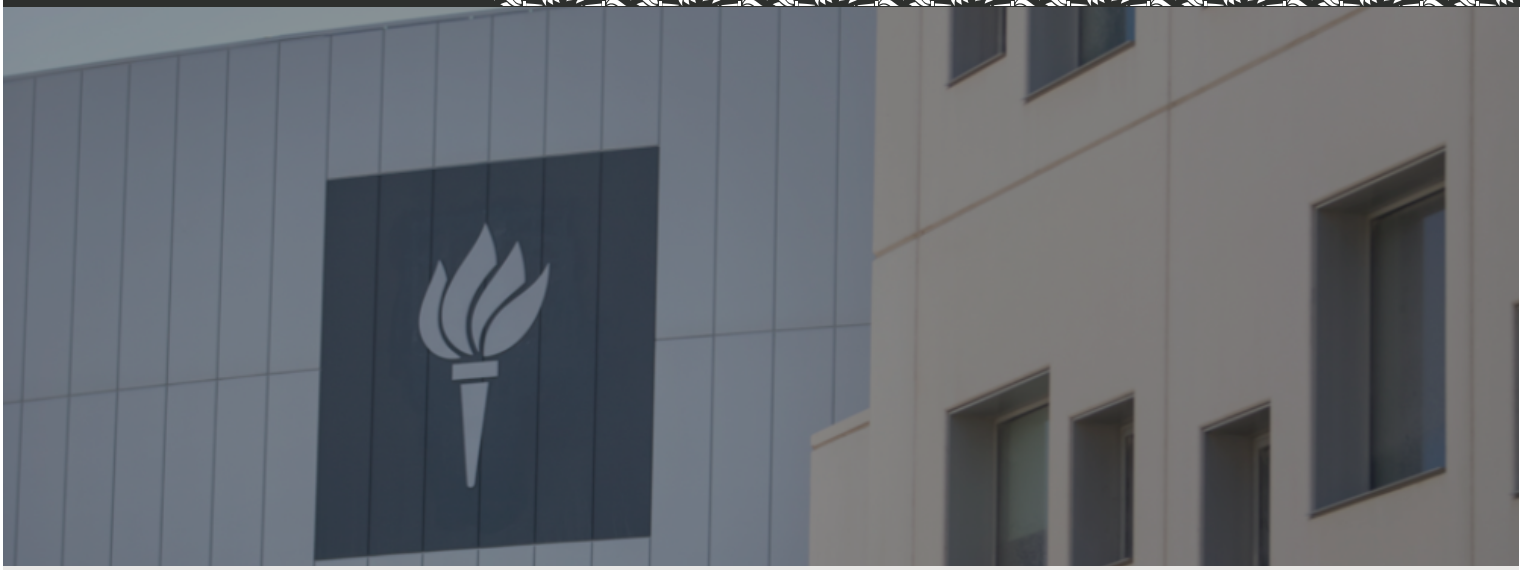
جامعة نيويورك أبوظبي

NYU | ABU DHABI



Normative Conflict and the Gender Gap in Cooperation

Nikos Nikiforakis, Ernesto Reuben and Robert Stüber

Working Paper # 0098

March 2024

Division of Social Science Working Paper Series

New York University Abu Dhabi, Saadiyat Island P.O Box 129188, Abu Dhabi, UAE

http://nyuad.nyu.edu/en/academics/academic-divisions/social-science.html

Normative conflict and the gender gap in cooperation

Nikos Nikiforakis
Center for Behavioral Institutional Design &
Division of Social Science, New York University Abu Dhabi
e-mail: nikos.nikiforakis@nyu.edu

Ernesto Reuben
Center for Behavioral Institutional Design &
Division of Social Science, New York University Abu Dhabi
e-mail: ereuben@nyu.edu

Robert Stüber
Center for Behavioral Institutional Design,
New York University Abu Dhabi
e-mail: robert.stueber@nyu.edu

Abstract

A normative conflict arises when individuals derive different benefits from cooperation. We analyze experimental data from three published studies to investigate the impact of normative conflict on the cooperative behavior of men and women. We find that women exhibit significantly lower levels of cooperation in the presence of normative conflict. We observe no significant gender differences in cooperation in the absence of normative conflict.

