# Supplementary Material

# The Choice of Institutions to Solve Cooperation Problems: A Survey of Experimental Research

Tables S.1-S.4 provide detailed information about all studies included in the review. The numbers provided in these tables may differ from the numbers provided in the paper because we provide average numbers across all rounds in the tables, while in the paper we pay special attention to the outcomes at the beginning and at the end of the game.

Table S.5 provides detailed information about the studies that are included in Figures 1-4 in the main paper, including the treatments and from where we have obtained the numbers.

Abbreviations (in the order of appearance):
PD: Prisoners' dilemma
PGG: Public goods game
BCG: Beauty contest game
MPCR: Marginal per capita return
MPT: Minimum participation threshold
CPRG: Common pool resource game
NE: Nash equilibrium
CG: Coordination game
CP: Centralized punishment
DP: Decentralized punishment
FS: Formal sanctioning
IS: Informal sanctioning option

**Table S.1** Local cooperation and exclusive institution

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (exogenously enforced modification of payoffs)* | | | | | | | | | | |
| Bohnet & Kübler 2005 | 2 | 5 rounds, stranger, players choose every round or once-for-all | PD vs. modified PD with higher payoff to unilateral cooperation (modification does not change the defection equilibrium) | Players bid in an auction to play the modified PD. Number of players that can play the modified PD is fixed. | Random assignments of games as control. Number of players who can play the modified game. Number of auctions. | No prior experience. Subjects learn about their own payoff. No information about groups from the other institution. | Yes, higher cooperation in modified PD than in PD | Fixed by design | Cooperators who meet defectors in the PD. Cooperators who meet cooperators in the modified PD. | For those who implement the institution: yes, higher cooperation under endogenous than exogenous institution. |
| Grimm & Mengel 2009 | 2 out of a population of 8 | 4 + 96 rounds, stranger (partner within the population), each player chooses every 4 rounds | PD vs. modified PD with lower payoffs to defection (modification does not change the defection equilibrium) | 2 out of 8 players decide each round to either stay in their group or join the other group. | Exogenous assignment to games as control. Information about average payoffs in both groups. (Not considered here: imperfect separation). | 4 rounds with random assignments to groups. Prior to playing, subjects are informed about the percentage of players in the two groups. After playing, subjects learn about the co-player's decision and own payoff. | Yes (62% cooperation in modified PD vs. 10% in PD) | 59% of players on average, relatively stable over time (67% when information about average payoffs in both groups is provided) | Conditional cooperators who have pessimistic beliefs about the PD. | For those who implement the institution: yes, higher cooperation under endogenous (62%) than exogenous institution (51%). For those who do not implement the institution: no. |
| Grimm & Mengel 2011 | 2 out of a population of 8 | 4 + 96 rounds, stranger (partner within the population), each player chooses every 4 rounds | PD vs. punishment of defection (modification makes cooperation the dominant strategy) | 2 out of 8 players decide each round to either stay in their group or join the other group | (Not considered here: imperfect separation). | 4 rounds with random assignments to groups. Prior to playing, subjects are informed about the percentage of players in the two groups. After playing, subjects learn about the co-player's decision and own payoff. | Yes (97% cooperation in modified game vs. 16% in PD) | 50% of players at the beginning (by design), almost all in the second half of the game | Conditional cooperators and norm enforcers who support punishment of defection. | n/a |
| Cobo-Reyes et al. 2019 | x out of a population of 10 | 30 rounds, partner in the same group, players choose the group every round | PGG vs. punishment of defection (punishment institution is costly, it makes cooperation the dominant strategy) | In the No-Voting treatment, players decide each round whether to move to the other group. In the Voting treatment, players vote every 5 rounds on the punishment institution and decide each round whether to move to other group. | Voting and No-Voting on the punishment institution. | No prior experience. Subjects receive information about contributions in both groups. | Yes (91% vs. 41% in No-Voting, 93% vs. 50% in Voting) | No-Voting: 50% of players at the beginning (by design), about 80% at the end. Voting: Little migration between groups; 41 of players vote for punishment in the beginning, 62% at the end. | n/a | n/a |
| *Choosing an informal institution (punishment or reward option)* | | | | | | | | | | |
| Gürerk et al. 2006 | x out of a population of 12 | 30 rounds, partner in the same group, players choose every round | PGG vs. PGG with sanctioning option (punishment cost 1:3, reward cost 1:1) (modification does not change zero-contribution equilibrium) | Players decide each round to either join the sanction-free group or join the sanction group | n/a | No prior experience. Subjects receive detailed information about performance in both groups. | Yes (91% cooperation in PGG with sanctioning option vs. 14% in PGG) | 37% of players in the first round, more than 80% in the second half of the game | Initially high contributors who punish low contributors | n/a |
| Gürerk 2013 | x out of a population of 12 | 30 rounds, partner in the same group, players choose every round | PGG vs. PGG with punishment option (cost 1:3) (modification does not change zero-contribution equilibrium) | Players decide each round to either join the PGG or the PGG with punishment option | Social history provided or not | No prior experience. Subjects receive detailed information about performance in both groups. In social history treatment, players receive information about main results of a similar previously conducted experiment. | Yes (With social history: >85% cooperation in punishment game vs. <10% in PGG. Without social history: >75% cooperation in punishment game vs. <10% in PGG). | With social history: 54% of players in the first round, >90% in the second half of the game. Without social history: 31% in the first round, >80% in the second half of the game. | n/a | n/a |

