

Salient Gender Identity and Power Imbalance in a Group Contest

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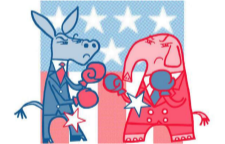
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Introduction – Group Contests

- ▶ Applications for group contests range from warfare, to research and from political campaigns, to rent-seeking activities.
 - ▶ Examples: racial conflict, conflict relating to language, religion or culture, political competition, collective rent-seeking...
- ▶ Group identity as one of the major components in initiating and escalating conflict.
 - ▶ We study the effect of the salience of types of identities and its interaction with group size on group conflict.



Introduction – Social Identity

Identity is one of the main ingredients of the cause of conflict

- Sen (2007) Theory** The salience of real identities can cause conflict.
- Chowdhury et al. (2016) Experiment** Two homogeneous groups – East Asians and Caucasians – compete in a contest either without revealing the racial composition or with revealing it.
- ▶ Revealing racial composition increases contest expenditures.
 - ▶ Using UK nationals and immigrants, Bhaumik et al. (2020) find no effect in a similar setup.



Gender as Identity

- ▶ Sen (2007) defines gender as one of the groups through which we define ourselves in daily life.
- ▶ Categorisation in terms of gender avoid problem of identification. Observations of membership by gender are usually made without any error (Akerlof and Kranton, 2002).

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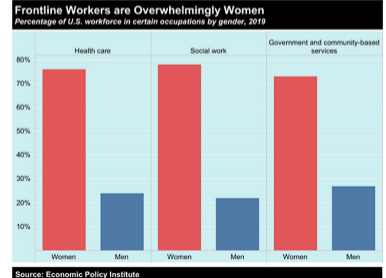
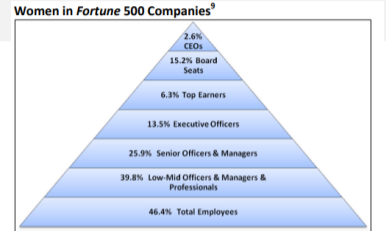
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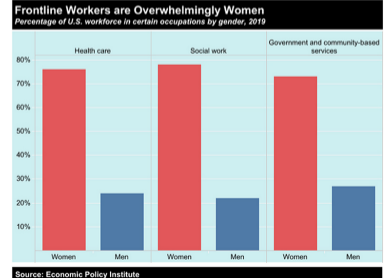
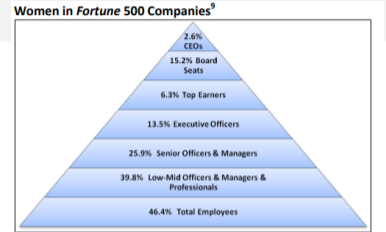
Introduction – (Power) Imbalance

- ▶ Many related applications in the field, such as competition for promotion or tenure, are characterised by a (power) imbalance between social identity groups.
- ▢ How does the salience of social identity (gender identity) influence the degree of engagement into competition between groups?
- ▢ Interaction with being (dis-)advantaged.



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Introduction – Gender Identity and Competition

Competitive Environments

(Group) Contest Games Female participants contribute more to the contest (Price and Sheremeta, 2015; Chowdhury et al., 2016; Heine and Sefton, 2018)...

- ▶ In Chowdhury et al. (2016), higher efforts in the social identity manipulation are predominantly driven by female participants.
- ▶ Females are more prone to the winner's curse (Casari et al., 2007).
- ▶ Identity brings in more competitiveness among females in a laboratory setting (Cadsby et al., 2013).

Other Situations Males are more aggressive and competitive in situations in which the conflict is physical and can sustain physical harm. In non-physical conflict situations females are either more aggressive than their male counterparts or there is no significant gender difference (Hyde, 2005).

- ▶ Salience of gender identity interacts with aggressiveness (virtual bomb throwing experiment by Lightdale and Prentice, 1994).

- ▶ Phenomenon of female competitiveness in between group competition triggered via group identity?
- ▶ Group contests ubiquitous within firms, especially among top management.

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Research Questions

- ▶ We contribute to the field of *conflict and identity* by investigating
 - ▶ Whether (*salience of*) *gender composition* alters conflict seeking behaviour in an experimentally controlled environment.
- ▶ We investigate, for the first time, the *interaction* of identity and group size.

