



Cooperation, reciprocity, and efficiency in polygynous pastoralist households

Presentation at SEEDEC
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Anti-poverty programs often give cash or in-kind transfers to households

- Mexico's Progressa/Oportunidades
- Ethiopia's Productive Social Safety Net Program
- GiveDirectly
- World Food Programme
- Heifer International

Does it matter whether you give transfers to the husband or the wife?

- Evidence is mixed
 - Yes
 - Thomas (1990, 1994)
 - Duflo (2003)
 - Yoong et al. (2012)
 - No
 - Akresh et al. (2016)
 - Haushofer and Shapiro (2016)

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Polygyny in Sub-Saharan Africa

- Outside of Sub-Saharan Africa, 92% of families are publically monogamous (Fenske 2015)
- In Sub-Saharan Africa, 28% of families are publically polygynous (Fenske 2015)



Setting: Senegal

- 32% of women 15-49 are in registered polygynous unions (DHS 2017)
- Roughly half of all women will be in polygynous unions at some point in their lives (Antoine et al. 2002)



Models of the household

- Most household models assume exactly two decision-makers
- Collective/cooperative models
 - Bargaining power matters
 - Outcomes Pareto efficient
 - **Spouses cooperate to maximize total household income**
- Non-cooperative models
 - Everything else

Model of the **polygynous** household

- Akresh, Chen, and Moore (2016)
 - Family members make agreements with each other, and threaten punishment if the agreement is broken.
 - Husbands and wives feel altruism toward each other, and pain if they have to enact punishment.
 - Co-wives don't, so they are more willing to enact punishment.
 - **Co-wives are thus more conditionally cooperative/reciprocal, and more efficient.**
 - **Polygynous households are more efficient than monogamous.**

Research questions

- Do families cooperate/maximize total income?
- Are monogamous families differently (conditionally) cooperative than polygynous?
- Are specific dyads differently (conditionally) cooperative? (e.g. husband and 1st wife v. husband and 2nd wife)

Empirical strategy

- Use public goods games to measure cooperation between husbands and wives, and between co-wives
- Test whether monogamous households are differently (conditionally) cooperative overall
- Test whether specific dyads are differently (conditionally) cooperative

Setting: Semi-nomadic pastoralists



- Milk production in Northern Senegal dominated by the Fulani
- In 2006, La Laiterie du Berger (LDB) opened a processing facility in Richard Toll

Sample and Data

- Data from a Randomized Controlled Trial (RCT) that looks at impacts of incentives and training on milk production
- Sample contains all households delivering to LDB
- Data collected 2014



Sample and Data

- Household survey (AM)
 - 591 households participated in 2014
- Laboratory games (PM)
 - Male household head and up to 2 of his wives
 - Focus on 240 families:
 - 180 monogamous
 - 60 polygynous



