The Democratic Peace: An Experimental Test of a Causal Relation and of Underlying Mechanisms

Jordi Brandts, Catherine Eckel, Enrique Fatas, Shaun Hargreaves-Heap

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An experimental test of a causal relation and of underlying mechanisms

Jordi Brandts
Instituto de Análisis Económico- CSIC
and
Barcelona GSE
Jordi.Brandts@iae.csic.es

Catherine Eckel
Department of Economics
Texas A&M University
ceckel@tamu.edu

Enrique Fatas
University of Pennsylvania
and Universidad ICESI
efatas@upenn.edu

Shaun Hargreaves-Heap
Department of Political Economy
King's College London
s.hargreavesheap@kcl.ac.uk

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Abstract

Democracies go to war with each other less frequently than dictatorships do with each other. This is an established empirical regularity. We use a laboratory experiments to study whether there is a causal relation between democracy and peace. We distinguish democracy from dictatorship along three dimensions of governance: voting, equal treatment of citizens and participation in deliberation. We find a full democracy in this sense is less bellicose than a full dictatorship. The key source of this difference in democracies is participation in deliberation because this raises the opportunity cost of conflict. We also study two extensions of the basic problem.

Keywords: conflict, governance, democracy, dictatorship.

JEL Classification Codes: C72, C92, D9, H11.

1. Introduction

The term 'Democratic Peace' describes an empirical regularity. Democratic countries go to war with each other less frequently than do pairs of dictatorships. Although controversial (e.g. Raknerud 1997), it is claimed to be 'as close as anything we have to an empirical law in international relations' (Levy 2002, p. 270). However, using observational data alone, it is impossible to determine whether this relationship is causal. We use the methodology of experimental economics to ask whether democracy produces peace, and if so, why?

This test is important because the causal version of the thesis influences policy. US foreign policy is one illustration. Woodrow Wilson (1917) at the end of WW1 and, more recently, both Bill Clinton (1994) and George W. Bush (2004) encouraged the spread of democracy internationally because they thought it would promote peace in the world.[1] The causal interpretation is important for this reason; but it is also controversial. This is because there are alternative possible explanations of the empirical association. It has been argued, for instance, that the correlation largely arises from the post-WW2 experience of peace in the Americas and Western Europe, which has been driven by *Pax Americana* with its commitment to the expansion of democracy (see Rosato 2003). In a similar fashion, it is possible to argue that the practice of EU expansion has been to make democracy a condition of membership. It could be this practice, together with the way economic integration promotes peace, that explains the association in post-WW2 Europe and not any causal link between democracy and peace.

Since there are few natural experiments that allow the effects on bellicosity of a controlled change in governance arrangements to be studied, those working with observational data have attempted to address the causal claim by examining whether there is evidence that is consistent with particular causal mechanisms producing peace among democracies (see Rosato 2003, and Doyle 2005). The evidence on these causal mechanisms is also controversial; in part for the same reason that the evidence takes the forms of empirical associations. The methodological advantage in this context of a laboratory experiment is clear: in principle, an experiment can be designed both to test for governance treatment effects and for the precise causal mechanisms. This is what we do.

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[1] See Bill Clinton's State of the Union Address, 1994, ('Ultimately, the best strategy to ensure our security and to build a durable peace is to support the advance of democracy elsewhere. Democracies don't attack each other') and George W. Bush at the Bush/Blair meeting November 12, 2004 ('The reason why I'm so strong on democracy is democracies don't go to war with each other.')

Our approach is to develop a simple experimental model that captures both the key features of a country's governance arrangements for making collective decisions (e.g. over conflict) and the central elements of conflict between countries. This allows us to test for the causal influence of each feature of democratic governance singly and in combination on bellicosity and several possible individual causal mechanisms.[2]

We identify three distinguishing features of governance arrangements that identify a democracy (following Diamond 2016). They are: voting v. dictatorship as alternative ways of making a collective decision; equal v. unequal treatment of individuals; and citizen participation v. non-participation in policy deliberation. The internal governance arrangements of our groups in the lab vary by design along these three dimensions (details below) and we capture the warfare decision through a choice each group makes over how much to invest in winning an inter-group conflict.

War is a costly way to determine which group's interests will prevail when there is a dispute. It is costly because it uses resources in determining the outcome of this conflict, and these resources could have been used productively to increase the total sum of goods and services available to both groups. Wars, in practice, also come in a variety of forms and intensities. Our experimental design models a conflict that can be settled through a 'war' that has these attributes. There is a prize that only one of the teams can obtain. We capture both the wasteful aspect of war and the variation in its intensity by allowing each team to decide, through a tax on each individual member's endowment, how much to invest in a contest to obtain this prize for their team. The investments determine each team's relative likelihood of winning the prize in the manner of a Tullock contest (Tullock 1980).[3] To capture the opportunity cost of investing in warfare, the post-tax remainders of the individual endowments are available for productive employment, either in a private account or a team production account, in a manner similar to a standard linear public good game (Eckel and Grossman 2005). Our measure of a team's bellicosity then becomes the fraction of resources used in attempting to win the prize, and the intensity of the actual conflict that ensues (the war) is given by the total spent on winning the prize. In this framework, our teams could, of course, also resolve the conflict peacefully (i.e. without 'war') by both choosing a zero investment.

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[2] This type of experiment is sometimes referred to as a behavioral model (Croson and Gaechter 2010), exhibit (Sugden 2005) or material model (Schmidt 2009). Experimental models face a similar challenge to formal mathematical models: the need to simplify naturally-occurring settings to focus on key phenomena.

[3] For a survey of experiments using contests see Dechenaux et al. (2015) or Sheremeta (2018).

1. Voting v. dictatorship.

This feature of governance in our experiment concerns how the collective decision is made over the tax rate to fund the investment in winning the contest. In a democratic team everyone has a vote in an election that determines this tax rate. In a dictatorship, one person within the group, the same one throughout, always decides on this tax rate.[4] We call this the 'voting' attribute of a democracy and dictatorships do not have it. Voting is fundamental to our definition of democracy because it is always present in a democracy, but it is not the only feature required of a democracy in our experiment. Our definition of democracy always combines voting with equal treatment.

2. Equal v. unequal treatment of citizens.

This feature relates to possible constraints on collective decision making: in particular, whether individuals must be treated equally under any joint decision. In our setting, the two joint actions relate to the conflict investment and the team production, and we associate the equal treatment constraint with the equal allocation of any benefit from these decisions. Thus, equal treatment requires that when a team wins the conflict, the prize is shared equally among team members and, in so far as the residual endowments are employed in team production, these benefits are also shared equally. Such equal treatment is a form of 'inclusivity,' and we use this term hereafter to describe this feature so as to make explicit the potential connection to Acemoglu and Robinson's (2012) analysis of different governance arrangements.

We define democracy (D) as a system that combines voting and inclusivity, based on Kant's (1795) original causal argument that a republican democracy (as opposed to any other type of governance) promotes peace. To be republican, a system of government must afford individuals equal standing in society: they must be citizens with rights and not simply subjects. This is a common idea in liberal versions of democracy: Individuals do not simply vote in a liberal democracy, they have rights and these rights protect all individuals equally from some types of collective decision. De Tocqueville (1840), for instance, makes a similar point when famously identifying democracy in America with a fundamental equality of conditions. (See Buchanan and Congleton 1998 for an alternative argument linking their "generality principle" to voting in democracy.)

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[4] To the best of our knowledge, there are no previous studies that specifically investigate how the collective decisions are made in this setting. Abbink et al., 2010, and Fallucchi et al., 2020, are good examples of how group investment decisions are generated by voluntary 'taxes,' paid individually, in intergroup Tullock contests.

In principle, in this framework, a dictatorship might be combined either with inclusivity or its absence. We call its absence in a dictatorship 'extractive'. This is a natural extension of the Acemoglu and Robinson (2012) terminology in our experimental setting, where the dictator in an extractive dictatorship also decides how to allocate the prize and the team production (as well as determining the tax rate). Dictators can literally extract for themselves all the benefits of joint action. Thus, our experiment includes two possible types of dictatorship: inclusive (I) and extractive (E). Although at first sight, an inclusive dictatorship may seem akin to an oxymoron, there are examples that combine non-voting or weak electoral competition with respect to the voting dimension with elements of inclusivity (i.e. in countries with effective one-party rule that nevertheless have a tradition of equal treatment via the rule of law, like Singapore or Hong Kong---see also Mukand and Rodrik 2020). In addition, having an inclusive dictatorship has an important role in our experimental design as it allows us to test for the distinct possible influences of voting and inclusivity in D when compared with E. Hence, three of our governance treatments consist of D, I and E and we label these as D-NC, I-NC, E-NC to take account of the final feature of governance.

    3. Participation in deliberation v non-deliberation.

    This feature relates to whether individuals can participate in collective decision making through discussion as well as voting. The addition of this discursive possibility is what distinguishes so-called deliberative or participatory democracies (see Pateman 1970; Gastil 2018 provides a recent survey of experiments on the influence of deliberation in democracies). We represent this possible dimension through a 'chat' facility (C) in the experiment where all citizens within a team can talk to each other freely, without any of them having an advantage over any of the others (see for example, Brandts et al., 2022, and the references therein). We denote its absence by NC (and hence D-NC, etc., above). Thus, our design allows us to isolate the effect of this element of democracy, and to distinguish 'full democracy' (D-C) from D-NC above, which excludes deliberation. Although deliberation, or 'chat' in our design, is typically a feature of democracy, and such deliberation is much less frequently found in authoritarian governments, dictatorships could, in principle, also have consultative mechanisms that enabled deliberation among individuals. To allow for this possibility, and again to aid in the identification of the causal effects of chat, our complete design also includes two further contrasting types of dictatorship: an inclusive dictatorship with chat = I-C; and an extractive dictatorship with chat = E-C. Overall, we therefore have six distinct governance arrangements, summarized in Table 1 below. They range from a full democracy that enjoys all three democratic governance features (D-C) to a full dictatorship

which has none of the democratic governance features (E-NC). Note that some of these governance types are easily observed, while others occur rarely in practice.

In our Study 1 we begin our analysis of the democratic peace causal relation begins by testing whether full democracies (D-C) invest less in conflict when they are paired with a fellow D-C than do full dictatorships (E-NC) when paired together. We find that they do in a statistically significant sense. This is our key result providing support of the democratic peace causal thesis in the first part of the paper (Study 1).

With respect to what aspect(s) of governance in a full democracy are responsible for this difference with full dictatorships, we find in Study 1 that it is the scope for participating in deliberation. Add deliberation to the full dictatorship (E-C) and it invests in conflict the same as a full democracy (D-C); take deliberation away from the full democracy (D-NC) and it invests the same as the full dictatorship.

Typically, two causal mechanisms operating at the individual level have been identified in the literature as potentially underpinning the democratic peace causal thesis (e.g. Rosato 2003). One relates to the way that a change in governance institutions alters incentives to action (also see Doyle 1986, Levy and Razin 2004, and Conconi et al., 2014). We can test for this possibility because our experimental model together with the assumption of individual rationality generates precise predictions regarding how the changes in governance affect incentives and behaviour. The other causal mechanism turns on the possibility that different governance arrangements call forth different preferences (see Bowles and Polanía-Reyes 2012) or encourage different behavioural norms (e.g. Rosato 2003). We test for this possibility by introducing some behavioural hypotheses into our experimental model. In particular, using behavioural insights, we hypothesise that governance arrangements might either change the preferences that individuals act upon; or shift individuals from individual rational choice reasoning to a form of team reasoning.

We find virtually no evidence that the differences in incentives under the various governance arrangements, by themselves, explain the difference in conflict investments. Instead, we find evidence to support an interaction between a behavioural mechanism and a resulting change in incentives. In particular, the introduction of deliberation makes people more pro-social in team production (a behavioural mechanism) and this increases the opportunity cost of investing in conflict because the return to contributing to team production is higher (the incentive mechanism). This appears to be the central individual causal mechanism through which conflict expenditure becomes lower in a full democracy than in a full dictatorship.

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In the second part of the paper, we consider two extensions to Study 1.[5] In Study 2, instead of comparing conflicts between two full democracies with those between two full dictatorships, we study a conflict between a full democracy (D-C) and a full dictatorship (E-NC). Although the democratic peace thesis does not refer to these types of conflicts, the difference in conflict investments between full democracies and full dictatorships remains in Study 2. This suggests the particular difference between democracies and dictatorships captured by the democratic peace thesis may, in fact, be a more general difference. In addition, in Study 2, both full democracies and full dictatorships increase their conflict investments as compared with those in Study 1. In this sense, more 'war' occurs in conflicts between full democracies and full dictatorships than when there are conflicts between two full democracies. This is an interesting feature of our experiment because it is consistent with other aspects of the observational data on conflict in Coconi et al., (2014).

In Study 3 we add an initial 'peace' exploration phase to the contest, such that each team can send a non-binding message to the other that they plan to make no investment in the conflict and in the event that both subsequently make no investment, each team has an equal chance of getting the prize.[6] As a result, in repeated conflicts, each team can expect, if both make zero investment, to share in the prize equally over time without incurring any costs. The difference in conflict investment between a full democracy and full dictatorship remains and is significant in full democracy/full dictatorship conflicts. It also remains in the comparisons of conflicts between full democracies and those between full dictatorships but it is only significant when dictatorships make use of the peace message option. In both extensions, we find evidence of the same Study 1 individual causal mechanism distinguishing the behaviour of the full democracy from that of the full dictatorship: that is, deliberation encourages team production in a full democracy and this increases the opportunity cost of conflict investment for a democracy as compared with a dictatorship.

Our results from Study 1 are important because they support the democratic peace causal thesis. This thesis has frequently underpinned US foreign policy and has potential further applications to any conflicts between groups and not necessarily only those that are between countries: e.g. corporate lobbying for a government contract. However, our results also suggest that voting is not enough to secure the peace, and this result is potentially

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[5] Following Jones et al. (1996), Coconi et al. (2014) code countries that engage in 'militarised interstate dispute' according to the level of this MID. In their data set, the chances of a dispute having an MID greater than 2 is much higher when the dispute occurs between a democracy and dictatorship than when it occurs between two democracies.

[6] We would like to thank a referee and the editor for suggesting these extensions.

important for US foreign policy as well as these other possible applications. Peace through democracy depends on democracy being deliberative.

There are several survey experiments in the political science literature that have examined aspects of the democratic peace thesis. Tomz and Weeks (2013) provide a summary of prior studies, and then address some of their weaknesses by conducting a public opinion poll experiment. This experiment presents a scenario where another country is considering developing a nuclear weapon. They vary the details of the other country, including whether it is democratic, and find that the public in the US and the UK are significantly less supportive of military strikes against a democracy engaged in such development than a dictatorship.

The contribution of our experiment in this respect is threefold. First, prior studies focus on a singular democracy/dictatorship distinction. By contrast our distinction arises along three governance dimensions; we are thereby able to identify the causal impact of all three. In particular, we are able to show that the scope of participation in deliberation under democracies is the key governance difference responsible for less bellicosity among democracies. Second our experiment tests for actual bellicosity in the form of investment in conflict and so tests the democratic peace causal relation. In comparison, prior studies have focused on public opinion (e.g. Tomz and Weeks 2013, as discussed above) or re-election (e.g. Bausch 2017) as key disciplining factors in democracy. While these are important influences over government policy, prior studies do not directly test the causal relation between democracy and peace.[7] Finally, because it is designed as a structured set of decision problems to which we can apply the rational choice model, our experiment enables us to test whether behaviour is different under democracy because of differences in incentives, or because of other behavioral factors.

