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Cooperation in a Fragmented Society: Experimental Evidence on Syrian Refugees and Natives in Lebanon*

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Abstract

Lebanon is the country with the highest density of refugees in the world, raising the question of whether the host and refugee populations can cooperate harmoniously. We conduct a lab-in-the-field experiment in Lebanon studying intra- and inter-group behavior of Syrian refugees and Lebanese nationals in a repeated public goods game without and with punishment. We randomly assign participants to Lebanese-only, Syrian-only, or mixed sessions. We find that randomly formed pairs in homogeneous sessions, on average, contribute and punish significantly more than those in mixed sessions, suggesting in-group cooperation is stronger. These patterns are driven by Lebanese participants. Further analysis indicates that behavior in mixed groups is more strongly conditioned on expectations about the partner's cooperation than in homogeneous groups.

Keywords: refugees, public goods game, cooperation, punishment

JEL: D91, J5, F22

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1. Introduction

In 2018, the global population of forcibly displaced people stood at a record high 70.8 million, according to the UN refugee agency (UNHCR, 2018), representing one of the most pressing global humanitarian challenges of our time. At the end of the same year, Syrians continued to be the largest forcibly displaced population, with 13 million people displaced, including 6.7 million refugees, the majority of whom are hosted by neighboring countries. On the receiving end, Lebanon is one of the largest embracers of refugees, hosting more than one million Syrians in 2018, making it the country with the highest density of refugees in the world. Although Syrians and Lebanese are not ethnically different, and share the same language and culture, the relationship between these two nations has been rather strained in the recent past. Hence, whether these two populations can co-exist and co-operate is an intriguing case to study, given that many other populations become displaced and hosted in unwelcoming communities.

Cooperation is fundamental for the provision of public goods. As already well-documented in the literature, ethnic diversity can lead to lack of cooperation and therefore less provision of public goods (Alesina and La Ferrara, 2005; Miguel and Gugerty, 2005). Studies show that social groups have a strong tendency to favor their in-group (e.g. Bernhard, Fischbacher and Fehr, 2006; Charness et al., 2007). Interestingly though, little is known about the extent of cooperation and reciprocity between refugees and the communities that host them.[1] Refugees differ in several aspects from typical economic migrants, in terms of their demographic characteristics, skills, and their motivations for leaving from their home country and for establishing a permanent residence in the receiving country. They also represent a particularly vulnerable group due to the psychological trauma associated with exposure to violence and conflict, which might impact altruistic behavior (see Voors et al. 2012, Bauer et al., 2016). On the other hand, from the perspective of countries that receive refugees, the reasons for hosting them are primarily humanitarian and not based on possible economic benefits, as in the case of hosting immigrant workers. Yet, there are concerns about the (perceived) burden of hosting refugees, and in our particular case, previous tensions between the two nations might also affect reciprocity and cooperation of the host community.

[1] While trust might also be of interest in this context, we believe that it is of utmost importance to first understand issues of human cooperation. As Hardin (2002) puts it: "We are concerned with trust and trustworthiness because they enable us to cooperate for mutual benefit. *Cooperation is the prior and central concern.* There are manifold instances of cooperation that need not and quite likely do not require trust. Trust is merely one reason for confidence in taking cooperative risks, and trustworthiness is merely one reason such risks can pay off" (Chapter 8, p. 173; emphasis in original).

Against this background, the objective of this paper is to shed empirical light on the intra- and inter-group cooperation of Syrian refugees and the native Lebanese communities. To this end, we study a social dilemma situation in which a conflict emerges between personal and collective interest. This incentive structure characterizes a number of real-life settings such as teamwork, participation in collective actions and provision of public goods, tax compliance, environmental protection, and donations to charities. It is also a particularly suitable paradigm to apply in a context where tensions have built up between two natural groups (further described in section 2), the institutional framework is weak, and refugees are not secluded in refugee camps but are embedded in the wider community.