**Table S.1** (continued)

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing an informal institution (punishment or reward option)* | | | | | | | | | | |
| Gürerk et al. 2014 | x out of a population of 12 | 30 rounds, partner in the same group, players choose every round | PGG vs. PGG with punishment option (cost 1:3) and PGG vs. PGG with reward option (cost 1:3) (modification does not change zero-contribution equilibrium) | Players decide each round to either join the PGG or the PGG with punishment/reward option | Punishment option or reward option. Exogenous punishment option with allocation of subjects set equal to the endogenous case or fixed. | No prior experience. Subjects receive detailed information about performance in both groups. | Yes (90% cooperation in punishment game vs. 11% in PGG, 57% cooperation in reward game vs. 21% in PGG). | Punishment option: about 30% of players in the first round, > 80% in the second half of the game. Reward option: ≥ 80% throughout. | Punishment option: initially, subjects with a predisposition to cooperate and to punish. | For those who implement the institution: yes, higher cooperation under endogenous (73%) than exogenous institution (45%). |
| Nicklisch et al. 2016 | x out of a population of 10, 1 player plays the role of the authority | 4+4+4+4+4+4+4+4+4 rounds, partner in the same group, players choose at the beginning of each phase | PGG vs. PGG with decentralized punishment (DP) vs. PGG with central punishment by authority (CP) | Players decide before each phase to join one of the three games. | Signal about others' contributions is correct with 100%, 90%, or 50% probability. | No prior experience. At the beginning of each phase subjects are informed about performance in all three groups. | Yes (In 100% treatment: 72-92% cooperation with punishment vs. 29% in PGG. In 90% treatment: 74-83% cooperation with punishment vs. 24% in PGG. In 50% treatment: 45-49% cooperation with punishment vs. 20% in PGG) | In 100%: on average about 45% of players join DP, the rest equally CP and PGG. In 90%: equally DP, CP, and PGG. In 50%: almost 50% join PGG, the rest equally DP and CP. | Punishment of cooperators decreases support for that punishment institution. | n/a |
| Fehr & Williams 2017 | x out of a population of 9, 11, or 12 | 5+20 rounds, partner in the same group, players choose every round | PGG vs. PGG with uncoordinated punishment option vs. PGG with coordinated punishment option vs. PGG with coordinated central punishment by authority | Players decide each round to join one of the four games. | Endogenous and exogenous choice of institutions | 5 rounds of standard PGG. Before choosing the institution, players are informed about performance in each game. After each round, players are informed about individual contributions and own payoffs. | Yes (90-100% cooperation with coordinated punishment option and central punishment vs. 5-20% cooperation in PGG) | On average, 7% of players join the PGG, 1% the game with uncoordinated punishment option, 40% the game with coordinated punishment option, 52% the game with central punishment. | Prosocial subjects populate the games with coordinated punishment and central punishment first. | For those who implement the institution: yes, in the first 12 rounds, cooperation is higher in endogenous punishment institutions than in the same exogenous institutions. No difference in the last 8 rounds. |
| Gürdal et al. 2019 | x out of a population of 12 | 20 rounds, partner in the same game, players choose every round | PGG vs. PGG with punishment option (cost 1:3) (modification does not change the zero contribution equilibrium) | Players decide each round to either join the PGG or the PGG with punishment option | n/a | No prior experience. Subjects receive detailed information about performance in both groups. | Yes (>85% cooperation in punishment game vs. <10% in PGG) | 49% of players in the first round, more than 80% in the second half of the game | n/a | n/a |

**Table S.2** Local cooperation and inclusive institution

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (exogenously enforced modification of payoffs)* | | | | | | | | | | |
| Dal Bó et al. 2010 | 2 out of a population of 4 | 10 + 10 rounds, stranger (partner within the population), players choose once-for-all | PD vs. punishment of unilateral defection (modification transforms the PD into a coordination game where mutual defection and mutual cooperation are Nash equilibria) | Simple majority voting, once-for-all, computer breaks ties | Computer randomly overrides votes or not. | 10 rounds of the PD. Subjects are informed about the implemented game but not the distribution of votes. | Yes (72% cooperation in modified game vs. 18% in PD in the first round after choosing) | 53% of players vote for the modified game. | Subjects with high SAT scores and low numbers in BCG. Cooperators and those who faced little cooperation in the first part. | For those who implement the institution: yes, higher cooperation under endogenous than exogenous institution (72% vs. 50% in the first round after choosing). For those who do not implement the institution: only slightly higher cooperation in endogenous than exogenous PD (18% vs. 15% in the first round after choosing). |
| Dal Bó et al. 2018 | 2 out of a population of 6 | 5 + 5 rounds, stranger, players choose once-for-all or every round | PD vs. punishment of defection that also reduces all other payoffs (modification makes cooperation the dominant strategy) | Random, random dictator, majority voting, repeated majority voting | The game played in the first 5 rounds. The decision rule used to choose the game. Information about past subjects' behavior. | 5 rounds of the PD or the modified game. Subjects are informed about the implemented game but not the distribution of votes. No information about groups from the other game. | Yes (94-98% cooperation in modified game vs. 15-36% in PD) | 46% of players in the first voting round, 72% in the final round with repeated voting | Subjects who have more realistic beliefs about behavior in the two games. Personal characteristics, including SAT scores and chosen number in BCG, do not predict voting. Manipulating the belief that behavior differs between games increases support for the institution. | For those who implement the institution: only slightly higher cooperation under endogenous (94-98%) than exogenous institution (92-93%).<br>For those who do not implement the institution: only slightly higher cooperation under endogenous (21%, 17%, 36%) than exogenous institution (16%, 16%, 30%) in majority once, majority repeated, and reverse random dictator. In random dictator, slightly lower cooperation under endogenous (15%) than exogenous institution (16%). |