The challenge in designing an experiment in this respect is akin to the development of a theoretical model in the selection of key elements to include, and unnecessary complications to exclude, so that the model is both rich enough to be meaningful and sufficiently streamlined to be tractable, i.e. to be translated effectively into a set of

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[7] Bausch (2017) reports an experiment that directly addresses the democratic peace causal thesis and finds weak or qualified support. It is a more complicated experiment where democratic and dictatorial leaders must first decide whether to enter a conflict in the form of a Colonel Blotto game, and then if they do, they must decide how much and where to commit resources. The governance element distinguishing democracy in this set-up, however, concerns re-election. Both democratic leaders and dictators face re-election, but the threshold for re-election is lower under a dictatorship. In comparison, our experiment has a larger variety of governance differences, and we are able to assess the potential individual mechanisms underpinning any such differences.

instructions for subjects to follow. This raises an important question, as it does for theoretical modelling, regarding external validity. We do not directly address this issue here. Our objective is to see whether, and if so why, a causal relation exists between democracy and peace. Unless such a relation can be identified in the simple laboratory world, one might legitimately be skeptical about such a relation operating in the more complex world outside the lab.

In the next section, we set out the experimental design. Section 3 gives the results of Study 1 with respect to the democratic peace causal thesis, the influence of different aspects of governance and the specific individual causal mechanisms. In Section 4, we report on the extensions in Study 2 and Study 3. Sections 5 and 6, respectively discuss these results and conclude the paper.

2. Experimental design: Study 1

2.1 Setup

Our subjects have an endowment of 100 tokens each per round, exchanged into US dollars at a rate of (10 points = $1US). Subjects are organized into teams of 3 and teams are stable, remaining the same for all periods. Teams are distinguished by their governance structures and interact in fixed pairs of teams over 20 periods. This is designed to mimic the fact that individuals and governments interact over time. The game is finitely repeated in recognition that teams in practice and leaders have finite lives. Two decisions are made within each team with respect to the use of these individual endowments in each period: a collective decision about the tax rate for investment in winning the contest, and then individual decisions to allocate remaining funds between private and team production accounts.[8]

2.2 The decisions

The first decision in each period is a collective one: what tax rate, in effect, is to be applied to everyone's individual endowment to fund an investment in trying to win a prize in a contest with another team. The conflict is modeled as a standard Tullock contest (Tullock 1980) where there is a prize (= 600) and the probability of winning the prize depends on the relative size of each team's investment in trying to win the prize. In Study 1 and part of Study 3, a team is always in a contest with a team of the same governance structure. This is varied in Study 2 and the other part of Study 3.

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[8] The instructions for all treatments can be found in Appendix A.

The second decision is an individual one. Once the collective decision has been made over the allocation of endowments to the contest, each individual must decide how much of what remains of their individual endowment to contribute to team production, where the value of the team production is two times the sum of these individual contributions. The residual remains in an individual's private account.

The team production contribution decision is made before knowing the outcome of the conflict to mimic the traditional allocation of resources between "guns and butter" in society in the simplest way. The funds not used for conflict have an opportunity cost, consisting of the use of funds for private or team production. In this way, the alternative use of resources involves a choice between private and joint production and the latter is productive in the sense that each unit contributed is turned into two. This is more realistic as the productive use of resources can often be private or joint and the joint activity can have productivity advantages. It also enables us to examine whether the democratic/dictatorial character of their collective decision (its bellicosity in the conflict) is associated with differences in their abilities to solve team production problems.

After both decisions have been made in a period, subjects are informed about each team's investment in the conflict and which team won. They also receive information on the total contribution to their team's team production. Finally, they receive information on their earnings for this period derived from their share of the team production and the prize plus any residual amount in their private account.

2.3 Governance treatment effects on conflict investment

Teams are distinguished along three dimensions as discussed above: voting v. dictatorship, equal v. unequal allocation rules, and deliberation v non-deliberation. This 3 x 2 design gives rise to six types: two are democracies and four are dictatorships.

The first governance rule variation relates to how the collective contest investment decision is made: the tax rate on individual endowments is determined either by voting or by a dictator (termed the 'group decider' in the instructions). In teams that vote, each member makes a suggestion and the median suggestion determines the tax rate. We thereby mimic the median voter property of majority rule in democracies. In teams with a dictator, one member is randomly selected at the beginning of the session and thereafter this person always decides

on the tax rate for the entire dictatorial team (i.e. the team has same dictator throughout the experiment).[9]

The second rule variation is inclusivity. The team production and the contest prize, when won, are either divided equally in an inclusive team or, in an extractive dictatorship, its division among the team is determined by the dictator. Thus, in the extractive dictatorship, the dictator can retain all of the benefits of winning the contest.

The variation in the third dimension, deliberation, consists in whether there is a one-minute anonymous chat facility (C) available to members of a team in each round before decisions are made (or not in NC).[10] If there is this scope for chat, the team is called deliberative. (The experimental instructions, of course, employ neutral descriptions, and simply mention the option to chat.)

We combine these three sources of distinction in a 3x2 experiment design. This is set out in Table 1, where there are additional subject details. To distinguish the treatments from some in subsequent studies, we use DD, II, and EE to indicate same-governance matches.

Table 1: Design, Study 1

	Deliberation	
Voting	No chat	Chat
Democracy (D)	DD-NC	**DD-C**
	48 subjects	**48 subjects**
	16 teams	**16 teams**
	8 groups	**8 groups**
	960 rounds	**960 rounds**
Inclusive dictatorship (I)	II-NC	II-C
	48 subjects	48 subjects
	16 teams	16 teams
	8 groups	8 groups
	960 rounds	960 rounds
Extractive dictatorship (E)	**EE-NC**	EE-C
	48 subjects	54 subjects
	16 teams	18 teams
	8 groups	9 groups
	960 rounds	1080 rounds

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[9] Note that our democracy does not have an explicit leader; instead, in the interest of simplicity, our design has decisions that are made by direct democracy, with each individual making a suggestion. This approach had been adopted in many studies of political institutions (e.g. Kroll, Cherry and Shogren 2007; Ertan, Page and Putterman 2009; Ambrus and Greiner, 2018). Leader selection has been addressed in the experimental literature primarily in the context of public good provision, not warfare. Democracy can discipline leaders and increase public goods contributions (e.g. Castillo and Hamman 2021). Dictators can only be disciplined by revolution, explored in Basuchoudhary and Razzolini (2018).

[10] Note the chat is two minutes in the first round and one minute in each round after the first, allowing subjects sufficient time to become familiar with the interface at the beginning.

Our key test for the causal relation between democracy and peace is **DP**: a comparison along the minor diagonal of conflict investment in DD-C versus EE-NC (i.e. full democracy as compared with full dictatorship, paired with another team with the same type of governance, bolded in Table 1).

> **DP**: Conflict investment is less in conflicts between full democracies (DD-C) than full dictatorships (EE-NC).

There are three governance differences between a full democracy and full dictatorship, and the 3x2 factorial design enables us to test for the causal influence of each governance variation singly and in combination. For example, consider movement down a column: the comparison between DD and II isolates the effect of voting because this is the only factor that differs; likewise, the comparison between II and EE reveals the effect of inclusivity for the same reason; and the comparison of DD and EE gives the joint influence of voting and inclusivity because both have changed. Likewise, movement along each row gives the influence of deliberation for each governance type because this is the only thing that changes with a horizontal move.

In addition, we test two individual causal mechanisms through which the variation in governance rules could, in principle, produce an observed change in individual behaviour. A change in governance rules can alter the incentives faced by a selfish, rational-choice person (an incentive mechanism); alternatively, or in addition, a change in the rules could cause a pro-social change in the preferences or the type of reasoning of our subjects (a behavioural mechanism). We examine the incentive mechanism next.

2.4 Rational choice predictions and the incentive causal mechanism

We begin by assuming that individuals are motivated by pure self-interest. In the last period, equation 1 represents in a general way the expected return (ER) $\{\pi^e(x)\}$ in the contest to an individual in D, I and E when deciding on what tax (x) either to propose in D or impose if they are a dictator in I and E.

$$\pi^e(x) = V \cdot \frac{3 \cdot x}{(3 \cdot x + Y)} - x \cdot \theta \qquad (1)$$

Where Y is the total investment by the other team, V is the value of the prize to that individual and θ is the opportunity cost for that individual of paying one experimental point in tax. Using the first order conditions for maximization and solving for a symmetric equilibrium yields (2):

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$$x^* = \frac{V}{4 \cdot \theta} \tag{2}$$

The opportunity cost of using an experimental point on tax for the contest is the value of that point in the alternative productive decision when allocating the post-tax endowment to the team production or the private account.

Consider first an extractive dictator's post tax decision: every 1 point they allocate to team production generates 2 points and, since an extractive dictator chooses how to allocate these 2 points, they will, when selfish, allocate the 2 points to themselves. This contrasts with the value of 1 point for every point they keep in the private account. So, the extractive dictator will always allocate all their post-tax endowment to team production. Hence their opportunity cost of using one of their experimental points in the contest is 2. That is, for each 1 point they pay in tax, they could have got 2 from the team production ($\theta^E = 2$). In contrast, the opportunity cost of 1 tax point for all other individuals is 1. This is because the return from investing in team production is always less than 1 (because everyone is selfish by assumption) and so the individual's interests are best served by keeping the post-tax endowment in the private account ($\theta^D = \theta^I = 1$). This is one key difference. The other is that an extractive dictator allocates the prize among members of their team when they win and so selfishly decides on 600 for themselves: $V^E = 600$. In contrast, inclusive dictators and democratic individuals share equally in the prize and so the value to them of winning is 200 ($V^D = V^I = 200$).

Using these different values for θ and V, we get an individual tax payment in the last period of 50 in D and I, and 75 in E. By backward induction, the same logic will apply in each prior period and as communication is 'cheap talk' in this setting, the predictions are the same for each governance type under C as with NC. In the first three rows Table 2 sets out these predictions in full, including team production contributions and earnings (= team earnings). We get back to the last row of Table 2 below.

Table 2: Per-capita predictions

	Conflict Investment	Team Production	Earnings
Democracy (D)	50	0	150
Inclusive Dictatorship (I)	50	0	150
Extractive Dictatorship (E)	75	25;0*	350;25*
Behavioral: Team Reasoner	25	75	250

The first number in E refers to the dictator; *numbers refer to the other members in E

Note that the predictions for D and I are the same. Because of the equal-distribution requirement, the inclusive dictator chooses the same tax rate that citizens choose in democracy. In both governance régimes there are no contributions to team production and, as a consequence, earnings are the same in the two régimes. By contrast, in E the dictator imposes a higher tax rate for conflict investment than in D and I. Like the other regimes, the citizens contribute zero to team production, but the dictator contributes a positive amount. Finally, the extractive dictator earns substantially more than the inclusive dictator and the citizens in E earn less than in the other two regimes resulting in total earnings in E being lower than in the other two regimes.

From these deductions, three specific incentive predictions (IP) follow regarding the influence of the democracy's features of voting (VIP), inclusivity (IIP) and their combination (V+IIP). VIP is tested through a comparison of D and I as the only change is voting. For the same reasons IIP is tested on the comparison between I and E (as only inclusivity changes); the combined change of V+IIP is tested on D versus E.

VIP: voting does not change the incentive to bellicosity with the result that conflict investment is same in D-NC and I-NC and it is the same in D-C as I-C.

IIP: inclusivity reduces the incentive to bellicosity in I as compared with E with the result that conflict investment is lower in I-NC than E-NC; and lower in I-C than E-C.

V+IIP: voting and inclusivity reduce the incentive to bellicosity in D as compared with E with the result that conflict investment is lower in D-NC than E-NC; and lower in D-C than E-C.

2.5 Behavioural hypotheses and preference change/normative causal mechanism

We propose three different behavioural mechanisms. These mechanisms affect conflict contributions via team production contributions; that is, they lead to changes in team production contributions, which then affect the opportunity cost of conflict investments.

It has been argued that democratic governance arrangements encourage peace among democracies because they are conducive to the emergence of preferences or the development of norms that guide behavior towards peace among democratic countries (see Rosato 2003). We capture one such possibility through the hypothesis that 'team reasoning' rather than individual reasoning about team production contributions might be encouraged by democratic governance arrangements: that is, individuals in the team act to produce the highest returns to the team, as a whole, under democratic governance. With this form of team reasoning, individuals will expect full contribution to team production by themselves and others in the

team. So, the opportunity cost of a point spent on conflict now equals 2. Since, the value to the individual decision maker of the prize is still 200 for a voter in D, we therefore expect the higher opportunity cost of investing in conflict to produce a fall in conflict investment under team reasoning. Table 2 gives the precise predictions. The team reasoning causal prediction (TRP) which pertain to team production contributions follows.

> **TRP:** Team production contributions are higher in D-NC than I-NC and E-NC, and higher in D-C than I-C and E-C because team reasoning is triggered by D.

Democracy might also encourage pro-social behavior in team production through other mechanisms. We consider two such possibilities suggested by the behavioural literature. First, it has been found in experiments that voting by itself has a beneficial effect on contributions to a public good (e.g. see Sutter et al., 2009, and Dal Bo et al, 2010).[11] In these experiments, voting is not directly analogous to our voting on the conflict investment. For example, in those experiments, it takes place over the punishment rules in the public goods game and not a collective conflict decision. Nevertheless, a punishment rule is a kind of collective good, so there is a basis in similarity for projecting these behavioural results on to our experiment on conflict investment. This is our voting behavioural prediction (VBP). We focus the prediction on those cases where the only change is in voting (i.e. D to I) to avoid possible confounds associated with a change in inclusivity that also arises in a comparison between D and E.

> **VBP**: Team production contributions are higher in D-NC than I-NC and higher in D-C than I-C through influence of voting.

There is one potentially important difference between these earlier experiments on voting and our experiments. The influence of voting in these experiments is judged through a comparison between collective decision through voting and the collective decision being alternatively made by 'nature' (i.e. the experimenter). The alternative to voting is not another mechanism involving people (dictators), and there is some evidence that using a dictator comparison weakens the impact of voting on public goods contributions (see Hargreaves Heap, et al., 2020). So, VBP is to some degree speculative. Note also that the predictions

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[11] In a related branch of literature, a number of studies use experiments to explore the impact of different institutional settings on public goods contributions. Examples include: Andreoni and Gee 2012, Baldassarri and Grossman 2011, Dannenberg and Gallier 2020, among many others.

contained in TRP contain the ones of VBP. Hence, if TRP holds, VBP will hold, but the reverse is not necessarily the case.