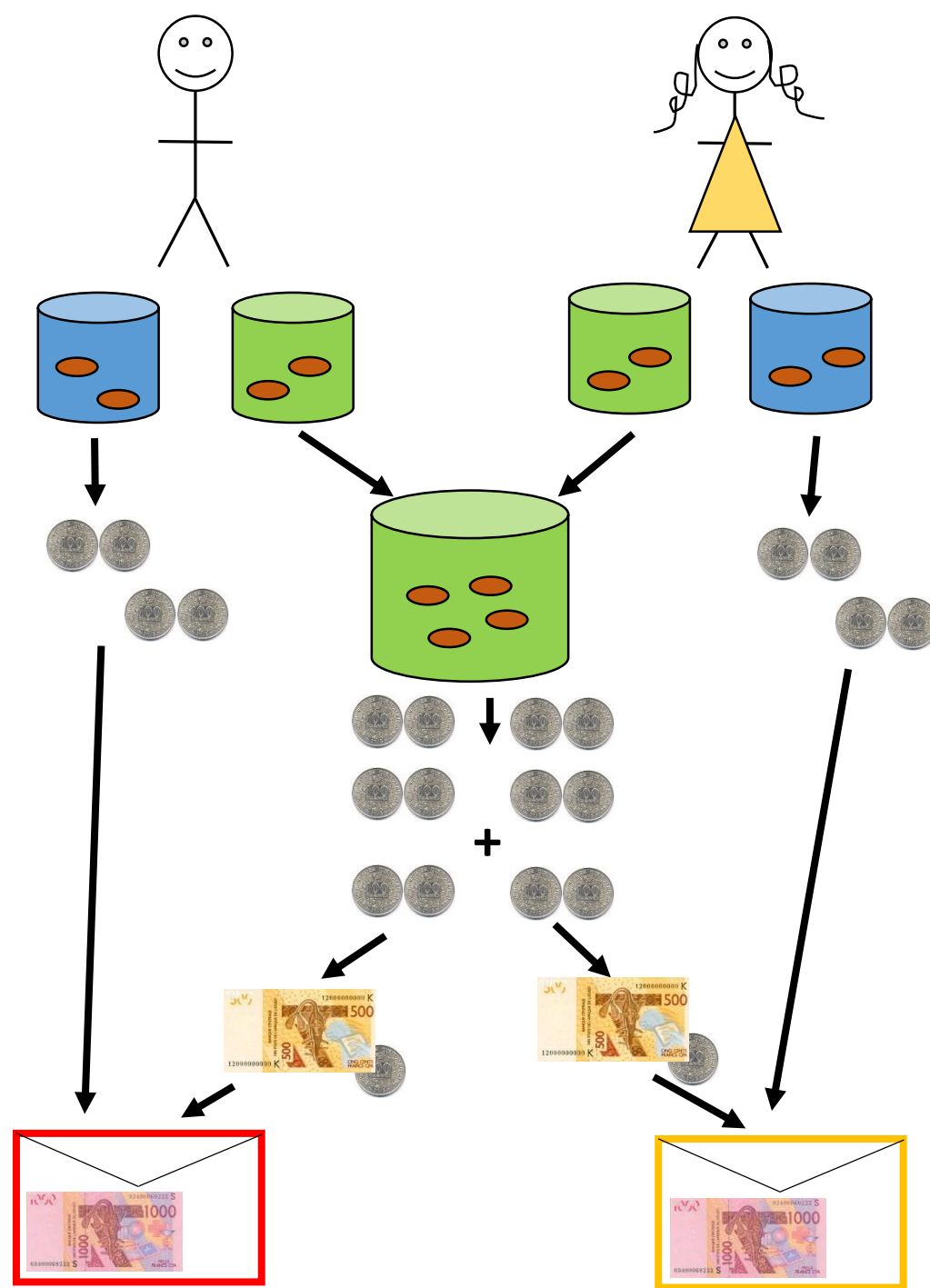
Setting: Demographics

	Mono Husbands mean(sd)[N]	Mono Wives mean(sd)[N]	Poly Husbands mean(sd)[N]	Poly First Wives mean(sd)[N]	Poly Second+ Wives mean(sd)[N]	Husband differences b(se)	First Wife difference b(se)	Poly Wives differences b(se)
Age	47.46 (14.49) [180.00]	35.39 (12.43) [180.00]	54.85 (12.01) [60.00]	42.57 (9.82) [60.00]	35.27 (10.07) [60.00]	7.39 (2.07)***	7.17 (1.76)***	-7.30 (1.82)***
Number of children	4.83 (2.49) [179.00]	4.35 (2.11) [178.00]	8.02 (3.55) [59.00]	4.32 (1.94) [60.00]	3.65 (1.85) [54.00]	3.18 (0.42)***	-0.03 (0.31)	-0.67 (0.36)*
Formal education	0.03 (0.18) [179.00]	0.08 (0.28) [178.00]	0.03 (0.18) [59.00]	0.00 (0.00) [60.00]	0.09 (0.29) [54.00]	0.00 (0.03)	-0.08 (0.04)**	0.09 (0.04)**
Koranic school	0.48 (0.50) [179.00]	0.38 (0.49) [178.00]	0.54 (0.50) [59.00]	0.35 (0.48) [60.00]	0.43 (0.50) [54.00]	0.06 (0.08)	-0.03 (0.07)	0.08 (0.09)
Illiterate	0.78 (0.42) [180.00]	0.87 (0.33) [180.00]	0.75 (0.44) [60.00]	0.95 (0.22) [60.00]	0.97 (0.18) [60.00]	-0.03 (0.06)	0.08 (0.05)*	0.02 (0.04)
Been divorced	0.15 (0.36) [179.00]	0.05 (0.22) [178.00]	0.07 (0.25) [59.00]	0.08 (0.28) [60.00]	0.37 (0.49) [54.00]	-0.08 (0.05)	0.03 (0.04)	0.29 (0.07)***

