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– **PRELIMINARY DRAFT** –

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Abstract

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1 Preliminary Results

This document summarizes preliminary results from a public goods experiment with chat communication. The experiment features 16 participants per session across 10 sessions (5 per treatment), organized into groups of 4 with a 25-point endowment and a 0.4 MPCR. Participants play 5 sequential supergames of varying length (3–7 rounds), with strategic regrouping between supergames and pre-decision chat in each round.

1.1 Contribution Summary Statistics

Table 1 reports mean contributions by treatment and supergame. Treatment 2 participants contribute more on average across all five supergames. Mean contributions in Treatment 1 range from 17.44 (supergame 1) to 20.46 (supergame 5), while Treatment 2 contributions range from 19.18 to 22.02 over the same span. Median contributions reach the endowment ceiling of 25 in most treatment-supergame cells.

Table 1: Contribution Summary Statistics by Treatment and Supergame

Treatment	Segment	N	Mean	SD	Min	Max	Median
1	supergame1	240	17.44	8.35	0.00	25.00	20.00
1	supergame2	320	20.12	8.20	0.00	25.00	25.00
1	supergame3	240	19.25	9.13	0.00	25.00	25.00
1	supergame4	560	18.98	10.10	0.00	25.00	25.00
1	supergame5	400	20.46	9.06	0.00	25.00	25.00
2	supergame1	240	19.18	8.53	0.00	25.00	25.00
2	supergame2	320	21.01	7.84	0.00	25.00	25.00
2	supergame3	240	20.25	8.69	0.00	25.00	25.00
2	supergame4	560	20.83	8.68	0.00	25.00	25.00
2	supergame5	400	22.02	7.36	0.00	25.00	25.00

1.2 Promise-Making and Behavioral Classifications

Chat messages are classified as promises using dual-LLM consensus. From promise classifications, we derive two additional behavioral measures:

- **Liar.** A player who made a promise in chat but subsequently contributed below a threshold. Under the *strict* definition, a liar is a promise-maker who contributed < 20 (out of 25); under the *lenient* definition, a liar contributed < 5. The lenient definition captures only extreme defection.
- **Sucker.** A player who contributed the maximum (25 points) in a round where a groupmate lied. Under the *strict* definition, a groupmate lied if they promised but contributed < 20; under the *lenient* definition, the groupmate contributed < 5. Because the strict liar threshold

is easier to meet, the strict sucker definition classifies *more* players as suckers.

Table 2 summarizes these classifications aggregated across sessions within each treatment. Promise counts are broadly similar across treatments (519 in Treatment 1 vs. 412 in Treatment 2 across all supergames). Lying and sucker incidence is concentrated in the longer supergames (supergame 4 in particular), suggesting that cooperation breakdowns are more likely in extended interactions.

Table 2: Behavioral Classifications by Treatment and Supergame

Treatment	Segment	N	Promises	Liars Strict	Liars Lenient	Suckers Strict	Suckers Lenient
1	supergame1	240	75	14	1	5	1
1	supergame2	320	95	12	3	17	9
1	supergame3	240	89	2	1	6	3
1	supergame4	560	123	19	18	33	33
1	supergame5	400	137	10	7	25	19
2	supergame1	240	77	4	3	9	9
2	supergame2	320	79	6	4	8	4
2	supergame3	240	63	4	3	8	5
2	supergame4	560	104	35	30	72	58
2	supergame5	400	89	17	5	22	13

