

Vienna
**BEHAVIORAL
ECONOMICS
NETWORK**



How Teamwork and Leadership Lead to Better Performance

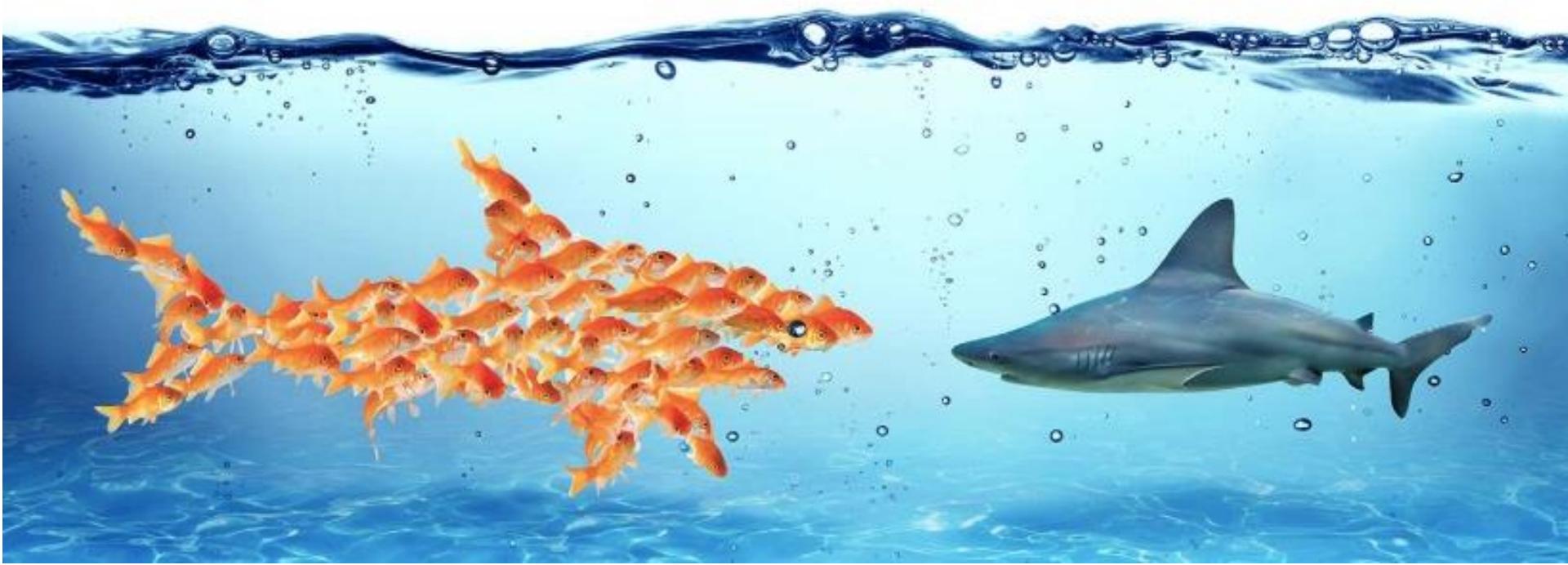
An evidence-based view

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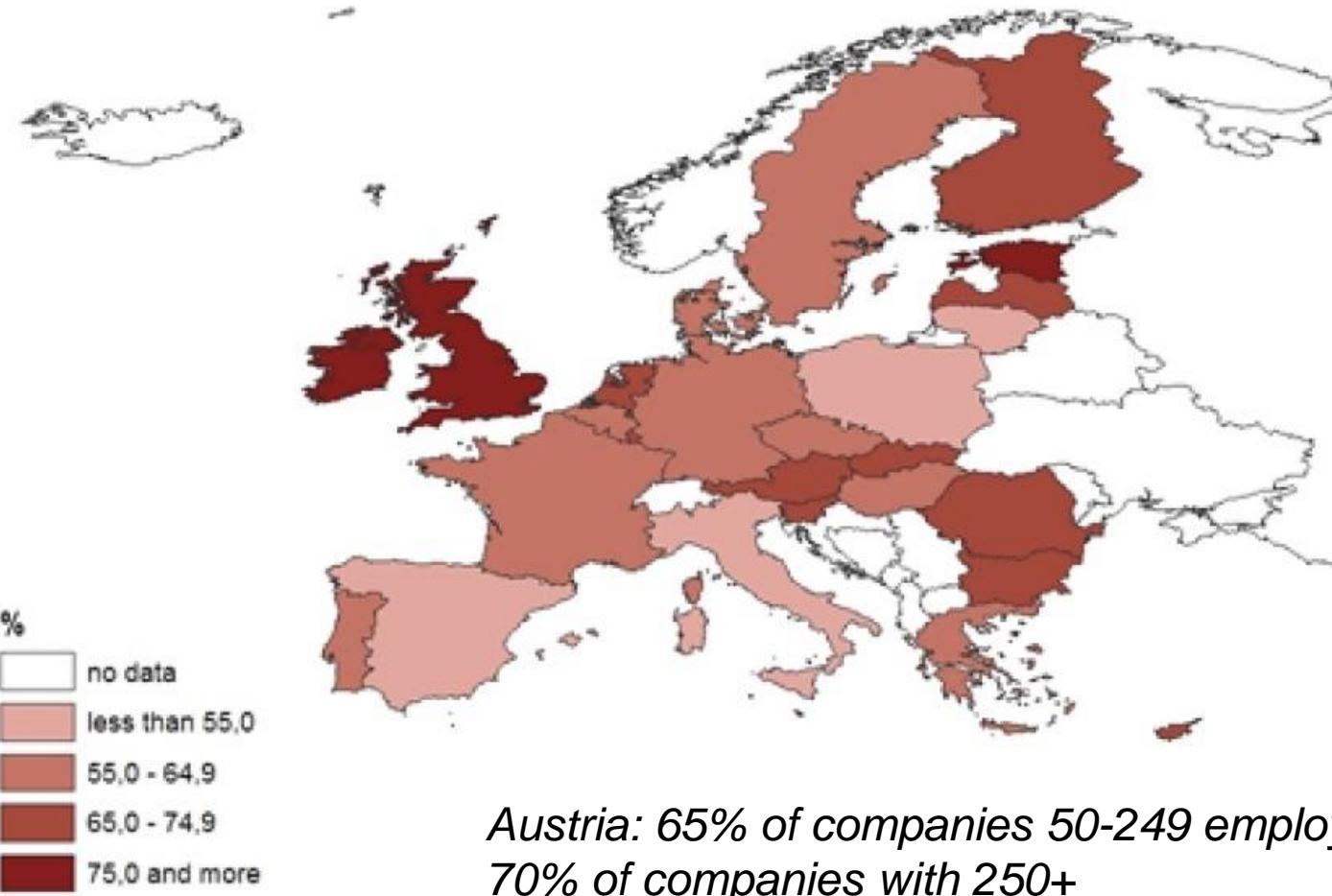
Teams are Ubiquitous

- Teamwork: Combination of employees' efforts to achieve a common objective that improves the performance of the group
 - “Groups of employees who have at least some collective tasks and where the team members are authorized to regulate mutually the execution of these collective tasks” (Delarue, 2003)



- Teamwork has become dominant in the new forms of work organization
 - The share of large firms with workers in self-managed teams rose from 27% to 78% between 1987 and 1996 (Lazear and Shaw 2007)
 - Higher prevalence in industrial sectors, medium- and large-sized firms, highly-skilled jobs

Teamwork incidence (%)



Source: EWCS 2000/2001: ('Does your job involve, or not doing all or part of your work in a team.')

ROAD MAP

- Why promoting teamwork?
 - Two heads better than one...
 - ...But selfishness can ruin cooperation
- Why are people willing to join teams?
 - Beliefs and social preferences
 - Teaching opportunities
- How to enhance cooperation and discourage free-riding?
 - Communication
 - What makes a good leader?

1. Why promoting teamwork?



- Considered as a major component of ‘high performance work organizations’ (HPWO)
- Assumes that teamwork is the key to success and better performance

A black and white photograph showing two hands coming together from opposite sides to meet in the center. They are holding several interlocking puzzle pieces. The hands are positioned vertically, with the fingers interlaced.

Coming together is a

beginning

Keeping together is

progress

Working together is

success

- Henry Ford -



**Talent wins games, but
teamwork and intelligence
wins championships.**

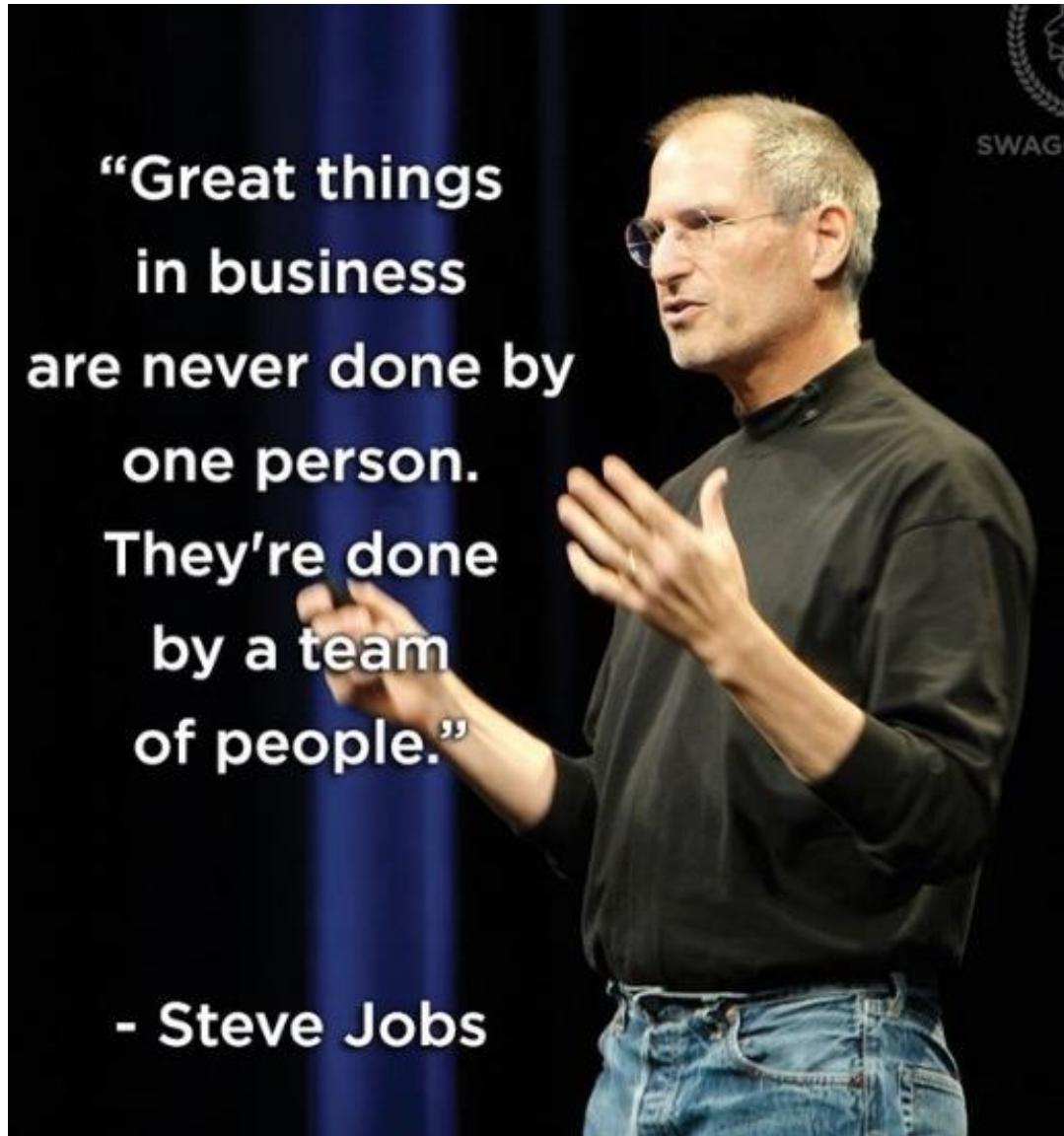
Michael Jordan



SWAGGER

**“Great things
in business
are never done by
one person.
They’re done
by a team
of people.”**

- Steve Jobs



- **Economic theory:** Several benefits from organizing work in teams (Alchian & Demsetz, Holmström, Grossman & Hart, Lazear)

- Complementarities when the whole is greater than the sum of parts
- Knowledge transfer and enlargement of abilities, provided specialization is not too large
- Quicker problem-solving
- Benefits of mutual monitoring
- Empowerment of employees through increased responsibility, control and participation

Higher employee motivation -> Higher productivity -> Better performance of companies

- Limitations of standard empirical methods

- Which representativeness of case studies?
- Declarative methods in surveys: employees' subjective assessment of their involvement in teamwork
- Selection issues
- Cannot inform on the behavioral dimensions of teamwork

- New evidence from behavioral and experimental economics:

- Production of data inaccessible by surveys (social preferences)
- Exogenous changes in the institutions that support cooperation (causality)

- A rich tool-box: Lab / Field / Lab-in-the-field experiments

- Controlled environment

- Control of information
- Anonymity
- Real incentives



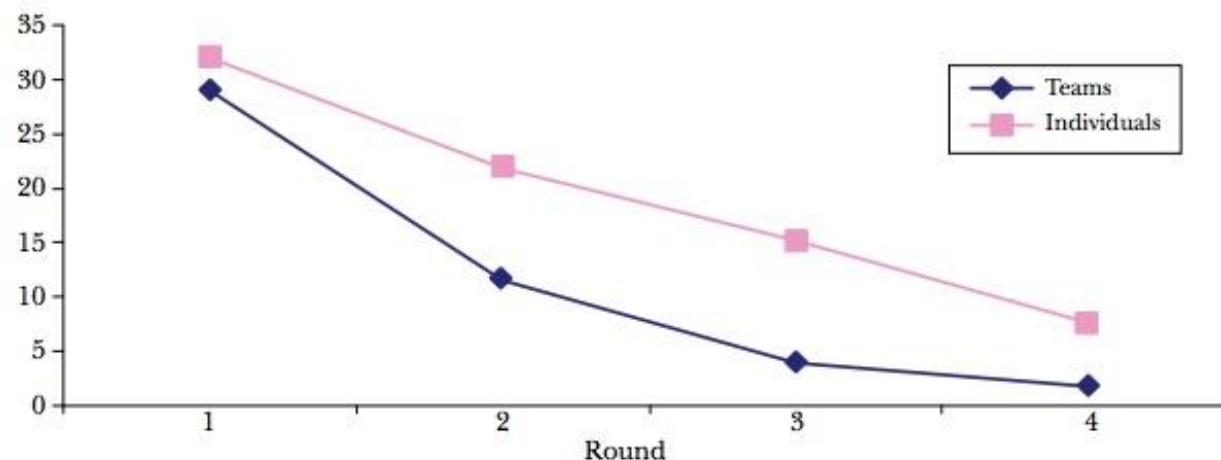
- *Why teams? Because two heads are better than one*