Setting: Bride wealth/price

	Mono Husbands mean(sd)[N]	Mono Wives mean(sd)[N]	Poly Husbands mean(sd)[N]	Poly First Wives mean(sd)[N]	Poly Second+ Wives mean(sd)[N]	Husband differences b(se)	First Wife difference b(se)	Poly Wives differences b(se)
Number cows for bride wealth		5.86 (3.09) [172.00]		6.66 (2.89) [59.00]	5.43 (1.84) [51.00]		0.80 (0.46)*	-1.23 (0.47)**
Zero cows for bride wealth		0.06 (0.23) [179.00]		0.00 (0.00) [60.00]	0.00 (0.00) [54.00]		-0.06 (0.03)*	0.00 (0.00)
Don't know how many cows for bride wealth		0.03 (0.18) [178.00]		0.02 (0.13) [60.00]	0.06 (0.23) [54.00]		-0.02 (0.03)	0.04 (0.03)
Cash for bride wealth		31,267.12 (62,821.07) [146.00]		24,750.00 (70,112.76) [52.00]	58,409.09 (114,001.08) [44.00]		-6,517.12 (10,464.35)	33,659.09 (19,009.21)*
Zero cash for bride wealth		0.47 (0.50) [179.00]		0.62 (0.49) [60.00]	0.39 (0.49) [54.00]		0.14 (0.07)*	-0.23 (0.09)**
Don't know how much cash for bride wealth		0.18 (0.39) [178.00]		0.13 (0.34) [60.00]	0.19 (0.39) [54.00]		-0.05 (0.06)	0.05 (0.07)

