## Supplementary Materials

## Task instructions of the Anticommons Bargaining Game

Below, are the exact instructions of the Anticommons Bargaining Task used in Studies 1,2 and 3. The instructions were presented using oTree, as webpages in a browser window. For the sake of clarity, the separate pages are numbered from 1 to 9 (the participants did not see these numbers). Participants could proceed to the next page by pressing a "Next" button. Text and images that varied between studies, treatments or roles are denoted in between square brackets.

## 1. The Puzzle-pieces task - Instructions (Part 1)

You have been anonymously paired with two other participants, who are also seated in this lab, and with whom you will complete the puzzle-pieces task. This task will be repeated 20 times (which we will call 20 rounds from now on). In all 20 rounds of the task, each person can earn points. These points are worth real money, namely 1 euro per 100 points. The amount of points each person earns in all rounds of the task will be added up, and will be exchanged for real money after the task is finished. So the more points you earn in the puzzlepieces task, the higher your payoff.

Two people in the puzzle-pieces task will be randomly assigned to the role of Seller (Seller 1 and Seller 2), and one of you will be assigned to the role of Buyer. The three of you will keep the same role in all 20 rounds. Before the first round starts, you will learn whether you have been assigned to the role of Seller 1 or Seller 2 or whether you are the Buyer. But first we will explain you how the task works.

## 2. The Puzzle-pieces task - Instructions (Part 2)

At the start of each round, the two Sellers each have part of a 100-piece puzzle in their possession. Each seller can try to earn points by selling his/her own part of the puzzle to the Buyer. In every round, each Seller indicates how many points he/she wants to receive for his/her own part of the puzzle. In other words, each Seller indicates his/her own individual asking price.

The Buyer starts each round with 20 points. The Buyer can keep these points for him/herself, or he/she can use these points to try to buy the puzzle from the two Sellers. To try to buy the puzzle, the buyer has to offer one amount to Seller 1 (for Seller 1's part of the puzzle), and one amount to Seller 2 (for Seller 2's part of the puzzle). The Buyer can obtain a monetary bonus by buying the whole puzzle from the Sellers. That is, if the Buyer manages to obtain the complete puzzle from the two Sellers, he/she earns a monetary bonus of 20 points.

## 3. The Puzzle-pieces task - Instructions (Part 3)

If the Buyer offers an amount to Seller 1 that is at least as high as this Seller's asking price, a deal is made between the Buyer and Seller 1. In that case, Seller 1 sells his/her part of the puzzle to the Buyer. The same goes for Seller 2: if the Buyer offers an amount that is at least as high as Seller 2's asking price, a deal is made between the Buyer and Seller 2. If the Buyer manages to make a deal with both sellers, the Buyer obtains the whole puzzle, and then receives a monetary bonus of 20 points.

However, it is important to know that the buyer will only earn a monetary bonus of 20 points if he/she manages to make a deal with BOTH sellers. In other words, only if the Buyer manages to obtain the WHOLE puzzle, he/she will receive a monetary bonus. If the Buyer only makes a deal with one of the sellers, but not with the other, the Buyer will not receive a monetary bonus of 20 points.

Similarly, the two Sellers can only earn points if they manage to make a deal with the Buyer. If a Seller does not make a deal with the Buyer (because his/her asking price is higher than the Buyer's offer), this Seller does not sell his/her part of the puzzle, and earns zero points in that round. For the two Sellers it is thus also important to make a deal with the Buyer.

## 4. Quiz [= comprehension check questions]

Below are a number of questions to check whether you understood the rules of the task.
If you want to read the instructions again before answering the questions, please click the below buttons:

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Instructions - Part 1
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Instructions - Part 2
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Instructions - Part 3

Question 1: How many persons are involved in the puzzle-pieces task?

- 1 participant
- 2 participants
- 3 participants
- 4 participants

Question 2: How many rounds does the puzzle-pieces task consist of?

- 10 rounds
- 20 rounds
- 30 rounds
- 40 rounds

Question 3: How large is the monetary bonus that the Buyer will earn if he/she manages to buy the whole puzzle?

- The Buyer will then not earn a monetary bonus.
- The Buyer will then earn a monetary bonus of 20 points.
- I have not been informed about how many points the Buyer will earn then.

