103	110	117	123
14	-217	-198	-179	-158	-134	-105	-65	52	72	85	95	104	112	120

Payoff-dominance: “12”. Risk-dominance: “3”

Experimental procedure

Experiments run in academic year 2006/07

- Weakest-link games at University of Cologne
- Average-opinion games at University of Innsbruck

	Participants		# groups (*N*)	
Game	*Ind.*	*Teams*	*Ind.*	*Teams*
WL-GAME	90	135	18	9
WL-RISK	30	90	6	6
AO-GAME	30	90	6	6
AO-PAY	30	90	6	6
AO-RISK	30	90	6	6
SEPARATRIX	30	90	6	6

$\Sigma = 825$

Irlenbusch and Sutter (2007) – Results

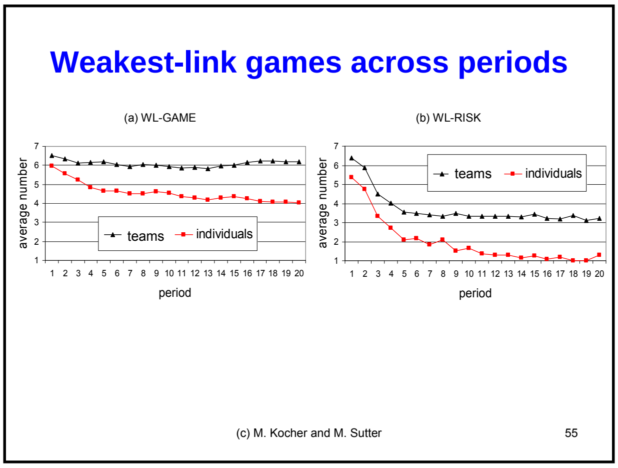
Table 7: Average numbers in 1st period and overall

	1st period			All periods		
Coordination game	*Individual*		*Team*	*Individual*		*Team*
WL-GAME (Tab. 1)	5.98	<**	6.53	6.06	<*	6.56
WL-RISK (Tab. 2)	5.37	<***	6.37	1.97	<	3.70
AO-GAME (Tab. 3)	5.67	<	6.17	6.57	<**	6.94
AO-PAY (Tab. 4)	5.33	<***	6.43	6.04	<**	6.95
AO-RISK (Tab. 5)	4.43	≈	4.40	4.07	≈	4.03
SEPARATRIX (Tab. 6)	7.90	<***	11.03	9.80	<**	12.63

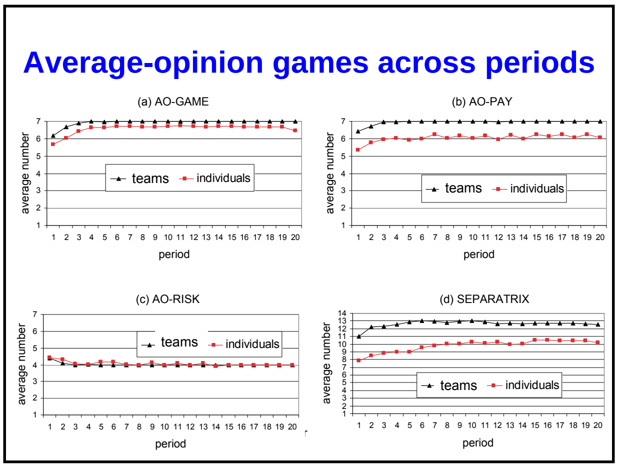
Observations 1: Teams choose higher numbers.

Observations 2: Teams get significantly higher payoffs.

(except in *AO-RISK* where payoff-dominance does not apply)



Weakest-link games across periods



Average-opinion games across periods

Miscoordination and adjustments across periods

Table 8: Coordination and adjustment

	Miscoordination			Adjustment		
Coordination game	*Individual*		*Team*	*Individual*		*Team*
WL-GAME (Tab. 1)	0.65	>**	0.30	0.60	>*	0.29
WL-RISK (Tab. 2)	0.39	>*	0.29	0.53	>**	0.21
AO-GAME (Tab. 3)	0.14	>***	0.06	0.09	>**	0.03
AO-PAY (Tab. 4)	0.25	>**	0.03	0.34	>*	0.02
AO-RISK (Tab. 5)	0.12	>	0.04	0.10	>	0.01
SEPARATRIX (Tab. 6)	0.84	>***	0.51	0.98	>***	0.56

Observation 3: Teams are more successful in avoiding miscoordination and settle quicker in an equilibrium.