Our game: Larger groups have more resources.

- ▶ How does this interact with salience of social identity?
- ▶ Effect on contest investment when in disadvantaged position?

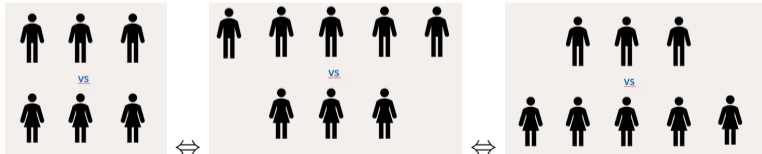


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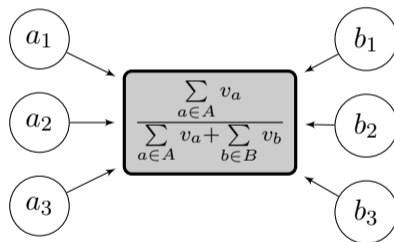
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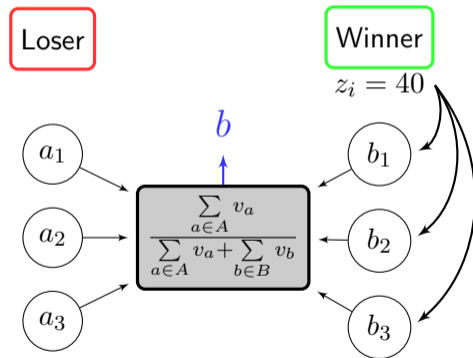
Contest Game – Symmetric Control

- ▶ Groups of three (partner matching) compete for a prize.
- ▶ Individual per-period endowment of $T_i = 60$ points.
- ▶ Individual prize if winning: $z_i = 40$ points.



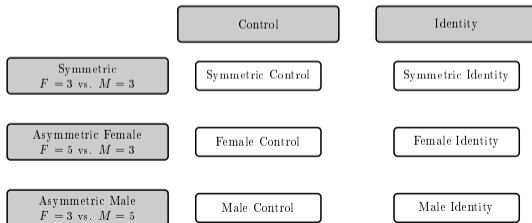
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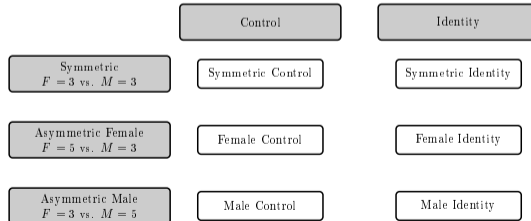
Experimental Design

- ▶ Group contest game (Tullock, 1980; Katz et al., 1990), a game typically used in experimental literature to study conflict behaviour (Dechenaux et al., 2015).
 - ▶ Players can expend costly resources in order to increase their chance to win a prize (which results in their opponent not winning the prize).
- ▶ Repeated play in partner matching (as in Chowdhury et al., 2016).
- ▶ 3×2 design to investigate how (salience of) identity and asymmetry affect conflict levels ((A)symmetry as in Kugler et al., 2010).



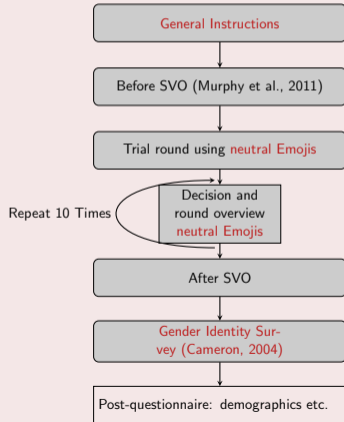
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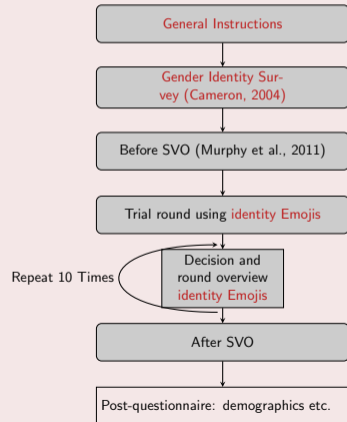


