Appendix

We noticed (thanks to Felix John) a few mistakes in the original code, and provided a corrected one. We repeated the analysis and did not qualitative differences in the results. Nevertheless we provide here the updated calibration results.

Table 1: Fitness score for the different null models and treatments

	Unconstrained communication	Constrained communication	Both treatments
Random	0.2437	0.4646	0.3531
Selfish	0.0410	0.0283	0.0346
Cooperative	0.3886	0.1931	0.2909
Mixed	0.6018	0.6267	0.5203
Conditional Cooperative	0.6487	0.4565	0.5470
Social Values	0.6086	0.6676	0.6155

Table 2: Parameters of the model on social value orientation. The middle column defines the range used in the calibration procedure, and the last column contains the estimated values as discussed in the results section.

Description	Calibrated (mixed)	Unconstrainted	Constrained
Selfish	0	0.06	0.01
cooperative	0.47	0.83	0.36
Random	0.53	0.11	0.63

Table 3: Parameters of the model on social value orientation. The middle column defines the range used in the calibration procedure, and the last column contains the estimated values as discussed in the results section.

Description	Parameter range	Calibrated (mixed)	Unconstrainted	Constrained
Strength of aversion to exploiting others α	[-1,1]	0.98	0.92	1.00
Degree of cooperative tendency β	[-1,1]	0.79	0.79	0.9
Weight for different utility values τ	[0, 1]	0.72	0.55	2.49
Minimum utility to be satisfied u_{min}	[0, 30]	15.5	15.5	23.2
Fraction of agents initially to be satisfied δ	[0, 1]	0.21	0.2	0.22

Table 4: Parameters of the model. The middle column defines the range used in the calibration procedure, and the last column contains the estimated values as discussed in the results section.

Description	Parameter range	Calibrated (mixed)	Unconstrainted	Constrained
Mean expected level of cooperation EC_0	[0,1]	0.19	0.54	0.68
Standard deviation of noise σ_T	[0,1]	0.39	0.35	0.46
Parameter defining the strength of trembling hand γ_w	[0, 10]	7.1	6.9	5.0
Relative update of EC due to communication, λ	[0,1]	0.71	0.44	0.71
Impact of constrained communication on EC, comC	[0,1]	0.17	0.31	0.45
Relative update of EC due to extraction, λ_E	[0,1]	0.55	0.54	0.07
Relative update of EC due to investment, λ_I	[0,1]	0.96	0.30	0.32

The following figures are the different types of metrics simulated with the diverse models and compared with the original data. We show here the figures calibrated on the combined dataset of constrained and unconstrained communication. Figure A1 demonstrates that the selfish actor model lead to a rapid depletion of the infrastructure, while random decisions lead to a persistent overinvestment. Figures A2 and A3 show the Gini coefficients over the rounds. The conditional cooperation model fits very well the Gini coefficients for investments. The social values model better fit with the extraction levels.

Figures A4 and A5 show the investment trajectories per position for the null models and the mixed model. There is no distinction for the two different treatments since the models will not generate different prediction for restricted and full communication. This is different for conditional cooperation and social values models (Figures A6 and A7) where we see the constrained communication lead to diverse investment levels, especially for conditional cooperation.