Voluntary contribution game



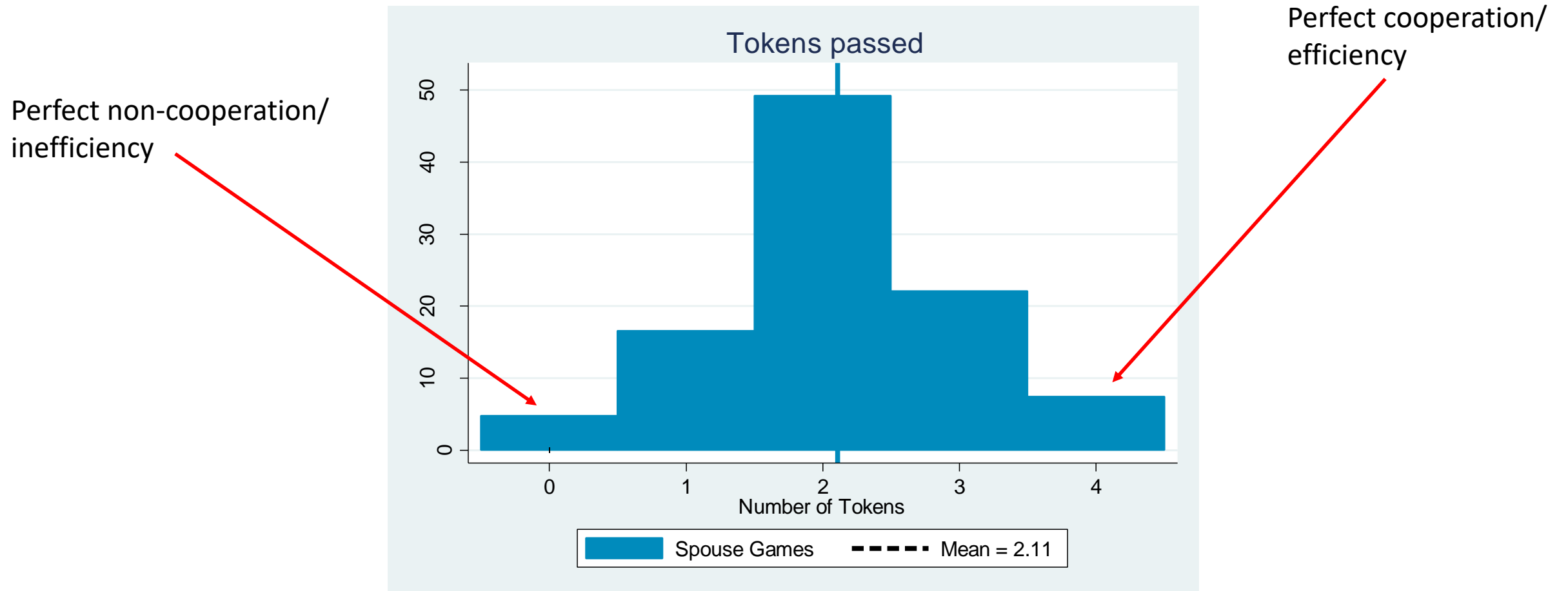
Team of 6 explains the games



Game design

- Each respondent played 3-4 games
 - Private risk game
 - VCM with primary spouse
 - If polygynous, VCM with secondary spouse
 - VCM with anonymous stranger
- One chosen at random to payout
- Payout game not symmetric in the household
- Also given a “random addition” of 0 to 450 CFA
- Designed to obscure choices in spouse games

Full sample



Are polygynous households more or less cooperative than monogamous households?