This version: March 2024

JEL Classification: C92, D70, H41, J16

Keywords: Cooperation, gender, inequality, normative conflict, heterogeneous groups

Acknowledgements: The authors gratefully acknowledge financial support from Tamkeen under the NYU Abu Dhabi Research Institute Award CG005. This is the authors' version of work that was accepted for publication in *Economics Letters*. Changes resulting from the publishing process may not be reflected in this document. A final version is published in https://doi.org/10.1016/j.econlet.2024.111680.

1. Introduction

Normative conflict arises in situations in which multiple plausible rules coexist about how one ought to behave. A normative conflict between equality and equity emerges, for example, when past choices or investments affect the returns that individuals derive from cooperation. Equality prescribes that those receiving higher returns from cooperation contribute sufficiently more than others so that final payoffs are equalized. Equity, on the other hand, stipulates that higher returns should be associated with higher (and hence unequal) payoffs. Despite the frequency with which normative conflict is encountered in daily life, little is known about how it affects behavior.

Normative conflict between equality and equity has been shown to reduce cooperation and also to lead to cycles of retaliation (Nikiforakis et al., 2012; Gangadharan et al., 2017; Koch et al., 2021). In this paper, we explore how normative conflict affects the relative willingness of men and women to cooperate. Evidence suggests that women tend to exhibit a stronger preference for equality, whereas men can be more tolerant of inequality when it results from past choices (Andreoni and Vesterlund, 2001; Almås et al., 2020). If women care more about equality than men, we would expect that women receiving low (high) returns from cooperation will contribute less (more) than men when equality and equity concerns are at odds.[1]

To study the impact of normative conflict on the cooperative behavior of men and women, we analyze data from three published papers that employ similar experimental protocols and manipulate the presence of conflict between equality and equity (Nikiforakis et al., 2012; Gangadharan et al., 2017; Koch et al., 2021). The experiments were conducted in experimental laboratories across three continents.[2]

2. The experiments

In the three experimental studies we consider, a total of 412 individuals first participate in a real-effort task taken from Erkal et al. (2011). Subsequently, they play a finitely-repeated linear public goods game in fixed groups of four or six individuals. In each period, all participants receive the same endowment and must decide how much of it to contribute to a public account. In all treat-

[1] When individuals receive the same returns from cooperation, the evidence suggests that there are no gender differences in cooperation (see, e.g., Thöni et al., 2021; Exley et al., 2022).

[2] To the best of our knowledge, these are the only studies on cooperation that specifically investigate the interplay between equality and equity. Other studies have explored the impact of heterogeneity in cooperation games (e.g., Noussair and Tan, 2011; Reuben and Riedl, 2013; Fischbacher et al., 2014). However, there exists no tension between equity and equality in these studies, as individual choices do not affect the allocation of returns.

ments, individuals have a pecuniary incentive not to contribute to the public account, but contributions increase the earnings of the other group members. The presence of normative conflict depends on the returns that each group member obtains from the public account. Specifically, in treatments with normative conflict, participants are told that the two best-performing group members in the real-effort task will receive a higher rate of return from the public account. To prevent other-regarding preferences from driving selection into high returns, participants are not provided details about the public goods game when performing the real-effort task (see Erkal et al., 2011).[3] In treatments without normative conflict, all participants receive the same returns from the public account but are still required to complete a fixed number of exercises in the real-effort task. The average rate of return across group members is held constant in treatments with and without normative conflict.[4]