Second, it is well known from public goods experiments that allowing deliberation encourages larger contributions to the public good (e.g. see Ostrom et al., 1992; Zelmer 2003 provides a meta-analysis of public goods experiments, and Villeval 2020 a recent survey). Larger contributions to team production increase the opportunity cost of conflict in our set-up and so lead to a prediction that there will be less conflict with deliberation under all governance arrangements (e.g. see earlier prediction regarding team reasoning). We ally this behavioural insight to a particular argument from John Stuart Mill that would make this effect especially strong under democracy, and so provide a link between democracy and peace. In particular, Mill (1861) argues:

> *Still more salutary is the moral part of the instruction afforded by the participation of the private citizen, if even rarely, in public functions. He is called upon, while so engaged, to weigh interests not his own; to be guided, in case of conflicting claims, by another rule than his private partialities; to apply, at every turn, principles and maxims which have for their reason of existence the general good....*' (Mill 1861:66)

In other words, the participation in decision making as a citizen of equal standing nudges people to think of the general interest and not just their own. De Tocqueville (1840) makes a similar claim when arguing that participation in political decision-making spills over to prime the other kinds of associational activity that he finds characteristic of democracy in America. We call this the Mill behavioral causal prediction (MBP).[12] It suggests that the addition of deliberation is particularly powerful in generating pro-sociality under democracy. Thus, we compare the change in team production contributions from DD-NC to DD-C with the change that occurs between II-NC and IO-C. and EE-NC and EE-C.[13]

MBP: The addition of deliberation has a larger impact on Team Production in DD than in II or in EE.

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[12] For some modern studies on deliberation see Karpowitz and Mendelberg (2011) and Myers and Mendelberg (2013).

[13] The experimental literature on the impact of communication in teams is mixed. Within-team deliberation on its own appears to increase bellicosity, but communication between teams (which we do not allow in our Study 1) has the possibility of reducing investment in conflict (Leibbrandt and Sääksvuori 2012).

2.6 Summary

Our test of the causal relation between democracy and peace is the comparison of conflict investment in a full democracy with that of a full dictatorship. The 3x2 design enables us to identify both singly and in combination the contribution that the three differences in governance rules between a full democracy and a full dictatorship make to any differences in bellicosity. Finally, we can test for two possible types of individual casual mechanisms that could link any change in governance rules to changes in individual behaviour.

The test of these individual causal mechanisms is interesting in its own right and, significantly, is separate from the causal test of the democratic peace thesis. This test is also important for the design of the experiment. Without such possible causal mechanisms, the direct test of the Democratic Peace causal thesis using the differences across governance arrangements of conflict investments might be difficult to interpret. The point is this: Suppose we do not find any treatment effects from a change in governance on conflict investment (i.e. there is no difference in bellicosity between D-C and E-NC). How is this null result to be interpreted? It will only count against the Democratic Peace causal thesis if there are reasons for supposing that some causal mechanisms capable of generating the Democratic Peace thesis could have been in play in the experiment. If there are no potential individual causal mechanisms that might have been activated by the experiment, then the null result would not be surprising. Indeed, the experiment would simply be poorly designed to test the causal thesis. For this reason, it is important that we have an experimental design with potential individual causal mechanisms in play. Otherwise, the treatment governance effects test of the causal relation between democracy and peace thesis is a weak test.

Our paper consists of three studies. In Study 1 we analyze behavior in the environment that we have just discussed. Studies 2 and 3 are extensions conducted subsequently that will be introduced later. The experiment was run in the Economic Research Lab at Texas A&M University, and was programmed using zTree (Fischbacher 2007). For Study 1, there were two waves, each conducted at the same time of the year. Subjects were undergraduates recruited from the general student population, aged from 16-49 and 49% were female. The average earnings were $27 and the experiment typically lasted 90 minutes. For Study 2 these values were: 18-39; 42.6%, $27.33; and for Study 3: 18-50, 58.3%, $26.43.

3. Results for Study 1

Our statistical analysis uses both conservative aggregate tests and regression analysis, though, because of the structure of the data, we place most weight on the regression results.

This is because regression analysis enables us a) to exploit the panel structure of the data on conflict investment and b) to control appropriately for a number of variables that could influence conflict investment when these decisions take place repeatedly.

In our regression analysis, we use two different dependent variables depending on our behavior of interest. We study investment in conflict at the team level, as decided by the median voter in democratic teams, and by the dictator in dictatorships. Whenever we estimate investment in conflict, we use only one observation per team (of three subjects) and period. However, we study investment in team production at the individual level, as decided by each individual in democratic teams or dictatorships. Whenever we estimate investment in team production in the tables below, we use one observation per subject and period.

Given the panel nature of the data (teams repeatedly interact over time in our experiment), we estimate panel data models. We always cluster standard errors by groups of six subjects (with two teams of three subjects each), as groups are statistically independent from each other. In all our econometric analysis, we estimate models using a simple incremental approach: we first study treatment effects using treatment dummies and a trend (period, from 1 to 20), and then we add controls in other models as robustness checks, and to study specific behavioral drivers (discussed below). Our selection of additional controls follows previous analysis of conflict and team production games. In the main text, we present a summary of coefficients and models. Full results are available in the Appendix.

3. 1. Full democracy versus full dictatorship: DP

Table 3 gives the descriptive statistics for our six governance treatments in the 3x2 design of Study 1. The comparison of conflict investment between DD-C (row 1) and E-NC (row 2) provides the aggregate evidence on **DP.** Full democracies do invest substantially less (19%) when in conflict with other democracies as compared with the investments in conflicts between full dictatorships, though the estimated difference is statistically imprecise (using a conservative test of one observation per team and one-sided t-test, $p = 0.0873$).

Table 3: Mean Investment in Conflict, Team production and Team Earnings

		Conflict	Team Production	Earnings
1.	DD_C	34.29	58.79	224.50
		(23.68)	(27.30)	(99.76)
2.	EE_NC	42.17	43.73	201.55
		(26.63)	(28.05)	(120.58)
3.	DD_NC	51.08	33.47	182.38
		(31.91)	(32.10)	(103.57)
4.	EE_C	31.83	63.92	232.08
		(28.34)	(31.14)	(124.00)
5.	II_C	41.83	52.34	210.51
		(25.26)	(28.66)	(99.58)
6.	II_NC	35.58	38.23	202.65
		(27.72)	(30.73)	(106.22)

Mean investment in conflict, team production and earnings.
Individual observations used to compute standard deviations.

Table 4 gives team-level panel regression analysis of conflict investments. All models include a dummy variable for the full dictatorship encounters. Model 1 controls only for the period, and gives a basic test for statistical significance of the additional investment by dictators. Our strong initial prior that democracies invest less in conflict gives justification for a one-tailed test, but even so the estimated effect is again statistically imprecise ($p=0.079$).

Model 2 adds various controls normally used in the contest literature in such regressions (i.e. the factors that are believed to affect conflict investment when the conflict occurs repeatedly). The addition of these appropriate controls strengthens the statistical relationship between dictatorship and conflict investment. In particular, L(Win) is a dummy variable indicating whether the team won the contest the previous period. L(Conflict J) is the lagged value of the other team's investment in conflict. L(Team Production) is level of team production in the previous round. In Model 2, with these controls, the coefficient on the dictatorship dummy is positive and significant at the 1% level, and is robust to the choice of controls (Appendix B gives the full regression results, including those where the controls are serially added). Result 1 follows.

Result 1 (in support of the Democratic Peace causal thesis DP): *The investment in conflict is significantly larger in E-NC (full dictatorship) than in D-C (full democracy) after controlling for other factors that can influence team conflict investment.*

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Table 4: Study 1 – Investment in conflict
Full Democracy DD_C versus Full Dictatorship EE_NC

	(1) Conflict	(2) Conflict
Constant (DD_C)	41.41***	38.39***
	(3.594)	(5.937)
Dictatorship (EE_NC)	3.942[a]	26.85***
	(2.793)	(9.444)
Period	Yes	Yes
L (Win)	No	Yes
L (Team Production)	No	Yes
L (Conflict J)	No	Yes
Observations	640	608
Number of Groups (n=6)	16	16

[a] Two-sided p-value=0.158 (one side p-value=0.079)
Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per team and period. Controls include Period (round, 1 to 20), the dummy variable L (Win) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Team Production) {investment in team production in the previous round} and L (Conflict J) {investment in conflict made by the other team of three players in the previous round}. Full results in Appendix B.
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

3.2 Governance contributions: voting, inclusivity and deliberation

Comparing treatments with and without chat in Table 3 shows that deliberation tends to reduce investment in conflict in both DD and EE disputes, suggesting that deliberation is the central aspect of democratic governance accounting for **DP.** Indeed, add deliberation to an extractive dictatorship and conflict investment in E-C (31.83) is very close to that in D-C (34.12) and remove deliberation from the full democracy and conflict investment in D-NC is actually higher than that in E-NC. Table 5 provides statistical analysis of this pattern, using team-level observation regressions with and without the same controls as in Table 4. For these models we also include inclusive dictatorship disputes (II) for later discussion and present separate models with and without deliberation/chat so as to be able to make these same comparisons in the individual team conflict investment data. Models 1 and 2 include data for treatments without deliberation, and Models 3 and 4 include data for treatments with deliberation. For all models, the coefficient for the EE dictatorship pairs is small and not statistically significant. Thus, absent the difference in deliberation (i.e. holding its presence or absence constant), DD and EE do not differ significantly. Result 2 follows and shows the

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critical importance of the presence of deliberation in a full democracy and its absence in a full dictatorship for Result 1.

Table 5: Investment in conflict with and without deliberation
Models (1) and (2): DD_NC, II_NC and EE_NC
Models (3) and (4): DD_C, II_C and EE_C

	(1) No Deliberation	(2) No Deliberation	(3) With Deliberation	(4) With Deliberation
Constant (DD)	59.67***	63.64***	44.97***	40.26***
	(4.689)	(8.524)	(3.580)	(5.939)
II	-15.50**	-28.65***	7.543*	17.44**
	(7.363)	(9.696)	(4.177)	(8.351)
EE	-8.909	2.892	-2.453	14.31
	(6.673)	(10.81)	(5.624)	(10.02)
Period	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Observations	960	912	1,000	950
Number of Groups (N=6)	24	24	25	25

Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per team and period. Controls include the dummy variable L (Win) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Team Production) {investment in team production in the previous round} and L (Conflict J) {investment in conflict made by the other team of three players in the previous round}, and interaction terms with the treatment dummies {e.g. L (Winning}*II, L (Winning}*EE…}.
Full results in Appendix B.
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Result 2 (in support of the influence of deliberation*): there is no difference in the investment in conflict between a full democracy and an extractive dictatorship <u>with</u> deliberation and there is no difference in conflict investment between a democracy <u>without</u> deliberation and a full dictatorship.*

Turning to the voting dimension of governance, recall that comparing DD with II holding deliberation constant allows us to isolate the effect of voting on investment in conflict. This investment is lower in DD-C than II-C in Table 3. The reverse is the case, however, without deliberation: investment in DD-NC is greater than in II-NC. In the individual team conflict regressions in Table 5, the coefficient on I is negative and significant without chat and positive and significant with chat. Result 3 follows.

Result 3 (against a clear influence from voting): *In the comparison of DD-C and II-C, voting reduces conflict investment, significantly so in team regressions; but in the comparison of DD-NC and II-NC voting increases investment in conflict, significantly so in team regressions.*

Finally, in Table 3 the comparison of conflict investment in EE-C and II-C suggests that inclusivity, in the form of equal division of resources, increases bellicosity, but when EE-NC is compared with II-NC inclusivity significantly lowers conflict investment. In the Table 5 regressions, the coefficient on II is in absolute terms larger on II than EE without chat but the difference is not significant; and the coefficient on II is larger than EE and significantly so when there is chat. Result 4 follows.

Result 4 (against a clear influence of inclusivity*): in the comparison of EE-C and II-C, inclusivity increases conflict investment and significantly so in team regressions, but in the comparison of EE-NC and II-NC inclusivity lowers conflict investment, albeit not significantly.*

3.3 Individual causal mechanisms: incentives and/or behavioural?

Results 3 and 4 contradict our predictions regarding the effects of incentives on voting and inclusivity (**VIP** and **IIP**, respectively). Specifically, we expected that there would be no difference between D and the comparison group I in the effect of voting, but Result 3 indicates that voting has an effect, albeit in opposite directions depending on whether there is deliberation. In **IIP**, we expected that inclusivity would lead to lower bellicosity in I than in E, but Result 4 showed that this only occurs when there is no deliberation, and the opposite is true when there is deliberation.[14]

With respect to the combined features, **V+IIP,** the combination of voting and inclusivity should lower conflict in D as compared with E and Result 2 tells against this prediction as the coefficient on EE is never significant in Table 5.

Result 5 (against VIP, IIP and V+IIP*):* we find no systematic evidence in support of any of the incentive causal mechanisms.

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[14] We have no clear idea why the effects of voting and inclusivity reverse in the presence/absence of deliberation.

We turn now to the behavioural causal mechanisms which work through team production contributions in democracies. We start with **TRP**, the team reasoning causal prediction, and **VBP,** the voting behavioural causal prediction. Against both, in Table 3 team production is actually lower in DD than II and EE when there is no deliberation, and while DD-C > II-C , DD-C < EE-C the differences are relatively small.

Table 6 is structured similarly to Table 4 above, and shows the investment in Team Production by individuals in full democracy (DD-C) and full dictatorship (EE-NC). In column 1 there are no controls except for a period dummy. In column 2, we introduce the controls that are common in public goods discussions (e.g. whether the previous individual contribution was above or below the team average, see Ashley et al., 2010; Croson 2007, and the level of inequality, measured by the standard deviation of earnings, within the team, see Hargreaves Heap et al. (2016) and references therein). In addition, we include a dummy for whether the team won the contest prize in the last round. The coefficient on the dummy variable indicating dictatorship governance is negative and statistically significant in both columns, implying a reduction in team production of about one third of the democracy level.

Table 6: Investment in team production
Full Democracy (DD_C) versus Full Dictatorship (EE_NC)

	(1)	(2)
Constant (DD_C)	48.87***	63.45***
	(4.613)	(6.200)
Dictatorship (EE_NC)	-15.06***	-20.20***
	(5.751)	(6.707)
Period	Yes	Yes
L (Win)	No	Yes
L (Inequality)	No	Yes
L (Team Production above)	No	Yes
L (Team Production below)	No	Yes
Observations	1,920	1,824
Number of Groups (N=6)	16	16

Panel data regressions. Team Production investment made by subjects. One observation per subject and period. Controls include Period (round, 1 to 20), the dummy variable L (Win) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Inequality) {the standard deviation of team earnings in the previous round}, L (Team Production above) {investment in team production minus the team average, 0 if not above, in the previous round} and L (Team Production below) {absolute value of investment in team production minus the team average, 0 if not below, in the previous round }. Full results in Appendix B.
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 7 below is structured similarly to Table 5 above, and explores individual Team Production decisions across all the treatments in Study 1. We compare DD (the omitted variable) with II and EE when there is no deliberation (Model 1, without controls, and Model 2, with controls,) and when there is deliberation (Model 3, without controls, and Model 4, with controls). The coefficients on the governance dummies in these equations reinforce the aggregate insights from Table 3. In both cases, holding the presence of deliberation or its absence constant, the II and EE coefficients are not significantly different from zero. This shows, once again, the importance of deliberation. Result 6 follows.

