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# Prosociality in the economic Dictator Game is associated with less parochialism and greater willingness to vote for intergroup compromise

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**Abstract**

Is prosociality parochial or universalist? To shed light on this issue, we examine the relationship between the amount of money given to a stranger (giving in an incentivized Dictator Game) and intergroup attitudes and behavior in the context of randomly assigned teams (a minimal group paradigm) among $N$ = 4,846 Amazon Mechanical Turk workers. Using a set of Dynamic Identity Diffusion Index measures, we find that participants who give more in the Dictator Game show less preferential identification with their team relative to the other team, and more identification with all participants regardless of team. Furthermore, in an incentivized Voter Game, participants who give more in the Dictator Game are more likely to support compromise by voting for the opposing team in order to avoid deadlock. Together, these results suggest that – at least in this subject pool and using these measures – prosociality is better characterized by universalism than parochialism.

Keywords: Prosociality, Dictator Game, Ingroup Bias, Intergroup Attitudes

## 1 Introduction

The willingness to help others at a cost to oneself – often referred to as prosociality – is a central feature of human behavior. But prosociality seems to contradict both the economic logic of rational self-interest and the evolutionary logic of survival of the fittest, and it presents an enduring challenge to economists and evolutionary game theorists. Thus, a great deal of research across natural and social sciences has sought to characterize prosocial behavior and explain its emergence.

One stream of such work has sought to provide an empirical definition of prosociality. This work explores the boundaries of prosociality by experimentally characterizing the "cooperative phenotype," identifying a cluster of prosocial behaviors that tend to co-occur. Several studies using different populations have found that an individual's choices are correlated across various economic games that involve paying costs to benefit others (i.e. the Dictator Game, Trust Game, Prisoner's Dilemma, Public Goods Game) (Böckler, Tusche & Singer, 2016; Capraro, Jordan & Rand, 2014; Littman et al., 2019; Reigstad, Strømland & Tinghög, 2017; Yamagishi et al., 2013). Similarly, play in such economic games has also been found to correlate with real-world helping (Benz & Meier, 2008; Franzen & Pointner, 2013; Peysakhovich, Nowak & Rand, 2014; Stoop, 2014). These findings support the existence of a cooperative phenotype, in that prosociality is not entirely context dependent but rather seems to represent an underlying trait. Furthermore, it has also been repeatedly observed that this cooperative phenotype does *not* extend to punishment - that is, people who are more inclined to pay costs to help others are not typically more inclined to pay costs to punish others for being selfish (Böckler et al., 2016; Littman et al., 2019; Peysakhovich et al., 2014; Reigstad et al., 2017; Yamagishi et al., 2012).

Here, we probe another dimension of the cooperative phenotype: how does prosociality relate to intergroup attitudes? Much theorizing in the social sciences (Aaldering, Ten Velden, van Kleef & De Dreu, 2018; Böhm, Rusch, & Gürerk, 2016; de Dreu, 2010) sees prosociality as fundamentally parochial – that is, that prosociality is rooted in the tendency of people to favor members of their own group while underweighting or ignoring harm to outsiders (Schwartz-Shea & Simmons, 1991). This tendency towards parochialism has been most famously demonstrated, for example, by "minimal group paradigm" experiments where participants give more money to people who (ostensibly) prefer the same abstract artist over those who prefer a different artist (Tajfel, Billig, Bundy & Flament, 1971). Conversely, classical con-

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ceptions of altruism – dating back at least to the Enlightenment – invoke the principle of universalism, an "expanding circle" whereby others are seen as worth of aid regardless of their group membership, such that greater prosociality should lead to less parochialism. Empirical studies aiming to differentiate between these accounts of prosociality have thus far yielded mixed results. For example, different studies have found an individual's level of prosociality and their level of parochialism to be positively related (Abbink, Brandts, Herrmann & Orzen, 2012; de Dreu, 2010), unrelated (Corr, Hargreaves Heap, Seger & Tsutsui, 2015), and negatively related (Aaldering & Böhm, 2019; Fiedler, Hellmann, Dorrough & Glöckner, 2018; Thielmann & Böhm, 2016).

We aim to shed new light on this question by contributing more data regarding whether prosocial people are more or less parochial. To do so, we use a classical "minimal groups" paradigm in which participants are randomly assigned to meaningless teams (Tajfel et al., 1971), in order to explore basic psychological parochialism rather than the idiosyncrasies of any particular intergroup conflict. Within this paradigm, we assess parochialism in two different ways: (*i*) attitudinal measures of closeness with own team, other team, and all participants regardless of team; and (*ii*) a behavioral measure of willingness to vote for compromise with the other team in an economic coordination game. We then correlate each of these measures with prosociality as measured by giving in an anonymous Dictator Game (DG), the most basic of the economic prosociality games shown to be part of the cooperative phenotype (Peysakhovich et al., 2014).