1.3 Contribution Dynamics

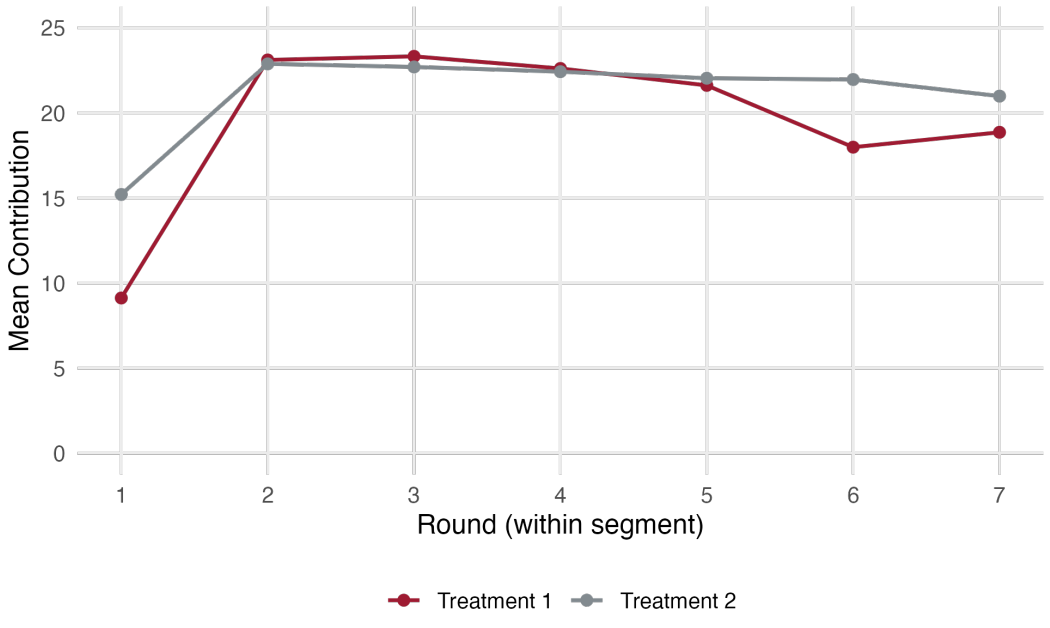

Figure 1: Mean contribution by round within each supergame. Vertical breaks separate supergames.

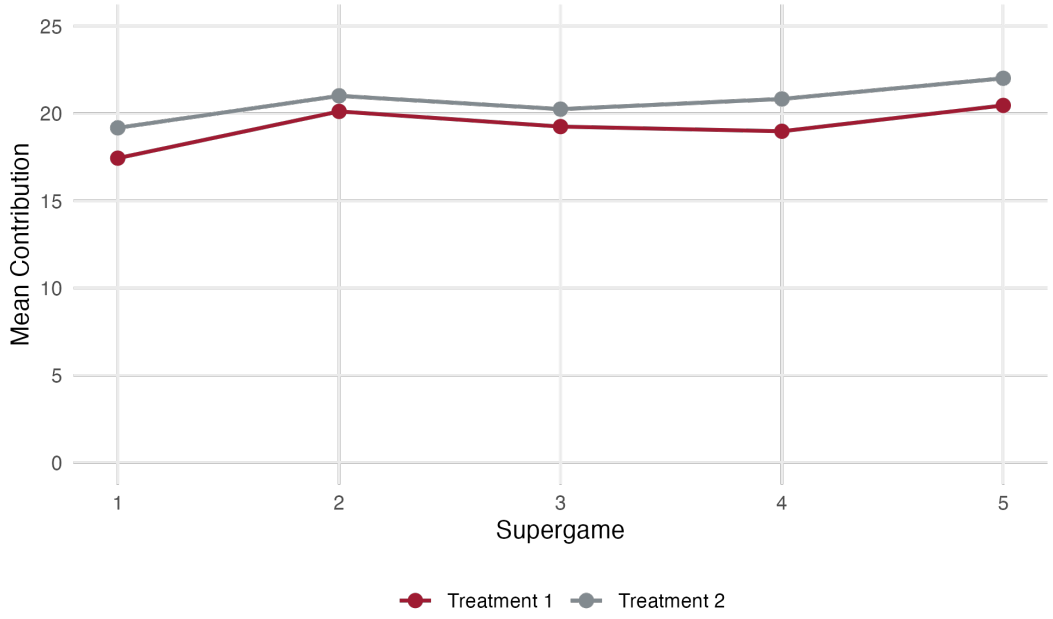

Figure 2: Mean contribution by supergame, split by treatment.