Question 4: What happens if the Buyer buys only one part of the puzzle (but does not manage to obtain the whole puzzle)?

- The Buyer will then not earn a monetary bonus.
- The Buyer will then earn a monetary bonus of 20 points.
- I have not been informed about how many points the Buyer will earn then.

Question 5: How much does a Seller earn if he/she manages to sell his/her part of the puzzle to the Buyer?

- That Seller will then earn the number of points he/she asked for his/her part of the puzzle.
- That Seller will then earn zero points in that round.
- I have not been informed about how many points that Seller will earn then.

Question 6: How much does a Seller earn if he/she does NOT manage to sell his/her part of the puzzle to the Buyer?

- That Seller will then earn the number of points he/she asked for his/her part of the puzzle.
- That Seller will then earn zero points in that round.
- I have not been informed about how many points that Seller will earn then.


## 5. Your role in the task

[If round number $=1$ ]
Before you make your decision, it is important to know what your role is:
The computer has randomly determined that you are [Seller 1 / Seller 2 / the Buyer].
As you can see in the picture below, Seller 1 has [number of puzzle pieces of Seller 1] of the [4/100]-piece puzzle in his/her possession and Seller 2 has [number of puzzle pieces of Seller 2] of the [4 / 100]-piece puzzle in his/her possession.
[If round number > 1]
Just as in the previous round, you are [Seller 1 / Seller 2 / the Buyer].
Again, Seller 1 has [number of puzzle pieces of Seller 1] of the [4 / 100]-piece puzzle in his/her possession and Seller 2 has [number of puzzle pieces of Seller 2] of the [4/ 100]-piece puzzle in his/her possession.
[if role $=$ Seller]
You are [Seller 1 / Seller 2] and therefore you have [number of puzzle pieces of Seller 1 / number of puzzle pieces of Seller 2].
[Dependent on study and treatment, one of the below images was shown]
[Study 1: Equality vs. Inequality]

[Study 2: Equality vs. Inequality]

[Study 3: Small Inequality vs. Large Inequality]


## 6. $\quad$ [WTA page only shown if player $=$ Seller]

You are [Seller 1 / Seller 2].
How many points do you ask for your [number of puzzle pieces of Seller 1 / number of puzzle pieces of Seller 2]?

Please fill in your asking price:

[image of the puzzle was shown again below this decision screen]

## 7. [WTP page only shown if player $=$ Buyer]

You are the Buyer.
Seller 1 has [number of puzzle pieces of Seller 1] in his/her possession.
How many points do you offer to Seller 1?
$\square$
Seller 2 has [number of puzzle pieces of Seller 2] in his/her possession.
How many points do you offer to Seller 2?
$\square$
[image of the puzzle was shown again below this decision screen]

## 8. Your outcome

You were [Seller 1 / Seller 2 / the Buyer] in this round, and you earned [number of points earned].

Below, you can see the outcomes of this round for all three persons.

## Seller 1

Seller 1 asked [WTA of Seller 1] for his/her part of the puzzle. The Buyer offered [WTP to Seller 1] to Seller 1. [Therefore, the Buyer made a deal with Seller 1 to buy his/her part of the puzzle for / Therefore, the Buyer did not make a deal with Seller 1 to buy his/her part of the puzzle for][WTA of Seller 1]. Seller 1 earned [payoff of Seller 1\} in this round.

Seller 2
Seller 2 asked [WTA of Seller 2] for his/her part of the puzzle. The Buyer offered [WTP to Seller 2] to Seller 2. [Therefore, the Buyer made a deal with Seller 2 to buy his/her part of the puzzle for / Therefore, the Buyer did not make a deal with Seller 2 to buy his/her part of the puzzle for][WTA of Seller 2]. Seller 2 earned [payoff of Seller 1\} in this round.

Buyer
[The Buyer managed to buy the whole puzzle from the two sellers, and therefore the Buyer receives a bonus of / The Buyer did not manage to buy the whole puzzle from the two sellers, and therefore the Buyer does not receive a bonus of] 20 points. The Buyer spent [points spent by Buyer] of his/her endowment of 20 points to buy puzzle pieces. Therefore, the Buyer earned [payoff of Buyer] in this round.

## 9. Motive Questionnaire [only after round 20]

Below are a number of questions about your motives in the puzzle-pieces task. Please answer each question on a scale from 1 to $7(1=$ to a small extent, $7=$ to a large extent $)$.