## 2 Methods

**Participants.** Subjects were recruited from Amazon Mechanical Turk ($N$=4,846, 47% female, $M_{age}$=32, 82% US residence) to participate in an online experimental session. Experiments were conducted from September 2017 through March 2018. Each session of the experiment took up to 40 minutes. Participants in our study were paid a $3 show-up fee plus a bonus of up to $2, depending on the outcome of the game. These data were originally collected as part of a research program that culminated in the studies described in Stewart et al. (2019); however, this other research program did not analyze the parochialism and prosociality measures that are the focus of the present paper. Furthermore, the various manipulations used in the prior work are not relevant to the current research question, and therefore we aggregate over all experimental sessions and conditions in the present analyses (our results are robust controlling for all manipulations/treatments in Stewart et al., 2019; see regression tables in the Supplement).

**Parochialism/universalism measures.** We used a minimal groups paradigm in which participants were randomly assigned to either the yellow team or the purple team (immediately after they joined the experimental session, they were informed to which team they were assigned and were reminded of their assigned team throughout the game on the top of their screen). Within this context, we examined both attitudinal and behavioral measures of parochialism versus universalism.

For our attitudinal measures, we examined the extent to which participants identified with their own team, the other team, and all participants (both teams combined). We did so using the Dynamic Identity Diffusion Index (DIFI) (Gómez et al., 2011), a continuous identification measure that involves asking subjects to position a smaller circle representing oneself with respect to a bigger circle representing a specified group. We used the *distance* between the centers of the two circles as our measure of identification; the distance is inverted such that values range from −100 to 125, with −100 represents the least identification (greatest distance) and 125 represents the highest identification (least distance). The circles were initialized to a value of −50. Subjects completed three such measures, asking them to position themselves with respect to their own team, the other team, and the whole group (order randomized across subjects). To measure attitudinal parochialism, we used the distance from own team minus the distance from the opposing team. To measure attitudinal universalism, we used the distance from the whole group.

For our behavioral measure, we examined participants' willingness to support intergroup compromise in the context of an incentivized voter game (played in groups of 18–24 subjects, following the completion of the DIFI measures). In the game, half of the players were on the yellow team and half were on the purple team. At any given time, each player indicated an intention to either vote for yellow or purple. Critically, players did not simply choose a color to vote for. Instead, players' votes were initialized as their assigned team, and then over the 4 minutes that the game lasted, each player could dynamically change their intended vote at any time. Furthermore, they were placed on a network and provided real-time aggregated polling data indicating the fraction of players in their network neighborhood intending to vote for yellow versus purple. Players were aware that polls only show voting intentions of a subset of players (their neighbors) rather than the entire group. Thus, players could change their voting intention in response to the information they were given about how others planned to vote. A count-down timer indicated the remaining time in the game. Each subject was provided with real-time aggregated polling information of the voting intentions of those subjects assigned to their polling group; their own current vote; and their assigned team. A screenshot of the game interface is shown in Figure 1.

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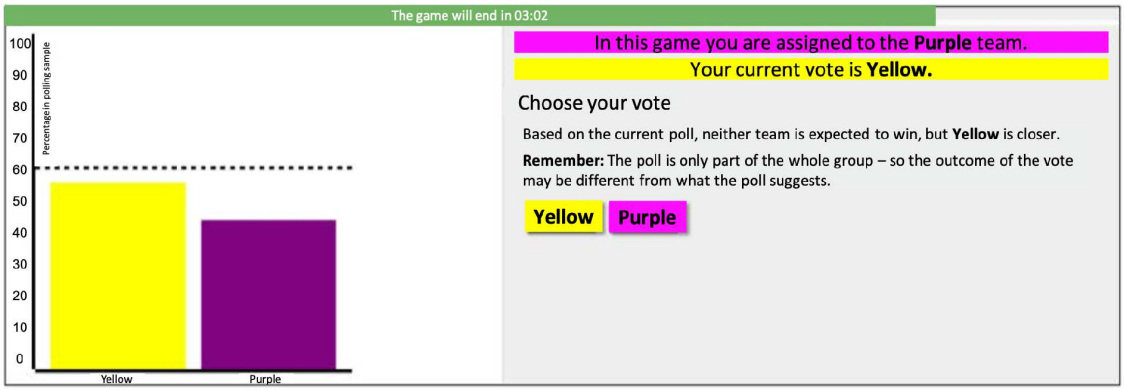


FIGURE 1: Screen-shot of player interface. During the voter game each player sees a screen reminding them of their assigned team, their current vote, and the current state of the poll (both visually and in words). In addition, they are reminded that the poll shows only a subset of the entire group's voting intentions. Two colored buttons allow players to change their vote at any time, with a single click.