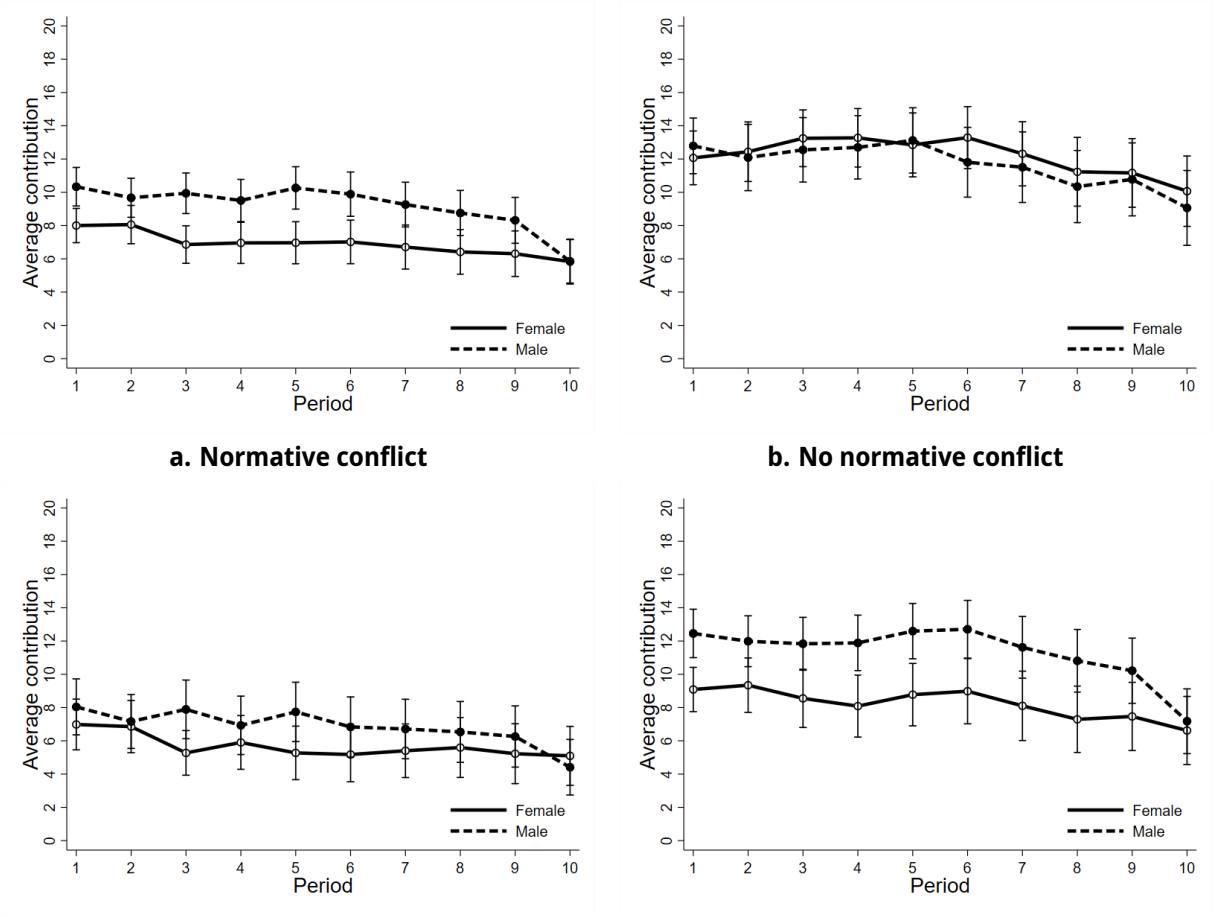
To evaluate the impact of normative conflict on the willingness of men and women to cooperate, we compare contributions in treatments with and without normative conflict. In all treatments, joint maximal contributions to the public account maximize group earnings. However, in treatments with normative conflict, joint maximal contributions also maximize pay inequality between group members.[5] These treatments include the *Asymmetric* and the *No Feud* treatments in Nikiforakis et al. (2012), the *Het-NC* treatment in Gangadharan et al. (2017), and treatment *ComLate* in Koch et al. (2021). If women care more about equality than men, we would expect that those who receive a low return from the public account will contribute less than their male counterparts in these treatments, whereas those who receive a high return will contribute more than their male counterparts.[6] By contrast, we predict no gender differences in contributions in treatments where participants obtain the same returns from the public account. These treatments include treatment *Symmetric* in Nikiforakis et al. (2012) and treatments *Hom-NC* and *Hom-C* in Gangadharan et al. (2017).