Question 1: To what extent did you try to earn as many points as possible in the task?
Question 2: To what extent did you try to earn more points than the other participants in the task?

Question 3: To what extent did you try to make fair decisions in the task?
Question 4: To what extent did you feel that you deserved less points than the other participants?

Question 5: To what extent did you adjust your decisions to the choices of the other participants?

Question 6: To what extent did you try to make sure that the other participants would earn less points than you?

Question 7: To what extent did you try to make sure that all three participants (including you) would earn an equal amount of points?

Question 8: To what extent did you feel that you were entitled to earn more points than the other participants?

## Comparing Unequal Sellers 1 and 2 to Equal Sellers

When looking at the WTA scores, it looked like Unequal Seller 1 (for convenience now referred to as Advantaged Seller) deviated more from the two Equal Sellers than Unequal Seller 2 (for convenience now referred to as Disadvantaged Seller), especially in Study 1. We conducted additional data analyses to test whether this was indeed the case. To do so, we conducted a small meta-analysis to compare the Equal Sellers of studies 1 and 2 to the Disadvantaged and Advantaged Sellers of studies 1, 2 and 3. In Study 3, we did not have a perfectly equal treatment, only a Slightly Unequal and a Highly Unequal treatment, and therefore we decided to only include the latter Treatment in these analyses (So only Highly Unequal Seller 1 and Seller 2)

First, we merged all three datasets, and made two new dummy variables, one for the advantaged Sellers ( 0 vs 1 ) and one for the disadvantaged Sellers ( 0 vs. 1). Next, we conducted a mixed model regression, with the Advantaged Seller and Disadvantaged Seller dummies as fixed-level predictors, the study number (1, 2, and 3) as categorical control variable, the participant identifier as random intercept, and the WTA scores as the outcome variable. This meta-analysis showed that both the Disadvantaged Seller, $B=-2.01, S E=0.38$, $t(199.23)=-5.29, p<.001$, and the Advantaged Seller, $B=2.78, S E=0.38, t(199.23)=7.30$, $p<.001$, deviated significantly from the two Equal Sellers. However, comparing the size of these two deviations with one another (using the R package multcomp; Hothorn, Bretz, \& Westfall, 2008) showed that although Advantaged Sellers indeed deviated more from Equal Sellers than Disadvantaged Sellers descriptively, the difference of the two deviations was not statistically significant, $B=0.76, S E=0.66, z=1.17, p=.409$.

## Regression Tables of the Mixed Model Analyses: WTA and WTP

Study 1-Table 1: Regression table of the mixed models on the WTA difference scores.

| Predictors | Model 1 | Model 2 |
| :--- | :--- | :--- |
| Intercept | 0.25 | 0.15 |
|  | $(0.52)$ | $(0.53)$ |
| Treatment (Equality vs. Inequality) | $4.50 * * *$ | $4.70^{* * *}$ |
|  | $(0.75)$ | $(0.77)$ |
| Round Number (1 to 20) | -0.01 | -0.01 |
|  | $(0.01)$ | $(0.01)$ |
| Treatment $\times$ Round Number | - | -0.02 |
|  |  | $(0.02)$ |
| $* p<.05, * * p<.01, * * * p<.001$ |  |  |

Study 1-Table 2: Regression table of the mixed models on the WTP difference scores.

| Predictors | Model 1 | Model 2 |
| :--- | :--- | :--- |
| Intercept | 0.53 | 0.01 |
|  | $(0.50)$ | $(0.51)$ |
| Treatment (Equality vs. Inequality) | $4.82^{* * *}$ | $5.94^{* * *}$ |
|  | $(0.66)$ | $(0.68)$ |
| Round Number (1 to 20) | $-0.03^{* * *}$ | $0.02^{*}$ |
|  | $(0.01)$ | $(0.01)$ |
| Treatment $\times$ Round Number | - | $-0.11^{* * *}$ |
|  |  | $(0.01)$ |

[^0]Note. In the mixed models on WTP, gender and age were included as control variables.

