

Identity, Homophily and In-Group Bias: Experimental Evidence

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In-Group Bias

- ▶ Experimental studies have found that people display *differential behavior* towards others perceived to be in the same group (in-group) compared to outsiders. (Tajfel and Turner, 1986, Chen and Li, 2009, Akerlof and Kranton, 2002, 2005,...)
- ▶ In-group favoritism occurs under minimal conditions for group identification.
- ▶ Minimal design: labels defining groups are statistically uncorrelated with agents' characteristics, so in principle payoff irrelevant (Tajfel and Turner, 1986).
- ▶ Patterns of interaction are exogenous.

Homophily

- ▶ "homophily": the tendency of social actors to *interact* with other actors similar to themselves.
- ▶ Well documented and robust phenomenon, along:
 - type of similarity: race, gender, religion, preferences, age,...
 - type of relation: friendship, marriage, acquaintance, professional ties, job contacts,...
- ▶ Distance in characteristics translates into distance in social network - flow of information, opinions, etc... becomes localized
- ▶ Recent interest in economics (Currarini, Jackson, Pin, 2009, 2010, 2011, Bramouille and Rogers 2011, Currarini and Vega Redondo 2011, Jackson and Golub 2010,...)

Research Issues

- ▶ Both homophily and in-group bias seem to involve some degree of discrimination towards "others".
- ▶ Joint systematic study of both phenomena is missing - potentially relevant.
- ▶ Are in-group bias and homophily correlated phenomena?
- ▶ Result of pure preference bias or strategic?
- ▶ Does endogenous choice of partner mitigate or increase in-group bias?
- ▶ ...and why? Does behavior change? What the role of self selection?

Overview of Results (and Conjectures)

1. We find evidence of both in-group bias and homophily under minimal design
2. Homophilous agents have are more reciprocal to in-group than to out-groups, and are more risk averse
3. Homophily is consistent with strategic thinking.
4. Endogenous matching mitigates (and sometimes eliminates) in-group bias.
5. This cannot be explained as a pure self-selection effect: there is some shift in behavior.

Design: 8 games about social preferences

- Game 1** Player B chooses between (400,400) and (750,375).
- Game 2** Player B chooses between (100,300) and (400,200).
- Game 3** Player A chooses (250,250) or s/he lets player B choose. If s/he lets B choose then B can choose between (100,100) and (500,100).
- Game 4** Player A: (50,650) or B. Player B: (0,100) or (100,100).
- Game 5** Player A: (500,0) or B. Player B: (300,300) or (600,275)
- Game 6** Player A: (250,0) or B. Player B: (100,100) or (250,50)
- Game 7** Player A: (350,100) or B. Player B: (300,300) or (100,350)
- Game 8** Player A: (400,0) or B. Player B: (200,200) or (0,400)

Games from

Altruism; Negative Reciprocity; Positive Reciprocity;

Design: Treatment (T1) ENDO

1. Participants are randomly assigned to one of two groups **RED** or **BLUE**.
2. Participants can state a preference for whether they would prefer to play with **RED** or **BLUE**.
3. We elicit their willingness to pay (wtp) for their choice with incentive compatible mechanism.
4. Their match is determined according to wtp and they are informed about whether their match is from the **RED** or **BLUE** group.
5. Participants are randomly assigned the role of player A or B and play the 8 games, no feedback.

Design: Treatment (T2) EXO

1. Participants are randomly assigned to one of two groups **RED** or **BLUE**.
- 2.
- 3.
4. Their match is determined *randomly* and they are informed about whether their match is from the **RED** or **BLUE** group.
5. Participants are randomly assigned the role of player A or B and play the 8 games, no feedback.

Design: Treatment (T3) CONTROL

- 1.
- 2.
- 3.
- 4.
5. Participants are randomly assigned the role of player A or B and play the 8 games, no feedback.