Table 7: Investment in team production without and with deliberation
DD, II and EE

	(1) No Deliberation	(2) No Deliberation	(3) With Deliberation	(4) With Deliberation
Constant (DD)	27.86***	24.92***	46.74***	53.94***
	(5.074)	(6.460)	(4.513)	(5.465)
Inclusive Dict. (II)	4.766	11.46	-6.445	-8.311
	(7.333)	(9.160)	(5.328)	(6.833)
Extractive Dict. (EE)	10.26	12.99	5.128	2.392
	(6.715)	(7.928)	(6.512)	(7.426)
Period	Yes	Yes	Yes	Yes
L (Win)	No	Yes	No	Yes
L (Inequality)	No	Yes	No	Yes
L (Team Production above)	No	Yes	No	Yes
L (Team Production below)	No	Yes	No	Yes
Observations	2,880	2,736	2,880	2,736
Number of Groups (N=6)	24	24	24	24

Panel data regressions. Team Production investment made by subjects. One observation per subject and period. Controls include Period (round, 1 to 20), the dummy variable L (Win) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Inequality) {the standard deviation of team earnings in the previous round}, L (Team Production above) {investment in team production above the team average, 0 if not above, in the previous round} and L (Team Production below) {investment in team production below the team average, 0 if not below, in the previous round }, and interaction terms with the treatment dummies {e.g. L (Win}*II, L (Win}*EE…}. Full results in Appendix B.
Robust standard errors clustered by groups of 6
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Result 6 (against TRP and VBP): *from Table 7 there is no evidence that team production contributions are higher in D-NC than I-NC or E-NC, likewise there is no evidence that team production contributions are higher in D-C than I-C or E-C.*

Lastly, we examine the Mill behavioural causal prediction (MBP). From Table 3 the change in team production in D from deliberation is +25, in I it is +14 and in E, it is +20. In Table 7, team production contributions are higher in EE-NC and in II- NC than DD-NC, though the coefficients are not statistically significant. The differences are smaller with deliberation.[15]

Result 7 (against MBP): *The addition of deliberation does not have a significantly larger impact on team production in DD than in II and in EE.*

3.4 Summary Study 1: the democratic peace

Thus, there is support for the democratic peace causal relation in Study 1. Further, there is support for deliberation as the key governance difference that produces **DP;** and deliberation makes this difference because it boosts team production through an individual behavioural mechanism, raising the opportunity cost of conflict in the full democracy as compared with the full dictatorship. Result 8, drawn from Table 3 where Team Production in the full democracy (58) is 35% higher than in a full dictatorship (43) and this is a significant difference (p= 0.0075 in the one-sided t-test), summarizes this.

Result 8 (in support of the team production contribution mechanism explaining DP): *team contributions are significantly higher in D-C (full democracy) than in E-NC (full dictatorships).*

We find no support for any of the distinct individual causal mechanisms linking democracy specifically with less bellicose behaviour, either rational-choice based or behavioural. We were surprised by that, since all of them had an ex-ante rationale. There is, however, clear evidence of a behavioural mechanism underpinning our DP result: deliberation boosts contributions to team production. This effect is just not specific to a democracy in our experiment as conjectured in MBP. Deliberation is a difference (and the key one) between a full democracy and a full dictatorship in our test of DP. But, add deliberation to an extractive dictatorship and there is a similar boost to team production as that which occurs in a democracy through the addition of deliberation. In other words,

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[15] All one can say is that in a descriptive sense the differences go in the direction of the MBP.

deliberation works behaviourally to boost team production in both a democracy and a dictatorship and, in the comparison between a full democracy and full dictatorship, the former has deliberation and the latter does not; and that makes the DP difference .

To put this finding into perspective, it is worth noting that deliberation in naturally occurring democracies is often very different to that in naturally occurring dictatorships. In democracies all citizens have, albeit imperfect, access to society's deliberation over certain policy options. In dictatorships, in contrast, when there is deliberation, it typically involves only a small group of people, like party elites. In contrast, in our experiment, deliberation has exactly the same form in a democracy as in a dictatorship: i.e. everyone can participate.

4. Extensions

In the first extension, Study 2, we examine full democracy-full dictatorship interactions. This extension is not about the Democratic Peace hypothesis in the political science literature, where the claim is that democracies go to war less frequently with fellow democracies than do dictators when in conflict with fellow dictators. It is nevertheless of interest to study full democracy-full dictatorship conflicts, since it allows us to analyse whether some of the regularities found in Study 1 carry over to these types of conflicts between teams with different governance structures. In the second extension, Study 3, we add to the experimental setting the possibility of teams explicitly proposing a peace solution. We introduce this distinct peace option first to the Study 2 conflicts between full democracies and full dictatorships. We then do the same for Study 1 comparison of the conflict investment in disputes between full democracies as compared to those between full dictatorships (i.e. the basis of the democratic peace thesis).

4.1 Study 2 on full democracy-full dictatorship conflicts

Table 8 provides sample sizes and the descriptive statistics for Studies 1-3 with one-tailed t-test of differences, using conservative tests of one observation per team. The top section reproduces the results from Study 1 in this respect. The middle section contains the data from Study 2 and Study 3 where democracies and dictatorships interact with each other. The final section contains data from Study 3 for paired full democracy conflicts as compared with paired full dictatorship ones when there is the explicit peace option. This panel is discussed later.

Table 8: Summary Statistics by treatment
Full Democracy versus Full Dictatorship

Study 1 – Same-governance interactions – DD_C versus EE_NC - No Peace

Team	Peace	Conflict	Team Production	Earnings
Democracy (DD_C)	No	34.29	58.79	224.50
		(23.67)	(27.29)	(99.76)
Dictatorship (EE_NC)	No	42.17	43.72	201.55
		(26.62)	(28.04)	(120.57)
t-test p-value (One side)	N=16+16	0.0873	0.0075	0.0626

Study 2/3 -Different-governance interactions D_C & E_NC (Peace & No Peace)

Team	Peace	Conflict	Team Production	Earnings
Democracy (D_C)	No	42.55	49.49	184.71
		(26.04)	(31.96)	(95.17)
Dictatorship (E_NC)	No	49.99	34.30	206.53
		(20.51)	(23.28)	(121.34)
t-test p-value (One side)	N=9+9	0.1303	0.0536	0.0986
Democracy (D_C)	Yes	39.72	51.75	214.01
		(29.18)	(33.07)	(95.53)
Dictatorship (E_NC)	Yes	52.74	24.60	169.87
		(29.60)	(24.90)	(135.55)
t-test p-value (One side)	N=8+8	0.0679	0.0022	0.0099
Democracy (D_C)	Yes & No	41.27	50.52	198.08
		(27.54)	(32.47)	(96.40)
Dictatorship (E_NC)	Yes & No	51.24	29.87	189.80
		(25.10)	(24.50)	(129.25)
t-test p-value (One side)	N=17+17	0.0264	0.0007	02440

Study 3 – Same-governance interactions (DD_C/EE_NC) – Peace

Team	Peace	Conflict	Team Production	Earnings
Democracy (DD_C)	Yes	41.25	53.53	212.28
		(30.01)	(32.67)	(94.23)
Dictatorship (EE_NC)	Yes	46.28	33.97	187.68
		(27.88)	(28.65)	(143.32)
t-test p-value (One side)	N=16+16	0.1806	0.0006	0.0276

The first part of the middle section shows Study 2 data for interactions between democracies and dictatorships without peace. Here democracies still invest less in the conflict when facing a dictatorship, though the difference is not significant in the aggregate. Importantly, Team Production and Earnings are both significantly higher for democracies, indicating their greater overall success. Note that this pattern is the same as for the comparison of conflicts between full democracies with those between full dictatorships.

Table 9: Investment in conflict
With and Without Peace

	(1)	(2)	(3)	(4)	(5)	(6)
	D_C & E_NC No Peace		D_C & E_NC – Peace		DD_C, EE_NC – Peace	
Constant (Democracy)	46.84***	19.02***	44.62***	19.69**	45.41***	40.31***
	(4.598)	(6.661)	(6.317)	(9.380)	(4.204)	(11.96)
Dictatorship	7.433***	21.65***	12.45[a]	27.32**	5.028	-4.833
	(2.180)	(7.790)	(8.075)	(13.08)	(5.343)	(15.12)
Peace message				0.482		-7.836**
				(5.470)		(3.924)
Dict. * Peace msg.				-9.553		-8.025
				(7.057)		(7.041)
L (Peace msg.)				-1.638		-4.578
				(4.689)		(3.832)
Dict. * L (Peace msg).				-1.923		12.12**
				(6.607)		(4.715)
Period	Yes	Yes	Yes	Yes	Yes	Yes
L (Win)	No	Yes	No	Yes	No	Yes
L (Team Production)	No	Yes	No	Yes	No	Yes
L (Conflict J)	No	Yes	No	Yes	No	Yes
Observations	360	342	302	267	640	608
Number of Groups (N=6)	9	9	8	8	16	16

[a] p-value=0.123, one sided p-value<0.10

Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per team and period. Controls include Period (round, 1 to 20), the dummy variable L (Win) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Team Production) {investment in team production in the previous round} and L (Conflict J) {investment in conflict made by the other team of three players in the previous round}, and interaction terms with the treatment dummies {e.g. L (Win}*II, L (Win}*EE…}. Full results in Appendix B.
Robust standard errors clustered by groups of 6
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9, columns 1 and 2, reproduce the Table 4 regression analysis of team level conflict investment, respectively without and with controls, only now for full democracies when facing full dictatorships. (Note this table includes results from Study 3, which are discussed later.) As before, L(.) indicates a one-period lag. The Dictatorship dummy variable is positive and significantly different from zero in both models indicating that dictator teams invest more in conflict than the democratic ones. Result 9 follows.

Result 9: *In full dictatorship v. full democracy conflicts, democracy conflict investment is smaller than the investment by the dictatorship.*

Result 9 suggests that the greater bellicosity of full dictatorships than democracies in Study 1 is a more general property of these governance structures.

Table l0 contains regressions on Team Production, following the structure of the previous analysis of team production in Tables 6 and 7. Focusing on the Study 2, results in Columns 1 and 2, for D-E conflicts without peace, the dictatorship dummy is significant and negative, indicating that dictatorships invest less in team production. In other words, the same individual causal mechanism found in Study 1 as contributing to lower conflict investment in a full democracy also operates for a full democracy-full dictatorship conflicts of Study 2.

Table 10: Investment in team production
D_C versus E_NC - Peace

	(1)	(2)	(3)	(4)	(5)	(6)
	D_C & E_NC		D_C & E_NC		DD_C & EE_NC	
	No Peace		With Peace		With Peace	
Constant (Dem.)	44.45***	46.79***	41.15***	37.32***	46.94***	47.01***
	(5.425)	(2.570)	(5.906)	(5.924)	(4.626)	(6.110)
Dictatorship	-15.19***	-13.33***	-26.52***	-25.53***	-19.57***	-23.34***
	(1.441)	(2.673)	(8.078)	(8.008)	(5.372)	(6.047)
Peace message				4.714		5.406
				(3.688)		(4.115)
Dict. * Peace msg.				-0.0259		6.131
				(4.742)		(6.395)
L (Peace msg.)				0.179		4.747
				(3.177)		(3.804)
Dict.*L (Peace msg.)				-4.014		-1.811
				(4.455)		(5.729)
Period	Yes	Yes	Yes	Yes	Yes	Yes
L (Win)	No	Yes	No	Yes	No	Yes
L (Inequality)	No	Yes	No	Yes	No	Yes
L (Team Production above)	No	Yes	No	Yes	No	Yes
L (Team Production below)	No	1,026	No	Yes	No	Yes
Observations	1080	9	906	839	1,920	1,824
Number of Groups (N=6)	8	Yes	8	8	16	16

Panel data regressions. Team Production investment made by subjects. One observation per subject and period. Controls include Period (round, 1 to 20), the dummy variable L (Win) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Inequality) {the standard deviation of team earnings in the previous round}, L (Team Production above) {investment in team production above the team average, 0 if not above, in the previous round} and L (Team Production below) {investment in team production below the team average, 0 if not below, in the previous round}. Full results in Appendix B. Robust standard errors clustered by groups of 6. *** p<0.01, ** p<0.05, * p<0.1

Finally, we note from Table 8 that the total conflict investment in full democracy-full dictatorship conflicts is higher than the conflict investment in the full democracy-full democracy ones (68.58 v 92.54); and significantly so in a one tail, t-test (p=0.0079).

Result 10: *Total conflict investment is higher in full democracy-full dictatorship conflicts than full democracy-full democracy ones.*

Hence, conflicts involving one dictatorship are overall more wasteful than those involving two democracies.

4.2 Study 3: Conflict with a 'peace' option

In the second extension, we introduce a 'peace' move into the Tullock contest. Prior research on communication in contests has focused primarily on the effect of within-group communication, as in our Study 1, while between-group communication has received less attention (Sheremeta 2018). Cason et al. (2012) show that pre-play communication can lead to more aggressive behavior in between-group competition; Leibbrandt, A. and Sääksvuori, L. (2012), on the other hand, show that open communication between contesting groups can reduce investment in confict. Clearly, the details of the setting matter. In our experiment, each team can in each round send a non-binding 'peace' message to the other about whether they plan to invest in conflict.

In practice, countries or other groups that are in conflict do not simply make decisions over how much to invest in conflict; instead, they can engage in prior discussions in the hope that they might come to a non-conflictual resolution of the dispute. Typically, however, there are no institutions to make any such agreement binding (e.g. the famous short-lived Munich agreement of 1938). We have incorporated this possibility of negotiated resolution through an additional move to be made by each team prior to their conflict investment decision. As noted above, the teams are also told that if actual subsequent invest decisions are zero for both teams, then they have an equal chance of receiving the prize. As a result, with a 'peace' agreement that the teams both then follow, they can be expected, with repetition, to share the prizes equally and incur no costs. A democratic team makes a decision over what message to send through voting in the same fashion as it decides what conflict investment to make. In dictatorships, the dictator makes the message decision unilaterally.

In Table 8, in the full dictator-full democracy interactions with peace, in the middle of the second section, it can be seen that full democracies paired with dictatorships still invest less in conflict than dictatorships: 53 v 40 (p=.07). In the Table 9, columns 3 and 4 give the team conflict investment regression when there is the peace option. Column 3 has no controls other than a period dummy and the dictator dummy is weakly significantly positive in a one-sided t-test. Column 4 has the same controls as before plus some additional ones that allow for possible influences from sending peace messages now and in the previous round and for

any such influence to vary with dictatorship. The dictatorship dummy is significantly positive and none of the peace controls is significant. Result 11 follows.

Result 11: *With the peace option, full democracies invest less in conflict than full dictatorships in full democracy v full dictatorship conflicts and, in regressions on team conflict investments, the dictator dummy is significant and positive when controlling for other factors that can influence conflict investment.*

Furthermore, Tables 8 and 9 point to the same causal mechanisms underpinning this difference between democracies and dictatorships that was found in Study 1 on the democratic peace causal thesis: deliberation is associated with team production contributions that are significantly higher in the aggregate (Table 8) in the full democracy than the full dictatorship ($p = 0.0022$) and the coefficient on the dictator dummy on individual contributions is significant and negative (Table 9). Earnings are also significantly higher in the democracy. Finally, we note that when the No Peace and Peace sessions are pooled (denoted by Yes&No), the difference in aggregate conflict investment becomes statistically significant due to the larger sample size in the pooled data ($p=0.0264$).

The addition of the peace option to DD and EE conflicts is shown in the bottom section of Table 9. This allows us to examine the robustness of the Study 1 **DP** result. These data reveal a continuing gap in conflict investment but it is smaller than in Study 1 and not significant in the aggregate: 46 versus 41 ($p= 0.1806$, in a one-sided t-test).