Study 2 - Table 1: Regression table of the mixed models on the WTA difference scores.

| Predictors | Model 1 | Model 2 |
| :--- | :--- | :--- |
| Intercept | 0.40 | 0.09 |
|  | $(0.59)$ | $(0.60)$ |
| Treatment (Equality vs. Inequality) | $4.46^{* * *}$ | $5.07^{* * *}$ |
|  | $(0.82)$ | $(0.85)$ |
| Round Number (1 to 20) | $-0.07^{* * *}$ | $-0.04^{* *}$ |
|  | $(0.01)$ | $(0.01)$ |
| Treatment $\times$ Round Number | - | $-0.06^{* *}$ |
|  |  | $(0.02)$ |

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* p<.05, * * p<.01, * * * p<.001
$$

Study 2 - Table 2: Regression table of the mixed models on the WTP difference scores.

| Predictors | Model 1 | Model 2 |
| :--- | :--- | :--- |
| Intercept | 0.43 | 0.14 |
|  | $(0.79)$ | $(0.79)$ |
| Treatment (Equality vs. Inequality) | $3.94^{* * *}$ | $4.51 * * *$ |
|  | $(0.79)$ | $(0.81)$ |
| Round Number (1 to 20) | $-0.04 * * *$ | -0.01 |
|  | $(0.01)$ | $(0.01)$ |
| Treatment $\times$ Round Number | - | $-0.05 * *$ |
|  |  | $(0.02)$ |

$$
* p<.05, * * p<.01, * * * p<.001
$$

Note. In the mixed models on WTP, gender and age were included as control variables.

Study 3 - Table 1: Regression table of the mixed models on the WTA difference scores.

| Predictors | Model 1 | Model 2 |
| :--- | :--- | :--- |
| Intercept | 0.84 | 0.51 |
|  | $(0.75)$ | $(0.75)$ |
| Treatment (Slightly vs. Highly Unequal) | $4.72^{* * *}$ | $5.41^{* * *}$ |
|  | $(1.06)$ | $(1.07)$ |
| Round Number (1 to 20) | 0.00 | $0.04 * * *$ |
|  | $(0.01)$ | $(0.01)$ |
| Treatment $\times$ Round Number | - | $-0.07 * * *$ |
|  |  | $(0.01)$ |
| $* p<.05, * * p<.01, * * * p<.001$ |  |  |

Study 3 - Table 2: Regression table of the mixed models on the WTP difference scores.

| Predictors | Model 1 | Model 2 |
| :--- | :--- | :--- |
| Intercept | $1.84^{*}$ | 1.32 |
|  | $(0.78)$ | $(0.78)$ |
| Treatment (Slightly vs. Highly Unequal) | $4.58^{* * *}$ | $5.64^{* * *}$ |
|  | $(1.01)$ | $(1.02)$ |
| Round Number (1 to 20) | $-0.08^{* * *}$ | $-0.03^{* *}$ |
|  | $(0.01)$ | $(0.01)$ |
| Treatment $\times$ Round Number | - | $-0.10 * * *$ |
|  |  | $(0.01)$ |

$$
* p<.05, * * p<.01, * * * p<.001
$$

Note. In the mixed models on WTP, gender and age were included as control variables.

## Exploratory Analyses: Payoffs Excluding Failures

For exploratory reasons, we also looked at the payoffs of the Buyers and Sellers, when excluding the rounds in which the Buyer had not managed to buy the whole puzzle from the two Sellers (= group failure). Below, we describe the outcomes of these additional analyses.

Study 1: Payoffs Excluding Failures. First, we excluded the rounds which had resulted in failure. Next, we ran a mixed model regression with Treatment (Equality vs. Inequality) and Round Number (1 to 20) as fixed-level predictors, the participant and group identifiers as random intercepts, gender and age as individual-level control variables, and the Buyer's payoff (in number of points) as the outcome variable. This analysis only showed a significant effect of Round Number, $B=-0.11, S E=0.01, t(359.29)$ $=-9.70, p<.001$, indicating that - excluding failures - the Buyers' payoffs decreased over rounds.