In-Group Bias: Design Issues

In-group Bias

average behavior of Player B in homogenous matches
(RED-RED or BLUE-BLUE)

$\neq$

average behavior of Player B in heterogeneous matches
(RED-BLUE).

- ▶ Our definition of in-group bias is at society level rather than at individual level
- ▶ It compares observed behavior in different matches (homo/hetero) rather than contingent behavior of the same agent.
- ▶ Pros (less risk of inducing a bias) and Cons (rely more on homogeneity of samples)
- ▶ Society level bias seems to matter for welfare

Results

In-group Bias

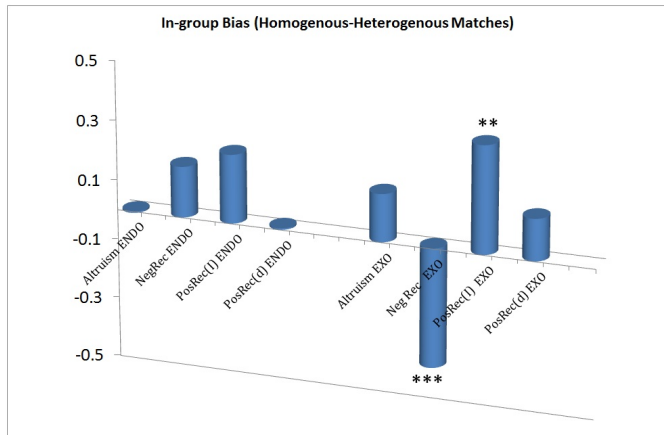


Figure: Difference in the % of B-players displaying “altruism” (Games 1-2), “negative reciprocity” (Games 3-4), “positive reciprocity” (Games 5-6, 7-8)) between in-group and out-group matches. *** 1%, ** 5%.

	Alt	NegRec	PosRec(I)	PosRec(d)
constant	-1.8245***	0.3364***	-2.3978***	-0.6931*
in-group	0.9555	-1.8405***	2.1234**	-0.6649
groups	40	40	40	40

	Alt	NegRec	PosRec(I)	PosRec(d)
constant	-1.332***	-1.332***	-1.3633***	-1.3633*
in-group	0.0430	0.8933	1.2091*	0.0332
groups	40	40	40	40

Table: Logit Regression with standard errors clustered by id. In-group Bias in ENDO (top) and in ENDO (bottom). 40 individuals (groups) in the role of Player B, 80 observations, Period 1 only. *** 1%, ** 5%, * 10%

Result 1 *The aggregate in-group bias either vanishes or decreases in the transition from exogenous to endogenous matching.*

Homophily

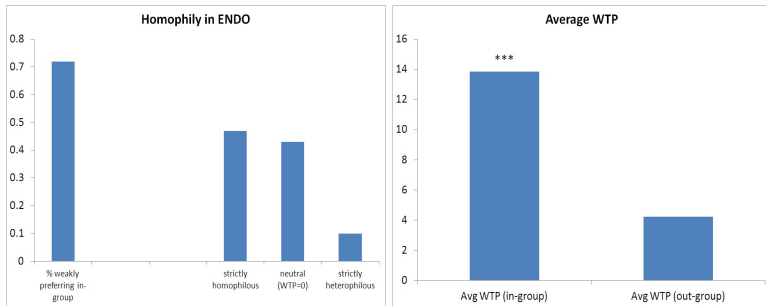


Figure: More than 50 percent of participants prefer to be matched homogeneously. The average willingness to pay for a in-group match is higher than that for a out-group match, which does not significantly differ from zero. (Mann-Whitney, $p = 0.0001$) (**1%, **5%, *10%).

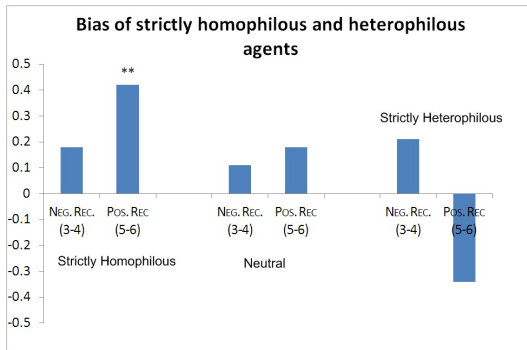


Figure: In treatment ENDO in-group biases are only found when restricting to homophilous agents. *** 1%, ** 5%, * 10%.