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**Give:
50%**



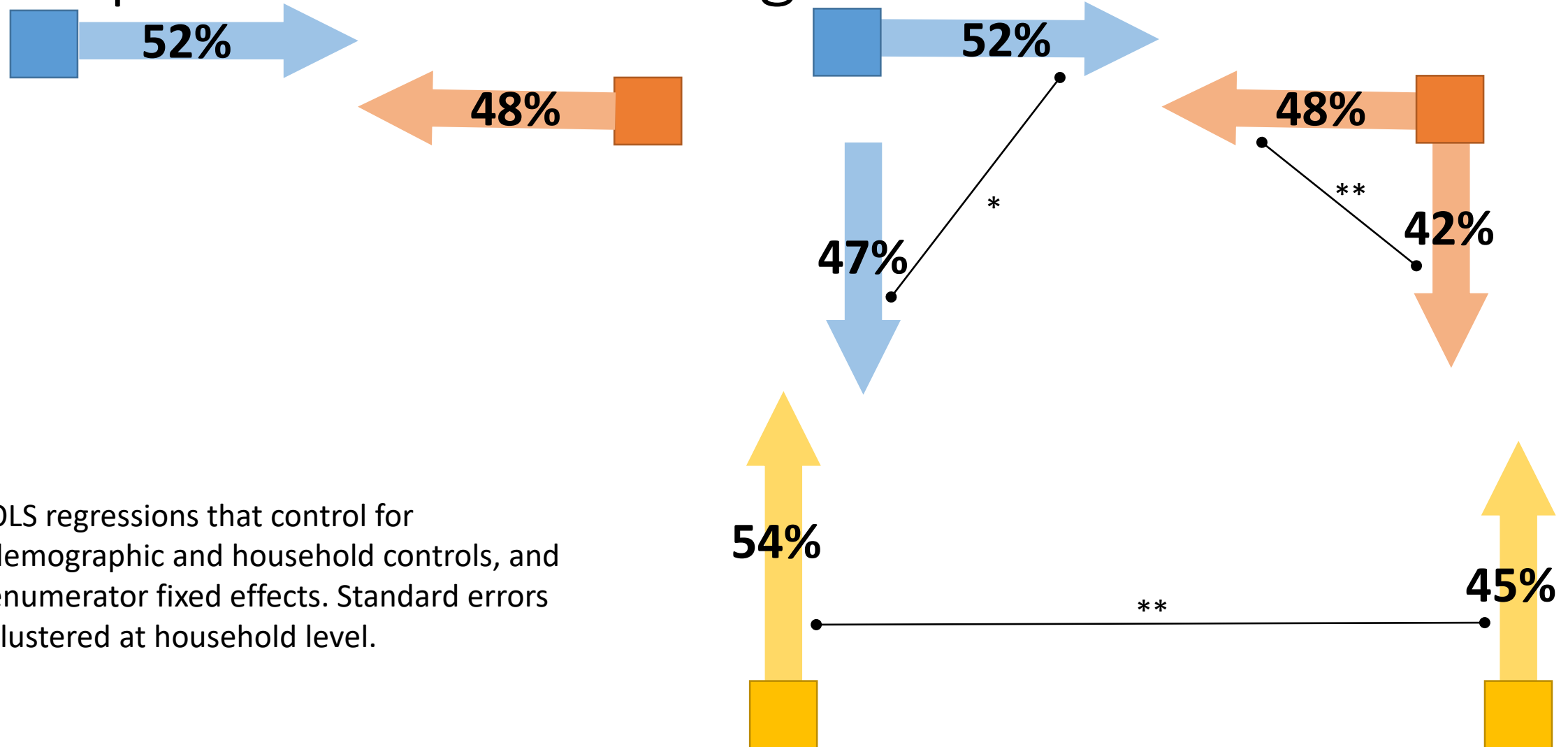
**Give:
48%**



OLS regressions that control for demographic and household controls, and enumerator fixed effects. Standard errors clustered at household level.



Are polygynous households more or less cooperative than monogamous households?



OLS regressions that control for demographic and household controls, and enumerator fixed effects. Standard errors clustered at household level.

Do polygynous households **expect** more or less cooperation than monogamous households?