Experimental Setup

Control Treatments



Identity Treatments

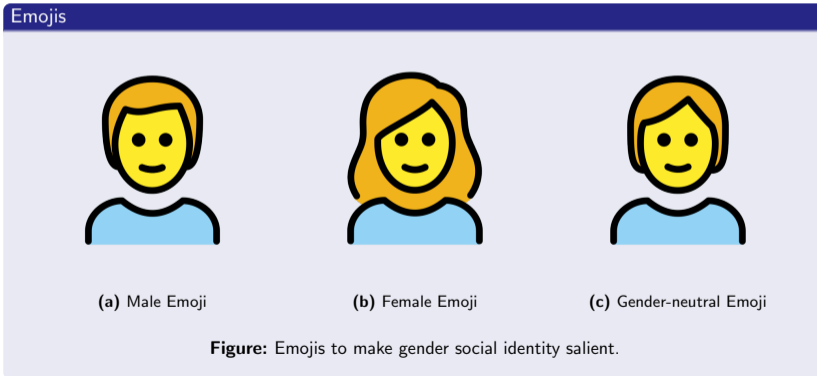


Gender Identity Survey

- ▶ We use a social identity questionnaire by (Cameron, 2004)
 - ▶ Identity represented on three factors: centrality; ingroup affect; and ingroup ties
 - ▶ Its efficacy examined in five studies involving 1,078 respondents, one nonstudent sample, and three group memberships (university, *gender*, and nationality)
- ▶ 12 item Likert type questionnaire
 - ▶ I have a lot in common with other (*ingroup members*).
 - ▶ I feel strong ties to other (*ingroup members*).
 - ▶ I find it difficult to form a bond with other (*ingroup members*).
 - ▶ ...

Making Identity Salient in the Contest Game

- ▶ We use emojis that either reflect the gender identity group, or neutral ones.
 - ▶ Emojis developed by OpenMoji (2020). OpenMoji graphics are licensed under the Creative Commons Share Alike License 4.0 (CC BY-SA 4.0).



Making Identity Salient in the Contest Game

Control Treatment

Round 1 out of 2 Remaining time 0

Please reach a decision

This is round # 1.
Please decide, how many Lottery tickets you want to buy

Other Group Your Group

Endowment: 60 Endowment: 60 Endowment: 60 Endowment: 60

Endowment: 60 Endowment: 60

Your Endowment: 60
How many Lottery Tickets would you like to buy? 10

OK

Identity Treatment

Round 1 out of 1 Remaining time 24

This is round # 1.
Please decide, how many Lottery tickets you want to buy

Your Group Other Group

Endowment: 60 Endowment: 60 Endowment: 60 Endowment: 60

Endowment: 60 Endowment: 60 Endowment: 60

Your Endowment: 60
How many Lottery Tickets would you like to buy? 1

OK

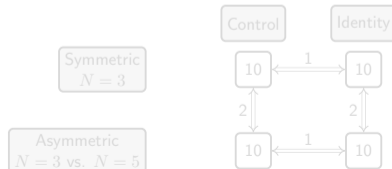
Theory and Hypotheses

$$\max_{a_g} \pi_g \left(\sum_{i \in A} i_{a_i}, \sum_{j \in B} b_j \right) = e + \frac{\sum_{a \in A} a_i}{\sum_{a \in A} a_i + \sum_{b \in B} b_j} \cdot z_i - a_g \quad (1)$$

- ▶ Konrad (2009) (and a myriad of other papers) show that for a group A , there exists a multiplicity of equilibria under individualistic preferences characterised by:

$$\sum_{i \in A} a_i = \frac{z_i}{4} \quad (2)$$

- ▶ At group level:



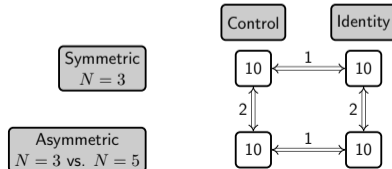
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$$\max_{a_g} \pi_g \left(\sum_{i \in A} i_a, \sum_{j \in B} b_j \right) = e + \frac{\sum_{a \in A} a_i}{\sum_{a \in A} a_i + \sum_{b \in B} b_j} \cdot z_i - a_g \quad (1)$$

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Theory and Hypotheses

- ▶ We use a social preferences model similar to Chen and Li (2009); Zaunbrecher and Riedl (2016); Kolmar and Wagener (2019)
- ▶ Agents maximise weighted sum of own and others' payoffs:

$$u_g(i) = (1 - \alpha) \cdot \pi_g + \alpha \cdot \bar{\pi}_{A \setminus g} \quad (3)$$