Figures A8 and A9 show the extraction levels per positions for the null models and the mixed model. For all models there is inequality between positions, although this is small for the cooperative model. In Figures A10 and A11 we see the predicted impact of the treatments for the conditional cooperation and social values models. In the social values model positions D and E fall behind, while in the conditional cooperation it is mainly position E.
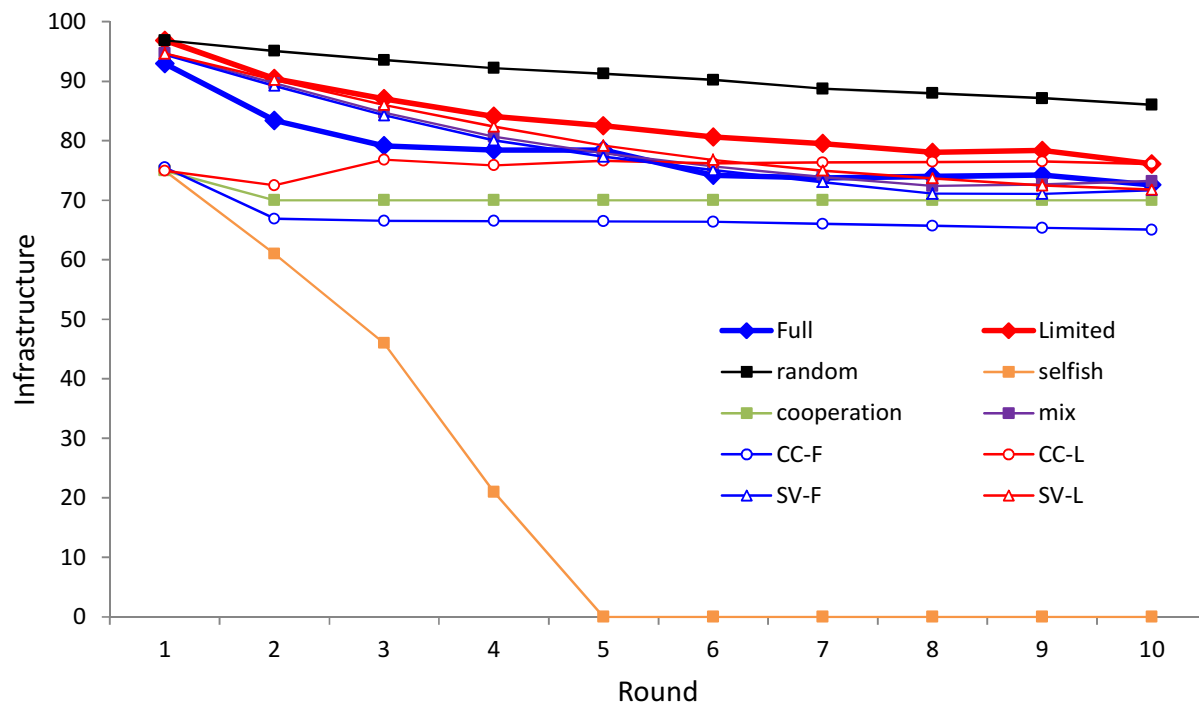
Figure A1. The average infrastructure over the rounds for data (Full, Limited) and the various models.
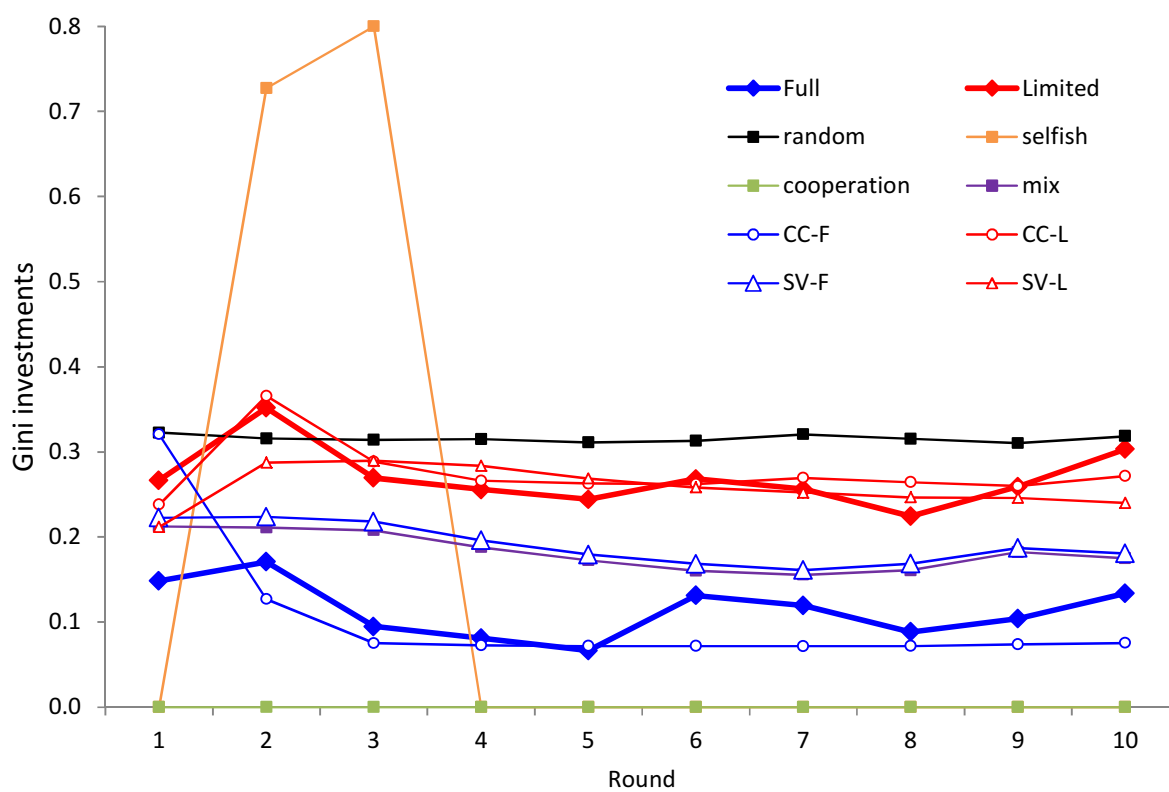