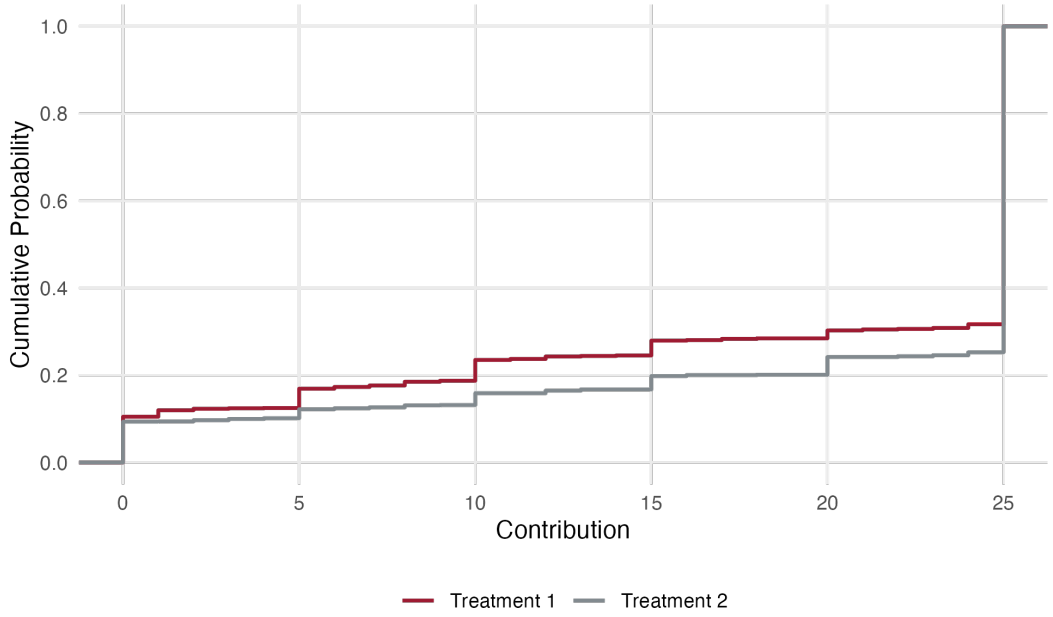

Figure 3: Empirical CDF of contributions by treatment. The Treatment 2 distribution first-order stochastically dominates Treatment 1.

1.4 Contribution Regression: Promise and Sucker Effects

Table 3 reports fixed-effects regressions of individual contributions on promise-making, sucker status, and treatment assignment. The model includes round and supergame (segment) fixed effects,

with standard errors clustered at the session-segment-group level.

Key findings:

- *Promise-making* is not significantly associated with higher contributions ($\hat{\beta} \approx 0.53$, $p > 0.10$). This likely reflects a ceiling effect: the contribution distribution is heavily right-skewed, with median contributions at the 25-point endowment in most treatment-supergame cells (Table 1). Both promise-makers and non-promise-makers tend to contribute near the maximum, leaving insufficient variation for the promise indicator to explain. The promise variable thus captures a near-universal norm of high contribution rather than a behavioral distinction.
- *Sucker status* has a large, negative, and highly significant effect. Under the strict definition (groupmate contributed < 20 after promising), being a sucker reduces contributions by 5.99 points ($p < 0.01$). Under the lenient definition (groupmate contributed < 5), the effect is even larger at -8.02 points ($p < 0.01$).
- *Treatment* is positive and significant ($\hat{\beta} \approx 1.62$, $p < 0.01$), confirming that Treatment 2 participants contribute more than Treatment 1 participants.

Table 3: Contribution Regression: Promise and Sucker Effects

Dependent Variable:	contribution	
	Strict Sucker	Lenient Sucker
Model:	(1)	(2)
Variables		
Made Promise	0.5288	0.5230
	(0.3320)	(0.3286)
Is Sucker (Strict)	-5.988***	
	(1.284)	
Treatment	1.623***	1.620***
	(0.5075)	(0.4834)
Is Sucker (Lenient)		-8.022***
		(1.391)
Fixed-effects		
round	Yes	Yes
segment	Yes	Yes
Fit statistics		
Observations	3,520	3,520
R^2	0.28594	0.29499

Clustered (session-segment-group) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

1.5 Sentiment–Contribution Regression with Liar Interaction

Table 4 tests whether chat sentiment predicts contributions and whether this relationship is attenuated for liars. The model interacts mean VADER compound sentiment (computed from pre-decision chat messages) with a liar indicator, including round and segment fixed effects with session-segment-group clustered standard errors.

The sample is restricted to person-rounds with non-missing chat sentiment ($N = 2{,}298$), which excludes Round 1 of each supergame (where no prior chat exists to influence contributions).

Key findings:

- *Sentiment* positively predicts contributions: a one-unit increase in compound sentiment is associated with roughly 2.1–2.2 additional contribution points ($p < 0.01$). Players who express more positive sentiment in chat contribute more.
- *Lying* has a large negative main effect. Strict liars (promised but contributed < 20) contribute 17.16 points less ($p < 0.01$); lenient liars (contributed < 5) contribute 22.49 points less ($p < 0.01$).
- *Interaction (Sentiment $\times$ Lied):* Under the strict definition, the interaction is small and insignificant (-0.23, $p > 0.10$), suggesting sentiment remains equally predictive for liars and non-liars. Under the lenient definition, the interaction is negative and significant (-2.65, $p < 0.05$), indicating that for extreme liars, positive sentiment does *not* translate into higher contributions—consistent with cheap talk.
- *Treatment* is not significant in either specification once sentiment and liar status are controlled, suggesting the treatment effect operates partly through the sentiment and honesty channels.