- Individuals are more influenced by biases, cognitive limitations and social considerations
- Teams make more rational and more self-interested decisions
 - ✓ Teams are smarter and make less mistakes
 - ✓ Teams coordinate better
 - ✓ Teams make more efficient decisions

Teams are smarter

- Kocher and Sutter 2005
- A Beauty Contest game (Keynes 1936)
- N players choose a number in the interval $(0,100)$
- The winner is the player whose number is closest to p times the average chosen number ($p= 2/3$ for ex.)
- Rational equilibrium choice = 0

Median Number Chosen by Groups and Individuals in a Beauty-Contest Game

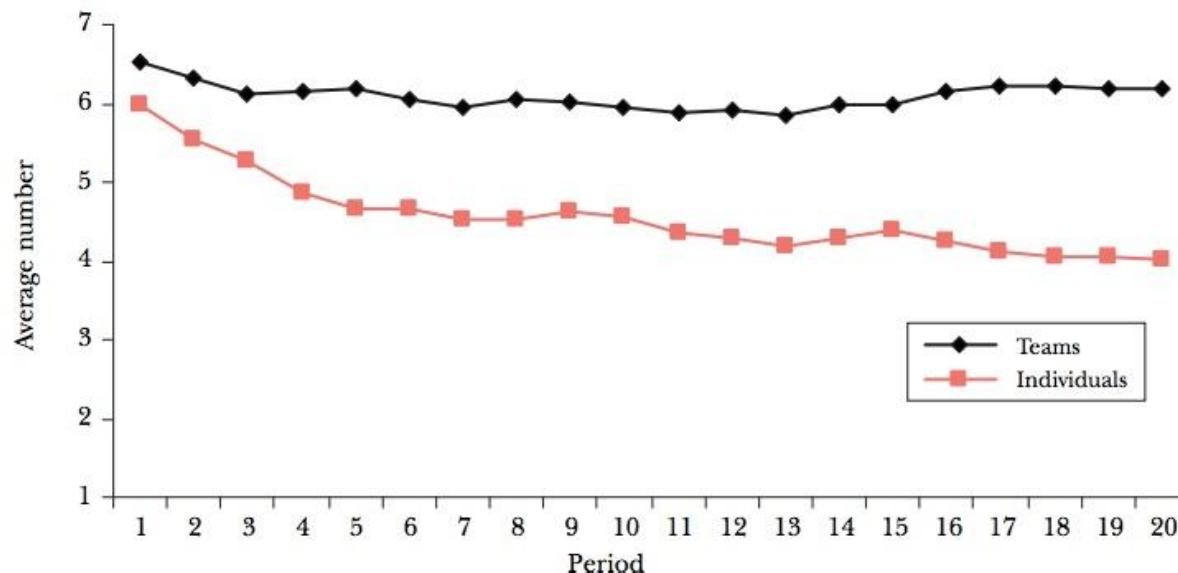


- Teams ($N=3$) think one step ahead of individuals
- Quicker convergence of teams towards equilibrium play

Teams coordinate better and are more efficient

- Ferri et al. 2010
- Weakest Link game
- 5 players play individually or in groups of 3
- Choice of a costly level of effort between 1 and 7
- Payoff of the group depends on the minimum effort chosen
- Several equilibria where all choose the same effort, Pareto-ranked

Effort Levels of Individuals and Groups in a Weakest Link Game



- Teams miscoordinate less often
- Converge towards more efficient equilibria: 24% higher social welfare

- ... But selfishness can ruin cooperation

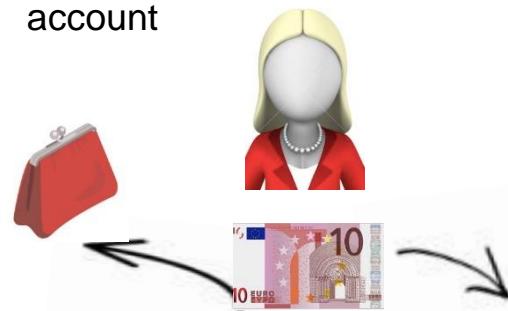
- Costs of teamwork:
 - Productivity losses due to **free-riding** on the effort of others
 - Inefficient decision-making because of coordination failures and **normative conflicts**

- Teamwork as a social dilemma

- Effort in teams is like contributing to a public good
- Team of N individuals
- Individual endowment of x units
- Decision on the allocation of these units to a private account and a public (team) account



Private
account



+



+



+



+

Private
account



+



+

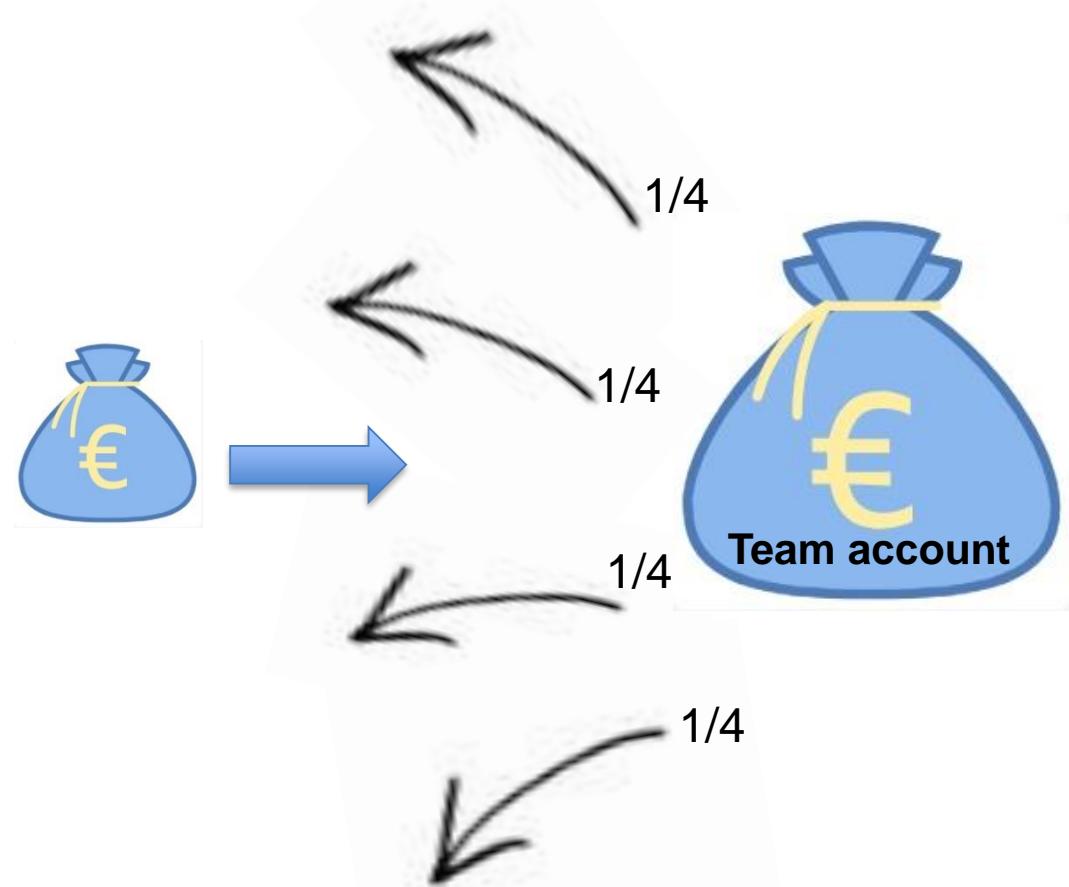


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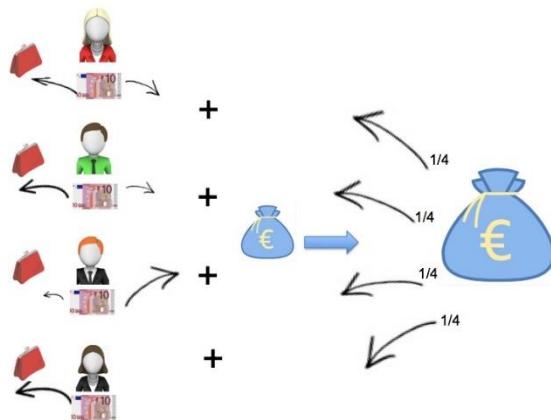


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Positive externalities



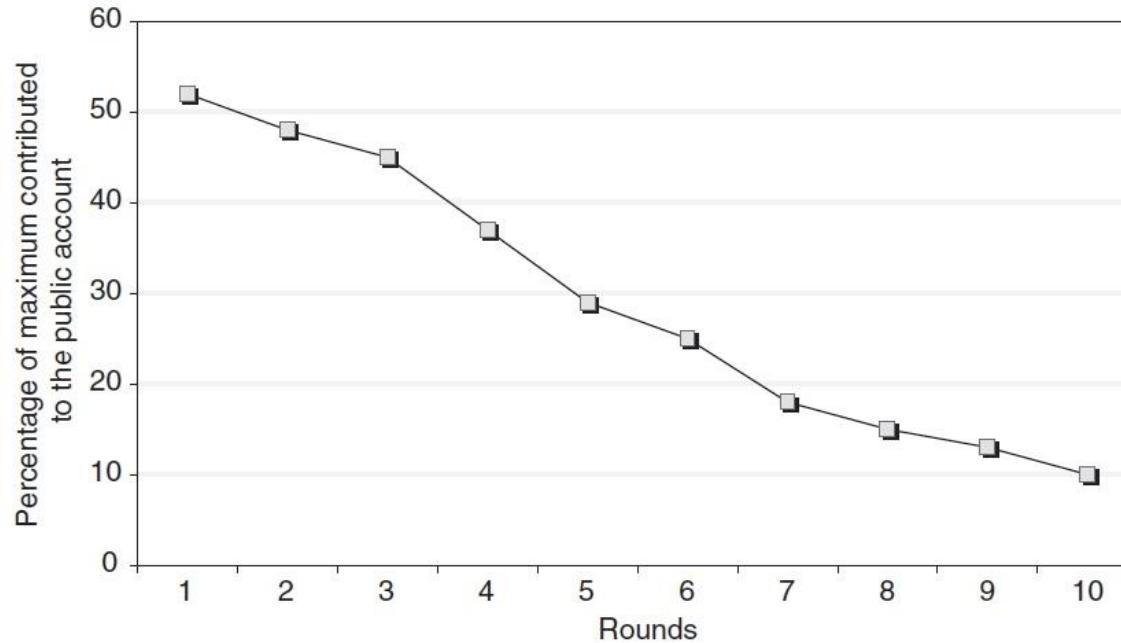
Team account equally shared between all team members, **regardless of their contribution**



Payoff: $10\text{€} - \text{my contribution to the public account}$
 $+ \frac{1}{4} (\text{total public account} \times 2)$

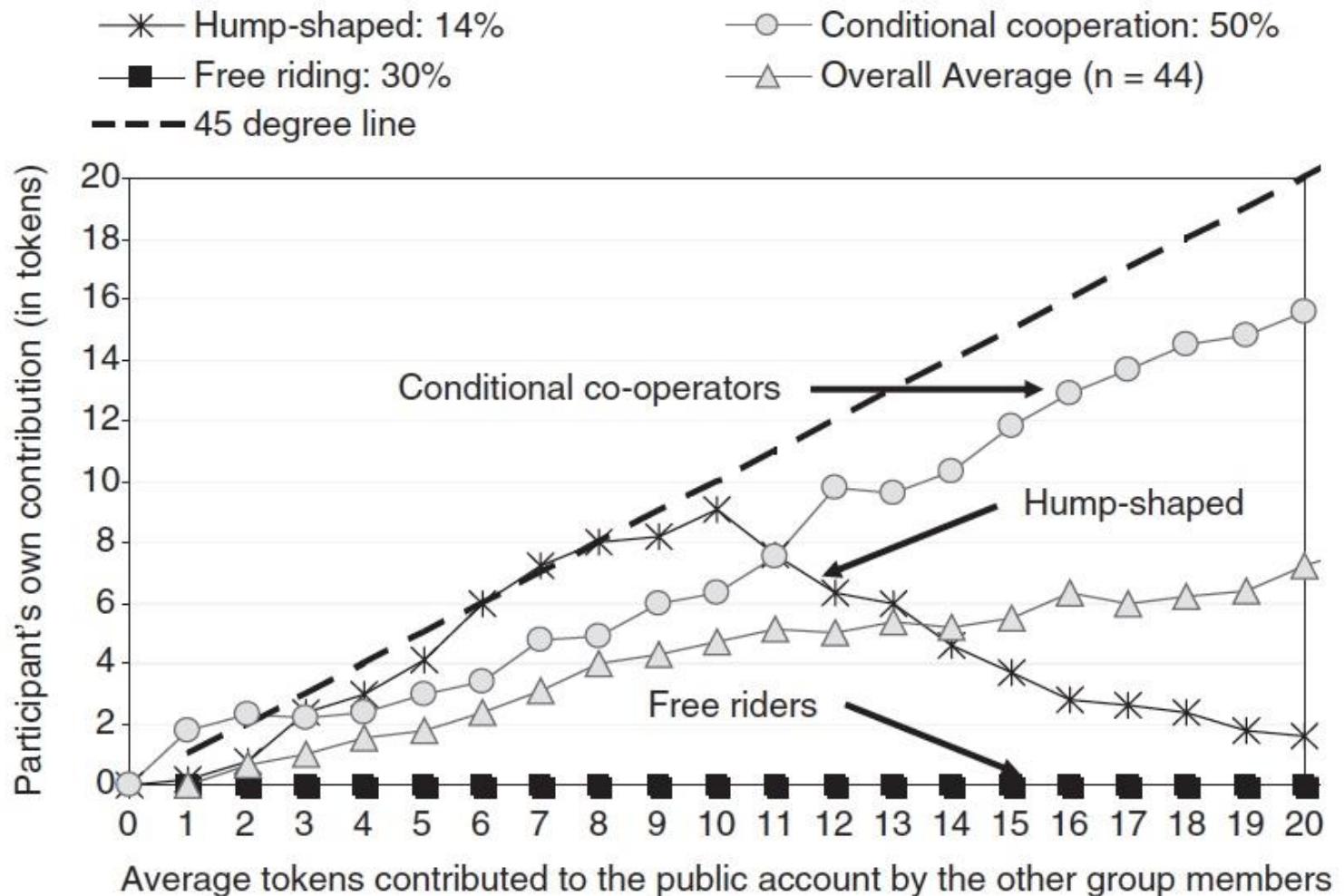
- Social optimum: contribute all endowment to the public account ($N \times \text{MPCR} > 1$) (each earns 20€)
- But a free-rider can earn more (25€ if all the others contribute)
- Equilibrium: everyone contributes nothing ($\text{MCR} < 1$) (each earns 10€)

- Typical pattern of evolution of cooperation over time



- Contributions (40-50% of the endowment) at the beginning
- Slow decay
- Full free-riding at the end