- ▶ π_g is g 's payoff as in Equation 1, a_g is g 's individual investment into the contest, $\bar{\pi}_{A \setminus g}$ is the average payoff of player g 's other group members.
- ▶ α is the social-identity parameter, i.e. the weight g puts on group mates' payoff. Parameter α reflects the strength of g 's social identity, where a higher α implies a stronger social identity.

$$u_g \left(\sum_{i \in A} a_i, \sum_{j \in B} b_j \right) = (1 - \alpha) \left[T_i + \frac{\sum_{i \in A} a_i}{\sum_{i \in A} a_i + \sum_{j \in B} b_j} \cdot z_i - a_g \right] + \frac{\alpha}{N_A - 1} \left[(N_A - 1) \left(T_i + \frac{\sum_{i \in A} a_i}{\sum_{i \in A} a_i + \sum_{j \in B} b_j} \cdot z_i \right) - \sum_{i \in A \setminus g} a_i \right] \quad (4)$$

Theory and Hypotheses

Symmetrical Groups

- ▶ We can show that:

$$\sum_{i \in A} a_i = \frac{z_i (1 - \beta)}{(2 - \alpha - \beta)^2}. \quad (5)$$

and

$$\sum_{j \in B} b_j = \frac{z_i (1 - \alpha)}{(2 - \alpha - \beta)^2} \quad (6)$$

- ▶ Further, $\frac{\partial \sum_{i \in A} a_i}{\partial \alpha} \geq 0$
- ▶ Does the social identity parameter α change in the identity treatment?
- ▶ We expect salience to enhance identity, i.e. increasing α .

Hypothesis 1

Total investment will be greater in the Social Identity Treatment.

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Theory and Hypotheses

Power imbalance between competing groups through relative over-representation of one group.

- ▶ Prior empirical results suggest that larger groups have a higher probability of winning against smaller groups (Sheremeta, 2018; Ahn et al., 2011; Abbink et al., 2010).
- ▶ If we attempt to explain this empirical finding with our model, we have:

$$N_A > N_B \rightarrow \sum_{a \in A} i_a > \sum_{b \in B} i_b \quad (7)$$

- ▶ Plugging Equations 5 and 6 delivers

$$\frac{z_i(1-\beta)}{(2-\alpha-\beta)^2} > \frac{z_i(1-\alpha)}{(2-\alpha-\beta)^2},$$

which simplifies into

$$\alpha > \beta.$$

- Social-identity parameter stronger in the large group.

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Total investment into the contest will be higher in the large group than in the small group.

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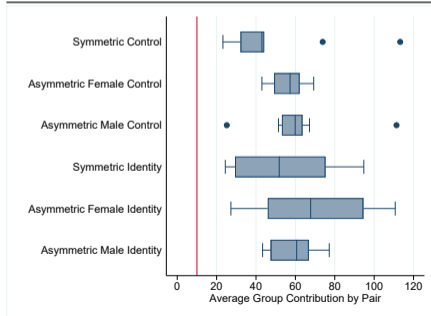
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Results – Overview

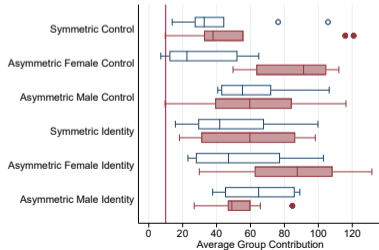
	Average	Standard Deviation	N
Symmetric Control	48.811	28.227	9
Asymmetric Female Control	56.693	8.727	7
Asymmetric Male Control	61.219	23.876	8
Symmetric Identity	54.000	26.283	8
Asymmetric Female Identity	69.287	30.383	8
Asymmetric Male Identity	58.806	11.890	8
Total	57.972	23.117	48



- ▶ Group contribution in all treatments significantly exceeds equilibrium prediction.
- ▶ Contribution in Identity Treatments does not appear higher.
- ▶ Social Identity does increase noise in data.