Columns 5 and 6 in Table 9 give the individual team conflict investment regressions for these conflicts with the peace option. Column 5 has only a period control and the dictatorship dummy is not significant. Column 6 has the controls for the other possible factors influencing conflict investment and while the dictator dummy remains insignificant the lagged peace interact with the dictator dummy is significant and positive. This means that full dictator teams do investment more in conflict than full democracies when the dictators have sent a peace message in the previous message. (Recall that the investment decision in each round is made without knowledge how the other team responded to the message that was sent, but they do know how the previous message worked out.) Thus, there is no evidence from this extension that contradicts the **DP** result in Study 1 and there is some in support of the **DP** result of Study 1. Result 12 follows.

Result 12 (support for democratic peace causal relation): *Full democracies invest less in conflict than full dictatorships in the aggregate and, in the individual team conflict*

investment regression, the dictator dummy interacted with a lagged peace message is significant and positive.

Finally, there is some evidence in this peace extension in Study 3 to support the same Study 1 causal mechanism being responsible for this key difference in the way that a full democracy as compared with a full dictatorship behaves over conflict investment. Team production in Table 8 is substantially lower in the dictatorship and the gap is statistically significant: 54 v 34 (p=0.0006 in a one-sided t-test). And in the individual team production contribution regressions in Table 10, the dictator dummy is significant and negative in both column 5 (without controls) and in column 6 (with controls).

5. Discussion

We begin with the specific implications of our results for the Democratic Peace causal thesis. We find support for this causal relation in Study 1 when we compare disputes involving full democracies with those involving full dictatorships, provided we control for other factors that can influence conflict investment. There also appears to be a simple individual behavioural causal mechanism that underpins this relation between peace and democracy in our experiment. Of the three dimensions of governance along which a full dictatorship can be distinguished from a full democracy, only one has a consistent effect on conflict investment: deliberation. Neither voting nor inclusivity (equal treatment) have a systematic effect on conflict investment. Furthermore, we find evidence that deliberation has this effect because, behaviourally, it encourages team production. This, in turn increases the opportunity cost of conflict investment for full democracies as compared with full dictatorships.

We have a specific robustness check on these findings in Study 3 when, with the addition of an initial peace option, disputes between full democracies are again compared with those between full dictatorships. We find the same individual behavioural causal mechanism in operation in this case: full democracies do invest significantly more in team production than full dictatorships here, as in Study 1. Further, there is some, albeit weaker, evidence that full democracies continue to invest less in conflict than full dictatorships: they do so when dictatorships have sent a peace message in the previous round and we control for other possible factors that can influence the conflict investment.

In Study 2, where full democracy is in conflict with a full dictatorship, we again find that democracies have significantly higher team production---thus making this behavioural individual causal mechanism an apparent robust distinguishing feature of full democracies

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when compared with full dictatorships. Furthermore, in Study 2, the predicted difference in conflict investment between a full democracy and a full dictatorship that flows from the difference in team production is not only there, it is significant when we control for the other factors that can influence conflict investment.

We also find in Study 2 that total conflict investment in these full democracy-full dictatorship conflicts is higher than in full democracy-full democracy ones. This is interesting because it reproduces another feature of the observational data: conflict outside the lab is actually more intense when the disputes are between a democracy and a dictatorship than when they are between democracies (see Coconi et al., 2014). This is <u>not</u> the empirical regularity of the **DP** thesis that we have sought to test in Study 1, but the fact that the Study 2 extension reproduces another aspect of the empirical regularities found in the observational data on conflict, and with the same individual causal mechanism, adds to the general confidence in our findings.

Our results are also broadly consistent with others that have been found in the experimental literature. For example, the general positive effect of chat on contributions to team production is a common finding in public goods experiments. Likewise, inequality has, if anything, a negative effect on team production in our experiment and this too has been found in public goods experiments (see Appendix B). Overinvestment, though, we should note, is a typical result in the contest literature (especially for teams);[16] whereas the reverse is the case here. This is perhaps because, unlike in many contest experiments, resources not used in the contest in our setting can be used productively in team production (that is, when invested in team production, they double in value). In theory, this only matters in extractive dictatorship when individuals are selfish. But it will matter in D and I too if individuals are pro-social and so expect their team members to make contributions to team production; and of course, they do, and more strongly so under deliberation. In this context, our unusual result, of lower investments in the conflict than the selfish Nash predictions, is not so surprising. It is predicted by pro-sociality (e.g. see the team reasoning prediction in Table 2).[17]

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[16] Abbink et al. (2010) and Fallucchi et al. (2021) explore contests between teams, and demonstrate over-investment in conflict by teams. Fallucchi et al. (2021) compare the predictions of a standard model with the ones arising from alternatives, including competitive preferences, joint payoff maximizing and asymmetric inequality aversion. All alternative models predict investment above the standard one, and the model with asymmetric inequality aversion is closest to the data.

[17] This is an interesting insight because it suggests that overinvestment may arise in these experiments because such investments disproportionately attract the attention of subjects when they are productive unlike funds kept in a private account.

6. Conclusion

The Democratic Peace causal thesis is important not least because it has influenced US foreign policy. It plausibly also has wider significance for the choice of governance arrangements in any collectivity that is involved in a possible conflict with another. For example, there are frequent contests between political parties, corporations, etc., over prizes of one kind or another and the democratic peace thesis is a claim that there will be less waste of resources on trying to win these contests if the collectivities are internally, democratically organised.

We test whether there is causal relation between democracy and peace through an experiment where we compare investment in a conflict between full democracies with the investment made when the same conflict occurs between full dictatorships. For this purpose, we distinguish a democracy from a dictatorship along three governance dimensions: voting (or not), inclusion (or not) and deliberation (or not). A full democracy is marked by the presence of all three and a full dictatorship by the absence of all three. The democratic peace causal relation holds.

We also find that one aspect of democratic governance is responsible for this difference: deliberation. Neither voting nor inclusion have a systematic effect on conflict investment in our experiment. In part as result of this, we also find no evidence that the democratic peace causal relation arises because individuals face different incentives under these different governance arrangements. Instead, deliberation is an important governance difference because it boosts contributions to team production. This is a behavioural mechanism that has been noted in other contexts when chat is added to a public goods game. In our setting, this boost raises the opportunity cost of conflict for full democracies with the result that they invest less in it when compared with the full dictatorship.

This appears to be a robust distinguishing feature of full democracies when compared with full dictatorships because it is also found in our two extensions in Studies 2 and 3. We find that the operation of the same behavioural individual causal mechanism tends to make full democracies invest less in conflict than full dictatorships both in conflicts between democracies and dictators and when there is an explicit, initial peace option.

With respect to the democratic peace thesis, our findings might be interpreted in two ways. On the one hand, it is natural to compare a full democracy with its opposite form of full dictatorship because this comparison involves a difference along each of the governance

dimensions that could distinguish a democracy from a dictatorship. The democratic peace result is therefore significant and points to an important consequence of democracy. However, the dependence of the democratic peace result on deliberation means that there is no similar clear result for the possible comparisons between other weaker types of democracies and other weaker types of dictatorships. In this sense, the result linking democracy to peace does not generalise to other weaker forms of democracy and dictatorship.

Alternatively, the findings can be taken to highlight the more general importance of deliberation within governance arrangements for the promotion of peace. This is the key attribute of a democracy and it is also conceivable that at least some degree of deliberation can be accommodated within otherwise dictatorial governance arrangements. In other words, the democratic peace causal relation holds for the diametric opposites, but it does not hold systematically outside this comparison for weaker forms of democracy and dictatorship. This is perhaps the key message of our experiment. When democracy is promoted in the name of peace, whether between countries or between other kinds of groups, the democracy has to be deliberative.

6. References

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All instructions as shown on screen

1. Instructions for Democracy (D)
Introduction
Welcome to our experiment. Please read the following instructions carefully. During the experiment you have to make various decisions that can earn you real money. Please, keep quiet during the entire experiment and if you have a question at any point in the experiment, just raise your hand.

All participants in the experiment have received the same set of instructions.

Assignment to a group
At the beginning of the experiment, participants are randomly assigned to groups of 3 people. You will stay in the same group for the entire experiment.

Earnings
Each person receives an initial endowment of 100 experimental points. These points will be used to make decisions, and you will earn additional points during the experiment. Points will be converted to dollars at the end of the experiment at the rate of 10 points = 1 dollar.

Decisions
Groups make two decisions in each round. The first is a group competition decision over how much (the same amount for each member) to place into a group competition fund. The winner of the group competition wins a prize. The second is an individual decision over how much of what remains of the individual endowment to invest, either in a private account or in a joint group account. There are 20 rounds of decision making.

Group competition
The first decision in each round is a group decision to determine how much each group member will place in the group competition fund. This fund will be used to compete with another group. The amount placed in the fund is the same amount for each individual in a group.

All group members participate in the decision over the individual contribution level. Each group member proposes an individual contribution level and the group choice is the median proposal– the one in the middle. For example, if the three group members propose 10, 40 and 50, the median proposal is 40 and so everyone contributes 40 points with the result that the group competition fund has 120 points.

The other group that you are matched with also must determine how much to place in the group competition fund. Their decision is made in the same way.

Insert: chat treatments:

> Before all the members of a group make their suggestions, there is the opportunity for them to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 1 minute.

_____

Group Competition, Continued

Each group is randomly paired with another group in a competition for a prize. The same groups are paired together for each of the 20 rounds. The winning group in each round gets a prize of ~~500~~ 600 points and this is shared equally among the members of the group. Each group knows the type of group (H or D) they belong to and the type of group (H or D) they are paired with. The probability of a group winning the prize depends on the size of its competition fund relative to that of the group it is paired with. The bigger the group's competition fund relative to the other, the higher is the chance that it wins the prize. In particular, the probability that your group wins against the other group is given by:

$$\frac{\text{Your Competition Fund}}{(\text{Your Competition Fund} + \text{Other Group's Competition Fund})}$$

Group Competition: Example

EXAMPLE: Suppose that your group's competition fund is 120 points, and the other group's competition fund is 40 points. The probability that you wins the prize is $120/(120+40) = 0.75$; and the probability that B wins the prize is $40/(120+40) = 0.25$. Note that if both funds are the same size, then your chance of winning is .50.
The computer will draw a random number to determine who wins the competition.

Individual Decision

The second decision concerns what remains of an individual's endowment after the group competition decision. Each individual decides how much of this residual to invest in a private account and how much to invest in a joint account with other group members. Every point that you invest in the private account returns one point to you. Every point that you invest in the joint account is doubled by the experimenter and then divided equally among all three members of your group.

EXAMPLE: Suppose the competition decision is a contribution of 40 points to the group competition fund. This leaves 60 endowment points for each individual in the group. Suppose that you allocate 20 to the joint account (and 40 into your private account) and the other two group members both allocate 30 to the group account (leaving 30 in their private accounts). The joint account therefore has an allocation of $20+30+30 = 80$. This doubles in value (to 160) and is shared equally. So you get 53.3 from the joint account. Your earnings will then be 40 from your private account, plus your share of the joint account, $40+53.3 = 93.3$ points.

Payoffs and information

At the end of each round, you will be told:
The size of your group's competition fund
The size of the competition fund for the group that you have been paired with
The winner of the competition
Your group members' decisions about how much to put in the group's joint account
Your total pay-off then has three parts:

       your share of the prize (if your group wins)
     + your allocation to the individual account
     + your share of the joint account.

Your Actual Payoff

At the end of the 20 rounds, one round will be chosen at random. Your pay-offs in this round will be converted into dollars at the rate of ten points = $1. The dollar earnings from this round, plus your show up fee, adds up to your pay-off from the experiment.

Before starting to make decisions, we ask you to fill in a questionnaire. The only purpose of the questionnaire is to check whether you have understood these instructions. When you have completed the questionnaire, please wait for the experimenter to come to check your answers.

Quiz questions

This question is about the Competition Fund. Suppose you suggest 60, and the other suggestions from your group are 3 and 47. What amount will be selected for each member to place in the Competition Fund? _____.

How much will you have left for the individual decision?   _____

This question is about the Individual Decision. Suppose your group decides to put 30 in the Competition Fund, leaving you with 70. Also suppose you put 20 into the group account, and the other group members put 15 and 25. What will be your share of the group account? _____ What will be your earnings from your private account? _____

Decision and outcome screens

Group Competition Decision

Recall that you and your group members each get to make a proposal for the amount to put in the Competition Fund. The median proposal will be implemented. There is no right or wrong decision; you should make the proposal you think is best.

My Proposal is _____.

(Submit)

Group Competition Outcome

You suggested _____, and the other suggestions were _____ and _____. The median suggestion is _____.

This amount is now deducted and put into the Competition Fund. You will find out later whether your group wins.

Individual Decision

Now you must decide how to divide your remaining funds, _____.

Each point invested in the private account returns one point to you.

Each point invested in the joint account is doubled by the experimenter and then evenly divided among all three group members.

Please indicate your allocation below (must add to your total remaining funds):

Private Account_____

Group Account _____

Competition

Your group put XX into the Competition Fund, and the other group put YY into the Competition Fund.

The probability that your group will win is xx and that the other group will win is yy.

The computer has drawn a random number and determined that your group WINS/LOSES.

Earnings from the accounts

You put ZZ into your private account.

The total contributed to the joint account is AA. Therefore your share of the earnings from this account is (AA*2)/3.

Total Earnings

Your earnings for this round are as follows:

CC from your private account
DD from the joint account
EE from your share of the competition

Your total earnings this round _____

2. Instructions for Inclusive Dictatorship (I)

Instructions

Introduction

Welcome to our experiment. Please read the following instructions carefully. During the experiment you have to make various decisions that can earn you real money. Please, keep quiet during the entire experiment and if you have a question at any point in the experiment, just raise your hand.

All participants in the experiment have received the same set of instructions.

Assignment to a group

At the beginning of the experiment, participants are randomly assigned to groups of 3 people. You will stay in the same group for the entire experiment.

Earnings

Each person receives an initial endowment of 100 experimental points. These points will be used to make decisions, and you will earn additional points during the experiment. Points will be converted to dollars at the end of the experiment at the rate of 10 points = 1 dollar.

Decisions

Groups make two decisions in each round. The first is a group competition decision over how much (the same amount for each member) to place into a group competition fund. The winner of the group competition wins a prize. The second is an individual decision over how much of what remains of the individual endowment to invest, either in a private account or in a joint group account. There are 20 rounds of decision making.

Group competition

The first decision in each round is a group decision to determine how much each group member will place in the group competition fund. This fund will be used to compete with another group. The amount placed in the fund is the same amount for each individual in a group.

In your group, one member is randomly selected as the Group Decider and he or she decides in every round the amount that each group member places into the group competition fund. For example, if this person decides that 30 points per group member should be placed into the fund, then the group will have a competition fund of 90 points.

The other group that you are matched with also must determine how much to place in the group competition fund. Their decision is made in the same way.

Insert: Chat treatments:

Before the Group Decider decides on the amount each member places in the group competition fund, there is the opportunity for the members of a group to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 1 minute.

Group Competition, Continued

Each group is randomly paired with another group in a competition for a prize. The same groups are paired together for each of the 20 rounds. The winning group in each round gets a prize of 600 points and this is shared equally among the members of the group. The probability of a group winning the prize depends on the size of its competition fund relative to that of the group it is paired with. The bigger the group's competition fund relative to the other, the higher is the chance that it wins the prize. In particular, the probability that your group wins against the other group is given by:

$$\frac{\text{Your Competition Fund}}{(\text{Your Competition Fund} + \text{Other Group's Competition Fund})}$$

Group Competition: Example

EXAMPLE**:** Suppose that your group's competition fund is 120 points, and the other group's competition fund is 40 points. The probability that you wins the prize is 120/(120+40) = 0.75; and the probability that B wins the prize is 40/(120+40) = 0.25. Note that if both funds are the same size, then your chance of winning is .50.