**Table S.3** Global cooperation and exclusive institution

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (players can join agreement with exogenously enforced restrictions for members)* | | | | | | | | | | |
| Kosfeld et al. 2009 | 4 | 20 rounds, partner, players choose every round | PGG where players choose between becoming member or non-member in an agreement (members are bound to cooperate fully, non-members are not bound) | Players decide individually whether or not to join the agreement. Those who join decide unanimously whether or not to implement the agreement. | High or low MPCR to the public good (not considered here: two treatments without possibility to form an agreement). | No prior experience. Subjects are informed about the number of players willing to join the agreement and whether or not the agreement is implemented. | Yes, by design (members are bound to cooperate fully) | With low MPCR, institution is implemented in 43% of cases and in 36% participation is full. With high MPCR, institution is implemented in 61% of cases and in 42% participation is full. Incomplete agreements are often rejected even when they are profitable. | Subjects who expect that all others will join, too. | For those who do not implement the institution: lower cooperation in endogenous than exogenous PGG in low MPCR (21% vs. 25%) and high MPCR (43% vs. 62%). |
| McEvoy et al. 2011 | 10 | 13 rounds, stranger, players choose every round | PGG where players choose between becoming member or non-member in an agreement (members are bound to cooperate fully and punished for lower contributions so that cooperation becomes profitable, non-members are bound to contribute zero) | Players decide individually whether or not to join the agreement. Agreements form if minimum participation threshold (MPT) is reached. | Cost of enforcement. Cost of public good production. Minimum participation threshold. | No prior experience. Real time information about how many other subjects join the agreement. | Yes, by design (non-members are bound to contribute zero). Compliance in the agreement is 68% if MPT=6 and 71% if MPT=10. | Institution is implemented 54-96% of cases depending on MPT (89% if MPT=10). | n/a | n/a |
| Dannenberg 2012 | 10 | 10 rounds, partner, players choose every round | PGG where players choose between becoming member or non-member in an agreement (different rules for members, non-members are not bound by any rule) | Players decide individually whether or not to join the agreement. | Members vote on a minimum contribution level and treatments differ in which proposal becomes binding for members. | No prior experience. Prior to playing, subjects are informed about the number of members and non-members. After each round, they are informed about total contributions and own payoff. | Yes, members contribute more than twice as much as non-members. | About 50% of players join the agreement when the smallest proposal becomes binding. About one-third join when higher proposals become binding. | n/a | n/a |
| Gerber et al. 2013 | 4 | 10 rounds, partner, players choose every round | PGG where players choose between becoming member or non-member in an agreement (members are bound to cooperate fully, non-members are not bound) | Players decide individually whether or not to join the agreement. Agreements form if MPT is reached. | Minimum participation threshold. | No prior experience. After each round, subjects learn about total contributions and their own payoff. | Yes, by design (members are bound to cooperate fully) | Institution is implemented 57% of the time if MPT=4, 44% if MPT=3, 53% if MPT=4 or =3. | Subjects are more likely to join when full participation is required. | n/a |
| Dannenberg et al. 2014 | 10 | 10 rounds, partner, players choose every round | PGG where players choose between becoming member or non-member in an agreement (different rules for members, non-members are not bound by any rule) | Players decide individually whether or not to join the agreement. | Members are forced to maximize joint payoffs or they can vote on a minimum contribution level and the smallest proposal becomes binding for members. | No prior experience. Prior to playing, subjects are informed about the number of members and non-members. After each round, they are informed about total contributions and own payoff. | Yes, members contribute more than twice as much as non-members. | 35% of players join the agreement when members' joint payoffs are maximized. 53% of players join when members can vote on minimum contribution level. | Subjects are more likely to join when the rule for members is endogenous and when payoff differences between members and non-members are not too large. | n/a |
| McEvoy et al. 2015 | 6 | 20 rounds, stranger, players choose every round | PGG where players choose between becoming member or non-member in an agreement (members are bound to cooperate fully, non-members are bound to contribute zero) | Players first vote on the MPT and then decide individually and sequentially whether or not to join the agreement. Agreements form if MPT is reached. | (Not considered here: capped MPCR so that efficiency requires less-than-full agreement) | No prior experience. Subjects are informed about the chosen MPT and whether the subjects before them have joined the agreement or not. | Yes, by design (members are bound to cooperate fully, non-members are bound to contribute zero) | 56% of players vote for full and efficient MPT so that this requirement is implemented in 77% of cases. In those cases, agreements from 91% of the time. Smaller agreements are rarely implemented. | n/a | n/a |