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**Expect:
57%**

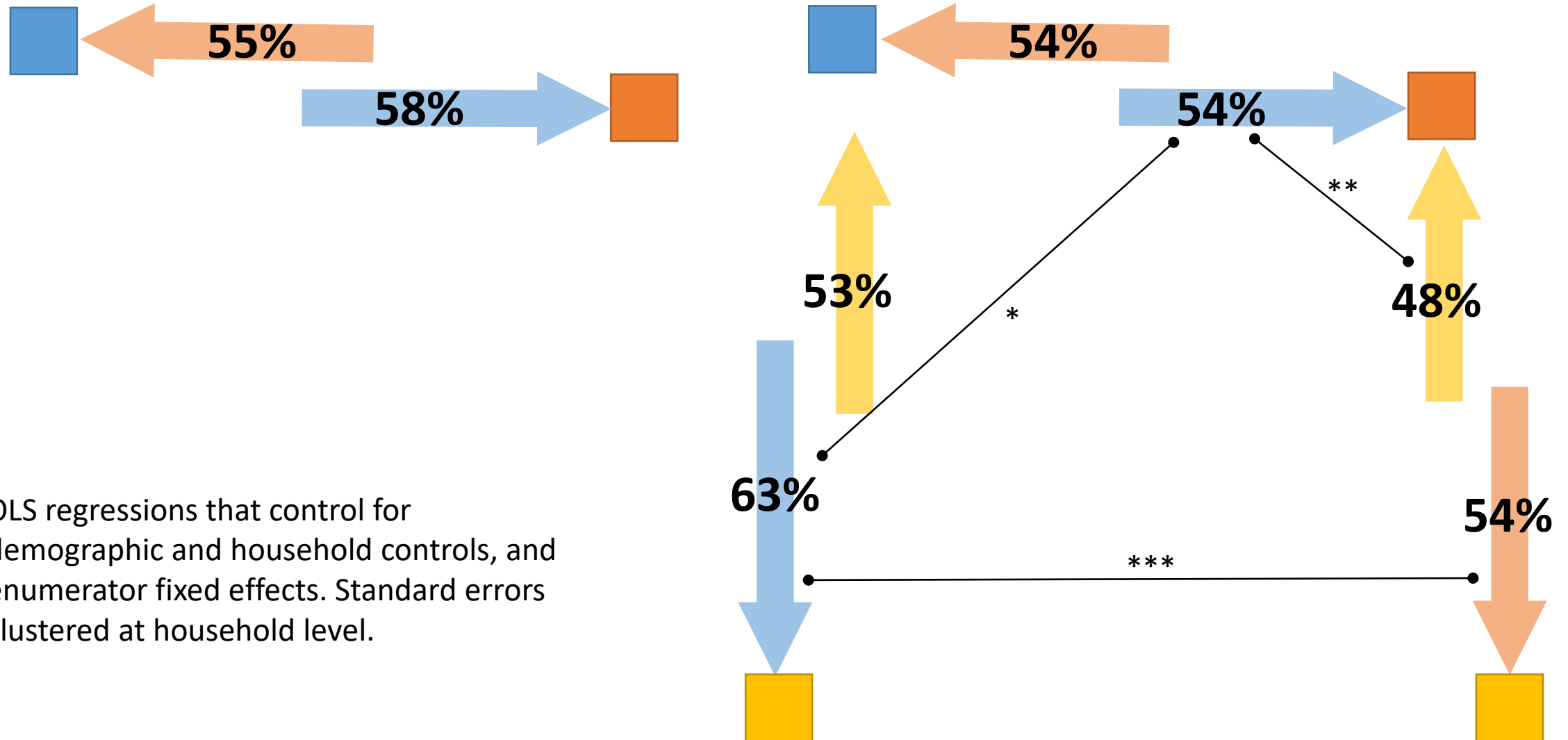


**Expect:
54%**



OLS regressions that control for demographic and household controls, and enumerator fixed effects. Standard errors clustered at household level.

Do polygynous households **expect** more or less cooperation than monogamous households?



Are polygynous households' expectations more biased than monogamous households?