Figure A2. Gini levels for the investments for data (Full and Limited) and various models.
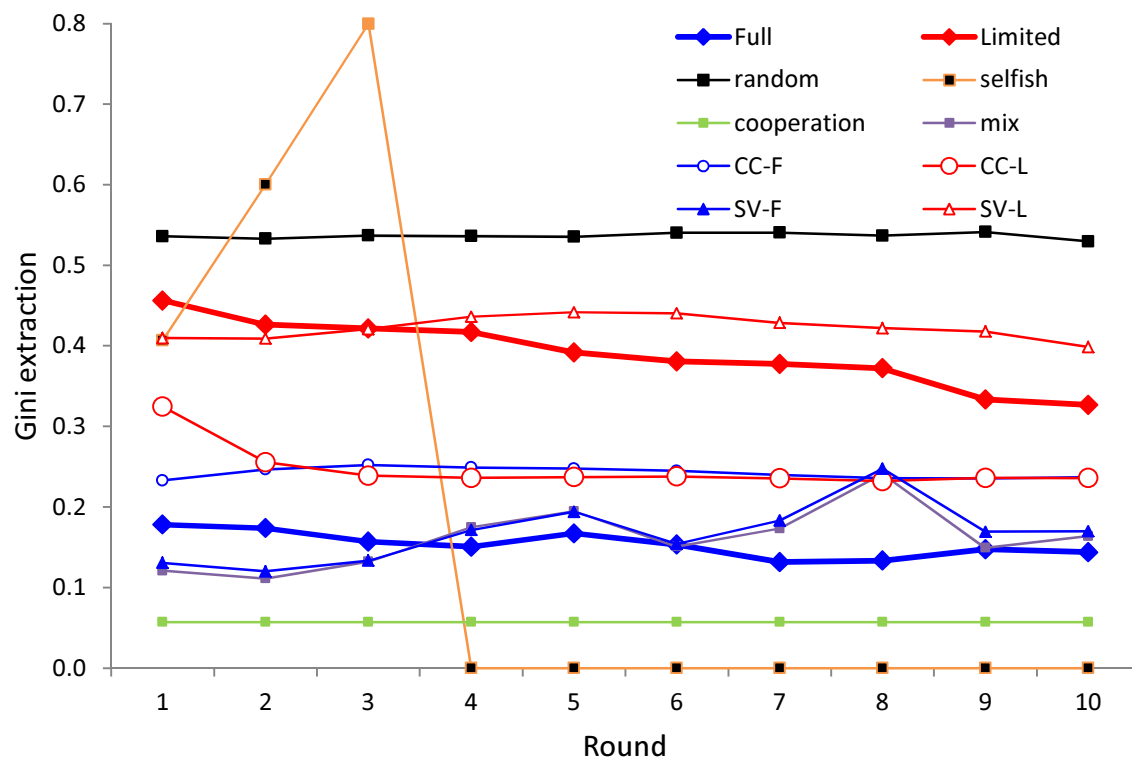
Figure A3: Gini levels for the extraction for data (Full and Limited) and various models.
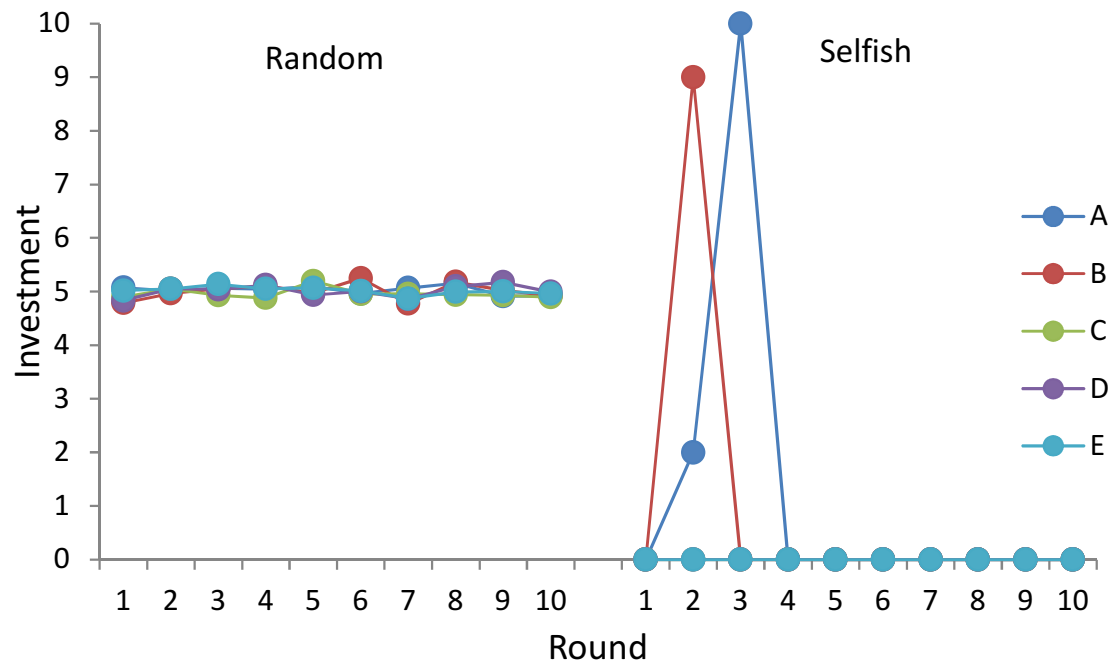
Figure A4: Average investment levels for random and selfish actors per position.
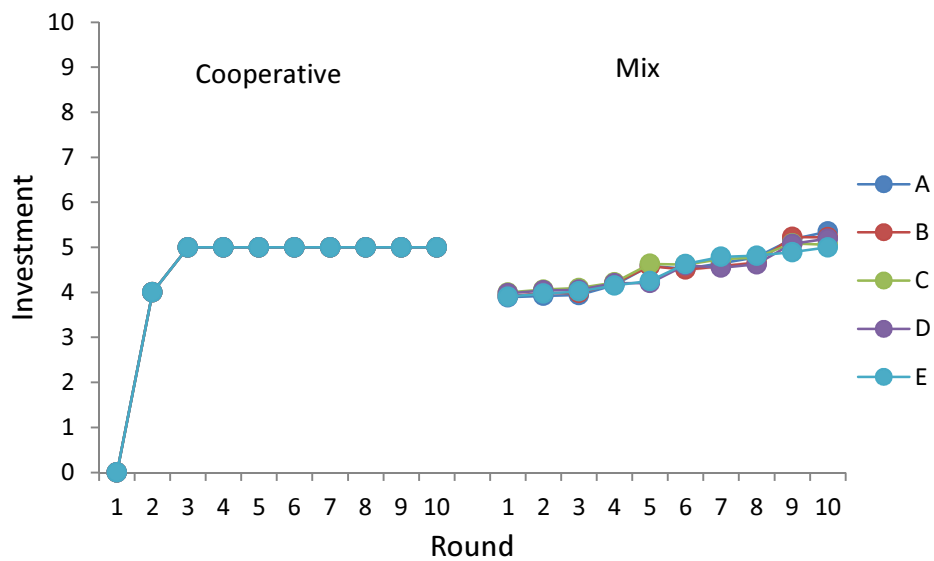