- Large heterogeneity in effort
- Why do people contribute to the team effort? Beliefs and preferences



Source: Fischbacher, Gächter and Fehr 2011

To sum up:

- Teams make smarter decisions and have less cognitive limitations
- They cooperate more than predicted by purely selfish rationality
- Decay of cooperation over time and development of free-riding because of conditional cooperation and self-serving behavior

2. Why join a team?



- Standard economic theory is unambiguous
 - Individuals of equal ability should prefer working for a piece rate because of free-riding
 - With heterogeneous ability, only low ability individuals may gain from team membership
- Behavioral economic reasons motivating individuals to join teams
 - Higher earnings if less skilled
 - Biased beliefs about others' ability
 - Social preferences
 - Social interactions
 - Opportunities for teaching and learning

Are women more attracted by cooperative work environments? *Economic Journal*, 2015, Kuhn and Villeval



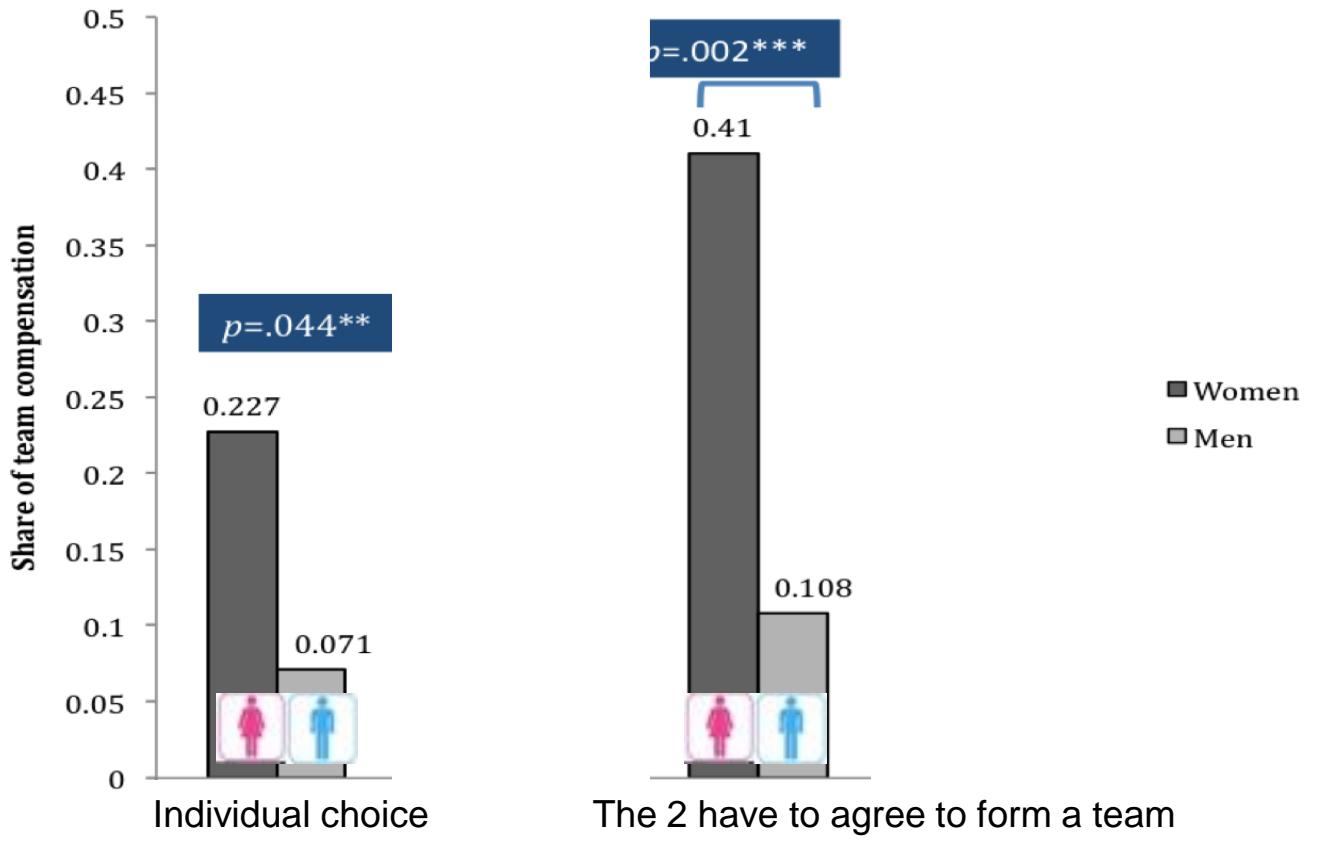
- Random matching of pairs, fixed
- Real effort task: 4 minutes for decoding numbers into letters
- Leisure opportunity: Internet access
- Uncertainty: No feedback on co-participant's output

- Payment schemes
 - Individual pay: $Y_i^I = p^I Q_i^1$ with $p^I = €0.20$
 - Team pay: $Y_i^T = p^T (Q_i^1 + Q_i^2)/ 2$

- Two treatments: Baseline and Efficiency Advantage
 - Baseline: $p^T = p^I = €0.20$
 - Efficiency Advantage treatment: $p^I = €0.20$, $p^T = €0.22$

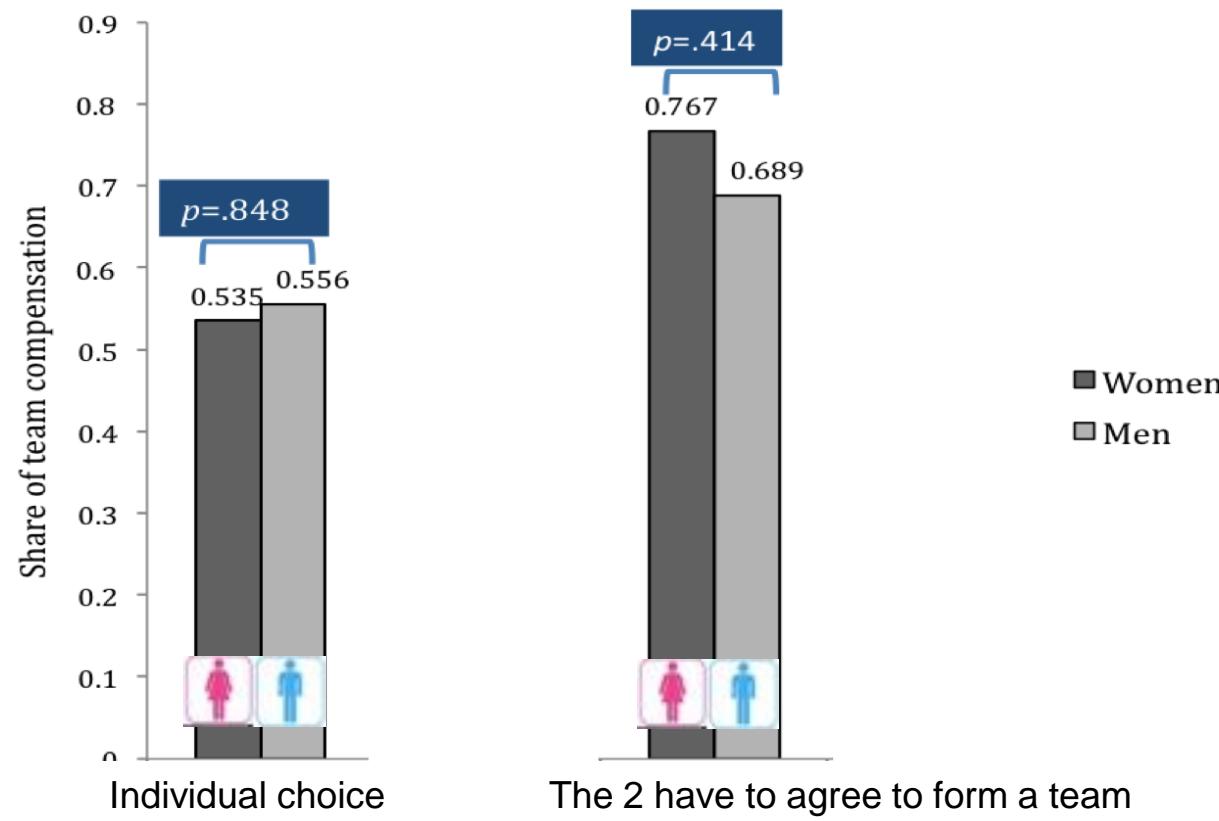
- Two conditions for choosing a payment scheme (after experiencing both successively)
 - Individual choice applies, regardless of the other player's choice
 - Forming a team requests that both chose to team up: social preferences may matter

Team choice - Baseline



- Women choose team compensation 3 times more than men
- Women more likely to choose teams when it ensures equal sharing **

Team choice - Efficiency Advantage treatment



- The gender gap vanishes with efficiency advantages
- Men react more to incentives
- Equal sharing of payoffs creates additional motivation for women***, less for men*

The choice of teamwork is mainly affected by:

- **Adverse selection and biased beliefs:** teams more attractive to people who are less able (both genders) or more optimistic about teammates' ability (women+)
 - Because adverse selection is stronger among males, self-selected male teams perform worse than self-selected female teams
- **Social preferences:** teams more attractive to people who value more equal payoffs and accommodate partner's intentions: *not letting down the team*
 - Only abler women increase their willingness to join teams when their choice impacts others' payoff (advantageous inequality aversion)
- **Responsiveness to instrumental reasons** for joining teams (men+)

Selection into teams: The role of teaching and communication



- What if there is NO uncertainty about teammates' ability?
- Can the possibility to teach / learn be a motivation to join teams?

Cooper, Saral and Villeval (2019)

- A 3-stage experiment
 - Subjects work on a teachable task (solving nonograms) in the three parts
 - Part 1: Imposed individual piece-rate scheme
 - Part 2: **Each high ability subject is paired with a low ability one**
Choice between individual and team scheme
 - Part 3: Imposed team scheme with revenue sharing and no communication

Nonograms: Logic puzzles

Each cell needs to be either marked or unmarked

Labels indicate the length of each run of consecutive marked cells

Potentially teachable

	2	3	2	3	2	1	1	2
	2	1		1	1	1		2
1	4							
1	2	1						
2	1							
1	3							
3								
3	1							
1	1	1						

	2	3	2	3	2	1	1	2
	2	1		1	1	1		2
1	4							
1	2	1						
2	1							
1	3							
3								
3	1							
1	1	1						

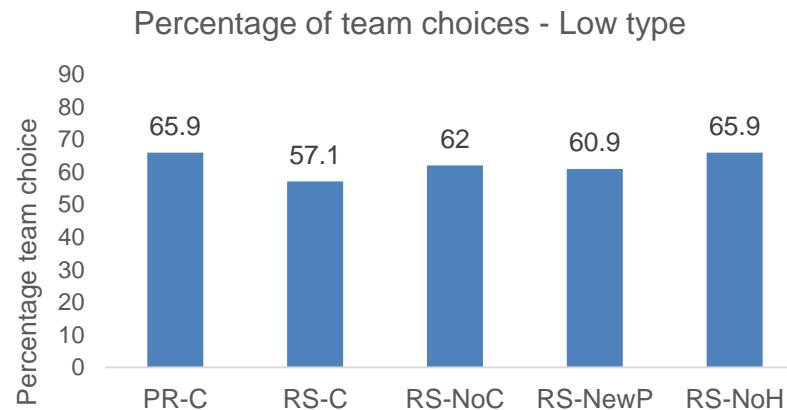
Various treatments in part 2

- **Incentives:** Revenue-sharing (RS) vs. individual piece rate (I)
- **Communication:** Chat (C) during 60 sec after each nonogram
- Facilitation of **teaching:** **Hints** sheet given to the most able partner
- **Turn-over:** Same vs. new partner in part 3, pre-announced in part 2

Main findings

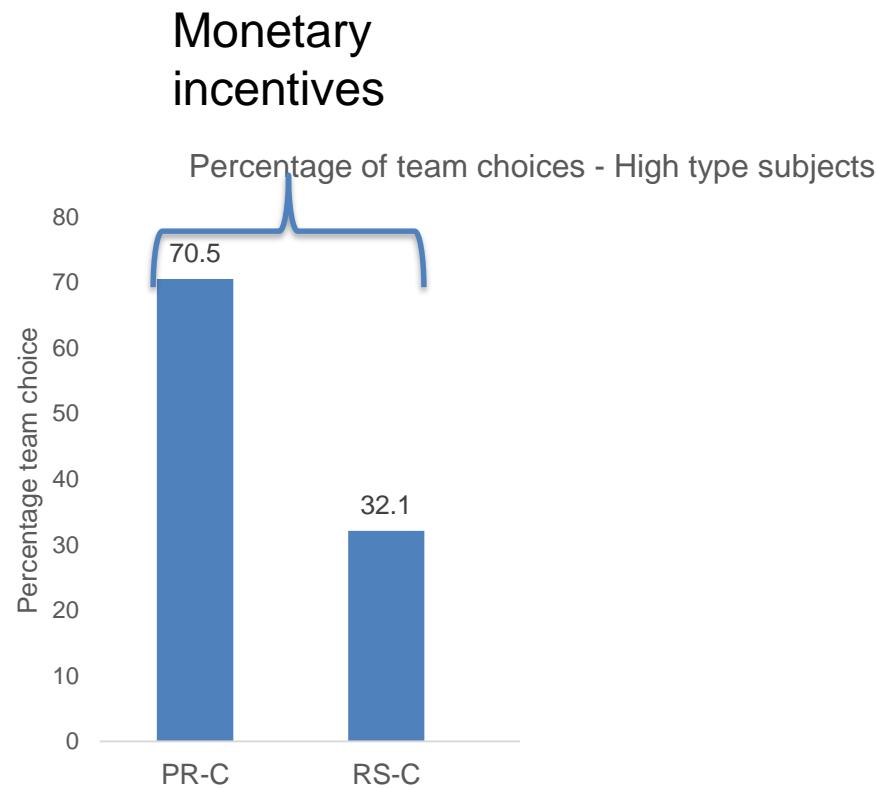
Low-type subjects

- Adverse selection: 62% of low-type are willing to join teams
- No reaction to communication manipulation
- Not all low-type join teams even under revenue-sharing (disutility from peer pressure, knowing they are less able?)