We carried out a lab-in-the-field experiment in Lebanon with Syrian refugees and Lebanese nationals.[2] To measure cooperation, we make use of a workhorse game in the experimental economics literature on cooperation and punishment: the linear public goods game without and with punishment (Fehr and Gächter, 2000; 2002). Participants were randomly assigned to Lebanese-only, Syrian-only, or mixed sessions and played six rounds of the public goods game in randomly formed pairs, anonymously. We use subtle differences in spoken Arabic to make salient the composition of participants at the beginning of each session, without explicitly invoking nationality in the experimental instructions. Our main interest lies in the levels of cooperation that are sustained across and within the two groups and the extent to which punishment opportunities to enforce cooperation are effective in raising cooperation. We expect that due to enhanced group identification (Tajfel and Turner, 1979), contributions to the public good will be greater in single-nationality groups than in mixed-nationality groups.[3] In a similar vein, we anticipate that punishment behavior will also be treatment-dependent but the direction of the effect is an open empirical question. In particular, our expectation is that higher contributions in homogeneous interactions will lead to lower punishment.

We contribute to the literature by providing new evidence on the question of intergroup cooperation in a novel and important setting involving populations that have not been studied before, to the best of our knowledge. Unlike the previous experimental studies, which examine cooperation between different ethnic groups, or natives and immigrant groups, and typically find in-group favoritism in prosocial behavior and cooperation, in our setting we study a recent

[2] Gneezy and Imas (2016) define a lab-in-the-field study "as one conducted in a naturalistic environment targeting the theoretically relevant population but using a standardized, validated lab paradigm" (p. 3).
[3] A growing literature has shown evidence that social identity plays an important role in shaping behaviour and preferences (e.g. Chen and Li, 2009; Benjamin et al., 2010; Charness et al., 2014; Chen at al., 2014).

forcibly displaced group, which although it shares similar ethnic, linguistic and cultural backgrounds with the host country, there are tensions between it and the host population due to historical circumstances and economic pressures. This creates an environment where the refugees might be fearful and therefore could be more cooperative toward the hosts. At the same time, unlike in studies where the majority group or the natives typically exhibit strong anti-outgroup behavior, the host group here might have empathy toward refugees due to the violence and loss they have incurred. In this sense, it is not clear ex-ante whether the evidence obtained in previous studies will immediately transfer to our setting.

Our findings indicate that, on average, contributions to the public good (and beliefs about the partner's contributions) are significantly higher in homogeneous groups compared to mixed groups, suggesting a stronger in-group versus out-group cooperation effect. This result is driven by Lebanese participants who exhibit a stronger tendency to reduce contributions in the mixed treatment. We also find that average earnings are significantly lower in mixed groups compared to homogeneous groups. In the case of the public goods game with punishment, we find a substantial degree of antisocial punishment, especially in Lebanese-only groups. Moreover, mixed groups punish significantly less than homogeneous groups, a result that is again driven by Lebanese participants. This suggests that for the Lebanese participants, although as expected there is greater in-group cooperation, there is also a lower willingness to punish out-group defectors and even evidence of an inclination to punish in-group cooperators. Finally, we find a higher tendency for participants in mixed groups to condition their cooperativeness on how much they believe their partner will cooperate than in homogeneous groups. Taken together, our findings indicate that mixing the two groups leads to lower provision of the public good and makes individuals worse off; moreover, punishing opportunities are not able to remedy the situation.

Our study is related to several strands of literature. First, our paper contributes to a literature that examines experimentally the role of diversity for the provision of public goods. Probably the most closely related previous studies are Habyarimana et al. (2007) and Alexander and Christia (2011), which find that cooperation in ethnically mixed groups is lower than that in homogeneous groups in studies that were carried out in Ugandan slums, with different ethnic groups, and in Bosnia with Catholic and Muslim participants, respectively. Ruffle and Sosis (2006) find that kibbutz members are more cooperative toward kibbutz members than they are toward city residents, while Castro (2008) carries out a public good game with participants of

British and Italian nationality and finds lower contributions in mixed groups than in homogeneous groups.[4]

In addition, our study relates to the literature that examines the economic impact of forced displacement on the refugees and on host communities. A growing number of papers have focused on the impact of refugees on the labor market, often with mixed results, which are summarized in two recent surveys (Becker and Ferrara, 2019; Verme and Schuettler, 2021). A few studies have focused on the large and sudden forced migration in high-income countries such as in the US, Israel, France, e.g. Card (1990), Borjas (2017), Clemens and Hunt (2019), while others examined the impact of refugees in low-income countries such as in Tanzania, Kenya, and Sudan e.g. Maystadt and Verwimp (2014), Ruiz and Vargas-Silva (2015) and Alix-Garcia et al. (2018).[5]