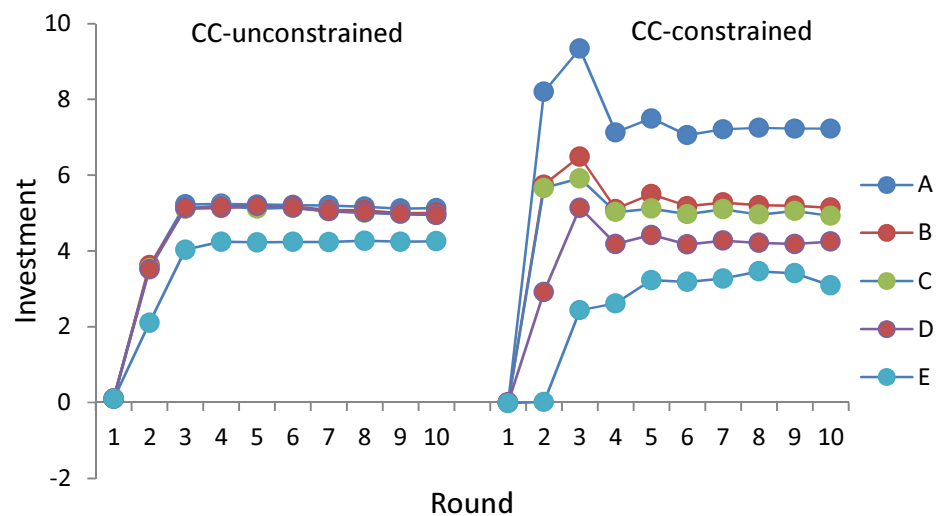Figure A5: Average investment levels for cooperative and mixed model per position.