**Table S.4** Global cooperation and inclusive institution

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (exogenously enforced restrictions for all players)* | | | | | | | | | | |
| Walker et al. 2000 | 7 | 10 + 10 rounds, partner, players choose every round | CPRG with binding extraction level for each player | All players make proposals for a binding extraction level for each player and then vote on the proposed allocations, using majority or unanimity voting. Standard CPRG if no allocation is adopted. | Standard CPRG without voting, majority voting or unanimity voting on proposed allocations. | 10 rounds of standard CPRG before voting. Before playing, subjects are informed about proposals, the distribution of votes, and the binding allocation. After each round, they are informed about total extraction and own payoff. No information about other groups. | Yes, efficiency is higher when a binding allocation is implemented than when it is not implemented (unanimity voting: 100% vs. 34%, majority voting: 96% vs. 53%). | Under unanimity voting, 60% of groups implement binding allocations. Under majority voting, 55% of groups implement binding allocations. | n/a | n/a |
| Sutter & Weck-Hannemann 2003 | 3 | 4+4+4+4+4+4 rounds, partner within each phase, stranger between phases, players choose at the beginning of each phase | Non-linear PGG vs. non-linear PGG with asymmetric binding minimum contribution levels below the Nash equilibrium (NE), players randomly receive a high or low minimum level (the minimum levels do not change the NE) | Repeated majority voting on pre-specified asymmetric minimum contribution levels | Non-linear PGG, exogenous asymmetric minimum contribution levels, endogenous asymmetric minimum contribution levels | No prior experience. Subjects are informed about whether the minimum contribution levels are implemented or not and actual contributions. No information about other groups. | No, no difference in cooperation rates when minimum contribution levels are implemented or not (8% vs. -3%). | On average, 82% of groups implement the minimum contribution level. No difference in voting behavior between advantaged players (low minimum level) and disadvantaged players (high minimum level). | High contributors are more likely to vote for the implementation of the minimum contribution level. | For those who implement the institution: on average, no difference between endogenous (8%) and exogenous (12%) institution. However, for participants with high obligations, lower cooperation rate under endogenous (0%) than exogenous institution (24%). For those who do not implement the institution: lower cooperation rate in endogenous (-3%) than exogenous PGG (6%). |
| Sutter & Weck-Hannemann 2004 | 3 | 4+4+4+4+4+4 rounds, partner within each phase, stranger between phases, players choose at the beginning of each phase | Non-linear PGG vs. non-linear PGG with uniform binding uniform minimum contribution level below or above Nash equilibrium (NE) (the low minimum level does not change the NE, the high minimum level increases the equilibrium contributions to the minimum level) | Repeated majority voting on pre-specified uniform minimum contribution levels | Non-linear PGG, Endogenous minimum contribution level is either below or above NE | No prior experience. Subjects are informed about whether the minimum contribution levels are implemented or not and actual contributions. No information about other groups. | Yes, cooperation rates are higher when minimum contribution levels are implemented than when they are not implemented (above NE: 47% vs. -7%, below NE: 6% vs. -16%). | 68% of groups implement the minimum contribution level when it is above NE, 78% when it is below NE. | If the minimum contribution level is below NE, high contributors are more likely to vote for the implementation of the minimum contribution level. No significant difference if the minimum contribution level is above NE. | For those who implement the institution: no difference between endogenous (6%) and exogenous (8%) institution. For those who do not implement the institution: yes, lower cooperation rate in endogenous (-16%) than exogenous PGG (6%). |
| Margreiter et al. 2005 | 6 | 10 + 10 rounds, partner, players choose every round | CPRG with binding extraction level for each player | All players make proposals for a binding extraction level for each player and then vote on the proposed allocations, using majority voting. Standard CPRG if no allocation is adopted. | Standard CPRG without voting, majority voting on proposed allocations. Homogeneous or heterogeneous groups. | 10 rounds of standard CPRG before voting. Before playing, subjects are informed about proposals, the distribution of votes, and the binding allocation. After each round, they are informed about total extraction and own payoff. No information about other groups. | Yes, efficiency is higher when a binding allocation is implemented than when it is not implemented (homogeneous groups: 99% vs. 66%, heterogeneous groups: 91% vs. 67%). | 61% of all homogeneous groups implement a binding allocation. 32% of all heterogeneous groups implement a binding allocation. | n/a | n/a |

**Table S.4** (continued)

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (exogenously enforced restrictions for all players)* | | | | | | | | | | |
| Kroll et al. 2007 | 5 | 10 + 10 rounds, partner, players choose every round | PGG with binding uniform contribution level or PGG with non-binding uniform contribution level and punishment option (binding voting makes proposing and voting for full contribution the weakly dominant strategy, non-binding voting does not change the zero-contribution equilibrium). | All players make proposals for a binding (or non-binding) uniform contribution level and then vote on the proposals, using majority voting. Standard PGG is played if no proposal is adopted. | Standard PGG, binding contribution level, non-binding contribution level with punishment option (not considered here: non-binding contribution level without punishment option). | 10 rounds of standard PGG before voting. Subjects are informed about proposals, the imposed uniform contribution level and actual contributions. No information about other groups. | Yes (by design in case of binding contribution levels). | With binding voting: almost all groups (100% in the final 3 periods) implement the efficient contribution level. With non-binding voting and punishment option: Almost all groups (100% in the final period) implement the efficient level and almost all players comply. | n/a | n/a |
| Bernard et al. 2013 | 9 | 10 rounds, partner, players choose each round | CPRG with binding uniform extraction level (binding voting makes proposing and voting for socially optimal extractions the weakly dominant strategy) | All players make proposals for a uniform extraction level and the median proposal becomes binding for all. | Standard CPRG (not considered here: 3 randomly selected leaders determine the uniform extraction level) | No prior experience. Subjects are informed about the proposals and the imposed uniform extraction level. No information about other groups. | Yes, by design. Extractions are close to the social optimum (98%). | n/a | n/a | n/a |
| Dannenberg et al. 2014 | 10 | 10 rounds, partner, players choose every round | PGG with binding uniform minimum contribution level (proposing full contribution is the weakly dominant strategy) | All players make proposals for a uniform minimum contribution level and the smallest proposal becomes binding for all. | Standard PGG | No prior experience. Before playing, subjects are informed about all minimum proposals and the binding level. After each round, they are informed about total contributions and own payoff. No information about other groups. | Yes, contributions are very close to the chosen minimum levels. | 40% of groups choose a low minimum level. The other 60% of groups have an increasing minimum level over time, close to the optimum at the end. | n/a | n/a |
| Kocher et al. 2016 | 4 | 1 + 1 rounds, stranger, players choose once | PGG with binding uniform minimum contribution level (voting for adoption of minimum level is dominant strategy) | Players vote on adoption of pre-specified binding minimum level and the decision of one randomly selected player is implemented. | Low minimum level (10% of endowment) and high minimum level (35%) | No prior experience. | For high minimum level, yes: 51% cooperation with minimum level vs. 31% without minimum level. For low minimum level, no: 34% cooperation with minimum level vs. 33% without minimum level. | 88% of players vote for high minimum level. 67% vote for low minimum level. | High contributors are more likely to vote for adoption of minimum level. | For those who implement the institution: slightly lower cooperation under endogenous than exogenous institution (high minimum: 51% vs. 55%, low minimum: 34% vs. 38%,). For those who do not implement the institution: yes, lower cooperation in endogenous than exogenous PGG (high minimum 31% vs. 42%, low minimum: 33% vs. 38%). |
| Martinsson & Persson 2019 | 3 | 1 + 1, stranger, players choose once | PGG vs. PGG with binding uniform minimum contribution level (voting for adoption of minimum level is weakly dominant strategy) | Majority voting on adoption of a pre-specified binding minimum level (25% of endowment). | Exogenous and endogenous adoption of minimum level. | 1 round of standard PGG but subjects do not get feedback until the end. | Yes, higher cooperation with minimum level than without (47% vs. 35%). | 81% of players vote in favor of the minimum level which means that 87% of groups implement it. | Women and subjects who contribute more than they expect others to contribute are more likely to vote for the adoption of the minimum contribution level. | For those who implement the institution: no, same average cooperation rate under endogenous and exogenous institution (47%). |

