# Pre-Analysis Plan:
# Magical Thinking: The Role of Time

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## 1 Introduction

Magical thinking – the belief that one's actions affect things which they cannot – is a phenomenon which has received some attention in psychology and sociology but which remains little studied in economics. One particular form of magical thinking has been proposed in the context of strategic interaction: the belief that one's own actions induce similar actions from others. Such beliefs would have profound consequences for some of the most frequently studied interactions in economics, and would help answer many empirically motivated questions. Why do people vote? Why do people behave cooperatively?

Shafir and Tversky (1992) showed that subjects playing prisoners' dilemmas are substantially more likely to cooperate when they do not know their opponent's choice of action (37%), than when they know that the opponent has cooperated (16%) or defected (3%). Standard beliefs would prohibit this, since the propensity for cooperation under uncertainty, to the extent that it depends upon beliefs, should be a convex combination of that propensity under the two respective cases of complete certainty. While the implications of magical beliefs usually have various other explanations, many experimental results are consistent with such beliefs, in that prosocial

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behavior is more prevalent when there is scope for magical thinking; see Grech and Nax (2020) for a recent example. The design of this experiment is based on one such study: Iriberri and Rey-Biel (2011) show that in binary dictator games, giving is much higher under role uncertainty (i.e. when participants do not know whether the choice implemented will be their own or their opponent's) than under traditional pre-determined and known giver/receiver roles.

I consider the possibility that part of this effect stems from magical beliefs – the notion that one's opponent is more likely to give if one does so oneself. This would create incentives for (seemingly) prosocial choices under role uncertainty which are absent under role certainty. This experiment asks whether such beliefs, to the extent that they exist, follow the rules of normal causal relationships, and in particular whether the timing of events is relevant: can I magically influence my opponent's choices more if I act first?

# 2 Sample and design

Participants will be recruited on the recruitment platform Amazon Mechanical Turk. The selection criteria are a minimum of 95% HIT approval rate and 500 HITs completed as well as current residence in the US. Approximately 1200 decisionmakers will be recruited.

The experiment follows a 2x2 treatment design wherein subjects are matched in pairs to play binary dictator games. Decisionmakers face 20 binary decisions, choosing one of two token allocations between themselves and the receiver. In each decision, there is a "selfish" option and an "unselfish" option, with the latter implying a lower payoff for the decider but a higher payoff for the receiver. The unselfish option is always the efficient one.[1]

The first dimension of treatment varies whether the decisionmaker knows his or her role in the game at the time of making his or her decisions. In the Role Certainty (RC) treatment, decisionmakers know that their choices will be implemented, and

[1] All implied transfer multipliers belong to the set $\{2, 3, 4, 5, 6, 7, 8\}$.

they are matched with a passive receiver as in a traditional dictator game. In the Role Uncertainty (RU) treatment, decisionmakers do not know whether the choices implemented will be their own or those of their opponent: both participants act as the dictator and, after decisions are made, one is randomly chosen to be dictator and the other to be receiver.

The second dimension of treatment is the time dimension, which varies whether participants are matched with another participant who has already participated, or one who will participate in the future. The idea is that if the increase in giving caused by role uncertainty stems in part from magical reasoning (of a strictly causal nature), then establishing a timeline which prohibits a causal link from one's own action to that of one's opponent may attenuate this effect.

## 2.1 Analysis

The main outcome of interest is the interaction between the treatment dimensions: does being the second-mover attenuate the effect of role uncertainty? Specifically, I will estimate the following:

$$G_{ij} = \beta_0 + \beta_1 RU_i + \beta_2 SM_i + \beta_3 (RU_i \times SM_i),$$

where $G_{ij}$ is a binary outcome equal to one if participant $i$ chose to "give" in decision screen $j$, $RU_i$ is a treatment indicator equal to one if participant i is in the Role Uncertainty condition, and $SM_i$ is a treatment indicator equal to one if participant i is in the second-mover condition. Standard errors are clustered on the individual level. The coefficient of interest is $\beta_3$. The hypothesis is that $\beta_3 < 0$.

The experiment will conclude by asking decisionmakers some questions about the motives behind their actions, as well as the frequency with which they believe that other decisionmakers choose allocations that favor the receiver. These are unincentivized.

# References

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