Figure A6: Average investment levels for conditional cooperation model per position for both treatments.
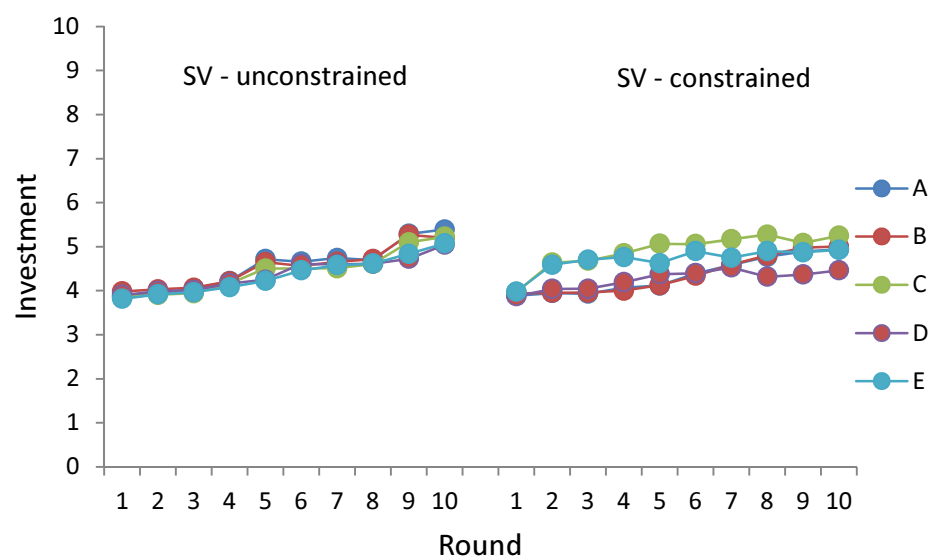