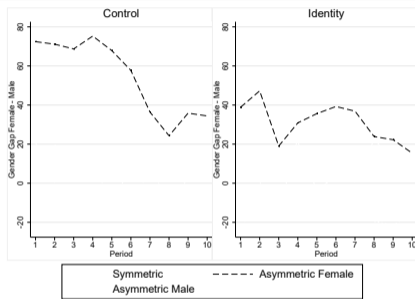
Results – Overview

	Average	Standard Deviation	N
Symmetric Control Male	47.863	28.473	8
Symmetric Control Female	56.163	40.560	8
Asymmetric Female Control Male	29.486	21.979	7
Asymmetric Female Control Female	83.900	23.104	7
Asymmetric Male Control Male	60.938	22.555	8
Asymmetric Male Control Female	61.500	33.521	8
Symmetric Identity Male	49.188	28.948	8
Symmetric Identity Female	58.812	30.827	8
Asymmetric Female Identity Male	56.400	31.960	7
Asymmetric Female Identity Female	86.786	34.901	7
Asymmetric Male Identity Male	64.812	22.271	8
Asymmetric Male Identity Female	52.800	16.791	8
Total	58.833	30.471	92



- ▶ Majority females slightly increase their engagement when the gender identity is salient whereas minority males **double** their engagement.
- ▶ In contrast, when females are minority they decrease their engagement when the gender identity is salient.

Difference between contest investment in female and male groups

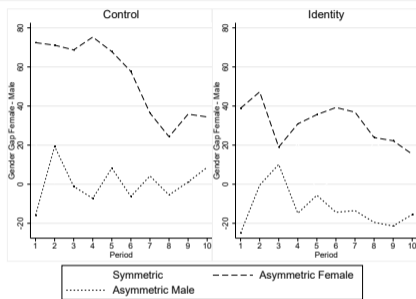


- ▶ Female groups invest relatively more into the contest when in an advantaged position.
 - ▶ I.e., when in larger group, **Asymmetric Female** treatments
 - ▶ Effect more pronounced if gender identity is *not* salient (Wilcoxon test, $N = 30$, $z = -3.215$, $p = 0.0013$).

Asymmetric Male Negative gender gap when identity is salient, but gap absent without salience (Wilcoxon test, $N = 32$, $z = 0.603$, $p = 0.5641$).

Symmetric Small yet not statistically significant difference between female and male group investment (Wilcoxon test, $N = 34$, $z = -0.827$, $p = 0.4084$).

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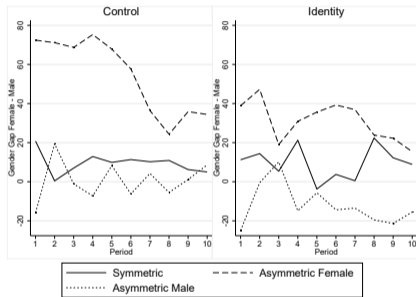


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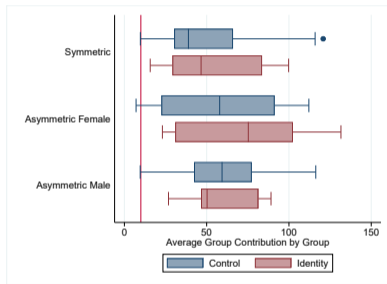


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Hypothesis 1 – Total Investment Greater in the Social Identity Treatment



- ▶ No significant difference between Control and Identity treatments.
- ➡ Making Gender Identity salient does not induce higher contest engagement.

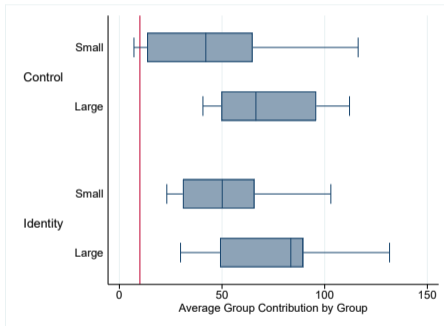
	(1)	(2)
Group Contribution in <i>t</i>		
Asymmetric Female	5.746	
Control	(9.15)	
Asymmetric Male	10.905	
Control	(11.46)	
Symmetric Identity	4.738	
	(11.74)	
Asymmetric Female	17.508	
Identity	(12.81)	
Asymmetric Male	7.763	
Identity	(9.48)	
Female	16.348***	21.832**
	(5.91)	(9.53)
Identity		10.086
		(7.90)
Female ×		-10.835
Identity		(12.02)
Lagged Other Group	0.128**	0.133**
Contribution	(0.05)	(0.05)
Constant	52.754***	55.031***
	(9.12)	(5.92)

Number of observations	864	864
Number of panels	96	96
Within model R-squared	0.268	0.268
Between model R-squared	0.127	0.110
Overall R-squared	0.170	0.158

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Clustered standard errors in parentheses. Round fixed effects not reported.