The computer will draw a random number to determine who wins the competition.

Individual Decision

The second decision concerns what remains of an individual's endowment after the group competition decision. Each individual decides how much of this residual to invest in a private account and how much to invest in a joint account with other group members. Every point that you invest in the private account returns one point to you. Every point that you invest in the joint account is doubled by the experimenter and then divided equally among all three members of your group.

EXAMPLE: Suppose the competition decision is a contribution of 40 points to the group competition fund. This leaves 60 endowment points for each individual in the group. Suppose that you allocate 20 to the joint account (and 40 into your private account) and the other two group members both allocate 30 to the group account (leaving 30 in their private accounts). The joint account therefore has an allocation of 20+30+30 = 80. This doubles in value (to 160) and is shared equally. So you get 53.3 from the joint account. Your earnings will then be 40 from your private account, plus your share of the joint account, 40+53.3 = 93.3 points.

Payoffs and information

At the end of each round, you will be told:

The size of your group's competition fund

The size of the competition fund for the group that you have been paired with

The winner of the competition

Your group members' decisions about how much to put in the group's joint account

Your total pay-off then has three parts:

> your share of the prize (if your group wins)
> + your allocation to the individual account
> + your share of the joint account.

Your Actual Payoff

At the end of the 20 rounds, one round will be chosen at random. Your pay-offs in this round will be converted into dollars at the rate of ten points = $1. The dollar earnings from this round, plus your show up fee, adds up to your pay-off from the experiment.

Before starting to make decisions, we ask you to fill in a questionnaire. The only purpose of the questionnaire is to check whether you have understood these instructions. When you have completed the questionnaire, please wait for the experimenter to come to check your answers.

Quiz questions

This question is about the Competition Fund. Suppose you are selected to be the Group Decider for your group. If you want there to be 120 in the Competition Fund, how much will each person (including you) place in the Fund? _____. How much will you have left for the individual decision? _____

This question is about the Individual Decision. Now suppose your Group Decider decides that everyone will put 30 in the Competition Fund, leaving you with 70. Also suppose you put 20 into the group account, and the other group members put 15 and 25. What will be your earnings from the group account? _____ What will be your earnings from your private account? _____

<div align="center">**Decision and outcome screens**</div>

<div align="center">**Group Competition Decision** (The Dictator sees this one)</div>

Recall that one person in your group is selected to be the Group Decider. That person determines the amount that all members of your group will put in the Competition Fund.

YOU have been selected as the Group Decider. You will retain this role for the rest of the experiment.

<div align="center">**Group Competition Decision** (Non-dictators see this one)</div>

Recall that one person in your group is selected to be the Group Decider. That person determines the amount that all members of your group will put in the Competition Fund.

One of the other group members has been selected as the Group Decider. The Group Decider remains the same for the rest of the experiment.

Please wait while the Group Decider makes a decision

<div align="center">**Group Decider Decision**</div>

Please indicate below how much you want <u>each person</u> to place into the Competition Fund this round. (Remember that the total placed in the Fund is three times this amount.)

There is no right or wrong decision; you should make the decision that you think is best.

My decision is _____.

(Submit)

<div align="center">**Group Competition Decision**</div>

The Group Decider determined that each group member will place XX into the Competition Fund.

This amount is now deducted and put into the Competition Fund. You will find out later whether your group wins.

<div align="center">**Individual Decision**</div>

Now you must decide how to divide your remaining funds, _____.

Each point invested in the private account returns one point to you.

Each point invested in the joint account is doubled by the experimenter and then evenly divided among all three group members.

Please indicate your allocation below (must add to your total remaining funds):

     Private Account_____

     Group Account _____

<div align="center">**Competition**</div>

Your group put XX into the Competition Fund, and the other group put YY into the Competition Fund.

The probability that your group will win is xx and that the other group will win is yy.

The computer has drawn a random number and determined that your group WINS/LOSES.

<div align="center">**Earnings from the accounts**</div>

You put ZZ into your private account.

The total contributed to the joint account is AA. Therefore your share of the earnings from this account is (AA*2)/3.

<div align="center">**Total Earnings**</div>

Your earnings for this round are as follows:

CC from your private account

DD from the joint account

EE from your share of the competition

Your total earnings this round _____

<div align="center">45</div>

3. Instructions for Extractive Dictatorship (E)

Introduction

Welcome to our experiment. Please read the following instructions carefully. During the experiment you have to make various decisions that can earn you real money. Please, keep quiet during the entire experiment and if you have a question at any point in the experiment, just raise your hand.

All participants in the experiment have received the same set of instructions.

Assignment to a group

At the beginning of the experiment, participants are randomly assigned to groups of 3 people. You will stay in the same group for the entire experiment.

Earnings

Each person receives an initial endowment of 100 experimental points. These points will be used to make decisions, and you will earn additional points during the experiment. Points will be converted to dollars at the end of the experiment at the rate of 10 points = 1 dollar.

Decisions

Groups make two decisions in each round. The first is a group competition decision over how much (the same amount for each member) to place into a group competition fund. The winner of the group competition wins a prize. The second is an individual decision over how much of what remains of the individual endowment to invest, either in a private account or in a joint group account. There are 20 rounds of decision making.

Group competition

The first decision in each round is a group decision to determine how much each group member will place in the group competition fund. This fund will be used to compete with another group. The amount placed in the fund is the same amount for each individual in a group.

In your group, one member is randomly selected as the Group Decider and he or she decides in every round the amount that each group member places into the group competition fund. For example, if this person decides that 30 points per group member should be placed into the fund, then the group will have a competition fund of 90 points. If your group wins, the Group Decider determines how the prize is divided among the members of your group.

The other group that you are matched with also must determine how much to place in the group competition fund. Their decision is made in the same way. If they win, their Group Decider determines how the prize is divided.

Insert: Chat treatments:

> Before the Group Decider decides on the amount each member places in the group competition fund, there is the opportunity for the members of a group to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 1 minute.

Group Competition, Continued

Each group is randomly paired with another group in a competition for a prize. The same groups are paired together for each of the 20 rounds. The winning group in each round gets a prize of 600 points. The Group Decider gets to decide how the prize is shared. The Group Decider will first decide his/her own share, then the rest will be equally divided between the two remaining group members.

The probability of a group winning the prize depends on the size of its competition fund relative to that of the group it is paired with. The bigger the group's competition fund relative to the other, the higher is the chance that it wins the prize. In particular, the probability that your group wins against the other group is given by:

$$\frac{\text{Your Competition Fund}}{\text{(Your Competition Fund + Other Group's Competition Fund)}}$$

You will find out who won and how the prize is shared later.

Group Competition: Example

EXAMPLE: Suppose that your group's competition fund is 120 points, and the other group's competition fund is 40 points. The probability that you wins the prize is 120/(120+40) = 0.75; and the probability that B wins the prize is 40/(120+40) = 0.25. Note that if both funds are the same size, then your chance of winning is .50.

The computer will draw a random number to determine who wins the competition.

Individual Decision

The second decision concerns what remains of an individual's endowment after the group competition decision. Each individual decides how much of this residual to invest in a private account and how much to invest in a joint account with other group members.

Every point that you invest in the private account returns one point to you. Every point that you invest in the joint account is doubled by the experimenter and then divided by the Group Decider among all three members of your group.

The Group Decider will determine his/her share, then the rest will be divided equally between the remaining two group members.

Individual Decision, Example

EXAMPLE: Suppose the competition decision is a contribution of 40 points to the group competition fund. This leaves 60 endowment points for each individual in the group. Suppose that you allocate 20 to the joint account (and 40 into your private account) and the other two group members both allocate 30 to the group account (leaving 30 in their private accounts).

The joint account therefore has an allocation of 20+30+30 = 80. This doubles in value (to 160).

The distribution of the earnings are determined by the Group Decider. Your earnings will then be 40 from your private account, plus your share of the joint account as determined by the Group Decider.

Payoffs and information

At the end of each round, you will be told:

The size of your group's competition fund

The size of the competition fund for the group that you have been paired with

The winner of the competition

How the prize is shared (if your group wins)

Your group members' decisions about how much to put in the group's joint account

Your total pay-off then has three parts:

      Your earnings from the private account

      Your share of the joint account.

      Your share of the prize (if your group wins)

Your Actual Payoff

At the end of the 20 rounds, one round will be chosen at random. Your pay-offs in this round will be converted into dollars at the rate of 12 points = $1. The dollar earnings from this round, plus your show up fee, adds up to your pay-off from the experiment.

Before starting to make decisions, we ask you to fill in a questionnaire. The only purpose of the questionnaire is to check whether you have understood these instructions. When you have completed the questionnaire, please wait for the experimenter to come to check your answers.

Quiz questions

This question is about the Competition Fund. Suppose you are selected to be the Group Decider for your group. If you want there to be 120 in the Competition Fund, how much will each person (including you) place in the Fund? _____.

How much will you have left for the individual decision? _____

This question is about the Individual Decision. Now suppose your Group Decider decides that everyone will put 30 in the Competition Fund, leaving you with 70. Also suppose you put 20 into the group account, and the other group members put 15 and 25. What will be the total earnings in the group account? _____ (Recall that your share of the joint account will be decided by the Group Decider.)

What will be your earnings from your private account? _____.

Decision and outcome screens

Group Competition Decision (Dictators see this one)
Recall that one person in your group is selected to be the Group Decider. That person determines the amount that all members of your group will put in the Competition Fund, and later will decide how the prize is divided (if your group wins).

YOU have been selected as the Group Decider. You will retain this role for the rest of the experiment.

Group Decider Decision (Dictators see this one)
Please indicate below how much you want each person to place into the Competition Fund this round. (Remember that the total placed in the Fund is three times this amount.)

There is no right or wrong decision; you should make the decision that you think is best.

My decision is _____.

(Submit)

Group Competition Decision (Non-dictators see this one)
Recall that one person in your group is selected to be the Group Decider. That person determines the amount that all members of your group will put in the Competition Fund.

One of the other group members has been selected as the Group Decider. The Group Decider remains the same for the rest of the experiment.

Please wait while the Group Decider makes a decision

Group Competition Decision
The Group Decider determined that each group member will place XX into the Competition Fund.

This amount is now deducted and put into the Competition Fund. You will find out later whether your group wins.

Individual Decision
Now you must decide how to divide your remaining funds, _____.

Each point invested in the private account returns one point to you.

Each point invested in the joint account is doubled by the experimenter and then the Group Decider determines how this is divided.

Please indicate your allocation below (must add to your total remaining funds):

     Private Account_____
     Group Account _____

Competition Outcome
Your group put XX into the Competition Fund, and the other group put YY into the Competition Fund.

The probability that your group wins is xx and that the other group wins is yy.

The computer has drawn a random number and determined that your group WINS/LOSES.

Sharing the Prize (Dictators see this one, in winning group)
As Group Decider, you now must decide how to divide the prize of 600 among yourself and the other two group members. You must first choose your share, then the other group members will evenly divide the rest.

Amount allocated to yourself _____

Amount allocated to each other group member _____

Sharing the Prize (Non-dictators see this one, in winning group)
Please wait while the Group Decider determines how the prize will be shared.

The Group Decider has determined that your share of the prize is _____

50

<div align="center">**Joint account outcome** (Dictators see this one)</div>

You put ZZ into your private account.

The total contributed to the joint account is AA. The total earnings from the joint account are AA*2= ??

As Group Decider, you now must decide how to divide the earnings from the <u>joint account</u> among yourself and the other two group members. You must first choose your share, then the other group members will evenly divide the rest.

Amount allocated to yourself _____

Amount allocated to each other group member _____

<div align="center">**Joint account outcome** (Non-dictators see this one)</div>

You put ZZ into your private account.

The total contributed to the joint account is AA. Total earnings from the joint account are AA * 2 = ??

Please wait while the Group Decider determines how the earnings from the joint account will be divided.

<div align="center">**Sharing the Joint Account (**Non-dictators see this one)</div>

The Group Decider has determined that your share of the joint account earnings is _____

<div align="center">Round Earnings</div>

Your earnings for this round are as follows:

CC from your private account

EE from your share of the competition

DD from the joint account

Your total earnings this round _____

Summary of instructions for Study 2
Handout for Study2: Democracy v. Dictatorship
(Note both groups get detailed screen-shot instructions as above)

Welcome to the experiment!

Introduction:
In this study you will make two decisions in each round. There are 20 rounds. One round will be
    selected randomly and your earnings for that round will be paid in cash. The exchange rate is
    12 points = $1.

Groups:
You are in a group of three persons. Your group is matched with another group of three persons.
    Both the group and the matching stay the same for the 20 rounds. You begin with 100 points in
    each round.

<u>*Decision 1: Group Competition*</u>
Your group is matched with another group to compete for a prize of 600 points. These groups are
    organized differently. You will find out which group you are assigned to when the study
    begins.

*<u>Group D</u>: Each person in this group makes a suggestion about how many points to place into the
    Group Competition Fund. The median suggestion (the one in the middle) will be selected.* This
    is the amount that each person will place into the Group Competition Fund. If this group wins,
    the prize is evenly divided among the members of their group (200 each).

*Before any decision is made, there is the opportunity for the members of Group D to chat with each
    other through a chat box.* In the chat box, each member of a group can write messages that all
    members of their group see. This opportunity for chat lasts <u>2 minutes</u> in the first round and <u>1
    minute</u> in each round after the first.

*<u>Group E</u>: One person in this group is randomly chosen to be the Group Decider. In each period, the
    Group Decider determines how much each member of Group E will place in the Group
    Competition Fund. Each group member contributes the same amount to the Fund, and if the
    group wins, the Group Decider determines how the prize is distributed among this group's
    members. Group E does not have an opportunity to chat, and will wait while the other group
    chats*.

<u>*How group competition works:*</u> Your chance of winning depends on the amount in your group's
    Competition Fund and in the other group's Competition Fund. The formula for the probability
    that your group will win is:

Your Competition Fund ÷ (Your Competition Fund + Other Group's Competition Fund).

If you both have the same amount in your Funds then the chances of winning are equal (50/50). The
    computer will draw a random number to determine who wins, and you will be notified of the
    outcome later.

<u>*Decision 2: Individual Decision*</u>
Each person in your group makes an independent decision of how much of their remaining funds to
    allocate to a Joint Account and how much to a Private Account. Each point placed in the
    Private Account returns one point to you. Both groups make this decision. *In <u>Group D</u>, each
    point placed in the Joint Account is doubled and equally shared among all three group
    members. In <u>Group E</u>, the Group Decider determines how the prize is divided among the three
    persons in the group.*

Round earnings:
Your round earnings consist of three parts:
        1. Your earnings from the Private Account
        2. Your share of earnings from the Joint Account
        3. Your share of the prize (if your group wins the competition).

Experiment Earnings:
One round is selected randomly and you will be paid your round earnings for that round in addition to
    your show-up fee of $10.

Summary of instructions for Study 3
Handout for Study 3: DD with Peace (summary of instructions)
(Note both groups get detailed screen-shot instructions as above)

Welcome to the experiment!