**Table S.4** (continued)

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (exogenously enforced modification of payoffs)* | | | | | | | | | | |
| Andreoni & Gee 2012 | 4 | 10 + 10 rounds, stranger (rematching within games), players choose once-for-all | PGG vs. PGG with punishment institution that punishes the lowest contributor (modification make full contributions the unique Nash equilibrium) | In a pre-play stage, all players receive an endowment from which they can contribute to a fund. If aggregate contributions reach a certain threshold, the punishment institution is implemented. | n/a | 10 rounds of PGG. Before playing, subjects are informed about the implemented game. | Yes, higher cooperation with punishment than without (95% vs. 14%) | 85% of groups implement the punishment institution | n/a | For those who implement the institution: only slightly higher cooperation under endogenous than exogenous institution (95% vs. 91%). |
| Barrett & Dannenberg 2017 | 5 | 5 + 5 + 5 + 5 rounds, partner, players choose at the beginning of each phase | PD vs. modified game (modification transforms the PD into a coordination game where all-defect and all-cooperate are Nash equilibria) | Repeated majority voting before each phase | Whether or not the modified game comes at a collective cost. Experience in both games before voting. | No prior experience in the main treatments. 5 rounds of each game in one treatment. No information about other groups. | Yes, higher cooperation in the modified game than in the PD (without cost: 100% vs. 21%, with cost: 92% vs. 27%) | 57% of players in the first round, 91% in the last round when modified game is free of cost. 11% in the first round, 51% in the last round when it is costly. | Subjects who face little cooperation in the PD. Those who have optimistic beliefs about the modified game. Support is higher when subjects play both games before voting. High school grades and BCG do not predict voting. | n/a |
| Feld & Tyran 2002 | 3 | 1 round | PGG vs. PGG with punishment of not contributing the full amount (modification does not change the zero-contribution equilibrium) | Majority voting | Control treatment with exogenous implementation of punishment. | No prior experience. In the endogenous condition, subjects make decisions for each possible voting outcome (strategy method). | Yes, higher cooperation with punishment than without (71% vs. 24%) | 50% of players vote for punishment | n/a | For those who implement the institution: yes, higher cooperation under endogenous (71%) than exogenous institution (38%). For those who do not implement the institution: yes, lower cooperation in endogenous (24%) than exogenous PGG (30%). |
| Tyran & Feld 2006 | 3 | 1+1 round, stranger | PGG vs. PGG with punishment of not contributing the full amount (mild punishment does not change the zero-contribution equilibrium, severe punishment makes full contributions the dominant strategy) | Majority voting | Mild punishment or severe punishment. Control treatments with exogenous institutions. | No prior experience. In the endogenous conditions, subjects make decisions for each possible voting outcome (strategy method). Subjects play both treatments with mild punishment and severe punishment. In the exogenous condition, subjects play all three treatments: exogenous control (PGG), exogenous mild and severe punishment. They do not get feedback until the end of the experiment. | Yes, higher cooperation with punishment than without (mild punishment: 64% vs. 22%, severe punishment: 96% vs. 15%) | 50% of players vote for mild punishment. 70% vote for severe punishment. | n/a | For those who implement the mild punishment institution: yes, higher cooperation under endogenous (64%) than exogenous institution (38%). For those who implement the severe punishment institution: only slightly higher cooperation under endogenous (96%) than exogenous institution (93%). For those who do not implement the institution: yes, lower cooperation in the endogenous (15-22%) than exogenous PGG (30%). |
| Vollan et al. 2017 | 3 | 1 (+1) rounds, stranger, how often players choose differs between sessions (one or two times). | PGG vs. PGG with punishment of not contributing the full amount (modification does not change the zero-contribution equilibrium) | Majority voting | Control treatments with exogenous institutions. Conducted with students and workers from China | No prior experience. Subjects play all treatments but do not get feedback until the end of the experiment. | Yes, higher cooperation when punishment is implemented than when it is not implemented (59% vs. 38%) | 42% of players vote for punishment. | Cooperators are more likely to vote for punishment. | For those who implement the institution: no difference between endogenous (59%) and exogenous institution (60%). For those who do not implement the institution: yes, lower cooperation in endogenous (38%) than exogenous PGG (47%). |

