

## An Exploration of the Social Free-rider Problem as Cause of the Boomerang Effect from Social Norm Information

Lauren A. Rhodes<sup>1</sup>; Gonzalo E. Sánchez<sup>1</sup>; José Gabriel Castillo<sup>1</sup>

<sup>1</sup>Escuela Superior Politécnica del Litoral (ESPOL)

### Abstract

Social norm information is often used to nudge people towards prosocial behavior, yet in some instances a boomerang effect may occur that can potentially cause unintended harm. While there have been several explanations for why boomerang effects occur, the standard literature does not provide explanations based in economic theory. As these nudges are often used in campaigns of societal importance, it is valuable to understand under what circumstances the boomerang effect will occur. One cause of a boomerang effect that we explore is a free-rider problem whereby the social norm information acts as a mechanism of updating prior probabilities on the actions of others. In this study, we explore the free-rider problem in the context of the boomerang effect from social norm information and estimate its effects in a laboratory experiment through a modified dictator game with the option for punishment. We find evidence that social norm information may result in boomeranged behavior in this context, particularly for females.

### Motivation

- Campaigns based on social norms sometimes result in undesirable behavior occurring with higher frequency.
- Little literature has sought to explain when a boomerang effect from social norm information will occur with the backing of economic theory.
- Where there is a chance to free-ride on others' pro-social behavior, providing social norm information may result in a boomerang effect.
  - The social norm information sends a signal for the average person to update their prior probability that someone else will act pro-socially in their stead.
  - Examples: Reporting of sexual harassment or corruption, environmental cleanup, etc.
- Being able to predict when a campaign may lead to increased boomeranged behavior will lead to better designed social nudges.
- **Main contributions:**
  - ✓ Examine the effect of social norm information on punishing behavior in a dictator game where there is the opportunity to free-ride on the behavior of other participants.
  - ✓ Show that social norm information leads to a higher frequency of boomeranged behavior when the opportunity to free-ride is present for females once they have confirmed the validity of the social norm.

### Experimental Design

- Experimental setting with 597 total participants [1,2].
- Participants were randomly put into groups of 4 and assigned the role of Player A, B, C, or D.
  - Treatment was randomly selected within group.
  - Standard tests show that the sample is balanced across treatments and control groups.
- Each Player A was initially given 10 economic monetary units (EMUs) and Players B, C, and D were initially given 2 EMUs.
- Player A was allowed to choose between keeping all 10 EMUs or keeping 4 and distributing the other 6 EMUs evenly among the other 3 players in the group (4 EMUs total for each player).
- If Player A chose to keep all 10 EMUs, then the other players in the group were given the option to punish Player A by taking away 3 EMUs to be distributed among the 3 other players.
  - It costed 1 EMU to choose the option reduce Player A's earnings.
  - Player A could only have at most 3 EMUs taken away, so it does not matter to Player A if 1 or more players chose to punish.
- At the time of punishment, the treatment group was given social norm information from a previous study [1] on the percentage of students who found it inappropriate for a dictator to keep all 10 EMUs.
  - The control group did not receive this information.
- The game was repeated for 3 rounds.