Once the game ended, the final intention to vote selected by each player was registered as his/her final vote. If a fraction of players greater than some pre-specified super-majority threshold $V$ ($V$>1/2) voted for one of the two colors, all members of the team corresponding to that color received the maximum playoff $B$ ($B$=\$2) while all players in the other team received a lower payoff of $b$<$B$. If neither color received enough votes to exceed the threshold $V$ ($V$=60% or 70% depending on the experimental condition and the portion of the population from whom voting information is received; in 47% of sessions across all conditions this threshold was met), then all players received no payoff (an outcome we refer to as "deadlock"). In all experiments $b$>0 ($b$=\$0.5-\$1 depending on the experimental condition), which makes it preferable (from a material payoff perspective) to reach a consensus over ending up in deadlock.

To quantify players' behavior in the voter game, we used the model developed in Stewart et al. (2019). In this model (which was developed through a process of pilot testing and refinement), the probability that a player selected the color of the opposing team in a given timestep $t$ is allowed to vary based on the current state of the poll she is shown: whether her team is winning (exceeding the supermajority $V$) in the poll, the opposing team is winning in the poll, or deadlock is occurring in the poll (neither color is above the supermajority threshold). Furthermore, players have different probabilities of voting for the opposing color in the early part of the game versus the later part of the game. This results in a six-parameter strategy space [own team is winning, opposing team is winning, deadlock] × [early phase of the game, late phase of the game]. For each player, these six values were estimated based on her history of play in the game using maximum likelihood estimation.[1]

As described in Stewart et al. (2019), there is a significant relationship between players strategies and their associated polling information during the course of the game. Both in the early and late stage of the game, almost all players intend to vote for their assigned team when the poll they see suggests their team is winning or that deadlock is occurring (when the poll projects deadlock, a player is more prone to vote for the opposing party late in the game, reflecting increased urgency to reach some form of consensus). However, when the poll suggests the *opposing* team is winning, many players switch to voting for the opposing color both in the early and late stage of the game – presumably in an effort to avoid deadlock. Thus, we use a participant's likelihood of voting for the opposing color when the opposing team is winning as a measure of that participant's willingness to compromise. Voting for the opposing color can be seen as universalist, because doing so reduces the chance of deadlock and thus increases all players' payoffs.[2] Continuing to vote for your own team's color, conversely, can be seen as parochial, in that it reduces the chance that the other team will – if one cares about the relative payoffs of the two teams, then one would prefer deadlock over the other team winning. Thus, probability of voting for own versus opposing color provides a behavioral measure of parochialism versus universalism; and we obtain two such measures for each subject, one for the early phase of the game and one for the late phase of the game.

**Prosociality measure.** Following the end of the voter game, after they were informed about the results of the game, all subjects play a one-shot anonymous Dictator Game DG with the following instruction: "Now that the main game

[1]It is not possible to estimate all 6 values for all players – for example, a player whose team was always winning in the poll will have missing data for the other 4 strategy values.

[2]Voting for the opposing team's color in this situation is also self-interested.