Result 2 *In ENDO, in-group bias is found only for strictly homophilous agents, who are more positively reciprocal towards the in-group than towards the out-group. Homophily is positively correlated with risk aversion.*

Self Selection

- ▶ What determines the decrease in aggregate bias?
- ▶ Two possible factors: "self-selection" and "change in behavior"
- ▶ The type-assortment of matches changes from ENDO to EXO:
 - in-group matches are more likely to include homophilous agents
 - out-group matches are more likely to include heterophilous agents

The effect on aggregate bias finally depends on absolute levels. For instance:

1. $IN_{hom} \geq OUT_{hom} \geq Oth \Rightarrow$ higher bias in ENDO
2. $Oth \geq IN_{hom} \geq OUT_{hom} \Rightarrow$ higher bias in EXO

Observed Levels of Reciprocity:

<i>Negative Reciprocity</i>	<i>Hom</i>	<i>Neutral</i>	<i>Hetero</i>	<i>EXO</i>
Out-Group Matches	0.18	0.21	0.25	0.58
In-Group Matches	0.35	0.33	0.5	0.18
<i>Pos. Reciprocity</i>	<i>Homo</i>	<i>Neutral</i>	<i>Hetero</i>	<i>EXO</i>
Out-Group Matches	0.27	0.14	0.5	0.08
In-Group Matches	0.64	0.33	0.16	0.44
Population Shares	45%	45%	10%	

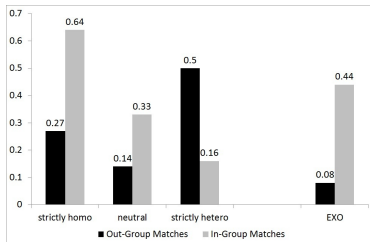
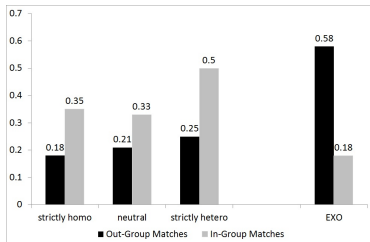


Figure: Negative (Left Panel) and Positive (Right Panel) Reciprocity

► Positive Reciprocity.

$$IN_{hom} = 0.64 > 0.27 = OUT_{hom}$$

and

$$OUT_{hom} = 0.27 \geq 0.2 = Oth,$$

we are in case 1 $\Rightarrow$ higher bias in ENDO. [► Link](#)

► Negative Reciprocity:

- In ENDO, we observe significantly lower average values in out-group compared to in-group matches, for all types.
- In EXO, average negative reciprocity is instead higher in out-group matches.

Result 3 *Self selection alone cannot explain the decrease of in-group bias in the transition from exogenous to endogenous matching.*

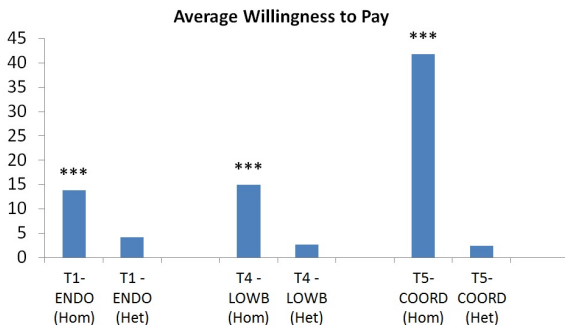
Shift in Behavior

We do not observe contingent choices - need to rely on observables.