### Main Results

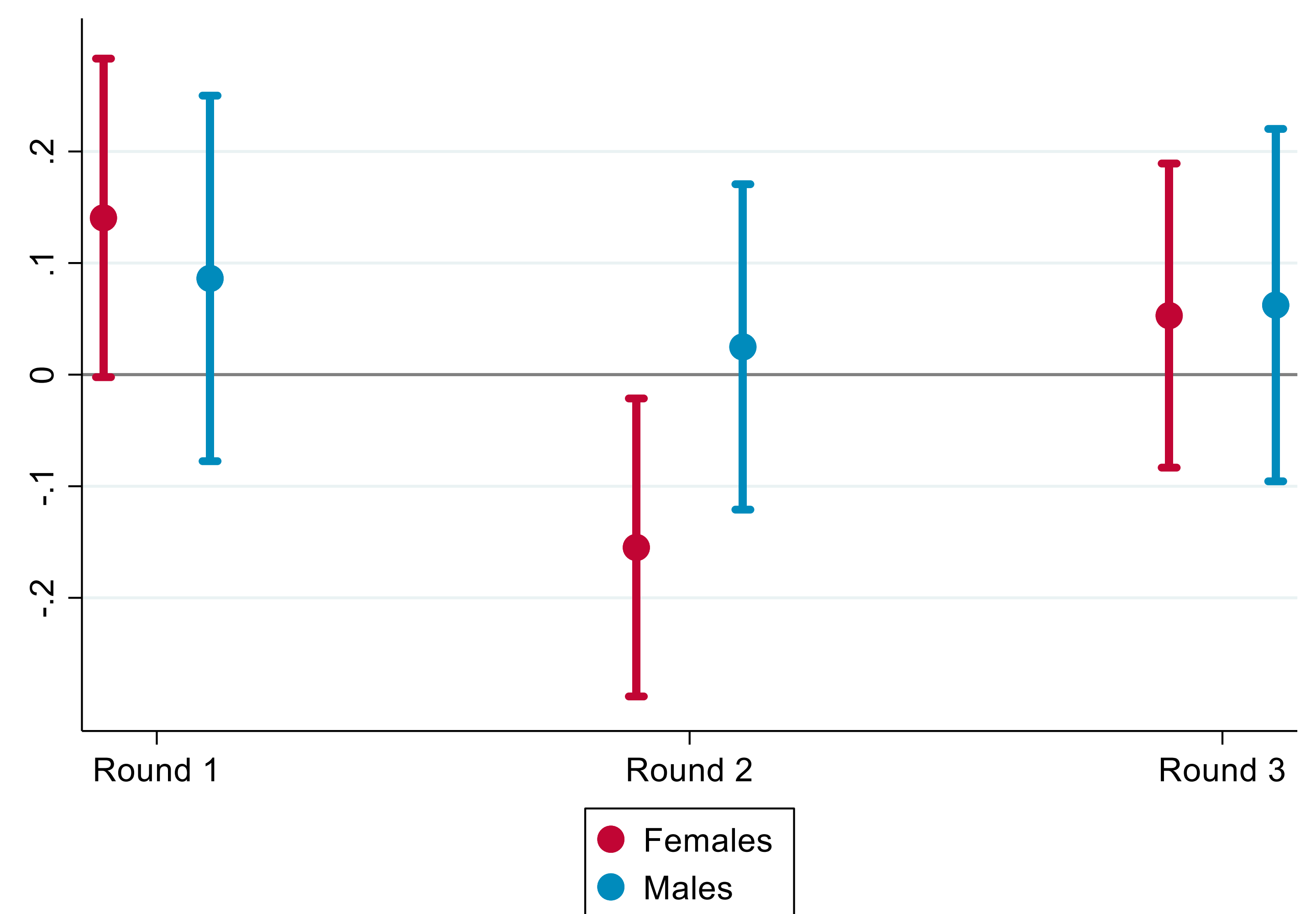


Figure 1. Treatment Effects on the Probability of Punishing Player A (95% Confidence Interval)

Table 1. Estimation of Treatment Effects on the Probability of Punishing Player A (Second Round)

Treatment effect for females	-0.155**	-0.157**	-0.167**
	(0.0713)	(0.0734)	(0.0722)
Male (binary)	-0.0613	-0.0632	-0.0898
	(0.0770)	(0.0804)	(0.0791)
Treatment x Male	0.180*	0.178	0.195*
	(0.101)	(0.108)	(0.106)
Constant	0.329***	-	-
	(0.0559)	-	-
Session fixed effects	No	Yes	Yes
Demographics	No	No	Yes
Observations	316	316	316
Robust standard errors clustered at the group level in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

### Discussion

- The literature supports the findings that men act more often on principle (punishing even when it is not to their economic advantage) and women tend to be more influenced by earnings outcomes in similar contexts [4].
- The second round is the most interesting for our research question.
  - In the first round, players were learning how the game works and the social norm information may have not yet been deemed credible, and thus participants don't take advantage of the opportunity to free-ride.
  - In the second round, those who had previously had the chance to punish could confirm the validity of the social norm and hence act considering this information. The control group lacked information to validate and therefore did not change their behavior in the second round.
- Our findings suggest that when opportunities to free-ride on others' good behavior is possible, campaign designers should use caution when using social norm information, especially for those campaigns aimed at women.
  - Example: Reporting observed sexual harassment.

### Contact

Lauren A. Rhodes  
 Facultad de Ciencias Sociales y Humanísticas  
 Escuela Superior Politécnica del Litoral  
 Email: [rhodes@espol.edu.ec](mailto:rhodes@espol.edu.ec)  
 Phone: + 593 96 004 9732

### References

- [1] Rhodes, Lauren A., et al. "Not That Way! An Exploration of the Social Free-rider Problem as Cause of the Boomerang Effect from Social Norm Information." OSF, 16 Nov. 2021. Web.
- [2] Rhodes, Lauren. 2021. "Not that way! An Exploration of the Social Free-rider Problem as Cause of the Boomerang Effect from Social Norm Information." AEA RCT Registry. October 15.
- [3] Krupka, Erin L., and Roberto A. Weber. "Identifying social norms using coordination games: Why does dictator game sharing vary?" Journal of the European Economic Association 11.3 (2013): 495-524.
- [4] Eckel, Catherine C., and Philip J. Grossman. "The relative price of fairness: Gender differences in a punishment game." Journal of Economic Behavior & Organization 30.2 (1996): 143-158.