**Table S.4** (continued)

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal institution (exogenously enforced modification of payoffs)* | | | | | | | | | | |
| Gallier 2017 | 3 | 10 + 10 rounds, partner, players choose once-for-all | PGG vs. PGG with weak punishment of not contributing the full amount. Punishment does not change the zero-contribution equilibrium. | Simple majority voting, once-for-all. | Computer randomly overrides votes | 10 rounds PGG. Subjects are informed about the implemented game but not the voting distribution. | Yes, higher cooperation with punishment than without (80% vs. 39%) | 73% of players vote for weak punishment. | Cooperators are more likely to vote for punishment. Also those with a high locus of control are more likely to vote for punishment. Females and participants with a high political commitment vote less frequently for punishment. | For those who implement the institution: only slightly higher cooperation under endogenous (80%) than exogenous institution (75%). For those who do not implement the institution: only slightly lower cooperation in endogenous (39%) than exogenous PGG (44%). |
| *Choosing an informal institution (punishment or reward option)* | | | | | | | | | | |
| Ostrom et al. 1992 | 8 | 10 + x + x rounds, partner, players choose once-for-all | CPRG vs. CPRG with punishment option (cost 1:2) (modification does not change the Nash equilibrium) | Strict majority voting, once-for-all, default is no punishment | Experience before the voting | 10 rounds of the CPR game plus x rounds of the CPR game with punishment. Face-to-face communication before the voting. | Yes, 84% average yields when punishment is adopted vs. 28% when punishment is not adopted. | 56% of players vote for punishment. | Subjects who faced a lot of punishment before vote against it. | n/a |
| Ertan et al. 2009 | 4 | 3+3+8+8+8 or 6+6+6+6+6 rounds, partner, players choose at the beginning of each phase | PGG with punishment option (cost 1:4) allowing punishment of below-average, average and/or above-average contributors (modification does not change the zero-contribution equilibrium) | Repeated majority voting on who can be punished (below-average, average, above-average contributors) | Number of voting rounds. Experience before the first voting round. | In one treatment, subjects play the PGG without punishment and unrestricted punishment (in rounds 1-6) prior to the first vote. No prior experience in the other treatment. Before playing, subjects are informed about the punishment rule, if any. After playing, subjects receive detailed information about all groups in the same session. | Yes, cooperation and efficiency are higher when punishment of low-but-not-high contributors is allowed than when punishment is prohibited. | 21% of votes support punishment of below-average contributions (11% against), 2% support punishment of average contributions (30% against), 6% support punishment of above-average contributions (26%). No group allows for unrestricted punishment or punishment of high contributors. Many groups move from no punishment (50%, 65%) to punishment of low-but-not-high contributors (85%, 90%). | Cooperators vote for punishment of below-average contributors and against punishment of above-average contributors | n/a |
| Sutter et al. 2010 | 4 | 10 rounds, partner, players choose once-for-all | PGG vs. PGG with binary punishment vs. PGG with binary reward option (modification does not change the zero-contribution equilibrium) | Repeated voting until unanimity is reached, voting is voluntary and costly, once-for-all | Cost ratio of the punishment and reward options (low leverage 1:1 or high leverage 1:3). Control treatments with exogenous games. | No prior experience. Players are informed about the number of voters and the outcome. After each round, players are informed about contributions and, if applicable, punishment or reward decisions, and own payoffs. | Yes, cooperation is higher with punishment or reward option than without (with low leverage: 81% for punishment, 43% for reward, 27% for PGG. With high leverage: 73% for reward, 46% for PGG). | With low leverage: 13% of groups choose the punishment option, 25% the reward option, and 63% the standard PGG. With high leverage: 0% choose the punishment option, 85% choose the reward option, and 15% the standard PGG. | Social orientation does not predict participation in the voting or the voting decision. | For those who implement the institution: yes, higher cooperation under endogenous than exogenous institution (low-leverage punishment: 81% vs. 44%, low-leverage reward: 43% vs. 33%, high-leverage reward: 73% vs. 56%). For those who do not implement the institution: only small difference between endogenous and exogenous PGG (low leverage: 27% vs. 33%, high leverage: 46% vs. 33%). |

**Table S.4** (continued)

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing an informal institution (punishment or reward option)* | | | | | | | | | | |
| Noussair & Tan 2011 | 4, half with low MPCR and half with high MPCR | 3+3+8+8+8 or 3+3+2+2+2+2+2+2+2+2+2+2+2 rounds, partner, players choose at the beginning of each phase | PGG vs. PGG with punishment option (cost 1:2) allowing punishment of below-average and/or above-average contributors, separately for low and high MPCR subjects (modification does not change the zero-contribution equilibrium). | Repeated majority voting on who can be punished (below-average, above-average contributors, separately for low and high MPCR subjects). | Number of voting rounds and number of contribution rounds after each voting round | 3 rounds PGG and 3 rounds PGG with unrestricted punishment option. Before playing, subjects learned about the punishment restrictions. After playing, subjects are informed about contributions and payoffs of all players and about own received and allocated punishment. No information about other groups. | Yes, cooperation is higher when punishment is allowed than when punishment is prohibited (Short-term treatment: 49% vs. 2%, long-term treatment: 49% vs. 4%). | Short-term treatment: proportion of groups that implement punishment of below-average contributors is 50% in the first round and 83 % the final round. Proportion of groups that prohibit punishment is 17% in both the first round and the final round. Long-term treatment: proportion of groups that implement punishment of below-average contributors is 67% in the first round and 50% in the final round. Proportion of groups that prohibit punishment is 17% in the first and 33 % in the final round. No group allows for unrestricted punishment. | Above-average contributors are more likely to vote for punishment of below-average contributors. Low MPCR types are more likely to vote for punishment of high MPCR types (and vice versa). | n/a |
| Dannenberg et al. 2019 | 5 | 5 + 5 +5 + 5 rounds, partner, players choose at the beginning of each phase | PGG vs. PGG with option to exclude players (exclusion option does not change zero-contribution equilibrium) | Repeated majority voting | Cost of the institution. Control treatments with exogenous games. | No prior experience. No information about other groups. | Yes, higher cooperation with exclusion option than without (76% vs. 41% without cost, 74% vs. 41% with cost) | 72% of groups choose the exclusion option without cost. 34% choose it with cost. | Subjects who face little cooperation in the PGG. | For those who implement the institution: only slightly higher cooperation under endogenous than exogenous institution (76% vs. 71% without cost, 74% vs. 69% with cost). For those who do not implement the institution: no difference or slightly higher cooperation in endogenous game (41% vs. 41% without cost, 41% vs. 35% with cost). |
| *Choosing a formal or informal institution* | | | | | | | | | | |
| Kamei et al. 2015 | 5 | 1+4+4+4+4+4+4 rounds, partner, players choose at the beginning of each phase | PGG with formal sanctioning (FS) vs. PGG with informal sanctioning option (IS) (cost 1:4) (IS does not change the zero-contribution equilibrium, deterrent FS makes full contributions the dominant strategy) | Repeated majority voting to choose between FS and IS. Having chosen FS, subjects also determine punishment rate and punishable action. | Experience before the first vote (no experience or experience with both punishment institutions). Number of voting rounds. Cost of the FS (with or without cost). | 1 round of the standard PGG or 4 rounds of each game prior to voting. Before playing, subjects learn about the implemented institution but not the distribution of votes. After playing, subjects are informed about contributions and received punishment. No information about other groups. | Yes, FS leads to higher contributions than IS in the first half of the game. Differences disappear in the second half. Later in the game, payoffs with IS are higher than with costly FS and about the same as costless FS. | 86% of groups choose FS when it is free of cost. Only 28% choose FS when it is costly. Having chosen FS, most groups implement deterrent FS. | Subjects with higher IQ are more likely to vote for FS when it is free of cost and for IS when FS is costly. Experienced subjects vote for the scheme under which they earned more. Anti-social punishers are less likely to vote for costless FS. | For those who implement the institution: yes, higher cooperation under endogenous than exogenous IS institution. |