Introduction:
In this study you will make two types of decisions in each round of the study. There are 20 rounds in total. One round will be selected randomly and your earnings for <u>that round</u> will determine your earnings. The exchange rate is 12 points = $1.

Groups:
You are in a group of three persons. Your group is matched with another group of three persons. Both your group and the group you are matched with stay the same for the 20 rounds. You begin with 100 points in each round.

Decision 1: Group Competition
Your group is matched with another group to compete for a prize of 600 points. For the group that wins, the prize will be evenly divided among that group's members (200 each). If there is a tie, including if both groups invest zero, the computer chooses randomly which group wins. Your group must determine two things for this decision: which message to send to the other group, and how much to invest in the Group Competition.

  A. Sending a message:
<u>Your Group</u>: You first will determine which message you wish to send to the other group. The message indicates to the other group whether you intend to enter the competition. The messages are nonbinding. You may send:

  Yes (we plan to enter the competition), or
  No (we plan to invest zero in the competition).

<u>The Other Group</u>: The group you are matched with is making the same decision, and makes its decision in the same way as your group. Once both decisions are made, you will see the other group's message, and they will see yours.

<u>Discussion</u>: Before the decision is made, there is an opportunity for group members to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 60 seconds in the first round and 30 seconds in each round after the first. When the discussion is over, each group member will suggest Yes (enter) or No (invest zero), and the suggestion entered by the most group members will determine the message that is sent.

  B. Deciding how much to invest:
<u>Your Group</u>: After the messages are exchanged, the second thing you must decide is how much to invest in the fund. Each person in your group makes a suggestion about how many points to place into the Group Competition Fund. The median suggestion of your group members (the one in the middle) will be selected. This is the amount that each person will place the Group Competition Fund. To stay out of the competition, all group members must enter "0" here.

<u>The Other Group</u>: Once again, the group you are matched with is making the same decision, and makes its decision in the same way as your group.

<u>Discussion</u>: Before group members make any suggestions, there is an opportunity for them to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 1 minutes in the first round and 30 seconds in each round after the first. When the discussion is over, each group member will suggest how much to invest, and the median suggestion determines the investment.

Your chance of winning depends on the amount in your group's Competition Fund and in the other group's Competition Fund. The formula for the probability that your group will win is:

Your Competition Fund ÷ (Your Competition Fund + Other Group's Competition Fund).

If you both have the same amount in your Funds (including if you both have zero) then the chances of winning are equal (50/50). The computer will draw a random number to determine who wins, and you will be notified of the outcome later.

Decision 2: Individual Decision

<u>Your Group</u>: Each person in your group makes an independent decision of how much of their remaining funds to allocate to a Joint Account and how much to a Private Account. Each point placed in the Private Account returns one point to you. Each point placed in the Joint Account is doubled, and then divided evenly among the three persons in your group.

Round earnings:

Your round earnings consist of three parts:
1. Your earnings from the Private Account
2. Your share of earnings from the Joint Account
3. Your share of the prize (200 – your share of the 600 prize -- if you win the competition)

Experiment Earnings:

One round is selected randomly and you will be paid your round earnings for that round in addition to your showup fee of $10. Earnings will be paid by Venmo or Paypal within 48 hours

Summary of instructions for Study 3
Handout for Study 3: DE with Peace (summary of instructions)
(Note both groups get detailed screen-shot instructions as above)

Welcome to the experiment!

Introduction:
In this study you will make two decisions in each round. There are 20 rounds. One round will be selected randomly and your earnings for that round will be paid in cash. The exchange rate is 12 points = $1.

Groups:
You are in a group of three persons. Your group is matched with another group of three persons. Both the group and the matching stay the same for the 20 rounds. You begin with 100 points in each round.

Decision 1: Group Competition
Your group is matched with another group to compete for a prize of 600 points. These groups are organized differently. You will find out which group you are assigned to when the study begins. Groups must determine two things for this decision: which message to send to the other group, and how much to invest in the Group Competition.

    C. Sending a message:
Both groups first will determine which message they would like to send to the other group. The message indicates to the other group whether you intend to enter the competition. You may send one of two messages:

        Yes (we plan to enter the competition), or
        No (we plan to invest zero in the competition).

Group D: Before the decision is made, there is an opportunity for group D members to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 90 seconds in the first round and 30 seconds in each round after the first. When the discussion is over, each group member will suggest Yes (enter) or No (invest zero), and the suggestion entered by the most group members will determine the message that is sent to the other group.

Group E: One person in this group is randomly chosen to be the Group Decider. In each period, the Group Decider chooses Yes (enter) or No (invest zero), and the decider´s choice will determine the message that is sent to the other group.

Group E does not have an opportunity to chat and will wait while the other group chats.

    D. Deciding how much to invest:
Group D: In each period, and regardless of the message sent, each person in this group makes a suggestion about how many points to place into the Group Competition Fund. The median suggestion (the one in the middle) will be selected. This is the amount that each person will place into the Group Competition Fund. If this group wins, the prize is evenly divided among the members of their group (200 each).

Before any decision is made, there is the opportunity for the members of Group D to chat with each other through a chat box. In the chat box, each member of a group can write messages that all members of their group see. This opportunity for chat lasts 2 minutes in the first round and 1 minute in each round after the first.

Group E: In each period, and regardless of the message sent, the Group Decider determines how much each member of Group E will place in the Group Competition Fund. Each group member contributes the same amount to the Fund, and if the group wins, the Group Decider determines how the prize is distributed among this group's members.

Group E does not have an opportunity to chat and will wait while the other group chats.

How group competition works: Your chance of winning depends on the amount in your group's Competition Fund and in the other group's Competition Fund. The formula for the probability that your group will win is:

Your Competition Fund ÷ (Your Competition Fund + Other Group's Competition Fund).

If you both have the same amount in your Funds then the chances of winning are equal (50/50). The computer will draw a random number to determine who wins, and you will be notified of the outcome later.

Decision 2: Individual Decision

In each group, each person makes an individual decision of how much of their remaining funds to allocate to a Joint Account and how much to a Private Account. Each point placed in the Private Account returns one point to each person. In each group, points placed in the Joint Account by group members are doubled and shared within their group.

In Group D, the Joint Account is doubled and equally shared among all three group members in group D.

In Group E, the Joint Account is doubled, and the Group Decider determines how is divided among the three persons in group E.

Round earnings:

Your round earnings consist of three parts:

      4. Your earnings from the Private Account
      5. Your share of earnings from the Joint Account
      6. Your share of the prize (if your group wins the competition).

Experiment Earnings:

One round is selected randomly and you will be paid your round earnings for that round in addition to your show-up fee of $10.

Handout for Study 3: EE with Peace (summary of instructions)
(Note both groups get detailed screen-shot instructions as above)

Welcome to the experiment!

Introduction:
In this study you will make two types of decisions in each round of the study. There are 20 rounds in total. One round will be selected randomly and your earnings for that round will **determine** your earnings. The exchange rate is 12 points = $1.

Groups:
You are in a group of three persons. Your group is matched with another group of three persons. Both your group and the group you are matched with stay the same for the 20 rounds. You begin with 100 points in each round.

Decision 1: Group Competition
Your group is matched with another group to compete for a prize of 600 points. One person in your group is randomly chosen to be the Group Decider. For the group that wins, the Group Decider will determine how the prize is divided. If there is a tie, including if both groups contribute zero, the computer chooses randomly which group wins.

Your group must determine two things for this decision: underline what message to send, and how much to invest in the Group Competition. Regardless of the message sent to the other group, the Group Decider can still make any decision. One person in your group will be selected at random to be the Group Decider. That person will determine which message to send, and how much to invest in the Group Competition.

  E. Sending a message:
Your Group: The Decider will determine which message you would like to send to the other group. The message indicates to the other group whether you intend to enter the competition. You may send one of two messages:
Yes (we plan to enter the competition), or
No (we plan to invest zero in the competition).
The Other Group: The group you are matched with is making the same decision, and makes its decision in the same way as your group. Once both decisions are made, you will see the other group's message, and they will see yours.

  F. Deciding how much to invest:
Your Group: After the messages are exchanged, the second thing you must decide is how much to invest in the fund. The Group Decider will determine how much each group member must contribute to the Group Competition Fund
The Other Group: Once again, the group you are matched with is making the same decision, and makes its decision in the same way as your group.
Your chance of winning depends on the amount in your group's Competition Fund and in the other group's Competition Fund. The formula for the probability that your group will win is:
Your Competition Fund ÷ (Your Competition Fund + Other Group's Competition Fund).
If you both have the same amount in your Funds, including zero, then the chances of winning are equal (50/50). The computer will draw a random number to determine who wins, and you will be notified of the outcome later.

Decision 2: Individual Decision
Your Group: Each person in your group makes an independent decision of how much of their remaining funds to allocate to a Joint Account and how much to a Private Account. Each point placed in the Private Account returns one point to you. Each point placed in the Joint Account is doubled, and then the Group Decider then determines how the amount in the Joint Account is divided among the group members.

Round earnings:
Your round earnings consist of three parts:
  4. Your earnings from the Private Account
  5. Your share of earnings from the Joint Account
  6. Your share of the prize (200 if you win the competition).

Experiment Earnings:

One round is selected randomly and you will be paid your round earnings for that round in addition to your showup fee of $10. Earnings will be paid by Venmo or Paypal within 48 hours.

Appendix B: Additional Analyses.

Table 4: Study 1 – Investment in conflict
Full Democracy DD_C versus Full Dictatorship EE_NC

	(1) Conflict	(2) Conflict	(3) Conflict	(4) Conflict
Constant (DD_C)	41.41***	38.17***	50.73***	38.39***
	(3.594)	(4.618)	(5.950)	(5.937)
Autocracy (EE_NC)	3.942[a]	11.97**	17.77**	26.85***
	(2.793)	(5.985)	(8.480)	(9.444)
L (Winning)		2.481	0.544	3.837**
		(2.531)	(2.325)	(1.848)
Autocracy*L (Winning)		-7.000*	-6.123	-8.543**
		(4.122)	(4.088)	(4.152)
L (Public)			-0.0904***	-0.0859***
			(0.0286)	(0.0247)
Autocracy*L (Public)			-0.0773**	-0.0958***
			(0.0387)	(0.0370)
L (Conflict J)				0.0795***
				(0.0200)
Autocracy*L (Conflict J)				-0.0555**
				(0.0270)
Period	-0.678***	-0.556**	-0.165	-0.0131
	(0.223)	(0.252)	(0.194)	(0.191)
Observations	640	608	608	608
Number of Groups (N=6)	16	16	16	16

[a] Two sides p-value=0.158 (one side p-value=0.079)
Panel data regressions using conflict investment made by teams of 3 subjects.
One observation per team and period
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 5a: Investment in conflict without chat
DD_NC, II_NC and EE_NC

	(1) Conflict	(2) Conflict	(3) Conflict	(4) Conflict
Constant (DD_NC)	59.67***	58.71***	80.24***	63.64***
	(4.689)	(5.446)	(4.517)	(8.524)
II_NC	-15.50**	-15.86*	-28.51***	-28.65***
	(7.363)	(8.103)	(7.983)	(9.696)
EE_NC	-8.909	-5.959	-11.43	2.892
	(6.673)	(7.158)	(6.984)	(10.81)
L (Winning)		1.743	-2.902	-0.0617
		(3.883)	(3.073)	(3.211)
II* L (Winning)		-0.695	2.232	1.948
		(5.076)	(4.173)	(3.929)
EE* L (Winning)		-6.358	-2.905	-5.066
		(5.082)	(4.524)	(4.879)
L (Public)			-0.231***	-0.200***
			(0.0211)	(0.0256)
II* L (Public)			0.128***	0.105***
			(0.0262)	(0.0299)
EE* L (Public)			0.0840**	0.0348
			(0.0341)	(0.0371)
L (Conflict J)				0.0650**
				(0.0257)
II* L (Conflict J)				0.0524
				(0.0437)
EE* L (Conflict J)				-0.0460
				(0.0321)
Period	-0.818***	-0.789***	-0.437***	-0.250*
	(0.222)	(0.247)	(0.147)	(0.145)
Observations	960	912	912	912
Number of Groups (N=6)	24	24	24	24

Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per team and period.
Robust standard errors clustered by groups of 6
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5b: Study 1 – Investment in conflict with chat
DD_C, II_C and EE_C

	(1) Conflict	(2) Conflict	(3) Conflict	(4) Conflict
Constant (DD_C)	44.97***	42.40***	52.89***	40.26***
	(3.580)	(4.455)	(5.925)	(5.939)
II_C	7.543*	9.112	18.62***	17.44**
	(4.177)	(5.751)	(6.915)	(8.351)
EE_C	-2.453	-1.627	14.26	14.31
	(5.624)	(6.158)	(9.111)	(10.02)
L (Winning)		2.607	0.877	4.342**
		(2.459)	(2.284)	(1.821)
II* L (Winning)		-1.598	-5.062	-4.920**
		(4.965)	(3.499)	(2.310)
EE* L (Winning)		-1.655	-4.808	-4.717*
		(3.254)	(3.041)	(2.510)
L (Public)			-0.0857***	-0.0843***
			(0.0266)	(0.0230)
II* L (Public)			-0.0602**	-0.0490*
			(0.0296)	(0.0287)
EE* L (Public)			-0.0674*	-0.0604*
			(0.0362)	(0.0354)
L (Conflict J)				0.0810***
				(0.0195)
II* L (Conflict J)				-0.0196
				(0.0363)
EE* L (Conflict J)				-0.00867
				(0.0277)
Period	-1.017***	-0.946***	-0.452**	-0.246
	(0.192)	(0.221)	(0.176)	(0.158)
Observations	1,000	950	950	950
Number of Groups (N=6)	25	25	25	25

Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per team and period
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Investment in team production
Full Democracy (DD_C) versus Full Dictatorship (EE_NC)

	(1) Public	(2) Public	(3) Public	(4) Public
Constant (DD_C)	48.87***	53.11***	56.03***	63.45***
	(4.613)	(5.612)	(5.649)	(6.200)
Autocracy (EE_NC)	-15.06***	-18.26***	-19.67***	-20.20***
	(5.751)	(6.326)	(6.456)	(6.707)
L (Winning)		-1.369	-1.472	-1.453
		(2.594)	(2.596)	(2.602)
Autocracy*L (Winning)		4.544	6.512	6.651*
		(4.014)	(4.094)	(4.005)
L (Inequality)			-0.828**	-0.939***
			(0.412)	(0.293)
Autocracy*L (Inequality)			0.774*	0.882***
			(0.413)	(0.294)
L (Public Above)				0.350
				(0.336)
Autocracy*L (Public Above)				0.115
				(0.349)
L (Public Below)				-0.150
				(0.247)
Autocracy*L (Public Below)				-0.243
				(0.271)
Period	0.945***	0.724***	0.684***	0.679***
	(0.238)	(0.261)	(0.244)	(0.238)
Observations	1,920	1,824	1,824	1,824
Number of Groups (N=6)	16	16	16	16

Panel data regressions. Public investment made by each subject. One observation per subject and period
Robust standard errors clustered by groups of 6
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 7a: Investment in team production
Model (1): DD_NC, II_NC and EE_NC
Model (2): DD_C, II_C and EE_C