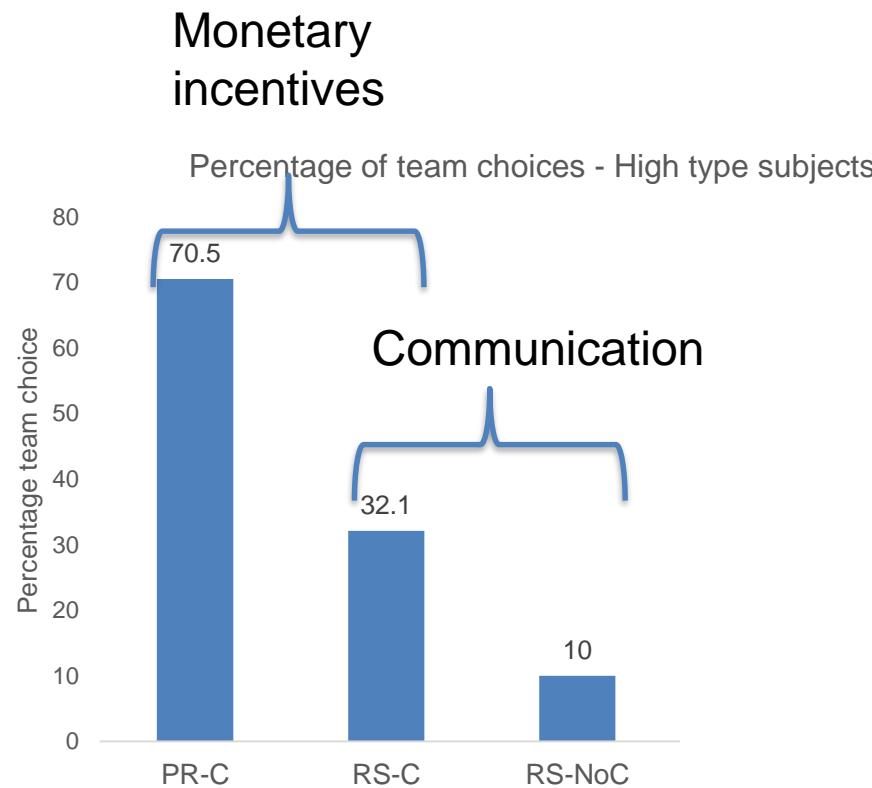
High-type subjects

- Less willing to choose Team option in part 2
 - under revenue-sharing



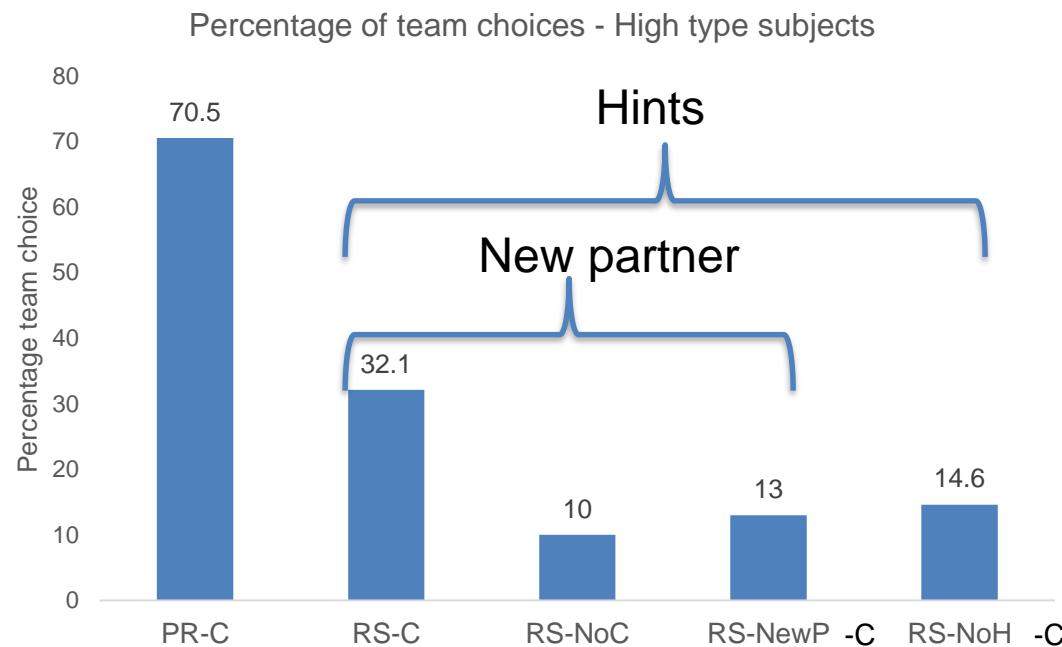
High-type subjects

- Less willing to choose Team option in part 2
 - under revenue-sharing
 - when no communication allowed



High-type subjects

- Less willing to choose Team option in part 2
 - under revenue-sharing
 - when no communication allowed
 - Or when new partner in part 3 or when no hint to teach
- 74% high-type evoke teaching as the main motivation to choose team



To sum up:

- When do high ability individuals join a team?
 - When able to teach (hints) and benefit from helping a low ability partner (keep same partner in the future)
 - Social preferences do not always play an important role

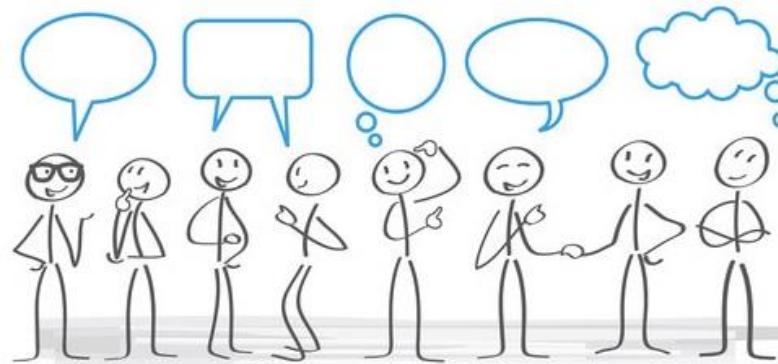
3. How to improve cooperation within teams: Communication and leadership



- Various mechanisms support cooperation in teams by changing its opportunity cost
 - Peer punishment of norm violators
 - Peer rewards of norm compliers
- Mitigate the free-riding problem (selfish imitate cooperators) but may decrease efficiency (cost, retaliation, misdirection of sanctions)
- Mechanisms centered on social interactions/**informational incentives instead of monetary incentives**
 - Communication
 - Leadership
 - Mobility

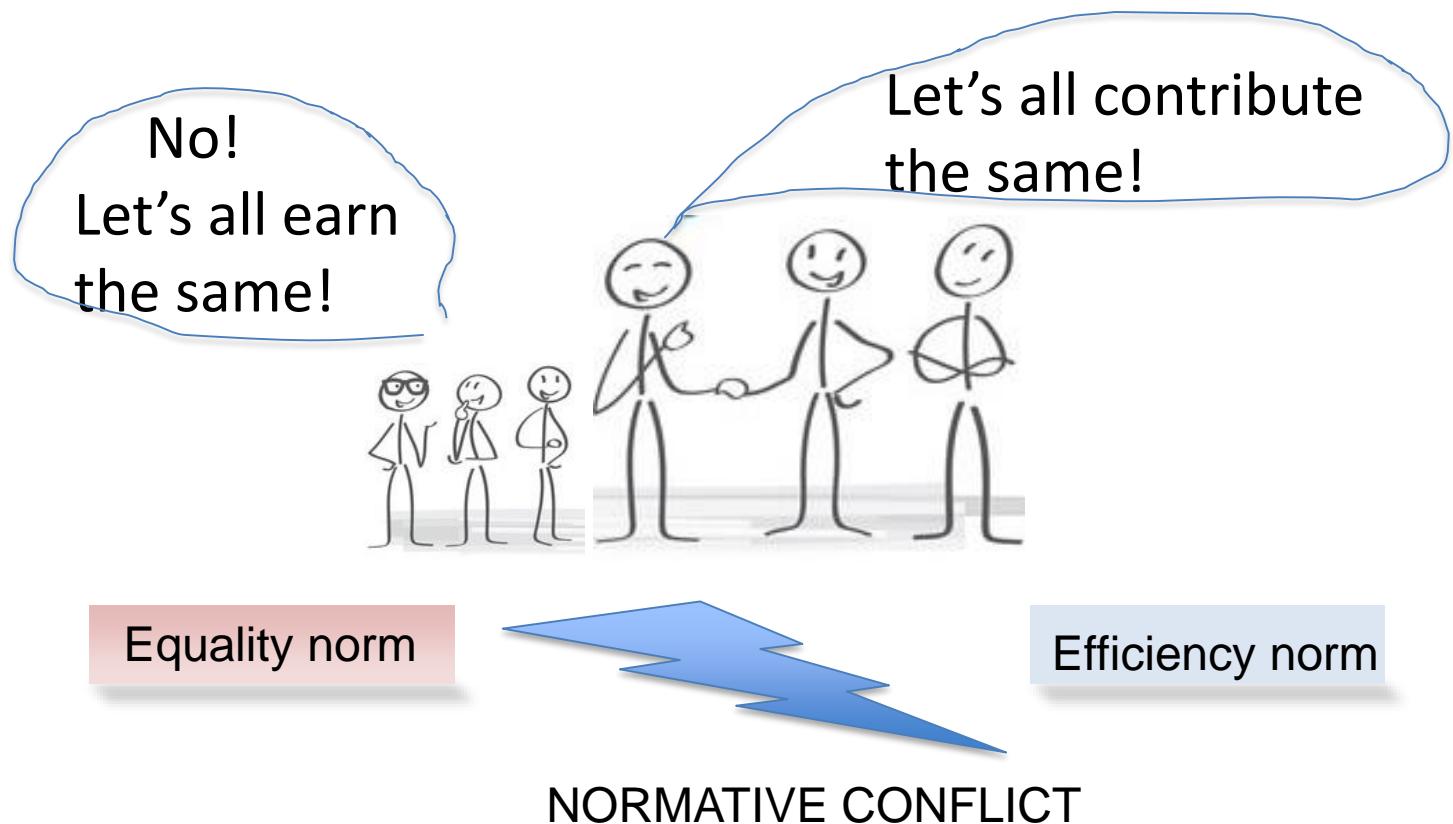
○ The power of communication

- Communication unfailingly increases efficiency
(Bochet et al. 2006; Janssen et al. 2010; Ostrom *et al.* 1992)



- Why? Promises, strengthened group identity, the signal of cooperative intentions, informal personal commitment device
- A stronger impact when messages enhance the benefits of cooperation than when they threaten free-riders

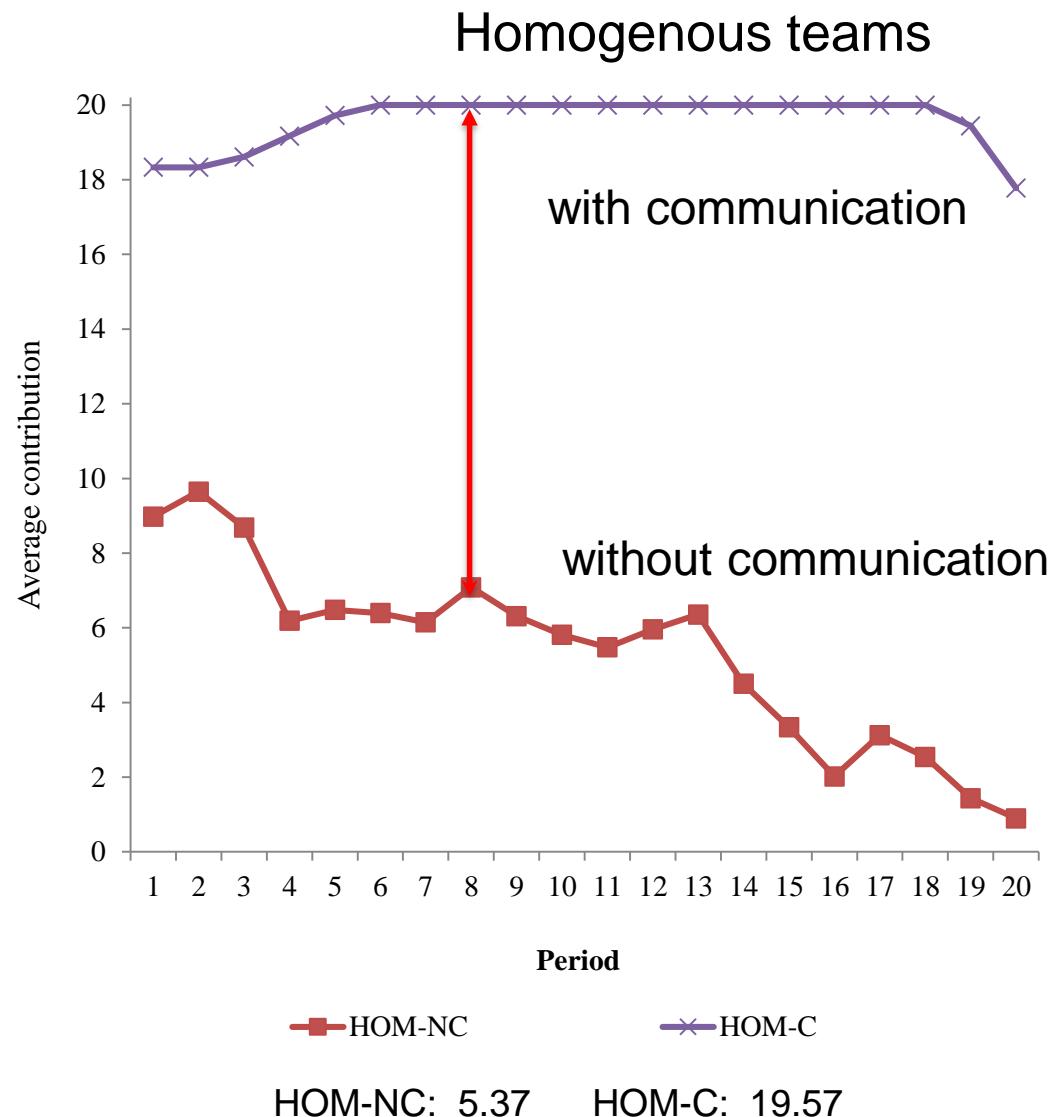
- Obtained when teams are homogeneous: no conflict between efficiency and equality of earnings
- What if teams are heterogeneous (high vs. low return from team effort)?
=> Trade-off between efficiency and equality



- Teams of 6 members
- Mechanism: 1) Contribution 2) Peer rewards
- 2x2 treatments
 - Communication or not before contributing
 - Homogenous (Return: 30%) vs. Heterogenous teams (40% vs. 20%)
- Mechanism enables HET teams **maximize efficiency** by cooperating fully (stage 1) and **minimize inequality** through rewards (stage 2)