**Table S.4** (continued)

| Study | No. of players | Rounds, matching, and choice | Available institutions | Decision rule | Treatment variables | Experience before choice of institution & information | Does the institution affect cooperation? | How many choose the institution? | Who chooses the institution? | Differences between endogenous and exogenous institution? |
|---|---|---|---|---|---|---|---|---|---|---|
| *Choosing a formal or informal institution* | | | | | | | | | | |
| Markussen et al. 2014 | 5 | 4+4+4+4+4+4+4+4 rounds, partner, players choose at the beginning of each phase | PGG vs. PGG with formal sanctioning (FS) or PGG with informal sanctioning option (IS) (cost 1:4) (IS does not change the zero-contribution equilibrium, deterrent FS makes full contributions the dominant strategy, non-deterrent FS does not change the zero-contribution equilibrium) | Repeated majority voting to choose between two games at a time. | Punishment rate (deterrent or non-deterrent) and cost (cheap or expensive) of the formal institution. Control treatments with exogenous games. | 4 rounds of the standard PGG before the first vote. Before playing, subjects learn about the implemented institution but not the distribution of votes. After playing, subjects are informed about contributions and received punishment. No information about other groups. | Yes, both FS and IS lead to higher contributions than the standard PGG. Payoffs are higher at least in later periods. | IS vs. PGG: About 20% of groups choose IS at the beginning, shares later increase to 50-67%.<br>FS vs. PGG: Less than 35% of groups choose FS when it is expensive (even when it's deterrent). 43-58% choose FS when it is cheap and non-deterrent. More than 70% choose FS when it is cheap and deterrent.<br>IS vs. FS: Less than 35% of groups choose FS when it is expensive (even when it's deterrent). About 30% choose FS when it is cheap and non-deterrent. 58% choose FS when it is cheap and deterrent. | n/a | For those who implement the institution: yes, higher cooperation under endogenous than exogenous institution (for IS: 94% vs. 74%, for non-deterrent FS: 69% vs. 58%). |