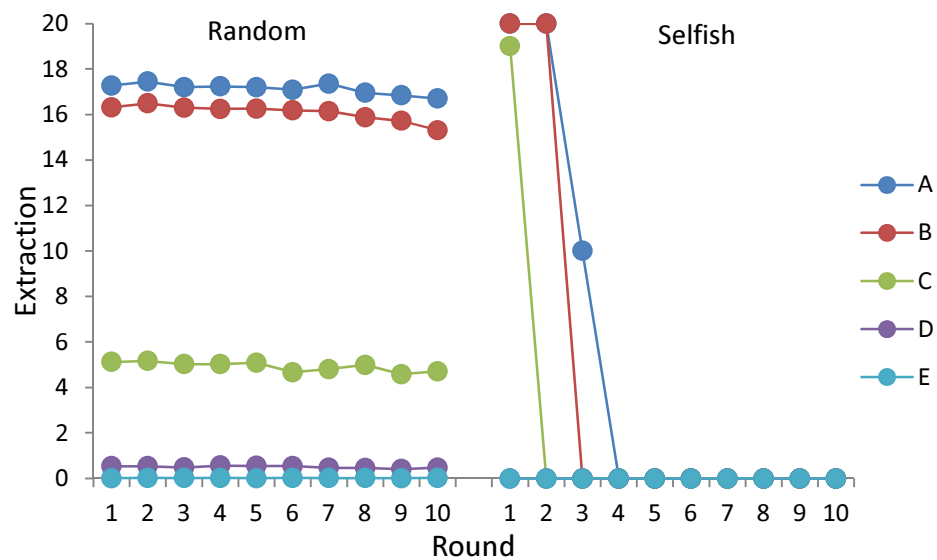Figure A7: Average investment levels for social values model per position for both treatments.

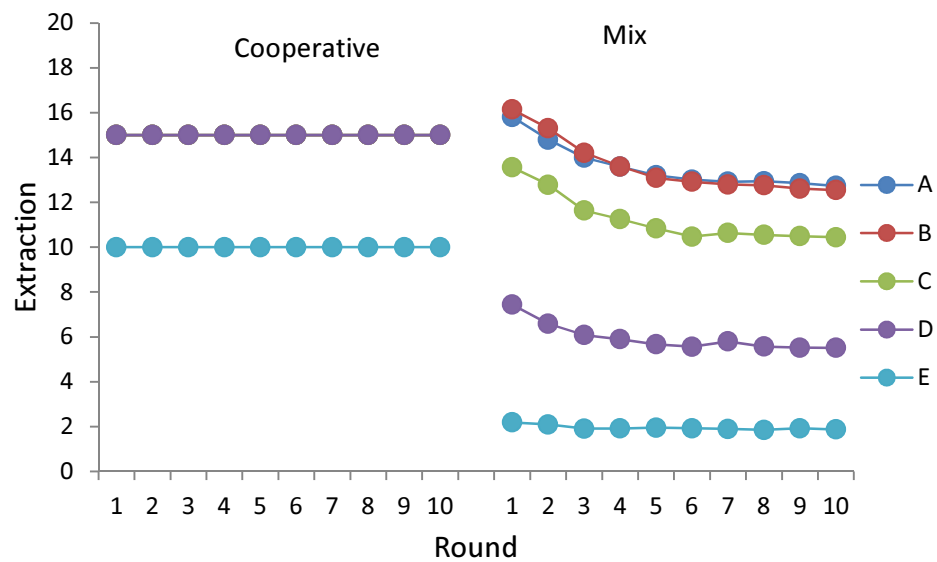Figure A8: Average extraction levels for random and selfish actors per position.