- ▶ hypothesis: nice behavior with in-group is a norm among homophilous agents;
- ▶ norm implies:
 - harsh punishment of bad behaviour coming from homophilous agents;
 - less reward of nice behavior coming from homophilous agents.
- ▶ Odds that an in-group opponent is homophilous is higher in ENDO than in EXO. Consistent with:
 - bias in Pos. Rec. only for homophilous agents. [▶ Link](#)
 - bias in Pos. Rec. decrease from EXO to ENDO.
 - bias in Neg. Rec. reverts sign from EXO to ENDO.
[▶ Link](#)
 - Behaviour of player A. [▶ Link](#)

Determinants of Homophily

- ▶ How strategic is homophily?
- ▶ We compare homophily levels in different treatments.
- ▶ LOWB and COORD provide upper and lower bounds for strategic homophily. [▶ Link](#)
- ▶ We find that:
 - WTP is not higher in ENDO compared to LOWB.
 - WTP is significantly higher in COORD



- ▶ All this suggests that homophily is not strategic.
- ▶ We also find that homophily is correlated with risk aversion...
- ▶ ...homophily may therefore aimed at minimizing risk.
- ▶ Hypothesis: homophilous agents are subject to a social norm that prescribes nice behavior within in-group matches.
- ▶ Social norm reduces the chances of unexpected "mean" behavior; consistent with view of favoring own group to minimize uncertainty (Hogg (2000)).

Summary and Conclusions

- ▶ There are significant in-group biases under exogenous matching (consistent with Chen and Li (AER, 2009)), which disappear under endogenous matching.
- ▶ Self Selection alone cannot explain these biases. Behavior of participants changes under endogenous matching.
- ▶ Proposed explanation: agents reward less nice behavior from in-group because expected under ENDO.
- ▶ Homophily does not seem to be driven by expected payoff maxim. Driven by variance minim.?

Sample Games LOWB and COORD

	X	Y
X	0,0	200,200
Y	200,200	0,0

Table: Treatment LOWB: no purpose for homophily

	BLUE	RED
RED	0,0	200,200
BLUE	200,200	0,0

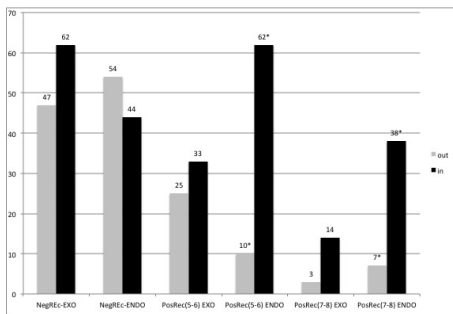
Table: Treatment COORD: homophily as coordination device

Design: Other Treatments

- ▶ LABEL coincides with ENDO but we use action labels to induce norms specific to RED and BLUE group. Not different from ENDO.
- ▶ BASE coincides with ENDO but the 8 games are such that there is no scope for in-group bias. (lower bound for homophily)
- ▶ COORD coincides with ENDO but the 8 games are such that being in the same group can help resolve coordination problem (more homophily than in ENDO)

Behaviour of Player A and Expectations

Percentage of A player letting player B move. *=95%



- ▶ Negative Reciprocity: no difference in- vs out-group in EXO and ENDO
- ▶ Positive Reciprocity: in ENDO more agents let B play in in-group vs out-group; no difference in EXO.
- ▶ Consistent with change of beliefs and norm for homophilous agents.

Pure Effects of Labels

We test if colors induce behavioural differences.

ENDO	red	blue
Altruism	0.23	0.15
Neg. Rec. (Games 3-4)	0.32	0.32
Pos. Rec. (Games 5-6)	0.35	0.16
Pos. Rec. (Games 7-8)	0.67	0.76

EXO	red	blue
Altruism	0.23	0.12
Neg. Rec. (Games 3-4)	0.31	0.43
Pos. Rec. (Games 5-6)	0.29	0.28
Pos. Rec. (Games 7-8)	0.71	0.73

Table: The colour of the group does not seem to matter per se.