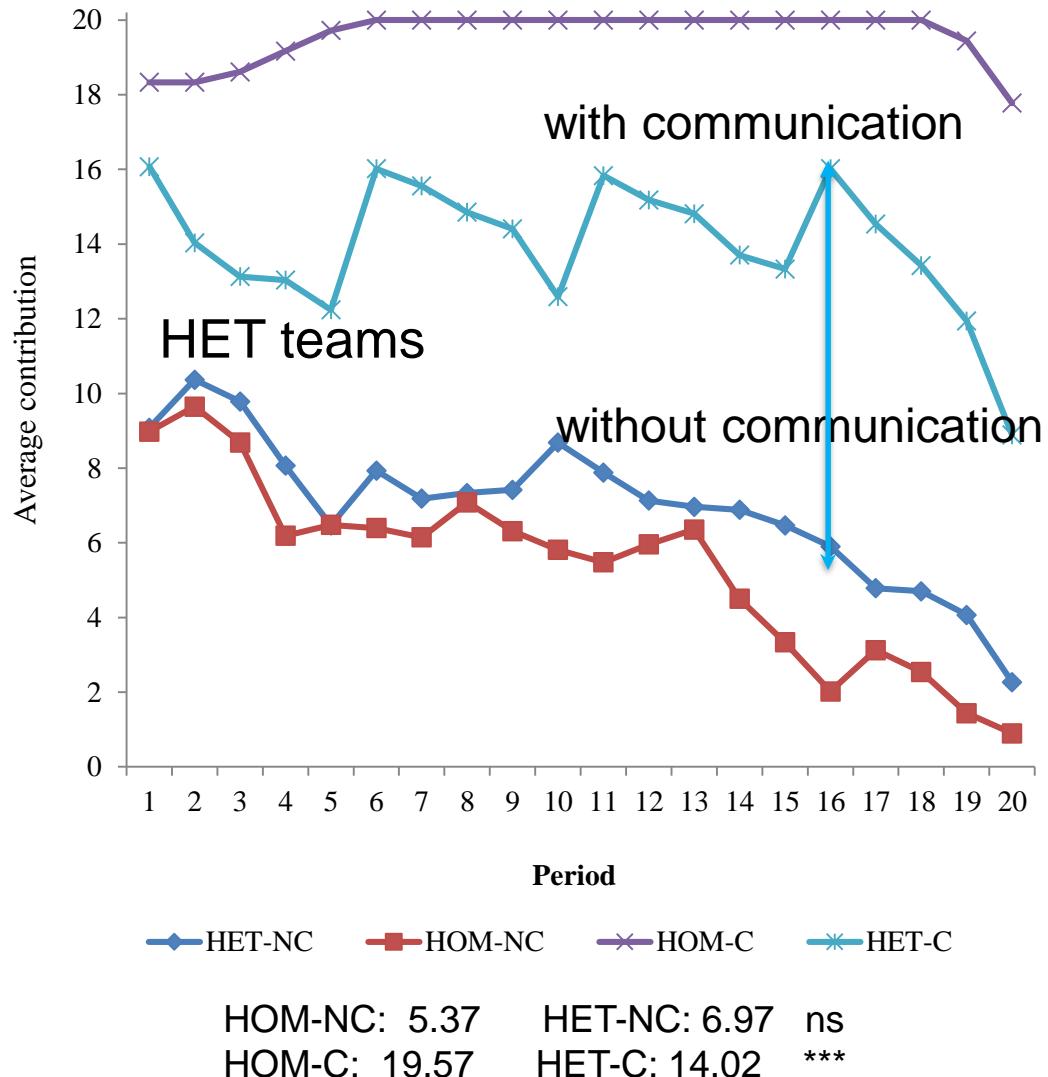
Impact of communication on team effort

- Communication increases cooperation when team members get the same return from the team effort (30%)



Impact of communication on team effort

- But the size of the effect in Heterogenous teams is only 38.17 % of that in Homogenous teams
(+265% in HOM***
+101.15% in HET***)



Normative conflicts undermine the efficacy of communication when teams are heterogenous teams because they adopt rules that **favor equality of earnings over efficiency**

- A minority of teams select the efficient contribution rule ($c_H=c_L$) (23%)
- Most teams choose a contribution rule that prioritizes equality over efficiency ($c_H=4c_L$)

- Leading-by-example

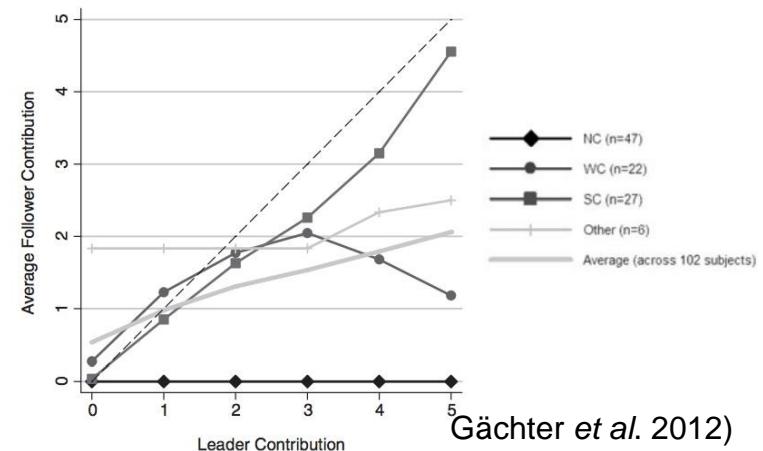


IF THERE IS SUCH A THING AS GOOD LEADERSHIP, IT IS TO GIVE A GOOD EXAMPLE. I HAVE TO DO SO FOR ALL THE IKEA EMPLOYEES. -INGVAR KAMPRAD, IKEA FOUNDER

- With a leader the team game becomes sequential:
 - Leader decides first on her/his contribution
 - Announced to followers before they make their own contribution

Typical results:

- Leaders make larger contributions to signal cooperative intentions, in expectation of followers' reciprocity
- Followers' contributions increase in the leader's contributions, but remain lower than the leader's contribution (50-60%)
- Cannot prevent decay of cooperation because of conditional cooperation with self-serving behavior

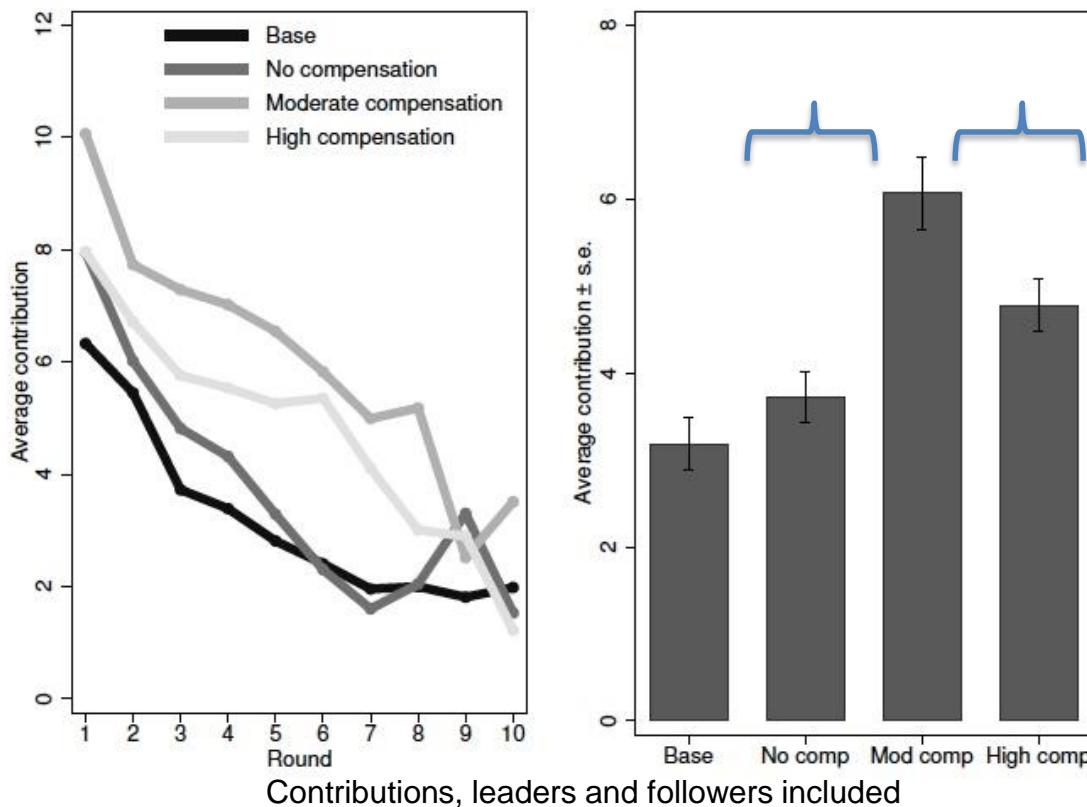


Gächter et al. 2012)

- Impact of leaders due to:
 - Reciprocity
 - Signal sent about the norm / value of a project
 - Reduced uncertainty about others' cooperativeness
- What determines the effectiveness of a leader?
 - Her/his own personal contribution
 - Her/his ability to motivate through communication
 - The social preferences of followers
- Performance is increased if the leader has formal authority:
 - Rewards and sanctions
 - Exclusion rights
 - Decision power on how to share the surplus

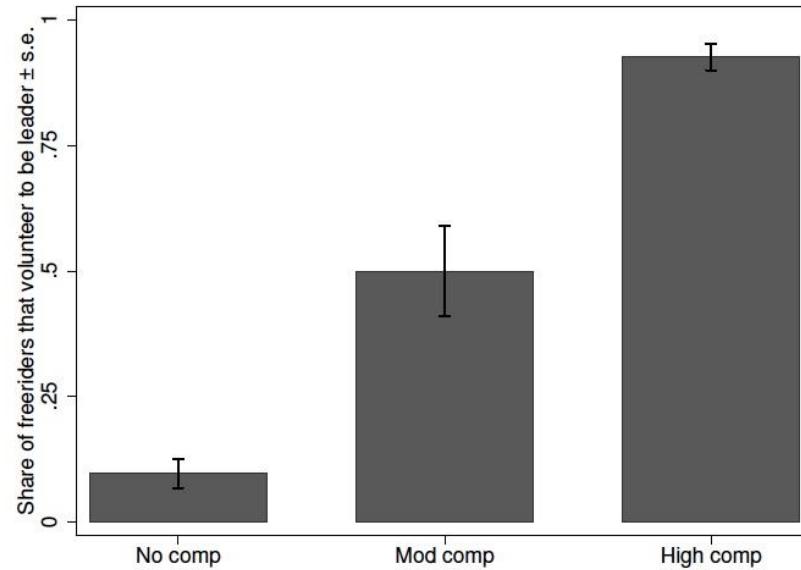
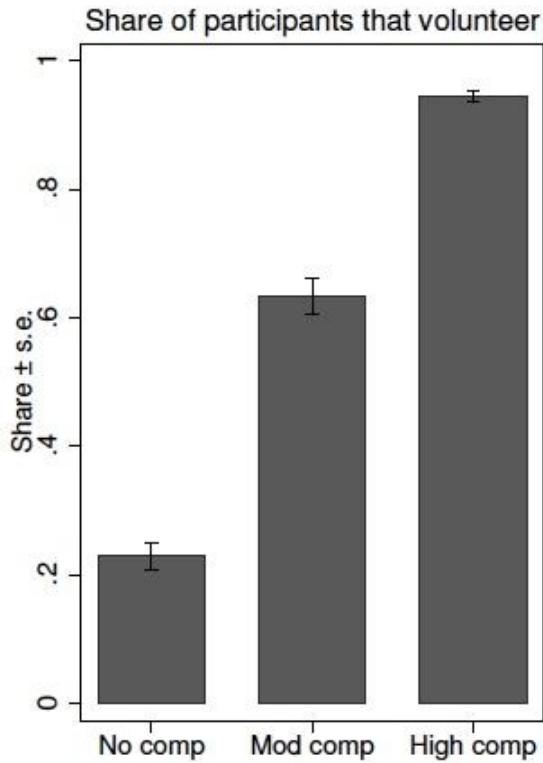
- Leaders earn less than followers
- Voluntary leaders who are not compensated are more likely
 - to be altruists or conditional cooperators
 - to care about social image
 - to hold optimistic beliefs on their impression on followers
- What happens if volunteers receive a compensation?

- Introducing compensation increases leaders' performance
- But a too high compensation (12) lowers mean contributions compared to a moderate compensation (4)



A higher compensation
attracts more volunteers...

... but also more free-riders...



Cappelen *et al.* (2016)

To take home

To take home

- Teamwork is a key to better performance because of complementarities in skills and reduced cognitive biases
- But teamwork also suffers from a strong temptation to free-riding
- Decay of cooperation because of conditional cooperation mixed with a selfish bias
- Self-selection into teamwork of less able individuals
 - But also of individuals with social preferences, more optimistic beliefs about others' abilities, and a willingness to teach

- **Communication** increases cooperation against free-riding
 - Less true in the presence of **normative conflicts** because most teams favor equality in earnings instead of efficiency
- **Leadership** has motivational effects by sending signals about the norm of cooperation
 - But the structure of **incentives** influences its impact

Behavioral Economics, an inspiring method to study teamwork, especially as regards

- heterogeneity in beliefs and social preferences
- cognitive and normative dimensions of team decision-making
- mechanism design: sanctions, rewards, communication, leadership



Thank you!