Hypothesis 2 – Total Investment Higher in the Large Group

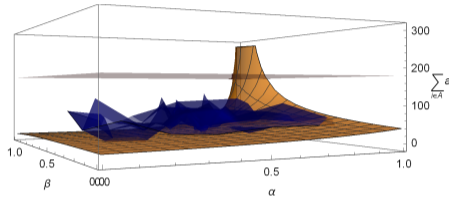


- ▶ Identity treatments and large groups invest more:
 - ▶ **BUT** Salience of gender identity crowds out investment in female groups.

	(1)	(2)
	Group Contribution in <i>t</i>	
Large	25.376*** (6.21)	33.750*** (11.77)
Female	20.544*** (6.08)	36.097** (14.51)
Identity	4.158 (6.85)	24.487* (13.02)
Large × Female		-10.349 (18.87)
Large × Identity		-20.451 (17.12)
Identity × Female		-34.822* (18.65)
Large × Female × Identity		29.903 (25.87)
Lagged Other Group Contribution	0.124* (0.07)	0.125** (0.06)
Constant	50.263*** (7.69)	40.637*** (10.01)
Number of observations	558	558
Number of panels	62	62
Within model R-squared	0.319	0.319
Between model R-squared	0.269	0.315
Overall R-squared	0.287	0.316

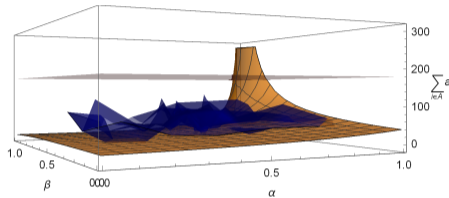
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
 Clustered standard errors in parentheses. Round fixed effects not reported.

Social Preferences



- ▶ Group investment significantly higher than prediction (Wilcoxon test, $N = 96$, $z = 7.908$, $p < 0.0001$).
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	(1)	(2)	(3)
	Contribution in t		
Alpha	8.249*** (2.58)	2.347 (3.79)	6.908** (2.94)
Identity	-0.619 (1.52)	-4.965* (2.75)	-0.639 (1.53)
Female	3.588** (1.47)	3.683** (1.47)	1.993 (3.09)
Identity \times Alpha		9.864** (4.93)	
Female \times Alpha			3.467 (5.51)
Beta	4.754 (4.71)	4.574 (4.60)	4.737 (4.74)
Contribution other group members $t - 1$	0.058*** (0.01)	0.059*** (0.01)	0.058*** (0.01)
Other Group	0.037***	0.037***	0.037***
Contribution $t - 1$	(0.01)	(0.01)	(0.01)
Constant	8.289*** (2.64)	10.621*** (2.94)	8.859*** (2.87)
Number of observations	3,150	3,150	3,150
Number of panels	350	350	350
Within model R-squared	0.117	0.117	0.117
Between model R-squared	0.111	0.123	0.113
Overall R-squared	0.113	0.120	0.114

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
 Clustered standard errors in parentheses. Round fixed effects not reported.

Conclusion

- ▶ Often, gender difference in promotion attributed to tendency to shy away from competition on the part of females (Lawless and Fox, 2008; Davies-Netzley, 1998).
- ▶ Here: Controlled study investigating degree of engagement in between-group contest against opposite gender identity players.
 - ▶ Vary salience of gender identity to test if this affects behaviour and interacts with own gender identity.

Our Results Show

- ▶ Being in a position of power can drive competitiveness.
 - ▶ Larger, more powerful groups invest more into the contest.
- ▶ Male and female groups react very differently to the salience



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Conclusion

Male and female groups react very differently to the salience of gender identity.

Female-dominated contest Salient gender identity *doubles* minority male investments.

Male-dominated contest Salient gender identity *decreases* minority female investments.

- ▶ Females and males react differently to being a minority, with females experiencing negative effects compared to males, thus justifying the implementation of gender quotas.
- ▶ Similar results are also found for in-group bias.
 - ▶ Masculine males showed higher in-group bias when they are minority and feminine females showed lower in-group bias.

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