[3]The fraction of men assigned the role of high return is similar to that of women in all three studies: (*i*) Nikiforakis et al. (2012): 51% men, $p = 1.000$; (*ii*) Gangadharan et al. (2017): 51% men, $p = 1.000$; (*iii*) Koch et al. (2021): 55% men, $p = 0.646$ (Fisher's exact tests).

[4]As an example, in Nikiforakis et al. (2012), earnings at the end of the contribution stage were given by: $\pi_i = 20 - c_i + m_i \times \Sigma_{j=1}^{4} c_j$, with $m_i = 0.4$ under homogeneous returns, and $m_i = \{0.3, 0.5\}$ under normative conflict, respectively. Similar incentives were provided in Gangadharan et al. (2017) and Koch et al. (2021).

[5]For instance, in Nikiforakis et al. (2012), if all group members contribute maximally, everyone earns $\pi_i = 32$ in the absence of normative conflict. By contrast, with normative conflict, high-return individuals earn $\pi_i = 40$, and low-return individuals earn $\pi_i = 24$. In all treatments, if nobody contributes, everyone earns $\pi_i = 20$.

[6]More specifically, let $\bar{c}_i = \mathbb{E}[\frac{1}{3}\Sigma_{j=1, j\neq i}^{4} c_j]$ denote the average contribution that i expects of her group members. Then, if i receives a low return from the public account and cares sufficiently strongly about inequality, she will contribute $c_i < \bar{c}$, if $0 < \bar{c} \leq 20$. If, on the other hand, she receives a high return, she will contribute $c_i > \bar{c}$ as doing so reduces pay inequality, at least if the other high-return player does the same.



a. Normative conflict **b. No normative conflict**

c. Normative conflict and low return **d. Normative conflict and high return**

Figure 1. Contributions to the public account by gender

Note: Error bars depict 95% confidence intervals. Participants in Gangadharan et al. (2017) interact for 20 rounds. For illustration purposes, we drop every second period. All data is used in the statistical analysis.

3. Results

Figure 1 presents the evolution of contributions for men and women in the presence and absence of normative conflict. As seen in Panel A, on average, men contribute 2.21 ECU (33%) more than women in the presence of normative conflict. The difference is noticeable in all periods but the last. In contrast, as seen in Panel B, in the absence of normative conflict, there are no noticeable gender differences in contributions. The latter is in line with previous findings in cooperation from homogeneous groups (e.g., Thöni et al., 2021; Exley et al., 2022). In Figure A2 in the Appendix, we show that the same pattern is observed in each of the three studies.

To obtain statistical support for these findings, Table 1 presents the results from a regression analysis. The dependent variable is an individual's contribution in a given round. The independent variables include dummy variables for being female, being exposed to normative conflict, and the interaction of the two variables. The regressions also include a variable to control for time effects

Table 1. Gender differences in contributions with and without normative conflict

	I	II	III	IV	V	VI
Female	1.501	1.501	0.046	−0.051	−0.051	−0.052
	(0.976)	(1.113)	(0.635)	(0.254)	(0.244)	(0.242)
Normative conflict	−3.217**	−3.217*	−4.479***	−4.809***	−5.017***	−5.310**
	(1.486)	(0.986)	(1.341)	(1.326)	(1.942)	(2.306)
Female×Normative conflict	−3.876***	−3.876**	−1.428*	−1.115***	−0.639	−1.598***
	(1.234)	(0.893)	(0.816)	(0.349)	(0.434)	(0.454)
Observations	5,560	5,560	5,560	5,560	2,780	2,780
Controls for return rate	✓	✓	✓	✓	✓	✓
Clustered standard errors: subjects	✓					
Clustered standard errors: groups	✓	✓				
Clustered standard errors: studies		✓				
Subject random effects			✓			
Group random effects			✓	✓	✓	✓
Study random effects				✓	✓	✓

Note: Regressions of individual contributions on indicator variables for gender, being in a treatment with normative conflict, and their interaction. The regressions also include controls for the rate of return and the period of the game (not reported). Columns I to IV present full sample estimates. Columns V and VI estimate the model separately for low-return and high-return players, respectively * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

and a dummy indicating whether the individual received high returns from contributing to the public account. To assess the robustness of our claims, in columns I to IV, we present estimates of our model under different assumptions. Columns V and VI estimate the model separately for low-return players, and high-return players, respectively.