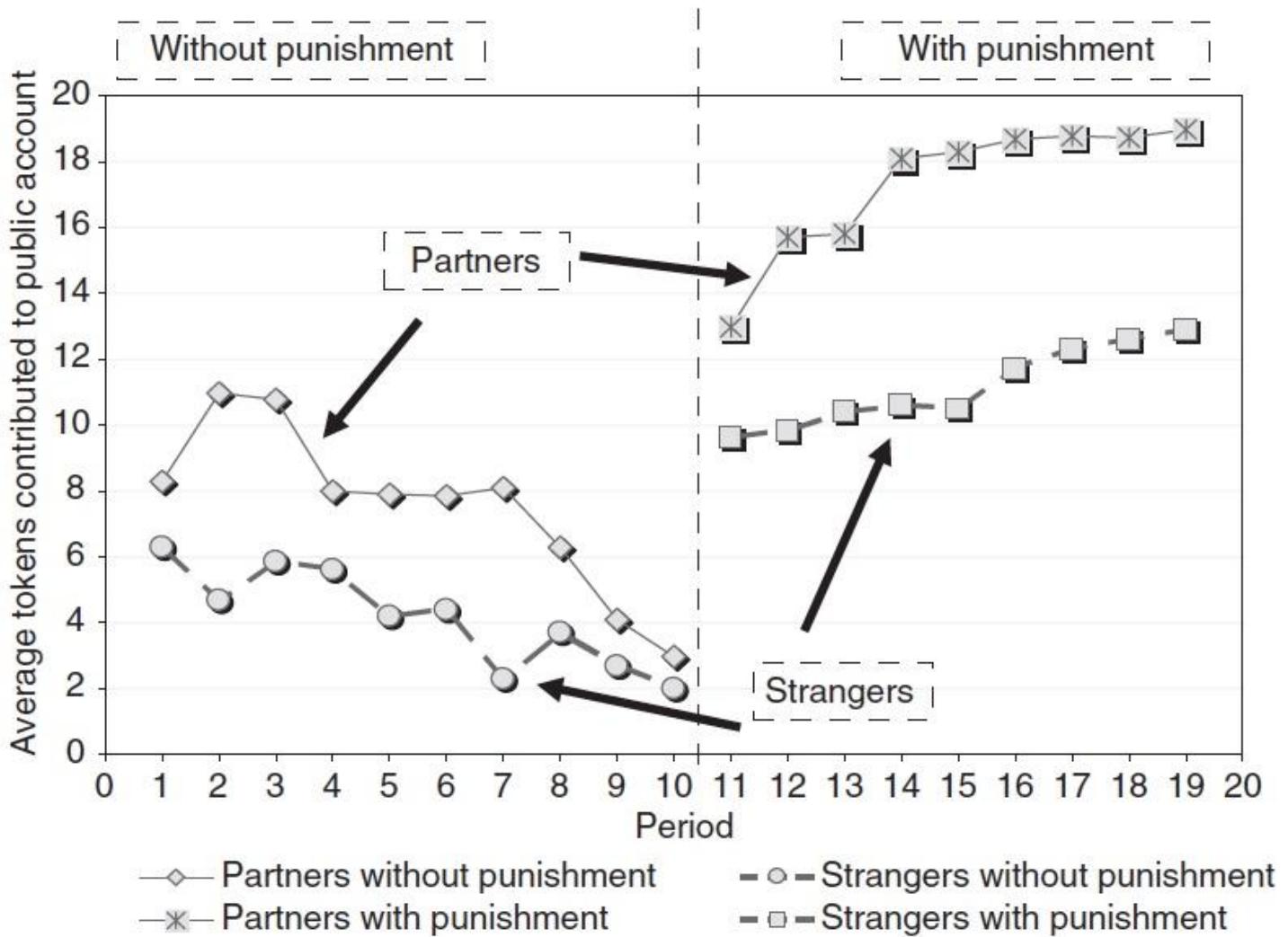
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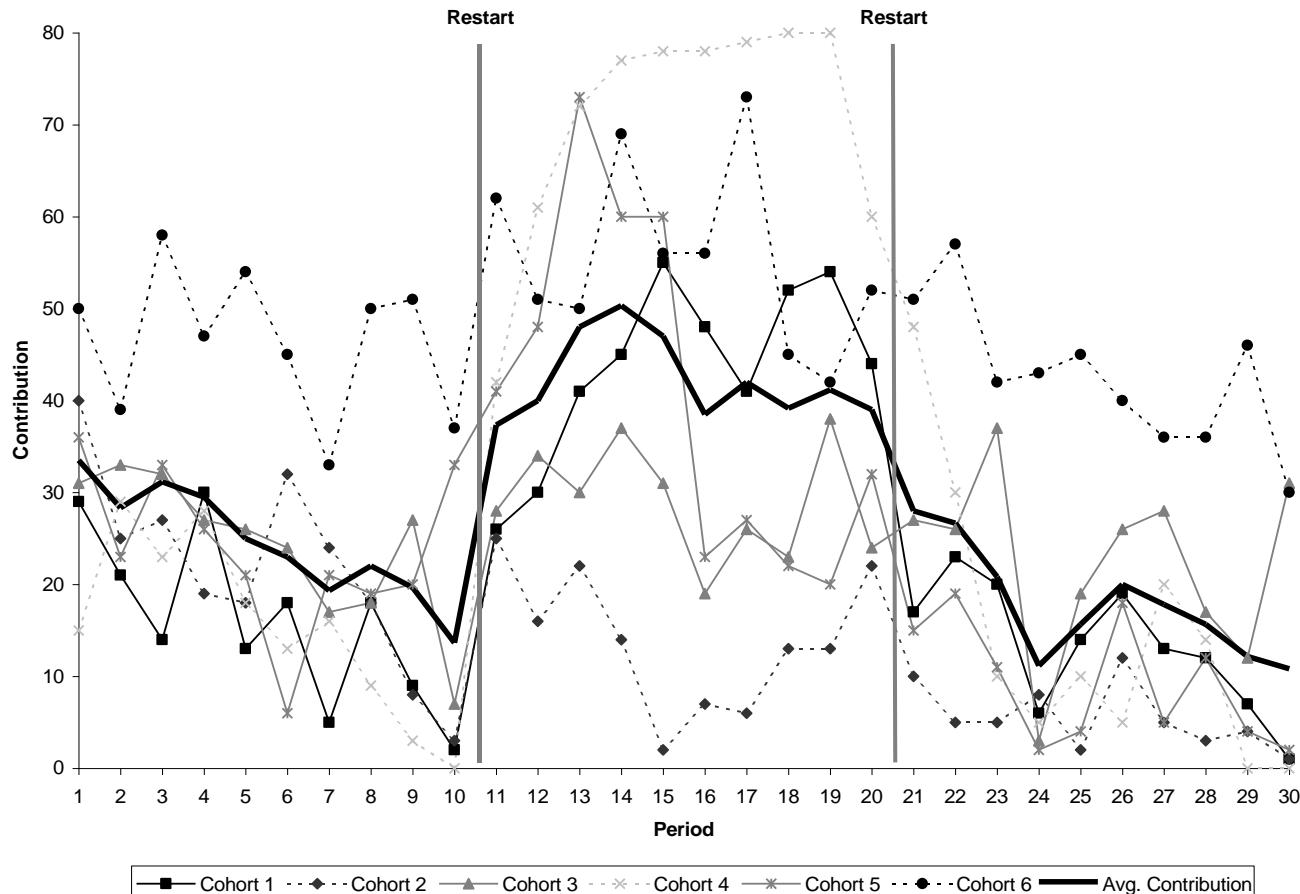
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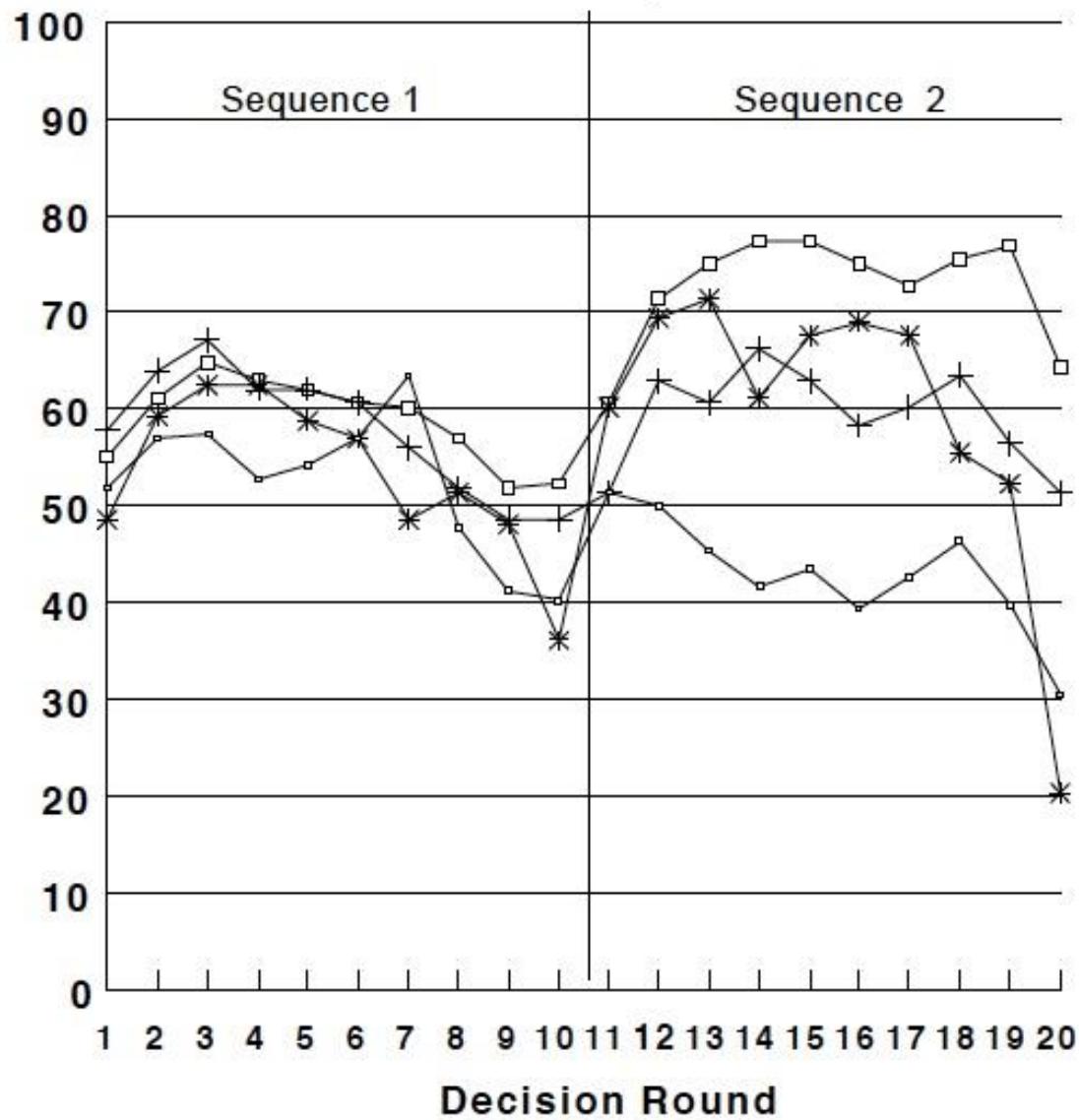


Fehr and Gächter 2000

Non-monetary sanctions



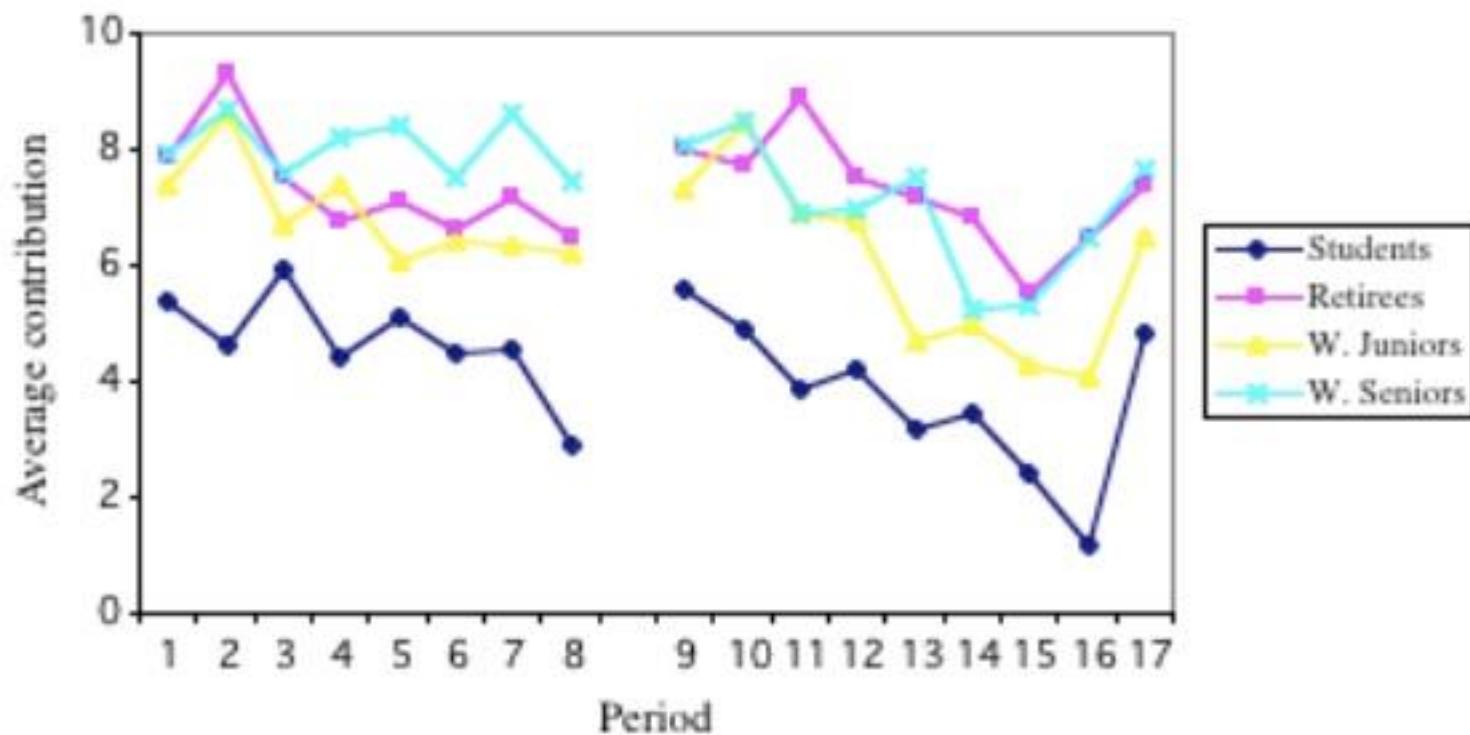
Masclet, Noussair, Tucker, Villeval, 2003



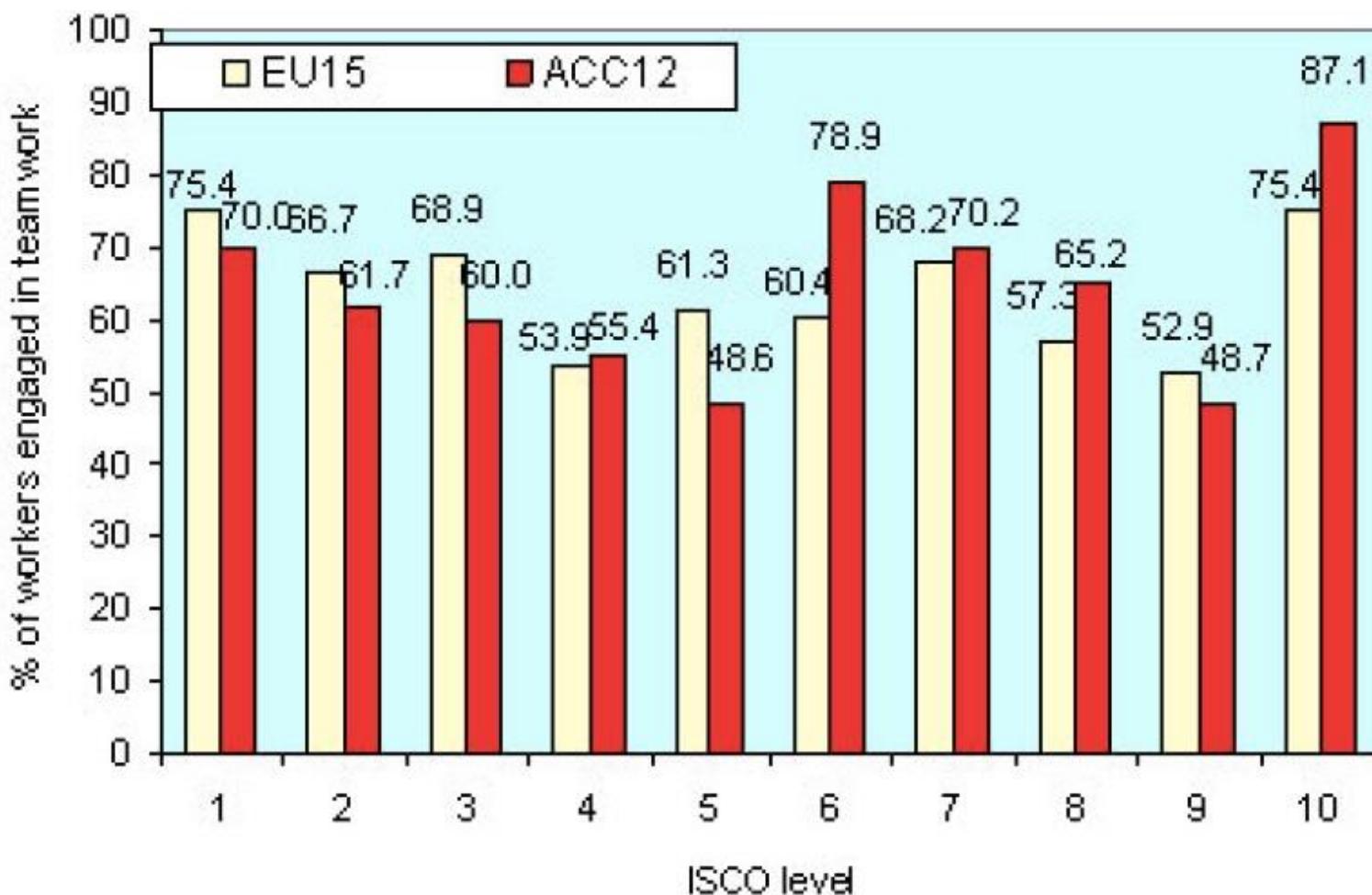
Sefton, Schupp, Walker, 2002

- | | | | |
|--|-----------------|------|----------------------------|
| —○— | <i>baseline</i> | ⊕ | <i>sanction</i> |
| *—* —</td <td><i>reward</i></td> <td>□—□—</td> <td><i>sanction&reward</i></td> | <i>reward</i> | □—□— | <i>sanction&reward</i> |