We also analyzed the Sellers' payoffs excluding failures. We ran a mixed model linear regression with Treatment (Equality vs. Inequality), Seller Number (1 vs. 2), Round Number (1 to 20) as fixed-level predictors, the participant and group identifiers as random intercepts, age and gender as individual-level control variables, and the Seller's payoffs as the outcome variable. In the next step, we also added the Treatment by Seller Number interaction. These analyses yielded a significant effect of Seller Number, $B=-2.46, S E=$ $0.51, t(75.04)=-4.85, p<.001$, which indicated that - excluding failures - Sellers 1 earned significantly more points per round than Sellers 2 . We also found a main effect of Round Number, $B=0.05, S E=0.01, t(719.73)=8.34, p<.001$, which indicated that - excluding failures - the Sellers' payoffs increased over rounds. Finally, we found a significant

Treatment by Seller Number interaction effect, $B=-5.04, S E=0.79, t(38.22)=-6.35, p<$ .001, indicating that - excluding failures - the difference in payoffs between the two Sellers was larger in the Inequality condition than in the Equality condition.

Study 2: Payoffs Excluding Failures. We ran the same mixed models as in Study 1 on the payoffs in Study 2, while excluding failures. These analyses again showed a significant effect of Round Number on the Buyers' payoffs, $B=-0.12, S E=0.02, t(304.45)=-5.70, p<$ .001, indicating that - excluding failures - Buyers' payoffs decreased over rounds. Additionally, these analyses again showed a significant effect of Seller Number, $B=-1.92$, $S E=0.49, t(72.42)=-3.96, p<.001$, which indicated that - excluding failures - Sellers 1 earned significantly more points per round than Sellers 2 . We also found a main effect of Round Number, $B=0.06, S E=0.01, t(606.83)=6.57, p<.001$, which indicated that excluding failures -Sellers' payoffs increased over rounds. Finally, we found a significant Treatment by Seller Number interaction effect, $B=-4.48, S E=0.84, t(71.76)=-5.33, p<$ .001, indicating that - also excluding failures - the difference in payoffs between the two Sellers was larger in the Inequality condition than in the Equality condition.

Study 3: Payoffs Excluding Failures. We ran similar mixed models as in Studies 1 and 2 on the payoffs in Study 3 (the only difference being that we now had a Slightly Unequal treatment instead of an Equality treatment), while excluding failures. These analyses again showed a significant effect of Round Number on the Buyers' payoffs, $B=-0.10, S E=0.02$, $t(370.24)=-6.20, p<.001$, indicating that - excluding failures - Buyers' payoffs decreased over rounds. Additionally, these analyses again showed a significant effect of Seller Number, $B=-3.41, S E=0.60, t(75.96)=-5.65, p<.001$, which indicated that -excluding failures - Sellers 1 earned significantly more points per round than Sellers 2. We also
found a main effect of Round Number, $B=0.05, S E=0.01, t(737.84)=7.40, p<.001$, which indicated that - excluding failures - Sellers' payoffs increased over rounds. Finally, we found a significant Treatment by Seller Number interaction effect, $B=-5.15, S E=1.03$, $t(74.62)=-4.98, p<.001$, indicating that - also excluding failures - the difference in payoffs between the two Sellers was larger in the Largely Unequal condition than in the Slightly Unequal condition.

## Exploratory Analyses: Comparing the WTA and WTP DIF-scores of Studies 1 vs. 2

For exploratory reasons, we also looked at whether the WTA and WTP difference scores of studies 1 vs 2 differed significantly. After all, the Unequal treatment in Study 2 was much more unequal ( 99 vs. 1) than the Unequal treatment of Study 1 ( 3 vs. 1), so it might be that the Treatment effect would be larger in Study 2. To do so, we first merged the datasets of the 2 studies, and then ran the same mixed models of the WTA and WTP difference scores that we also ran on the separate studies, while including the Study Number (1 vs. 2) as a fixed-level categorical predictor. In the next step, we also included the Treatment by Study Number interaction as an additional predictor These analyses showed that the WTA and WTP difference scores did not differ significantly between the two studies, as indicated by nonsignificant Study Number main effects (both $p \mathrm{~s}>.20$ ). Additionally, we also found no significant Treatment by Study Number interaction effects (both $p \mathrm{~s}>.39$ ), which indicates that the Treatment effects did not differ between the two studies.

## References

Hothorn, T., Bretz, F., \& Westfall, P. (2008). Simultaneous inference in general parametric models. Biometrical Journal, 50, 346-363. DOI: 10.1002/bimj. 200810425


[^0]:    * $p<.05$, ** $p<.01,{ }^{* * *} p<.001$