The coefficient for *Female* is statistically insignificant in columns I to VI in Table 1. This signifies that, in the absence of normative conflict, there is no statistically significant gender difference in contributions. The coefficient for *Normative conflict* is always negative and statistically significant, indicating that men and women contribute less in the presence of normative conflict. The interaction term *Female×Normative conflict* in columns I to IV indicates that women decrease their contributions significantly more in the presence of normative conflict than men, resulting in a statistically and economically significant gender difference.

Interestingly, the coefficients in columns V and VI in Table 1 reveal that the gender difference in contributions is driven by high- and not low-return women. This pattern, which can be seen clearly in Panels C and D in Figure 1 and is present in each of the three studies (see Figure A1 in the Appendix), is not in line with the hypothesis that women care more about equality than men. If this were the case, women receiving low (high) returns would contribute less (more) than their male counterparts. This is clearly not the case.

Evidence that women do not care more about equality than men can also be found in the post-experiment questionnaire in Gangadharan et al. (2017). The authors had participants express their

agreement to the following two statements, using a seven-point scale: (*i*) "Ideally, all group members should earn more or less the same from the experiment irrespective of whether their returns are low or high"; (*ii*) "Ideally, all group members should allocate the same amount to the public account irrespective of whether they have low or high returns and thus earn different amounts." Agreement with the first statement indicates that an individual favors pay equality over equity, whereas agreement with the second sentence indicates one's support for equity. We do not find evidence of a gender difference in responses for either statement ($p = 0.221$ and $p = 0.969$, respectively, Mann-Whitney U tests).

4. Discussion

We have presented robust evidence from three experimental studies conducted in three different continents over a decade, showing that normative conflict can cause gender differences in cooperation to emerge. This finding shows that, when it comes to gender differences in cooperation, one must take into account the specific context: gender differences may not emerge in homogeneous groups but are more likely to emerge in heterogeneous groups where there is normative conflict.

The underlying mechanism behind the gender gap in contributions remains unclear. The observed patterns do not align with the assumption that women care more about equality than men or that men care more about equity than women. If this were the case, we would anticipate seeing lower contributions by women among low-return players and lower contributions by men among high-return players, which is not what we observe.

One explanation, supported by the data, is that strategic motivations prompt men to contribute more. Men were found to make significantly higher contributions at the outset of the experiments, yet a marked decline in their contributions was observed in the final round of all three studies. Consequently, there is no discernible gender disparity in contributions during the last round of the experiments (see Figure 1). Differences in strategic motives between men and women could also account for the fact that the gender gap is observed only among high-return players; it is they who stand to benefit most from higher levels of cooperation.[7] Identifying the precise mechanism behind the gender gap in cooperation in the presence of normative conflict is an interesting topic for future research.

[7]The evidence on the relative strategic sophistication of men and women is mixed, with some studies finding men exhibit greater strategic sophistication (Cubel and Sanchez-Pages, 2022; Gauriot et al., 2023) and others finding no difference (Brañas-Garza et al., 2012; Burnham et al., 2009).

References

Almås, I., Cappelen, A. W., and Tungodden, B. (2020). Cutthroat capitalism versus cuddly socialism: Are americans more meritocratic and efficiency-seeking than scandinavians? *Journal of Political Economy*, 128(5):1753–1788.

Andreoni, J. and Vesterlund, L. (2001). Which is the fair sex? Gender differences in altruism. *The Quarterly Journal of Economics*, 116(1):293–312.

Brañas-Garza, P., García-Muñoz, T., and González, R. H. (2012). Cognitive effort in the beauty contest game. *Journal of Economic Behavior & Organization*, 83(2):254–260.