Figure 1: Avg. individual contributions

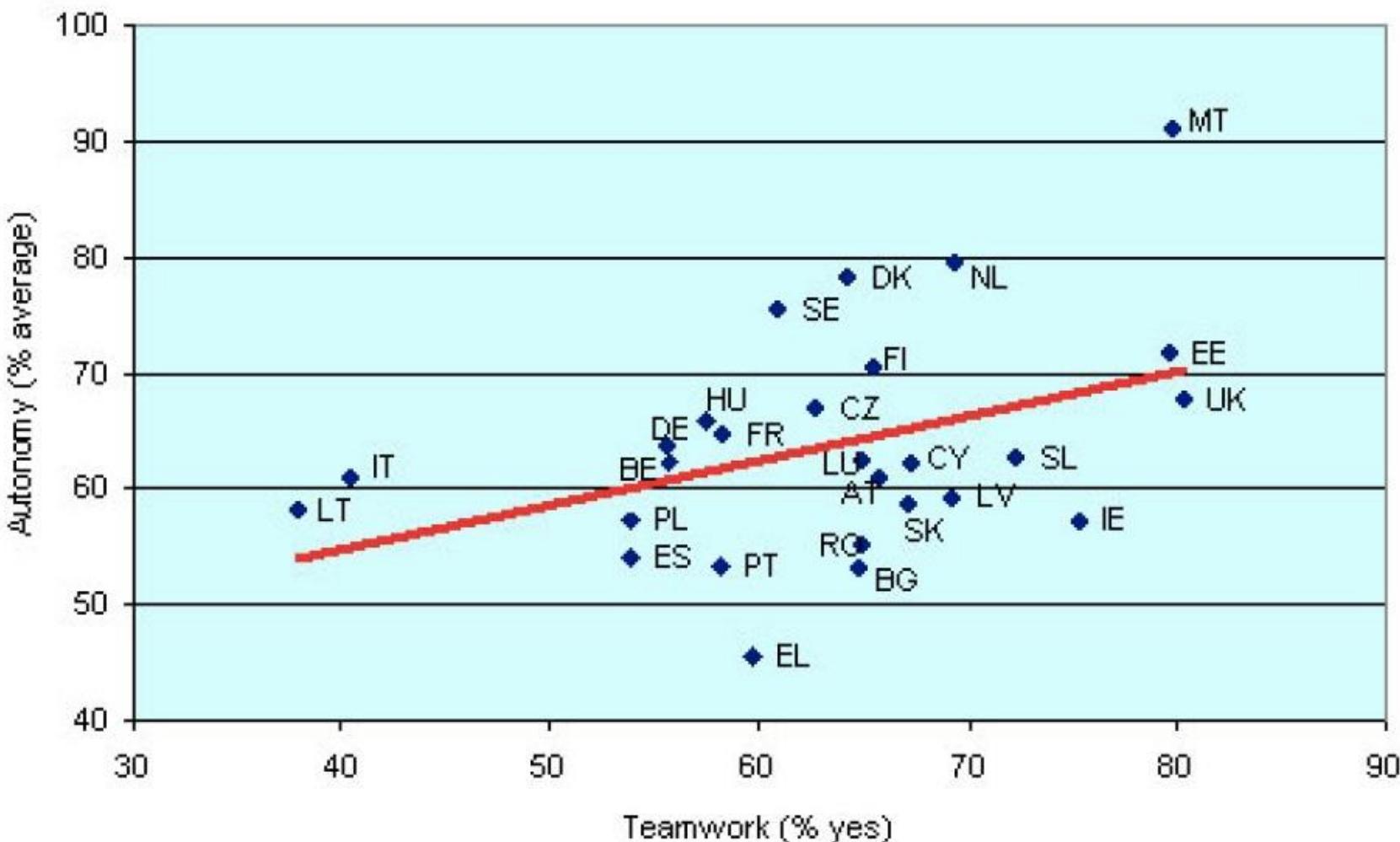


Prevalence of teamwork by occupation, Source: EWCS 2000/2001



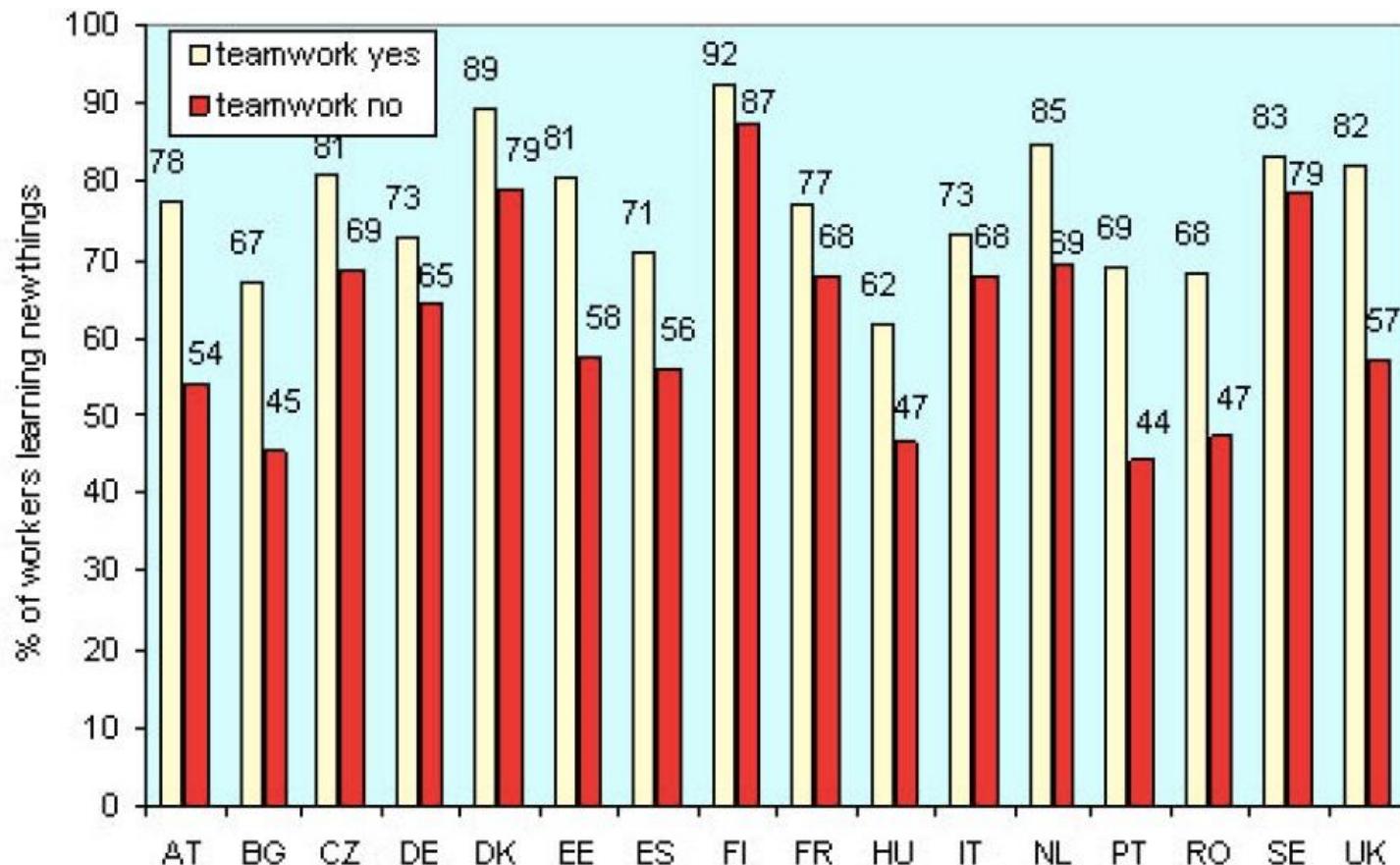
Notes: 1. Legislators and senior officials and managers; 2. Professionals; 3. Technicians and associate professionals; 4. Clerks; 5. Services workers and sales workers; 6. Skilled agricultural and fishery workers; 7. Craft and related-trades workers; 8. Plant and machine operators and assemblers; 9. Elementary occupations; 10 Armed

- More teamwork associated with more autonomy in the organization of tasks
- => higher need to coordinate and cooperate....



- Working in a team associated with an environment characterized by the possibility to learn new things and perform complex tasks

=> higher opportunities to learn....



Source: EWCS 2000/2001

Teams make less mistakes

- Tversky and Kahneman 1983; Charness, Karni, Levin 2010
- “Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.”

Which is more probable:

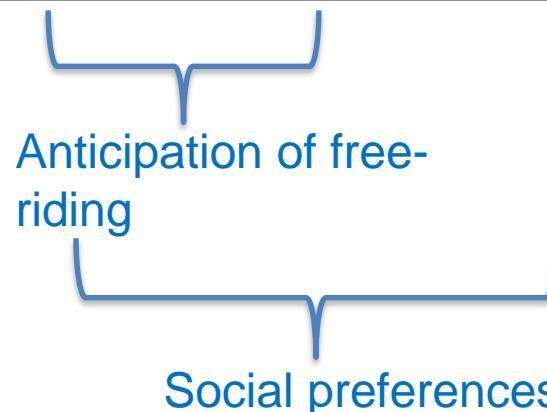
- (a) Linda is a bank teller
- (b) Linda is a bank teller and is active in the feminist movement

- Since condition (b) imposes an extra restriction, it cannot be more probable than (a)
- Violation rates of the conjunction rule:
 - Individuals: 45%
 - Pairs: 34%
 - Trios: 17%

Structure of the game

+

<i>Part</i>	1	2	3	4	5
<i>Is work performed?</i>	Yes	Yes	Yes	No	Yes
<i>Can participants choose the pay scheme?</i>	No	No	Yes	Yes	Yes
<i>Pay scheme</i>	Individual	Team	Individual or Team	Individual or Team	Team if both agree, otherwise Individual
<i>Partner's performance in this Part is used to compute team pay</i>	-	Part 2	Part 2	Part 1	Part 5
<i>Communication</i>	No	No	No	No	No



Gender and performance in endogenously-formed teams

- No performance gap in mandatory teams
- Two possible reasons for a possible gender gap in voluntary team performance:
 - o **selection on levels** (adverse selection into teams is stronger among men)
 - o **selection on slopes** (different responsiveness to the treatment)
- Estimates:
 - o Self-selected teams perform worse than mandated teams, due to strong selection on levels but no evidence of selection on slopes
 - o Because adverse selection is stronger among males, self-selected male teams perform worse than self-selected female teams

Conclusion 2

The willingness to join a team depends on:

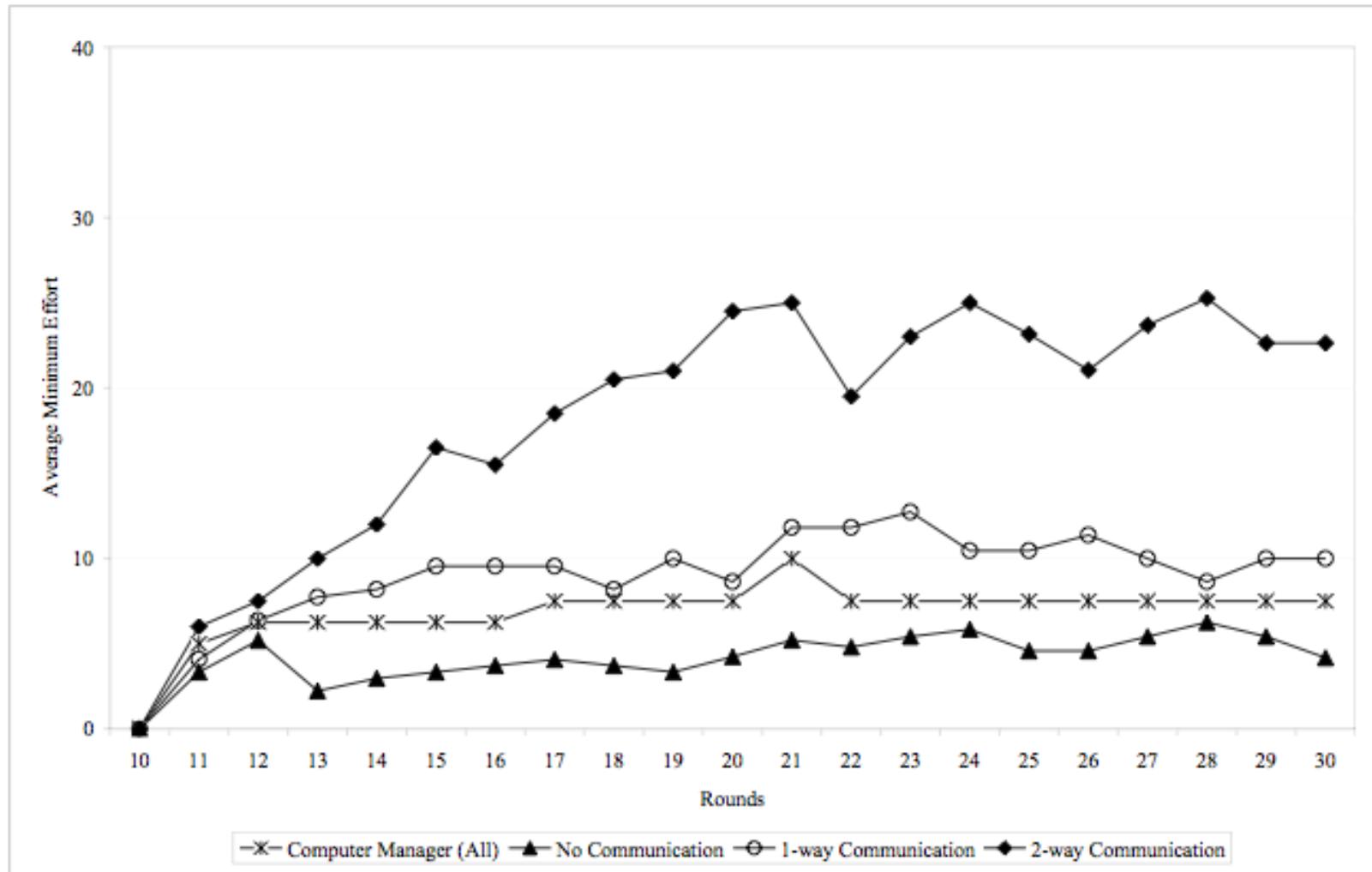
- *for the less skilled*

- Expected benefit of **sharing revenue more than learning**
- Non-monetary dimensions
 - o **Social preferences**: some refuse to join a team to avoid negative externalities but not a major factor since we find no difference between I-C and RS-C
 - o Fear of **peer pressure from comparisons?**