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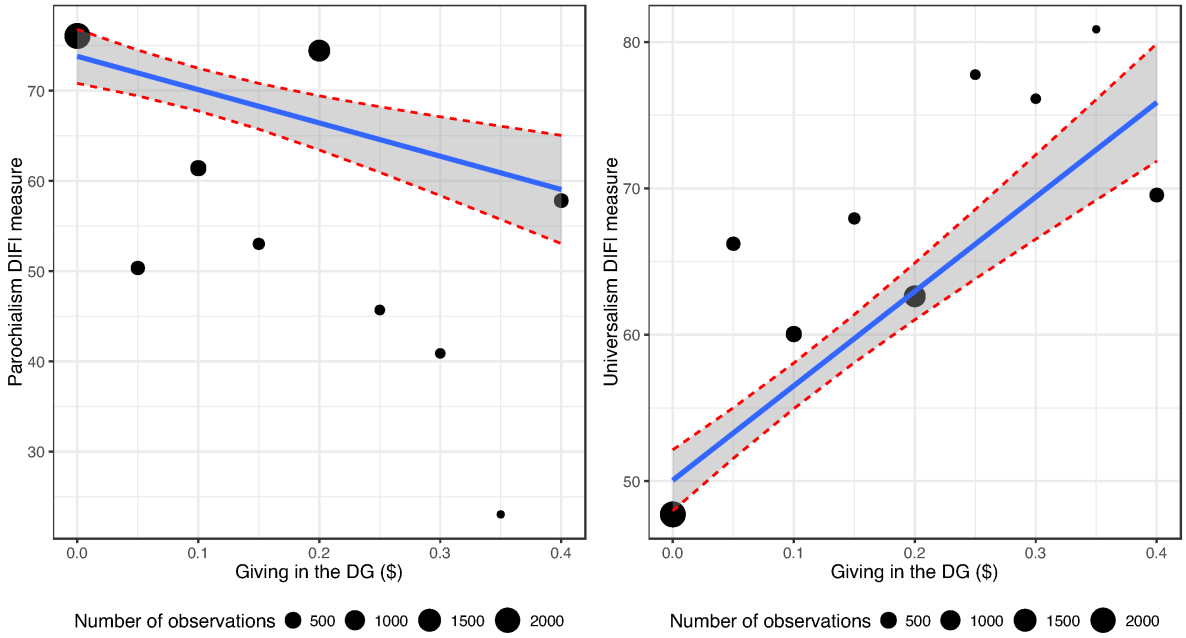


FIGURE 2: Parochialism and universalism as a function of DG giving. The size of the dots represents number of observations for each value of given in the DG. y axis shows average value of parochialism and universalism DIFI measures for all observations of a given value of DG giving. Gray lines show 95% confidence internal based on the regression model fitted on individual observations.

is over, you will do another interaction with a **totally new** MTurk worker who did **not play the earlier game**. In this interaction, you are given an additional $0.40 towards your bonus, and you decide how much (if any) to share with the other person (who receives no bonus other than what you give)." Then the subjects were asked to choose from {$0,0.05, . . . ,$0.40} to give in the DG. We used the amount given in the DG as our measure of prosociality.

**Analysis.** Unless otherwise noted, we used linear regressions with robust standard errors clustered on experimental session (to account for the non-independence of observations within the same session; see the code for details). We report standardized betas (i.e. we $z$-score all variables, and report resulting regression coefficients).

## 3 Results

We begin by confirming the expected relationship between the attitudinal and behavioral measures of parochialism versus universalism. We find that the parochialism DIFI measure (i.e., the distance from assigned team minus the distance from opposing team) is significantly negatively related to compromise (i.e., probability of voting for the opposing color) in both the early $\beta$=−0.052, $p$=0.016) and late phase of the voter game $\beta$=−0.064, $p$=0.002). Looking separately at the measures of identification with own team and identification with the other team, we find that the negative relationship between parochialism DIFI and compromise is mainly driven by a positive relationship between compromise and identification with the other team $\beta$=0.065, $p$=0.007 in early stage of the game and $\beta$=0.081, $p$<0.001 in the later stage of the game) as opposed to by identification with own team $\beta$=−0.025, $p$=0.242 in early stage of the game and $\beta$=−0.041, $p$=0.054 in the late stage of the game). There is also no interaction between own team DIFI and other team DIFI $\beta$=−0.014, $p$=0.565 in early stage of the game and $\beta$=−0.031, $p$=0.210 in the late stage of the game). Conversely, the universalism DIFI measure (i.e., the distance from the whole group) is significantly positively related to compromise $\beta$=0.044, $p$=0.054 in the early stage and $\beta$=0.057, $p$=0.024 in the late stage of the voter game).[3]

We now turn to our main question: Is prosociality parochial or universal? If prosociality is parochial, we should then expect giving in the DG with a completely anonymous stranger be positively related to the parochialism DIFI and negatively related to the universalism DIFI and the two measures of compromise in the voter game. Conversely, if prosociality is universalist, we should then expect DG giving be negatively related to the parochialism DIFI measure

[3]We note that the parochialism DIFI measure and the universalism DIFI measure are actually positively correlated with each other, (pairwise correlation, $r$ = 0.109, $p$<0.001).