Burnham, T. C., Cesarini, D., Johannesson, M., Lichtenstein, P., and Wallace, B. (2009). Higher cognitive ability is associated with lower entries in a p-beauty contest. *Journal of Economic Behavior & Organization*, 72(1):171–175.

Cubel, M. and Sanchez-Pages, S. (2022). Gender differences in equilibrium play and strategic sophistication variability. *Journal of Economic Behavior & Organization*, 194:287–299.

Erkal, N., Gangadharan, L., and Nikiforakis, N. (2011). Relative earnings and giving in a real-effort experiment. *American Economic Review*, 101(7):3330–3348.

Exley, C. L., Hauser, O. P., Moore, M., Pezzuto, J.-H., et al. (2022). Beliefs about gender differences in social preferences. University of Exeter Department of Economics Discussion Papers 22/04, University of Exeter.

Fischbacher, U., Schudy, S., and Teyssier, S. (2014). Heterogeneous reactions to heterogeneity in returns from public goods. *Social Choice and Welfare*, 43(1):195–217.

Gangadharan, L., Nikiforakis, N., and Villeval, M. C. (2017). Normative conflict and the limits of self-governance in heterogeneous populations. *European Economic Review*, 100:143–156.

Gauriot, R., Page, L., and Wooders, J. (2023). Expertise, gender, and equilibrium play. *Quantitative Economics*, 14(3):981–1020.

Koch, C., Nikiforakis, N., and Noussair, C. N. (2021). Covenants before the swords: The limits to efficient cooperation in heterogeneous groups. *Journal of Economic Behavior & Organization*, 188:307–321.

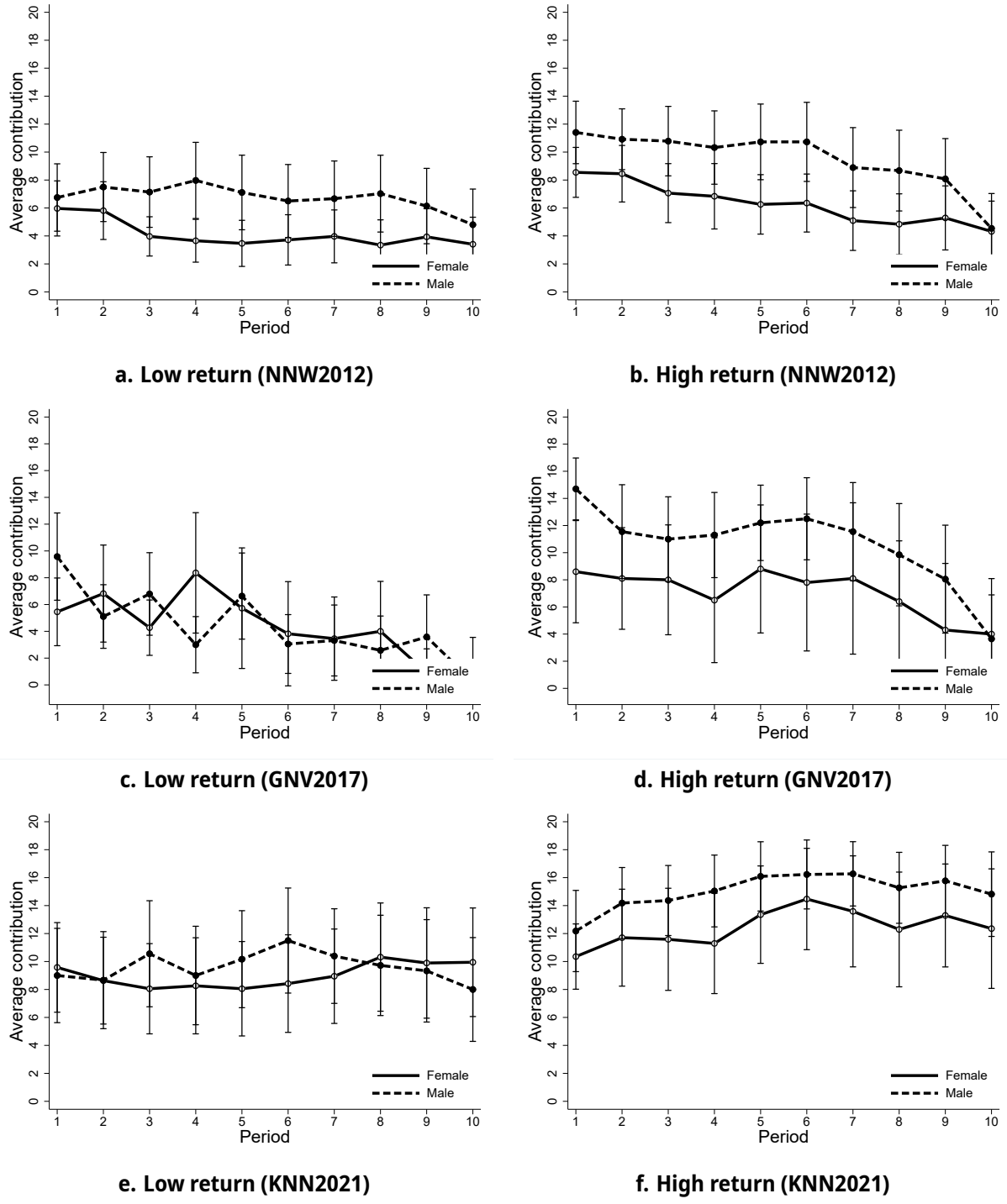
Nikiforakis, N., Noussair, C. N., and Wilkening, T. (2012). Normative conflict and feuds: The limits of self-enforcement. *Journal of Public Economics*, 96(9-10):797–807.