Table 4: Sentiment–Contribution Regression with Liar Interaction

Dependent Variable:	contribution	
	Strict Liar	Lenient Liar
Model:	(1)	(2)
Variables		
Sentiment	2.170***	2.114***
	(0.5885)	(0.5894)
Lied (Strict)	-17.16***	
	(1.054)	
Treatment	-0.1034	0.0569
	(0.4883)	(0.4965)
Sentiment x Lied	-0.2258	-2.648**
	(3.496)	(1.112)
Lied (Lenient)		-22.49***
		(0.5412)
Fixed-effects		
round	Yes	Yes
segment	Yes	Yes
Fit statistics		
Observations	2,298	2,298
R^2	0.31743	0.30210

Clustered (cluster_id) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

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Lastname, F. o. O. N. (Year of Access). Title of web page or document. `FullURLHere`. Accessed on [Date].

A Appendix: Detailed Summary Statistics

Table 5 reports contribution statistics for each session-supergame cell. Table 6 provides the corresponding behavioral classification counts.

Table 5: Contribution Summary Statistics by Session and Supergame

Treatment	Session	Segment	N	Mean	SD	Min	Max	Median
1	6sdkxl2q	supergame1	48	17.35	9.34	0.00	25.00	25.00
1	6sdkxl2q	supergame2	64	18.77	8.75	0.00	25.00	25.00
1	6sdkxl2q	supergame3	48	18.58	9.91	0.00	25.00	25.00
1	6sdkxl2q	supergame4	112	17.81	10.95	0.00	25.00	25.00
1	6sdkxl2q	supergame5	80	20.85	9.11	0.00	25.00	25.00
1	iiu3xixz	supergame1	48	14.29	8.26	0.00	25.00	13.00
1	iiu3xixz	supergame2	64	19.31	8.53	0.00	25.00	25.00
1	iiu3xixz	supergame3	48	18.94	9.08	0.00	25.00	25.00
1	iiu3xixz	supergame4	112	18.41	10.60	0.00	25.00	25.00
1	iiu3xixz	supergame5	80	21.98	7.64	0.00	25.00	25.00
1	r5dj4yfl	supergame1	48	18.90	7.18	0.00	25.00	22.50
1	r5dj4yfl	supergame2	64	21.73	7.22	0.00	25.00	25.00
1	r5dj4yfl	supergame3	48	18.88	9.50	0.00	25.00	25.00
1	r5dj4yfl	supergame4	112	20.03	9.47	0.00	25.00	25.00
1	r5dj4yfl	supergame5	80	20.48	9.25	0.00	25.00	25.00
1	sa7mprty	supergame1	48	17.00	7.91	0.00	25.00	20.00
1	sa7mprty	supergame2	64	21.56	6.35	5.00	25.00	25.00
1	sa7mprty	supergame3	48	19.92	8.08	0.00	25.00	25.00
1	sa7mprty	supergame4	112	20.46	8.67	0.00	25.00	25.00
1	sa7mprty	supergame5	80	18.80	10.15	0.00	25.00	25.00
1	umbzdj98	supergame1	48	19.67	8.22	0.00	25.00	25.00
1	umbzdj98	supergame2	64	19.22	9.52	0.00	25.00	25.00
1	umbzdj98	supergame3	48	19.94	9.30	0.00	25.00	25.00
1	umbzdj98	supergame4	112	18.21	10.52	0.00	25.00	25.00
1	umbzdj98	supergame5	80	20.21	8.93	0.00	25.00	25.00
2	6ucza025	supergame1	48	22.54	6.00	2.00	25.00	25.00
2	6ucza025	supergame2	64	23.06	5.53	0.00	25.00	25.00
2	6ucza025	supergame3	48	23.83	3.06	9.00	25.00	25.00
2	6ucza025	supergame4	112	23.68	4.38	0.00	25.00	25.00
2	6ucza025	supergame5	80	24.62	1.55	15.00	25.00	25.00
2	6uv359rf	supergame1	48	16.98	8.76	0.00	25.00	17.50
2	6uv359rf	supergame2	64	20.42	8.11	0.00	25.00	25.00
2	6uv359rf	supergame3	48	20.40	8.82	0.00	25.00	25.00
2	6uv359rf	supergame4	112	22.05	7.76	0.00	25.00	25.00
2	6uv359rf	supergame5	80	20.82	9.01	0.00	25.00	25.00
2	irrzlgk2	supergame1	48	18.81	9.51	0.00	25.00	25.00
2	irrzlgk2	supergame2	64	18.62	10.16	0.00	25.00	25.00
2	irrzlgk2	supergame3	48	16.31	11.29	0.00	25.00	25.00
2	irrzlgk2	supergame4	112	14.72	11.65	0.00	25.00	25.00
2	irrzlgk2	supergame5	80	20.44	8.79	0.00	25.00	25.00
2	j3ki5tli	supergame1	48	16.83	9.12	0.00	25.00	20.00
2	j3ki5tli	supergame2	64	20.34	7.52	0.00	25.00	25.00
2	j3ki5tli	supergame3	48	19.06	8.68	0.00	25.00	25.00
2	j3ki5tli	supergame4	112	22.58	6.55	0.00	25.00	25.00
2	j3ki5tli	supergame5	80	22.79	5.68	0.00	25.00	25.00
2	sylq2syi	supergame1	48	20.73	7.66	0.00	25.00	25.00
2	sylq2syi	supergame2	64	22.61	6.43	0.00	25.00	25.00
2	sylq2syi	supergame3	48	21.65	7.87	0.00	25.00	25.00
2	sylq2syi	supergame4	112	21.13	8.42	0.00	25.00	25.00
2	sylq2syi	supergame5	80	21.41	8.27	0.00	25.00	25.00