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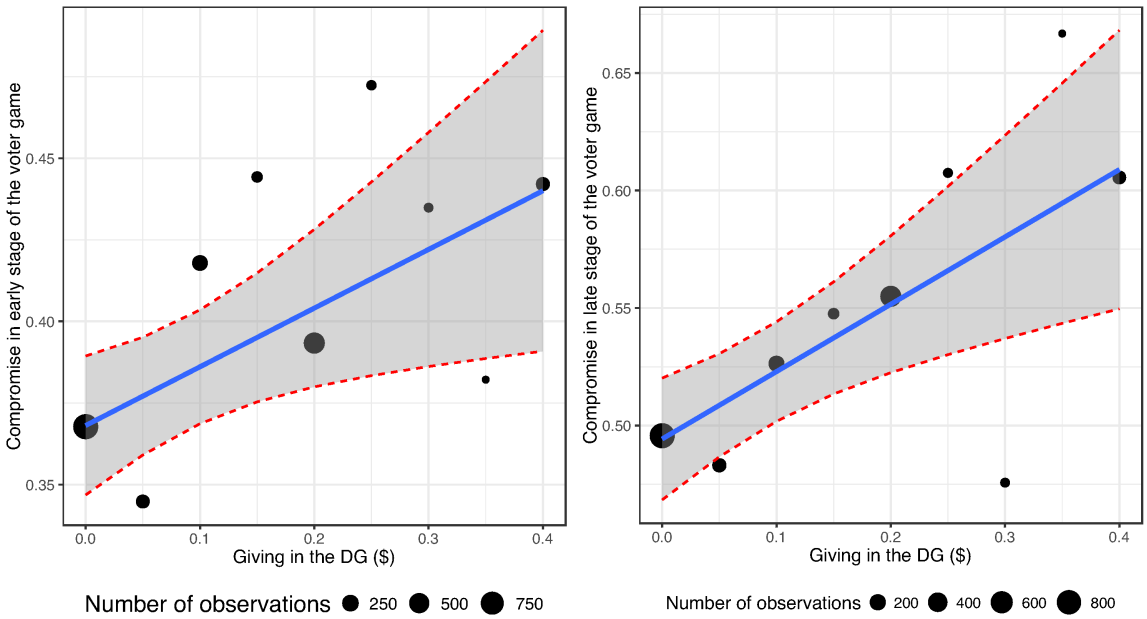


FIGURE 3: Compromise measures as a function of DG giving. The size of the dots represents number of observations for each value of giving in the DG. y axis shows average value of compromise measures in the early and late phase of the game, for all observations of a given value of DG giving. Gray lines show 95% confidence internal based on the regression model fitted on individual observations.

and positively related to the universalism DIFI measure and the two measures of compromise in the voter game. We find a consistent pattern of prosociality being universal: DG giving is significantly negatively related to the parochialism DIFI measure $\beta$=−0.061, $p$<0.001; Figure 2). Giving in the DG is significantly positively related with both identification with own team $\beta$=0.061, $p$<0.001) and identification with the other team $\beta$=0.129, $p$<0.001), with the negative relationship with parochialism resulting from the association with other team DIFI being stronger than own team DIFI. The positive association with both own and other team DIFIs is further evidence of prosociality being universal. Furthermore, we find that DG giving is significantly positively related with the universalism DIFI $\beta$=0.143, $p$<0.001; Figure 2).

Finally, DG giving is significantly positively related to the probability of compromise in both early $\beta$=0.050, $p$=0.017) and late $\beta$=0.077, $p$=0.002) phase of the voter game (Figure 3). All results are qualitatively equivalent when including age, gender, education, country of residence, and income, as well as dummies for the outcome of the voter game and the experimental treatments from which the data came the (see Supplement for complete regression tables). The positive relationship between compromise and DG giving supports the interpretation of compromise being driven by prosociality, rather than by self-interest.

# 4 Discussion

We have provided evidence that the cooperation phenotype extends to intergroup attitudes and behavior. In particular, our results suggest that the prosocial tendencies captured by the cooperative phenotype are universalist rather than parochial. Furthermore, our novel behavioral measure based on our voter game provides a window not just into one's own actions, but the decisions one makes about whether to support compromise at the level of the group. Our results therefore contribute to the psychology of prosociality.

Of course, our investigation also has important limitations. First, we used data collected on Amazon Mechanical Turk, mostly from American subjects. Thus, it is important for future work to test how our findings generalize to other populations, and to other tasks/measures. Furthermore, we used minimal groups, rather than groups with real-world relevance. Thus, future research should test the generalizability of our results to more salient social groups. Additionally, here we measured unconditional prosociality using a single measure, namely giving in the DG with an anonymous player. Further research should study how our results generalize when considering different other measures that allow one to distinguish different "types" of pro-social preferences (Charness & Rabin, 2002; Murphy, Ackermann & Handgraaf, 2011). We hope that the observations made here help advance our understanding of why people are willing to pay costs to help others.

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