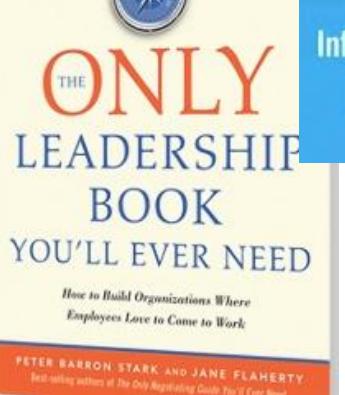
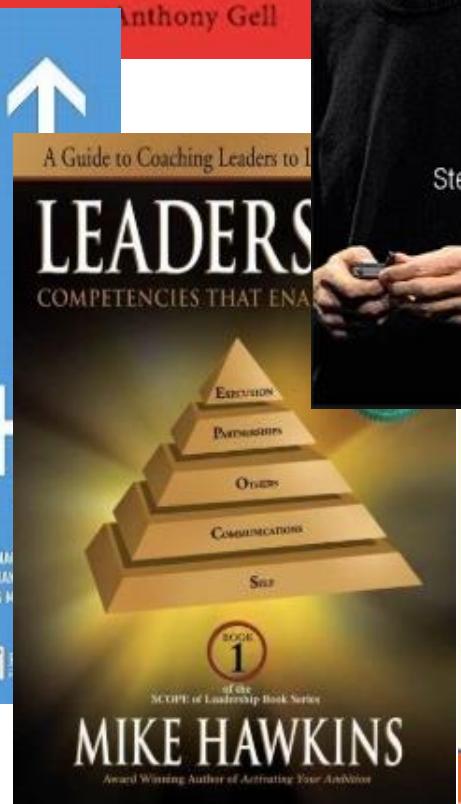
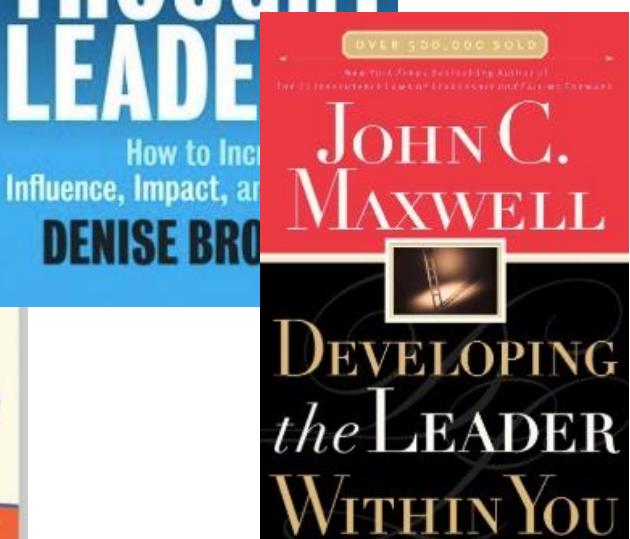
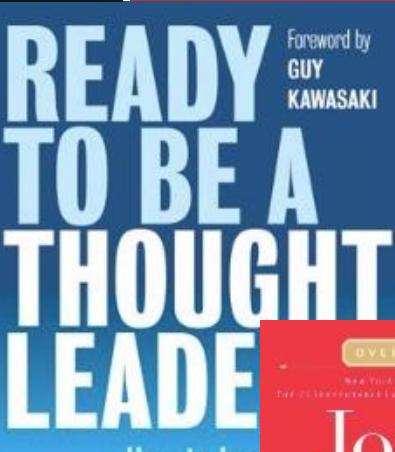
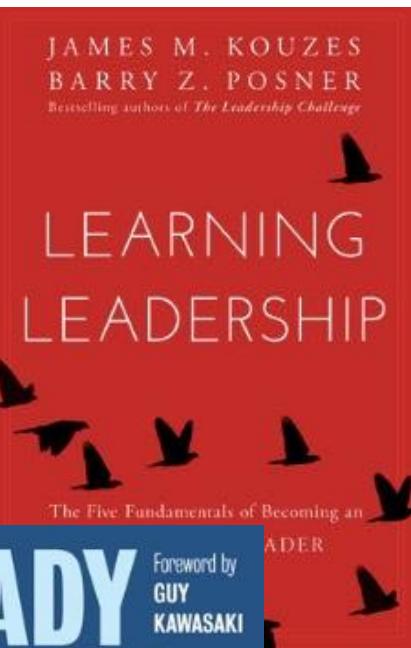
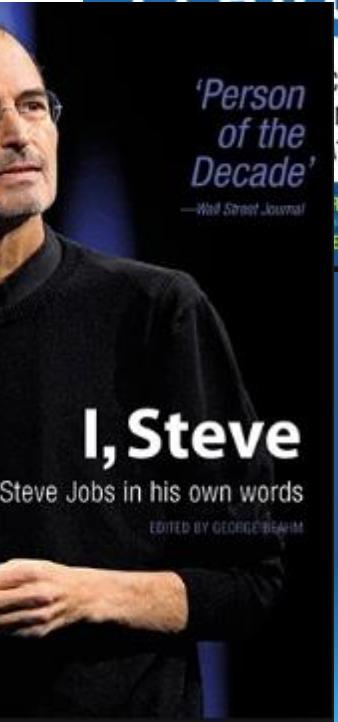
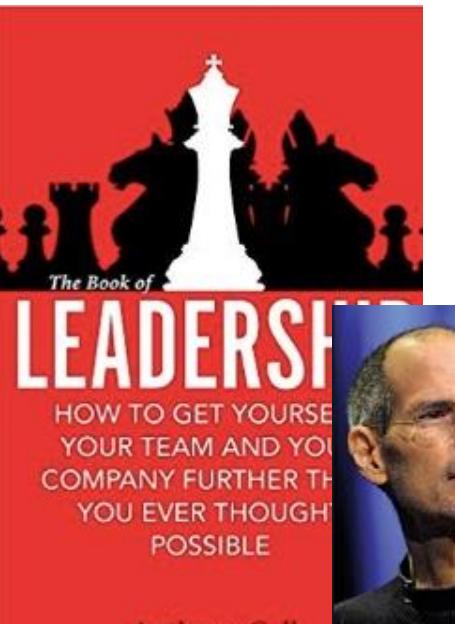
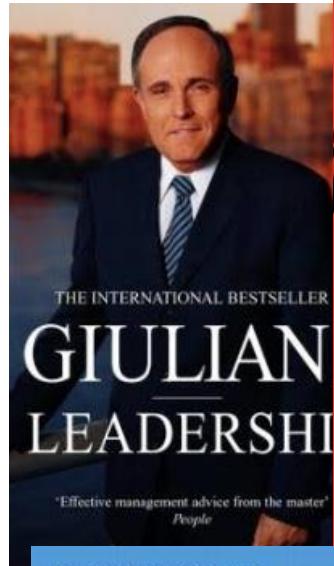
- *for the more skilled*

- Perspective to **communicate and teach** the partner
 - o pro-social reasons in the individualized environment
 - o also instrumental reasons under revenue-sharing with fixed matching
- Pleasure **from “making the difference”** (leadership effect)?

Comparison of Minimum Effort Across Treatments
Firms with Coordination Failure (Minimum Effort = 0 in Round 10)

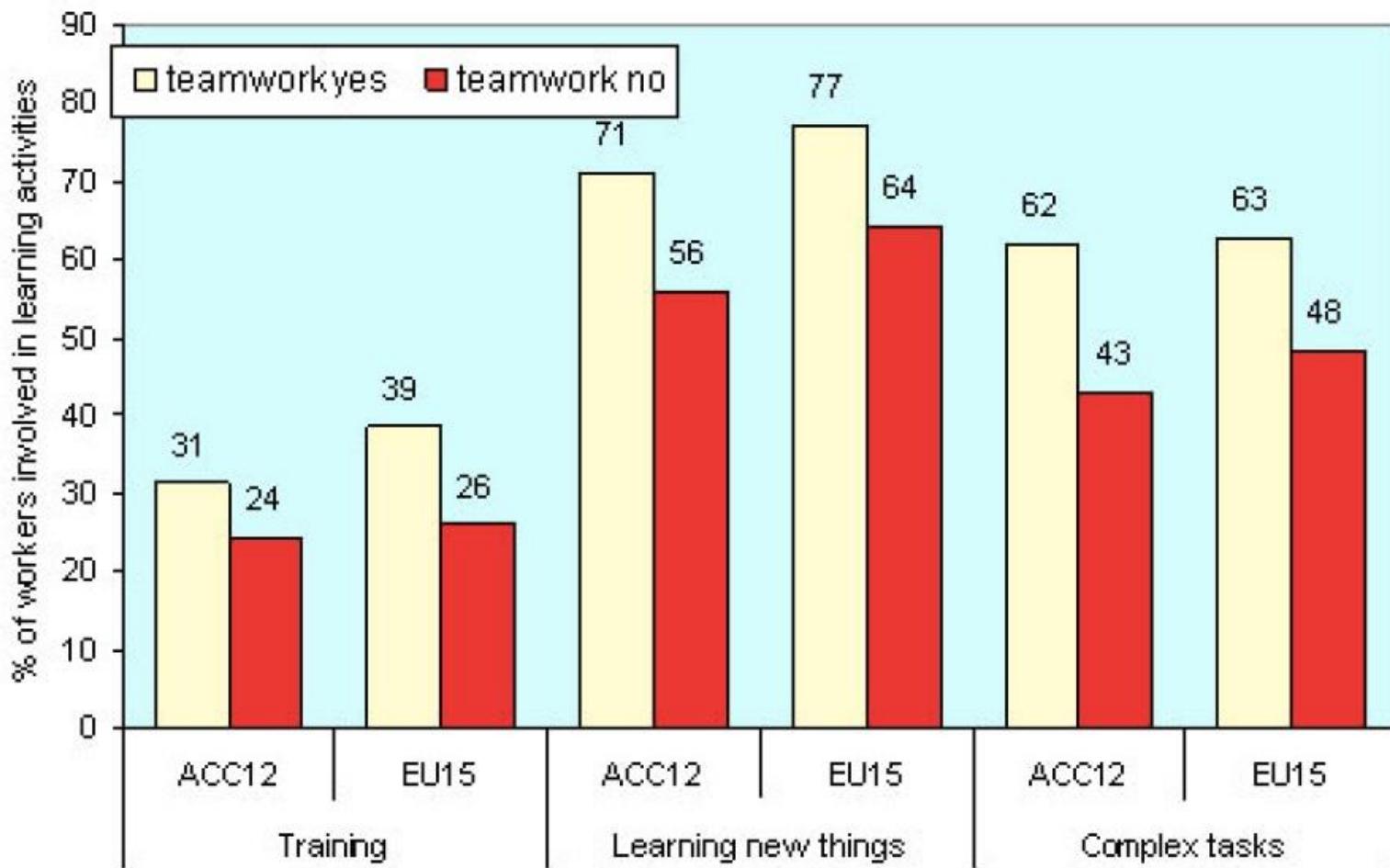


Sample restricted to the firms that have encountered a coordination failure in round 10 before the manager decides on the bonus



- Working in a team associated with an environment characterized by the possibility to learn new things and perform complex tasks

=> higher opportunities to learn....



Source: EWCS 2000/2001

Various treatments in part 2

- **Incentives**: revenue-sharing (RS) vs. individual piece rate (I)
- **Communication**: chat (C) during 60 sec after each nonogram
- **Socialization**: preliminary ice-breaker task (IB) or not
- Facilitation of **teaching**: **Hints** sheet given to the most able partner
- **Turn-over**: Same vs. new partner in part 3, pre-announced in part 2

Treatment	Ice-breaker	Revenue sharing in Part 2	Communication in Part 2	Same partner in Part 3	Hints
PR-C	No	No	Yes	Yes	Yes
PR-C-IB	Yes	No	Yes	Yes	Yes
RS-NoC	No	Yes	No	Yes	Yes
RS-NoC-IB	Yes	Yes	No	Yes	Yes
RS-C	No	Yes	Yes	Yes	Yes
RS-C-IB	Yes	Yes	Yes	Yes	Yes
RS-C-New Partner	No	Yes	Yes	No	Yes
RS-C-no Hint	No	Yes	Yes	Yes	No

Survey on the reasons for choosing the Team option - High-type subjects

Most common reason for picking Team option:

- Ability to teach the low ability partner
- Especially when teaching is likely to be beneficial (PR-C, RS-C)

Category	Frequency		
	All Data	RS-NoC, RS-NewP & RS-NoH	PR-C & RS-C
# Observations	63	17	46
Wanted to teach partner	63%	35%	74%
Thought communication would motivate partner	28%	18%	33%
Prefer to work with others	28%	47%	22%
Didn't want to let partner down by not communicating	25%	24%	26%
Didn't want to let partner down by not sharing revenue	22%	65%	7%
Thought communication would motivate me	14%	18%	13%
Thought partner was good at puzzles	11%	18%	9%
Thought sharing would motivate partner	11%	18%	9%

Content of messages

- Both types communicate more when they can use hints and when they know they will keep the same partner in the next part
- Ice Breaker event does not influence the decision to join teams but increases communication by both types
- High ability types provide more help when they have to share revenue than any other treatment



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