Table 6: Behavioral Classifications by Session and Supergame

Session	Treatment	Segment	N	Promises	Liars Strict	Liars Lenient	Suckers Strict	Suckers Lenient
6sdkxl2q	1	supergame1	48	19	3	0	0	0
6sdkxl2q	1	supergame2	64	21	5	0	6	0
6sdkxl2q	1	supergame3	48	17	0	0	0	0
6sdkxl2q	1	supergame4	112	32	2	2	1	1
6sdkxl2q	1	supergame5	80	30	0	0	0	0
iiu3xixz	1	supergame1	48	10	2	1	1	1
iiu3xixz	1	supergame2	64	19	4	1	3	3
iiu3xixz	1	supergame3	48	20	1	1	3	3
iiu3xixz	1	supergame4	112	26	4	4	12	12
iiu3xixz	1	supergame5	80	30	0	0	0	0
r5dj4yfl	1	supergame1	48	24	4	0	1	0
r5dj4yfl	1	supergame2	64	21	0	0	0	0
r5dj4yfl	1	supergame3	48	20	1	0	3	0
r5dj4yfl	1	supergame4	112	24	2	2	6	6
r5dj4yfl	1	supergame5	80	32	3	0	6	0
sa7mprty	1	supergame1	48	11	4	0	0	0
sa7mprty	1	supergame2	64	25	0	0	0	0
sa7mprty	1	supergame3	48	18	0	0	0	0
sa7mprty	1	supergame4	112	24	5	5	8	8
sa7mprty	1	supergame5	80	22	4	4	10	10
umbzdj98	1	supergame1	48	11	1	0	3	0
umbzdj98	1	supergame2	64	9	3	2	8	6
umbzdj98	1	supergame3	48	14	0	0	0	0
umbzdj98	1	supergame4	112	17	6	5	6	6
umbzdj98	1	supergame5	80	23	3	3	9	9
6ucza025	2	supergame1	48	25	0	0	0	0
6ucza025	2	supergame2	64	14	0	0	0	0
6ucza025	2	supergame3	48	11	0	0	0	0
6ucza025	2	supergame4	112	16	4	0	12	0
6ucza025	2	supergame5	80	7	0	0	0	0
6uv359rf	2	supergame1	48	16	1	0	0	0
6uv359rf	2	supergame2	64	17	0	0	0	0
6uv359rf	2	supergame3	48	15	0	0	0	0
6uv359rf	2	supergame4	112	20	0	0	0	0
6uv359rf	2	supergame5	80	21	4	4	10	10
irrzlgk2	2	supergame1	48	12	1	1	3	3
irrzlgk2	2	supergame2	64	17	4	4	4	4
irrzlgk2	2	supergame3	48	12	3	3	5	5
irrzlgk2	2	supergame4	112	19	25	24	42	40
irrzlgk2	2	supergame5	80	26	10	1	3	3
j3ki5tli	2	supergame1	48	10	0	0	0	0
j3ki5tli	2	supergame2	64	15	2	0	4	0
j3ki5tli	2	supergame3	48	13	1	0	3	0
j3ki5tli	2	supergame4	112	25	2	2	6	6
j3ki5tli	2	supergame5	80	16	3	0	9	0
sylq2syi	2	supergame1	48	14	2	2	6	6
sylq2syi	2	supergame2	64	16	0	0	0	0
sylq2syi	2	supergame3	48	12	0	0	0	0
sylq2syi	2	supergame4	112	24	4	4	12	12
sylq2syi	2	supergame5	80	19	0	0	0	0