	(1) No chat Public	(2) Chat Public
Constant (Democracy)	24.92***	53.94***
	(6.460)	(5.465)
II	11.46	-8.311
	(9.160)	(6.833)
EE	12.99	2.392
	(7.928)	(7.426)
L (Winning)	-0.236	-1.486
	(3.313)	(2.565)
II* L (Winning)	-0.851	-0.0804
	(4.468)	(4.787)
EE* L (Winning)	5.335	0.138
	(4.472)	(3.373)
L (Inequality)	0.613**	-0.906***
	(0.272)	(0.290)
II* L (Inequality)	-0.504	0.618*
	(0.315)	(0.315)
EE* L (Inequality)	-0.666**	0.891***
	(0.274)	(0.291)
L (Public above)	0.192	0.349
	(0.144)	(0.337)
II* L (Public above)	0.0163	-0.158
	(0.188)	(0.382)
EE* L (Public above)	0.281	0.265
	(0.173)	(0.408)
L (Public below)	-0.572***	-0.152
	(0.102)	(0.246)
II* L (Public below)	-0.0789	-0.161
	(0.124)	(0.323)
EE* L (Public below)	0.184	-0.154
	(0.151)	(0.267)
Period	0.476**	0.865***
	(0.233)	(0.224)
Observations	2,736	2,850
Number of Groups (N=6)	24	25

Panel data regressions. Public investment made by each subject.
One observation per subject and period
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 7b: Investment in team production without chat
DD_NC, II_NC and EE_NC

	(1) Public	(2) Public	(3) Public	(4) Public
Constant (DD_NC)	27.86***	29.49***	24.93***	24.92***
	(5.074)	(5.762)	(6.483)	(6.460)
II_NC	4.766	4.773	11.44	11.46
	(7.333)	(8.031)	(9.188)	(9.160)
EE_NC	10.26	8.334	13.58*	12.99
	(6.715)	(7.321)	(7.728)	(7.928)
L (Winning)		-1.455	-0.293	-0.236
		(3.141)	(3.312)	(3.313)
II* L (Winning)		0.565	-0.806	-0.851
		(4.366)	(4.468)	(4.468)
EE* L (Winning)		4.633	5.207	5.335
		(4.315)	(4.537)	(4.472)
L (Inequality)			0.399**	0.613**
			(0.194)	(0.272)
II* L (Inequality)			-0.537**	-0.504
			(0.231)	(0.315)
EE* L (Inequality)			-0.450**	-0.666**
			(0.198)	(0.274)
L (Public above)				0.192
				(0.144)
II* L (Public above)				0.0163
				(0.188)
EE* L (Public above)				0.281
				(0.173)
L (Public below)				-0.572***
				(0.102)
II* L (Public below)				-0.0789
				(0.124)
EE* L (Public below)				0.184
				(0.151)
Period	0.534**	0.453*	0.480**	0.476**
	(0.219)	(0.239)	(0.235)	(0.233)
Observations	2,880	2,736	2,736	2,736
Number of Groups (N=6)	24	24	24	24

Panel data regressions. Public investment made by each subject. One observation per subject and period
Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 7c: Investment in team production with chat
DD_C, II_C and EE_C

	(1) Public	(2) Public	(3) Public	(4) Public
Constant (DD_C)	46.74***	50.81***	53.91***	53.94***
	(4.513)	(5.344)	(5.456)	(5.465)
II_C	-6.445	-7.176	-8.305	-8.311
	(5.328)	(6.651)	(6.829)	(6.833)
EE_C	5.128	5.187	2.958	2.392
	(6.512)	(7.040)	(7.082)	(7.426)
L (Winning)		-1.371	-1.482	-1.486
		(2.565)	(2.564)	(2.565)
II* L (Winning)		-0.450	-0.0774	-0.0804
		(4.768)	(4.782)	(4.787)
EE* L (Winning)		-0.372	-0.0106	0.138
		(3.237)	(3.359)	(3.373)
L (Inequality)			-0.792**	-0.906***
			(0.397)	(0.290)
II* L (Inequality)			0.435	0.618*
			(0.427)	(0.315)
EE* L (Inequality)			0.783**	0.891***
			(0.398)	(0.291)
L (Public above)				0.349
				(0.337)
II* L (Public above)				-0.158
				(0.382)
EE* L (Public above)				0.265
				(0.408)
L (Public below)				-0.152
				(0.246)
II* L (Public below)				-0.161
				(0.323)
EE* L (Public below)				-0.154
				(0.267)
Period	1.147***	0.933***	0.867***	0.865***
	(0.208)	(0.227)	(0.223)	(0.224)
Observations	3,000	2,850	2,850	2,850
Number of Groups (N=6)	25	25	25	25

Panel data regressions. Public investment made by each subject. One observation per subject and period
Robust standard errors clustered by groups of 6
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9a: Investment in conflict
D_C & E_NC – No peace

	(1) Conflict	(3) Conflict	(4) Conflict	(5) Conflict
Constant (D_C)	46.84***	48.90***	57.51***	19.02***
	(4.598)	(5.556)	(5.221)	(6.661)
Autocracy (E_NC)	7.433***	5.617*	-3.205	21.65***
	(2.180)	(3.249)	(6.131)	(7.790)
L (Winning)		-6.110*	-9.552***	-1.433
		(3.289)	(3.554)	(3.250)
Autocracy * L (Winning)		4.687	8.490*	3.136
		(4.527)	(4.900)	(4.509)
L (Public)			-0.188**	-0.0347
			(0.0804)	(0.0745)
Autocracy * L (Public)			0.187*	0.0358
			(0.106)	(0.0967)
L (Conflict J)				0.589***
				(0.0686)
Autocracy * L (Conflict J)				-0.368***
				(0.0993)
Period	-0.408**	-0.342*	-0.336	-0.136
	(0.189)	(0.200)	(0.206)	(0.182)
Observations	360	342	342	342
Number of Groups (N=6)	9	9	9	9

Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per
team and period. Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 9b: Investment in conflict
D_C & E_NC - Peace

	(1) Conflict	(2) Conflict	(3) Conflict	(4) Conflict	(5) Conflict
Constant (D_C)	44.62***	43.50***	50.02***	48.10***	19.69**
	(6.317)	(6.293)	(6.957)	(8.253)	(9.380)
Autocracy (E_NC)	12.45[a]	22.41***	20.44**	23.53**	27.32**
	(8.075)	(7.478)	(8.791)	(11.26)	(13.08)
Peace message		0.424	-0.692	-0.485	0.482
		(6.081)	(5.999)	(6.049)	(5.470)
Autocracy * Peace message		-15.77**	-15.42**	-15.67**	-9.553
		(7.814)	(7.639)	(7.686)	(7.057)
L (Peace message)		-6.237	-2.955	-2.832	-1.638
		(5.363)	(5.241)	(5.251)	(4.689)
Autocracy * L (Peace message)		-1.570	-4.031	-3.653	-1.923
		(7.526)	(7.348)	(7.370)	(6.607)
L (Winning)			-16.80***	-16.32***	-4.325
			(4.608)	(4.774)	(4.633)
Autocracy * L (Winning)			7.228	6.316	1.342
			(6.360)	(6.624)	(6.320)
L (Public)				0.0581	-0.114
				(0.139)	(0.130)
Autocracy * L (Public)				-0.0829	0.128
				(0.161)	(0.149)
L (Conflict J)					0.553***
					(0.0876)
Autocracy * L (Conflict J)					-0.170
					(0.116)
Period	-0.468*	-0.443	-0.437	-0.427	-0.531*
	(0.272)	(0.312)	(0.304)	(0.326)	(0.291)
Observations	302	267	267	267	267
Number of Groups (N=6)	8	8	8	8	8

[a] p-value=0.123, one sided p-value<0.10
Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per
team and period. Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.1

Table 9c: Investment in conflict
DD_C versus EE_NC - Peace

	(1) Conflict	(2) Conflict	(3) Conflict	(4) Conflict	(5) Conflict
Constant (DD_C)	45.41***	49.59***	57.12***	65.79***	40.31***
	(4.204)	(5.372)	(6.305)	(8.384)	(11.96)
Autocracy (EE_NC)	5.028	4.498	1.066	-2.459	-4.833
	(5.343)	(6.862)	(7.449)	(10.10)	(15.12)
Peace message		-7.942**	-8.807**	-9.107**	-7.836**
		(3.911)	(4.160)	(4.021)	(3.924)
Autocracy * Peace message		-15.25**	-14.25**	-13.50**	-8.025
		(7.027)	(7.210)	(6.796)	(7.041)
L (Peace message)		-9.056	-9.628*	-8.425	-4.578
		(6.049)	(5.501)	(5.187)	(3.832)
Autocracy * L (Peace message)		15.50**	15.69**	16.21***	12.12**
		(6.831)	(6.191)	(6.153)	(4.715)
L (Winning)			-12.15**	-15.30**	-4.676
			(5.333)	(6.241)	(4.163)
Autocracy * L (Winning)			4.925	6.668	2.347
			(6.486)	(7.254)	(4.486)
L (Public)				-0.149***	-0.0768*
				(0.0517)	(0.0430)
Autocracy * L (Public)				-0.0285	-0.00688
				(0.101)	(0.0922)
L (Conflict J)					0.315*
					(0.171)
Autocracy * L (Conflict J)					0.113
					(0.224)
Period	-0.396	-0.256	-0.286	-0.235	-0.123
	(0.249)	(0.256)	(0.264)	(0.253)	(0.262)
Observations	640	608	608	608	608
Number of Groups (N=6)	16	16	16	16	16

Panel data regressions. Conflict investment made by teams of 3 subjects. One observation per
team and period. Robust standard errors clustered by groups of 6
*** p<0.01, ** p<0.05, * p<0.10

Table 10a: Investment in team production
DD_C versus EE_NC – No peace

	(1) Public	(2) Public	(3) Public	(4) Public
Constant (DD_C)	44.45***	45.93***	45.99***	46.79***
	(5.425)	(6.476)	(6.845)	(2.570)
Autocracy (EE_NC)	-15.19***	-15.15***	-15.32***	-13.33***
	(1.441)	(2.080)	(2.091)	(2.673)
L (Winning)		2.582	3.493	2.679
		(2.081)	(2.239)	(2.657)
Autocracy * L (Winning)		-1.958	-2.956	-2.191
		(2.944)	(3.111)	(3.690)
L (Inequality)			-0.0197	0.00154
			(0.0178)	(0.0205)
Autocracy * L (Inequality)			0.0225	-0.0110
			(0.0277)	(0.0331)
L (Above)				-0.404**
				(0.183)
Autocracy * L (Above)				3.10e-05
				(0.247)
L (Below)				0.162
				(0.147)
Autocracy * L (Below)				-0.515**
				(0.258)
Period	0.480***	0.315**	0.323**	0.305*
	(0.125)	(0.133)	(0.134)	(0.159)
Observations	1,080	1,026	1,026	1,026
Number of Groups (N=6)	9	9	9	9

Panel data regressions. Public investment made by subjects. One observation per subject and period. Controls include Period (round, 1 to 20), the dummy variable L (Winning) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Inequality) {the standard deviation of team earnings in the previous round}, L (Public above) {investment in team production above the team average, 0 if not above, in the previous round} and L (Public below) {investment in team production below the team average, 0 if not below, in the previous round}. Full results in Appendix A. Robust standard errors clustered by groups of 6. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 10b: Investment in team production
D_C versus E_NC - Peace

	(1) Public	(2) Public	(3) Public	(4) Public	(5) Public
Constant (D_C)	41.15***	41.49***	39.95***	39.22***	37.32***
	(5.906)	(6.322)	(7.129)	(6.624)	(5.924)
Autocracy (E_NC)	-26.52***	-26.74***	-26.59***	-25.40***	-25.53***
	(8.078)	(8.595)	(9.806)	(9.076)	(8.008)
Peace message		3.500	3.681	4.636	4.714
		(3.688)	(3.695)	(3.702)	(3.688)
Autocracy * Peace message		1.293	1.293	0.415	-0.0259
		(4.748)	(4.751)	(4.755)	(4.742)
L (Peace message)		0.960	0.751	0.182	0.179
		(3.177)	(3.175)	(3.178)	(3.177)
Autocracy * L (Peace message)		-4.304	-4.041	-3.266	-4.014
		(4.440)	(4.437)	(4.449)	(4.455)
L (Winning)			3.166	0.892	1.449
			(2.482)	(2.641)	(2.666)
Autocracy * L (Winning)			-0.610	1.909	2.135
			(3.487)	(3.648)	(3.676)
L (Inequality)				0.0497**	0.0473**
				(0.0200)	(0.0200)
Autocracy * L (Inequality)				-0.0595**	-0.0756**
				(0.0298)	(0.0305)
L (Above)					0.202
					(0.239)
Autocracy * L (Above)					0.111
					(0.272)
L (Below)					0.222
					(0.144)
Autocracy * L (Below)					0.0525
					(0.212)
Period	1.033***	0.937***	0.936***	0.900***	0.909***
	(0.151)	(0.168)	(0.168)	(0.168)	(0.168)
Observations	906	839	839	839	839
Number of Groups (N=6)	8	8	8	8	8

Panel data regressions. Public investment made by subjects. One observation per subject and period. Controls include Period (round, 1 to 20), the dummy variable L (Winning) {taking the value of one if the team won the tournament in the previous round, 0 otherwise}, L (Inequality) {the standard deviation of team earnings in the previous round}, L (Public above) {investment in team production above the team average, 0 if not above, in the previous round} and L (Public below) {investment in team production below the team average, 0 if not below, in the previous round }, and interaction terms with the treatment dummies {e.g., L (Winning}*II, L (Winning}*EE…}. Full results in Appendix A. Robust standard errors clustered by groups of 6. *** p<0.01, ** p<0.05, * p<0.1

Table 10c: Investment in team production
DD_C versus EE_NC - Peace

	(1) Public	(2) Public	(3) Public	(4) Public	(5) Public
Constant (DD_C)	46.94***	46.99***	46.50***	47.24***	47.01***
	(4.626)	(5.306)	(5.947)	(5.964)	(6.110)
Autocracy (EE_NC)	-19.57***	-21.50***	-20.93***	-22.20***	-23.34***
	(5.372)	(5.488)	(5.833)	(5.881)	(6.047)
Peace message		5.727	5.710	5.530	5.406
		(4.042)	(4.045)	(4.057)	(4.115)
Autocracy * Peace message		6.077	6.110	6.048	6.131
		(6.539)	(6.445)	(6.387)	(6.395)
L (Peace message)		4.321	4.409	4.661	4.747
		(3.819)	(3.821)	(3.803)	(3.804)
Autocracy * L (Peace message)		-0.593	-0.703	-1.255	-1.811
		(6.500)	(6.384)	(6.043)	(5.729)
L (Winning)			0.939	1.096	1.128
			(2.176)	(2.185)	(2.147)
Autocracy * L (Winning)			-1.106	-4.357	-3.839
			(3.582)	(3.795)	(3.609)
L (Inequality)				-0.0752	-0.102*
				(0.0673)	(0.0571)
Autocracy * L (Inequality)				0.111	0.137**
				(0.0701)	(0.0601)
L (Public above)					-0.0696
					(0.294)
Autocracy * L (Public above)					0.140
					(0.366)
L (Public below)					0.322*
					(0.182)
Autocracy * L (Public below)					-0.178
					(0.333)
Period	0.628**	0.378	0.378	0.338	0.338
	(0.249)	(0.266)	(0.266)	(0.269)	(0.273)
Observations	1,920	1,824	1,824	1,824	1,824
Number of Groups (N=6)	16	16	16	16	16

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1