Noussair, C. N. and Tan, F. (2011). Voting on punishment systems within a heterogeneous group. *Journal of Public Economic Theory*, 13(5):661–693.

Reuben, E. and Riedl, A. (2013). Enforcement of contribution norms in public good games with heterogeneous populations. *Games and Economic Behavior*, 77(1):122–137.

Thöni, C., Volk, S., and Cortina, J. M. (2021). Greater male variability in cooperation: Meta-analytic evidence for an evolutionary perspective. *Psychological Science*, 32(1):50–63.

A. Online Appendix: Additional figures



a. Low return (NNW2012)

b. High return (NNW2012)

c. Low return (GNV2017)

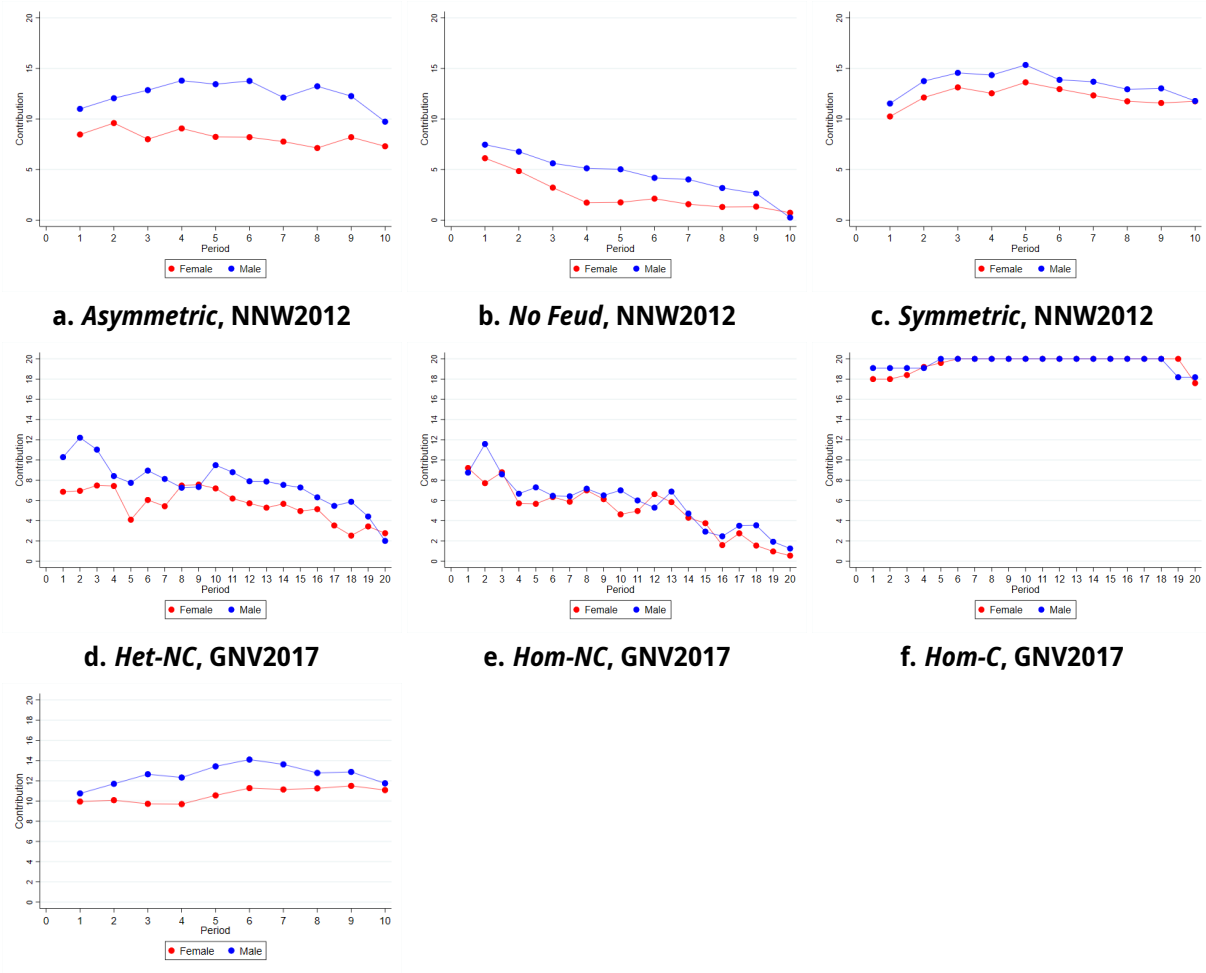
d. High return (GNV2017)

e. Low return (KNN2021)

f. High return (KNN2021)

Figure A1. Contributions to the public account by gender, return, and study

Note: The figure presents contributions separately by gender, rate of return, and study. The gender difference tends to be more pronounced for high returns in all three studies. We find a statistically significant difference in NNW2012 under high returns (difference 3.20; $p = 0.048$) but not low returns ($p = 0.106$) and a statistically significant difference in GNV2017 under high returns (difference 3.60; $p = 0.033$) but not low returns ($p = 0.760$). For KNN2021, the difference is much larger for high returns (2.59) than for low returns (0.62) but statistically insignificant for both rates of returns ($p = 0.162$ and $p = 0.770$).



a. *Asymmetric*, NNW2012 **b. *No Feud*, NNW2012** **c. *Symmetric*, NNW2012**

d. *Het-NC*, GNV2017 **e. *Hom-NC*, GNV2017** **f. *Hom-C*, GNV2017**

g. *ComLate*, KNN2021

Figure A2. The evolution of gender differences in contributions by treatment

Note: The figure displays the evolution of gender differences in contributions separately for each of the treatments used for the analysis in our paper. Panels A, B, and C display the treatments from Nikiforakis et al. (2012). Panel D, E, and F do the same for the treatments from Gangadharan et al. (2017). Finally, Panel G displays the evolution of contributions, for the first ten rounds, in the *ComLate* treatment from Koch et al. (2021).[8] Panels A, B, D, and G present treatments with normative conflict. Panels C, E, and F are treatments without normative conflict. Note that the differences in levels and trends across treatments are due to different mechanisms used (e.g., communication in *Hom-C* or punishment in *ComLate*.) For details about these mechanisms, please see the original studies. "NNW2012" refers to Nikiforakis et al. (2012), "GNV2017" to Gangadharan et al. (2017), and "KNN2021" to Koch et al. (2021).