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Bias:
3pp

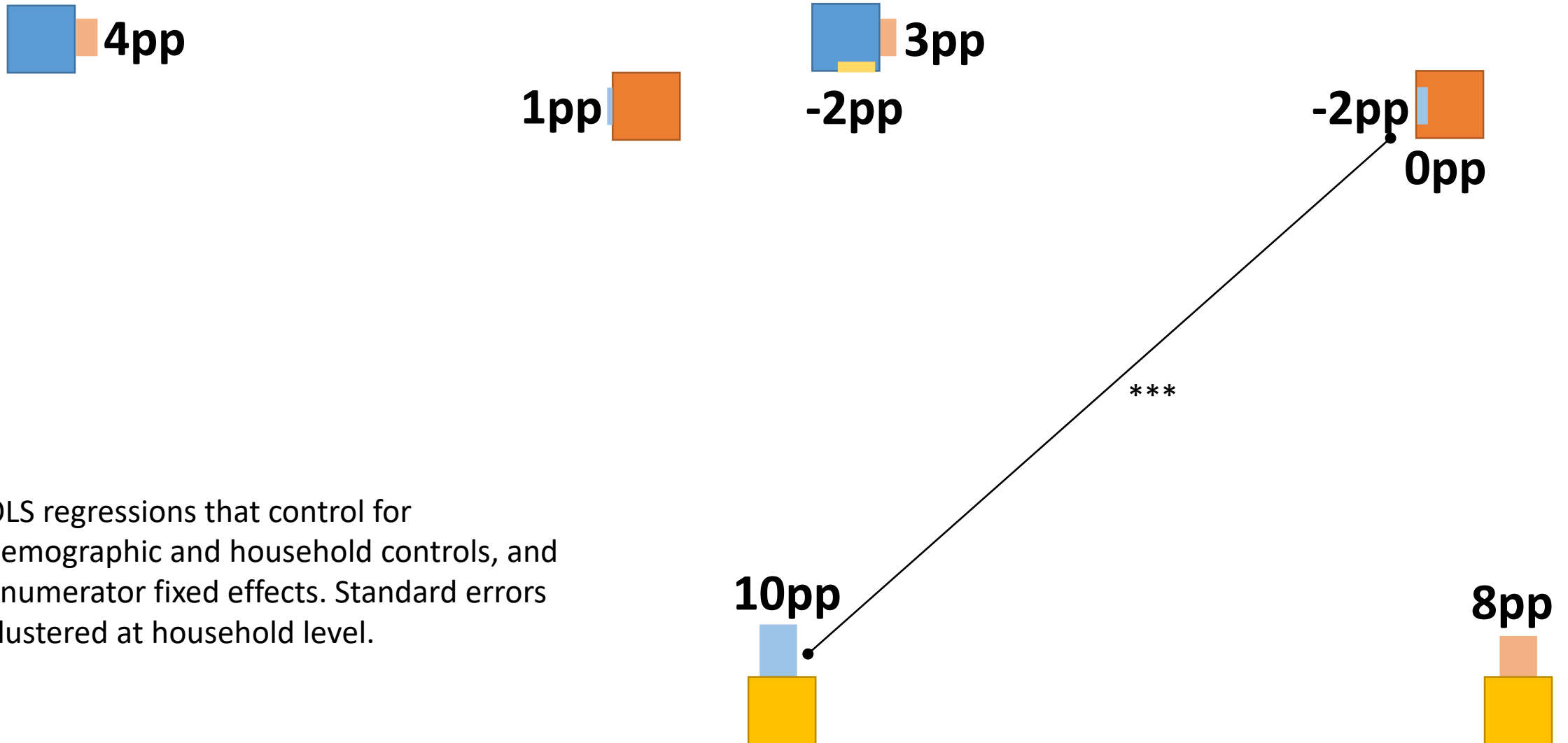


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OLS regressions that control for demographic and household controls, and enumerator fixed effects. Standard errors clustered at household level.

Are polygynous households' expectations more biased than monogamous households?