**Table S.5** Explanations for Figures 1-4 in the main paper

| Studies in Figure 1 | Source | Treatment | Comment |
|---|---|---|---|
| Fehr & Williams 2017 | Numbers are taken from Figure 4 and 5 | | "Inside the institution" refers to both coordinated peer punishment and central punishment. |
| Grimm & Mengel 2011 | Numbers are taken from Figures 1 and 2. | x=0 | Average cooperation is used for cooperation outside the institution because no numbers are provided for the first and last round. |
| Gürdal et al. 2019 | Numbers are taken from Figure 1. | PUN | |
| Gürerk 2013 | Numbers are taken from Figure 1. | SHT | |
| Gürerk et al. 2006 | Numbers are taken from Figure 1. | | |
| Gürerk et al. 2014 | Numbers are taken from Figure 1. | VF-PUN | |
| Nicklisch et al. 2016 | Numbers have been provided by the authors. | ONE | "Inside the institution" refers to both decentralized punishment and central punishment by authority. |
| Nicklisch et al. 2016 | Numbers have been provided by the authors. | POINT-NINE | "Inside the institution" refers to both decentralized punishment and central punishment by authority. |
| Cobo-Reyes et al. 2019 | Numbers are taken from Figures 1 and 3. | No-Voting | Share inside and outside the institution in the first round is given by design. |
| Cobo-Reyes et al. 2019 | Numbers are taken from Figures 1 and 3. | Voting | Share inside and outside the institution is approximated by the share of players voting for it. |
| Gürerk et al. 2014 | Numbers are taken from Figure 1. | VF-REW | |
| Nicklisch et al. 2016 | Numbers have been provided by the authors. | POINT-FIVE | "Inside the institution" refers to both decentralized punishment and central punishment by authority. |
| Grimm & Mengel 2009 | Numbers are taken from Figures 1, 2 and 3. | T0 | |
| **Studies in Figure 2** | | | |
| Dal Bó et al. 2010 | Numbers are taken from Table 4. | | Voting once for all, therefore NA in "last round". |
| Dal Bó et al. 2018 | Numbers are taken from Table 12 Panels A and C in the Appendix. | Majority Once | Voting once for all, therefore NA in "last round". |
| Dal Bó et al. 2018 | Numbers are taken from Table 12 Panels A and C in the Appendix. | Majority Repeated | Groups playing the prisoners' dilemma are taken as "outside the institution" and groups playing the Harmony Game are taken as "inside the institution." |
| Dal Bó et al. 2018 | Numbers are taken from Table 12 Panels A and C in the Appendix. | Random Dictator | Voting once for all, therefore NA in "last round". |
| Dal Bó et al. 2018 | Numbers are taken from Table 12 Panels A and C in the Appendix. | Reverse Random Dictator | Voting once for all, therefore NA in "last round". |
| **Studies in Figure 3** | | | |
| Gerber et al. 2013 | Numbers have been provided by the authors. | IF4 | Cooperation outside institution includes non-members of the institution and groups in which no institution was implemented. |
| McEvoy et al. 2011 | Numbers have been provided by the authors. | Costly enforcement-full | |
| Gerber et al. 2013 | Numbers have been provided by the authors. | IF3 | Cooperation outside institution includes non-members of the institution and groups in which no institution was implemented. |
| Gerber et al. 2013 | Numbers have been provided by the authors. | IF43 | Cooperation outside institution includes non-members of the institution and groups in which no institution was implemented. |
| Kosfeld et al. 2009 | Numbers have been provided by the authors. | IF40 | Low MPCR. Cooperation outside institution includes non-members of the institution and groups in which no institution was implemented. |
| Kosfeld et al. 2009 | Numbers have been provided by the authors. | IF65 | High MPCR. Cooperation outside institution includes non-members of the institution and groups in which no institution was implemented. |
| Dannenberg 2012 | Numbers have been provided by the author. | COALqual_maj | |
| Dannenberg 2012 | Numbers have been provided by the author. | COALsimple_maj | |
| Dannenberg et al. 2014 | Numbers have been provided by the author. | COAL | |
| Dannenberg et al. 2014 | Numbers have been provided by the author. | COALmin | |
| McEvoy et al. 2011 | Numbers have been provided by the authors. | Costless enforcement-high | |
| McEvoy et al. 2011 | Numbers have been provided by the authors. | Costless enforcement-low | |
| McEvoy et al. 2011 | Numbers have been provided by the authors. | Costly enforcement | |
| **Studies in Figure 4** | | | |
| Barrett & Dannenberg 2017 | Numbers have been provided by the authors. | B10 | No institutional cost |
| Dannenberg et al. 2019 | Numbers have been provided by the authors. | B10 | No institutional cost |
| Ertan et al. 2009 | Numbers are taken from Figures 2 and 3. | 3-Vote Design | Institution refers to punishment of low-but-not-high contributors. |
| Ertan et al. 2009 | Numbers are taken from Figures 2 and 3. | 5-Vote Design | Institution refers to punishment of low-but-not-high contributors. |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | DC (NS-IS) | First and last choice between NS and IS. |

**Table S.5** (continued)

| Studies in Figure 4 | Source | Treatment | Comment |
|---|---|---|---|
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | DE (NS-IS) | First and last choice between NS and IS. |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | NC (NS-IS) | First and last choice between NS and IS. |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | NE (NS-IS) | First and last choice between NS and IS. |
| Ostrom et al. 1992 | Numbers are taken from Table 3. | | Voting once for all, therefore NA in "last round". |
| Tyran & Feld 2006 | Numbers are taken from Figure 2 and Section IV. | SevereEnd | Authors used strategy method. Deterrent punishment. One-shot game, therefore NA in "last round". |
| Barrett & Dannenberg 2017 | Numbers have been provided by the authors. | B8 | Institutional cost |
| Dannenberg et al. 2019 | Numbers have been provided by the authors. | B8 | Institutional cost |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | DC (NS-FS) | First and last choice between NS and FS. |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | DE (NS-FS) | First and last choice between NS and FS. |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | NC (NS-FS) | First and last choice between NS and FS. |
| Markussen et al. 2014 | Numbers are taken from Figures 2 and 4. | NE (NS-FS) | First and last choice between NS and FS. |
| Sutter et al. 2010 | Numbers are taken from Figure 4. | \|L\|=1 | Low leverage. Inside institution refers to punishment or reward. Voting once for all, therefore NA in "last round". |
| Sutter et al. 2010 | Numbers are taken from Figure 4. | \|L\|=3 | High leverage. Inside institution refers to punishment or reward. Voting once for all, therefore NA in "last round". |
| Andreoni and Gee 2012 | Numbers are taken from Figure 1 and table 2. | | |
| Feld & Tyran 2002 | Numbers are taken from Table 1. | | Authors used strategy method. |
| Gallier 2017 | Numbers are taken from Table 4 in the Appendix. | | Voting once for all. |
| Kocher et al. 2016 | Numbers are taken from Table 1. | MC=2 | Authors used strategy method. |
| Kocher et al. 2016 | Numbers are taken from Table 1. | MC=7 | Authors used strategy method. |
| Martinsson & Persson 2018 | Numbers are taken from Table 1. | | |
| Sutter & Weck-Hannemann 2003 | Numbers are taken from Table 1. | | |
| Sutter & Weck-Hannemann 2004 | Numbers are taken from Table 1. | endo2-tax | Inside institution refers to low minimum contribution. Average cooperation in first and last four periods are used respectively. |
| Sutter & Weck-Hannemann 2004 | Numbers are taken from Table 1. | endo4-tax | Inside institution refers to high minimum contribution. Average cooperation in first and last four periods are used respectively. |
| Tyran & Feld 2006 | Numbers are taken from Figure 2 and Section IV. | MildEnd | Authors used strategy method. Non-deterrent punishment. One-shot game, therefore NA in "last round". |
| Vollan et al. 2017 | Numbers are taken from Table 1. | | Authors used strategy method. Each treatment is played one-shot, therefore NA in "last round". |