What drives team behavior?

In psychology, team decision-making is often related to a so-called “truth wins”-norm (in demonstrable tasks). I.e., if one team member advocates the “true” solution, then the others are easily convinced for that.

We examine whether the observed team behavior can be explained by a

- “payoff-dominance wins”-norm, or a
- “risk-dominance wins”-norm.

A simulation approach

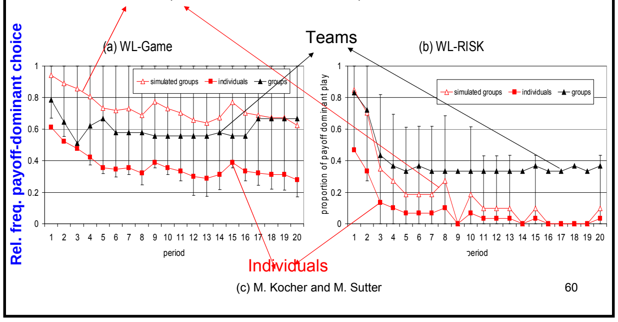
We take the observed individual data (in a given game and period) and randomly assign three individuals into a team. If one of the individuals has chosen the payoff-dominant (or the risk-dominant) action, then we assume that the team would have chosen that action as well.

We run 100,000 simulations (per game and period) and calculate from that the expected frequency of playing either the payoff-dominant or the risk-dominant action.

We also calculate confidence-intervals to check whether the actually observed team-decisions lie within these intervals.

Simulation results on payoff-dominance in weakest-link games

Simulated teams (with confidence intervals)

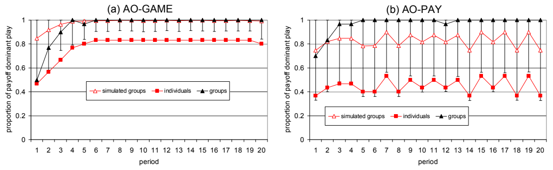


Teams

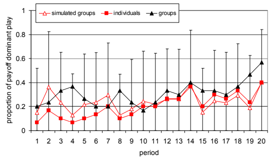
Individuals

Simulation results on payoff-dominance in average-opinion games

(a) AO-GAME (b) AO-PAY



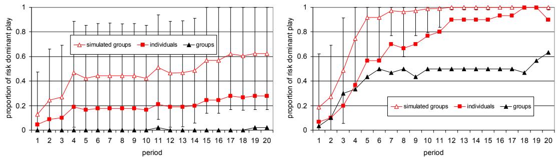
(c) SEPARATRIX



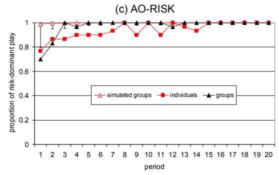
Observation 4: The more efficient coordination in teams can be explained by a "payoff-dominance wins"-norm.

Simulation results on risk-dominance

(a) WL-GAME (b) WL-RISK



(c) AO-RISK



Observation 5: Teams are significantly less likely to follow a "risk-dominance wins"-norm (if payoff-dominance applies).

Could our findings have been expected? Relation to team decision-literature

1) Teams have been found to be closer to standard game theoretic predictions (in bargaining games, signaling games, …, see Kocher and Sutter, 2005, for a review).
   → However, this regularity does not solve the equilibrium selection problem.
2) Teams care more for own payoffs (and exhibit less social preferences, see Bornstein and Yaniv, 1998).
   → This might explain why payoff-dominance is relatively more important for teams.
3) Teams are not *per se* more risk-averse or risk-loving (see Shupp and Williams, 2007).
   → This might explain the results in *AO-RISK*.