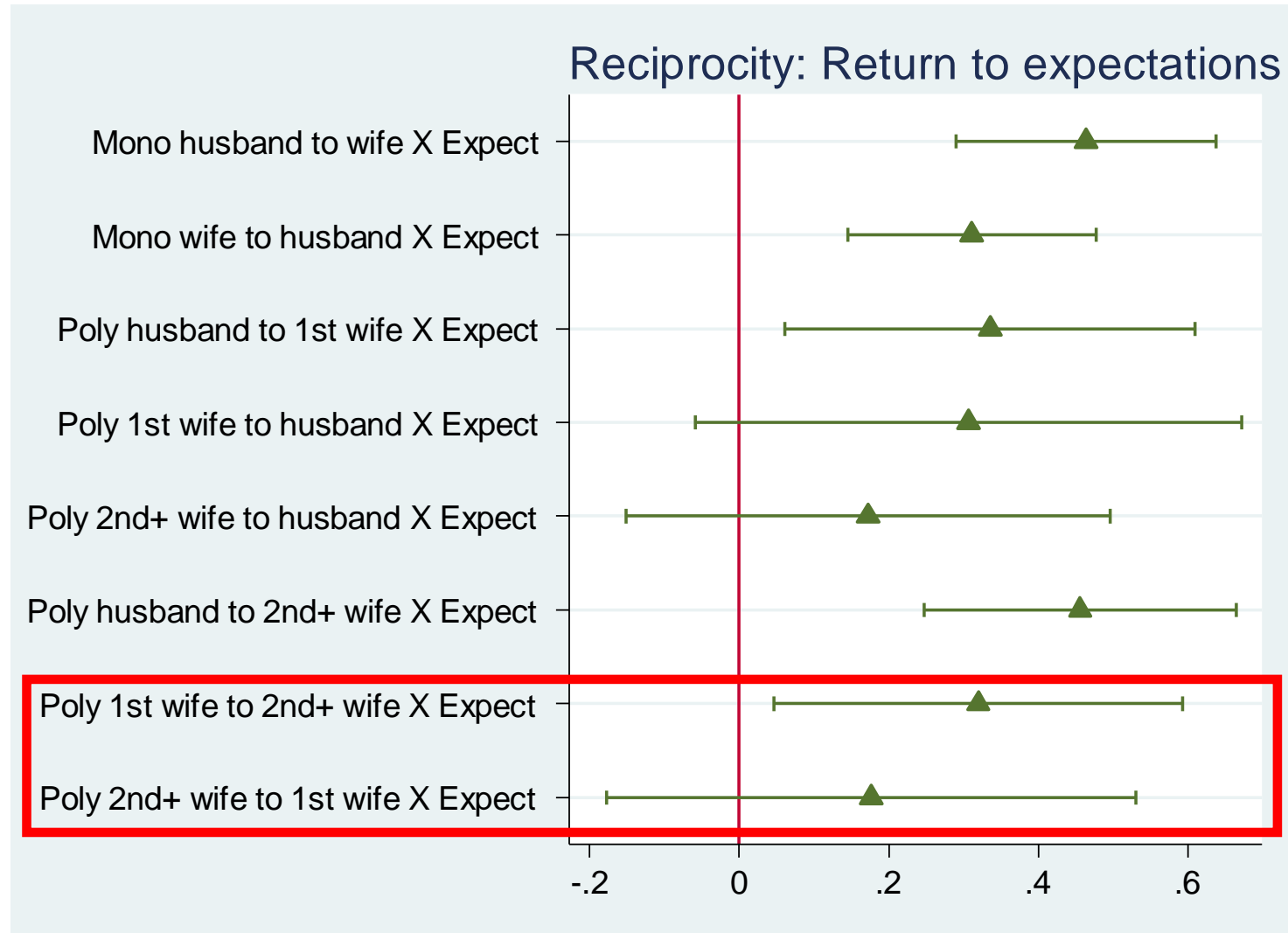
Are polygynous households more conditionally cooperative than monogamous households?

VARIABLES	(5) Contributions	(6) Contributions
Polygynous	0.02 (0.06)	0.02 (0.08)
Male		-0.04 (0.07)
Male x Polygynous		-0.01 (0.11)
Expected HH contribution	0.37*** (0.06)	0.31*** (0.08)
Poly x Expected HH contribution	-0.05 (0.10)	-0.04 (0.13)
Male x Expected HH contribution		0.15 (0.12)
Poly x Male x Expected HH contribution		-0.02 (0.19)
Constant	0.29*** (0.07)	0.30*** (0.07)
Observations	720	720
R-squared	0.17	0.18

Reciprocity by dyad



Reciprocity by dyad



Summary of results

- Monogamous families are no differently cooperative than polygynous over all; both types of households fail to maximize total income.
- All spouses are conditionally cooperative; co-wives are no differently reciprocal than other dyads.
- **2nd wives expect the most but get the least.**

What have we learned?

- Anti-poverty programs for polygynous families should be specifically targeted to 2nd wives, not just women in general.
- Thank you!
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