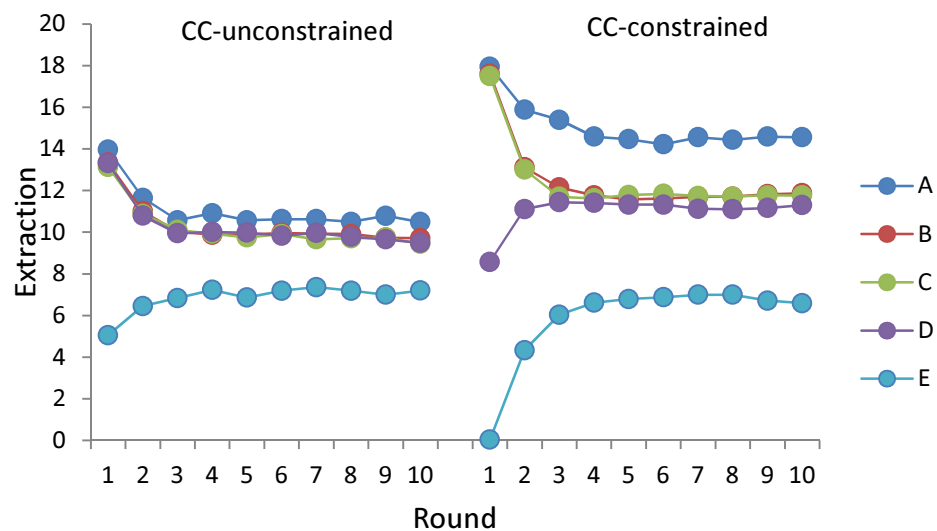Figure A9: Average extraction levels for cooperative and mixed models per position.

Figure A10: Average extraction levels for conditional cooperation model per position for both treatments.
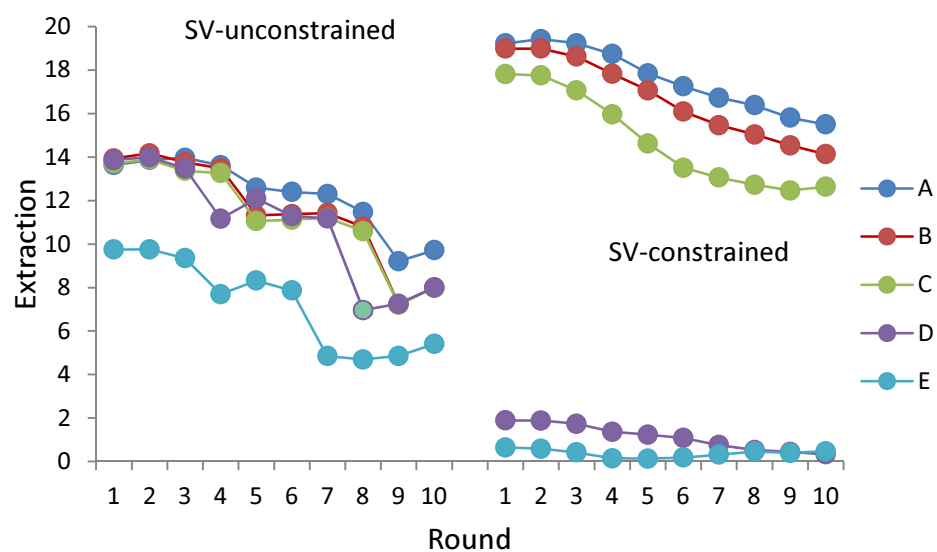

Figure A11: Average extraction levels for social values model per position for both treatments.