We contribute to this literature by providing direct experimental evidence on the degree of cooperation between a host community and a recently displaced population, in a context with the highest density of refugees in the world. This unique setting offers important insights to policymakers and humanitarian organizations that are interested in the welfare of refugees and social cohesion in the host community. Lack of cooperation between natives and refugees would be a barrier for the efforts of all those who are striving to ensure a decent living for the displaced populations in the host community, and an important challenge faced by societies experiencing a large influx of refugees.

The structure of the rest of the paper is as follows. Section 2 will provide a background to the relationship between Lebanon and Syria prior to the Syrian conflict. In Sections 3 and 4, we describe our experimental design and hypotheses. Section 5 discusses the data, while we present our experimental results in Section 6. Finally, Section 7 concludes.

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[4] Also, related is a strand of experimental literature that studies in-group and out-group trust of naturally occurring groups, such as, Ashkenazi and Sephardi Jews in Israel (Fershtman and Gneezy, 2001), non-Western immigrants and native Dutch in the Netherlands (Cettolin and Suetens, 2019), first-generation immigrants and native-born Americans in the United States (Cox and Orman, 2015), immigrant and native youth in Germany (Felfe et al., 2018), different ethnic groups in Afghanistan (Bartos and Levely, 2018) and different religious groups in Bangladesh (Gupta et al. (2018). Barr (2003) studies trusting behavior amongst resettled villagers in rural Zimbabwe almost 20 years post restellment. Unlike these studies, we examine cooperation and provision of public goods amongst recent refugees and the host community.

[5] More specific to our setting, a few recent studies have examined the impact of Syrian refugees on the labor market outcomes of natives in Turkey, for example Tumen (2016) and Del Carpio and Wagner (2015), and in Jordan, for example, Fallah et al. (2019). Another set of studies has studied the impact of the inflow of Syrian refugees on the well-being of the host population and in particular on the impact on education and housing (e.g., Balkan et al., 2018; Tumen, 2019; and Assaad et al., 2019), and consumer prices (Balkan and Tumen, 2016).

2. Background and Context

To put our research question into context, we describe briefly the current Syrian refugee crisis, and the history of Lebanese-Syrian relations. The Syrian war erupted in 2011 and caused a significant number of casualties and millions of forcibly displaced, many of whom are hosted in Lebanon. Recent reports show that the Lebanese host community perceives Syrian refugees as a significant burden on their country's resources, and highlight a decrease in intercommunal contact and an increase in the propensity for negative collective action (UNDP, 2018). While these tensions have parallels in other refugee-hosting countries, there are elements that make the Lebanese context peculiar: the two groups share a common culture and language, and circular migration between the two countries existed for centuries. Nevertheless, frictions were evident in recent history. During the 1975 Lebanese civil war, an Arab Deterrent Force – consisting almost exclusively of Syrian army – was mandated to restore peace in the country. Despite the war ending in 1990, Syrian forces remained in Lebanon until 2005 and had a strong influence on the country's governance. In 2005, a United Nations resolution was sought to expel the Syrian forces following their accusation of the assassination of a prominent Lebanese prime minister. This and subsequent atrocities, allegedly attributed to the Syrian regime, had not yet been wiped from the Lebanese collective memory. In addition to the tense history, the Lebanese fragility, poor governance, and stagnant economy (Malaeb, 2018) led to increased tensions within the society.

3. Experimental design and procedures

3.1 Framework

Our simple measure of cooperation is centered on a linear social dilemma game without and with punishment opportunities (Fehr and Gächter, 2000; 2002). In both games, participants are randomly assigned to a two-person group (henceforth, matching-group). This is the smallest group size for which a social dilemma can arise; nevertheless, it fits our purposes as it captures the strategic considerations in question in the simplest possible way.[6] Apart from this, recurring two-person interactions are a common occurrence making them an important class of relationships to study.

[6] The effect of group size on cooperation in this class of games is ambiguous, see Nosenzo et al. (2015).

The social dilemma game without punishment options consists of one stage, in which each subject is endowed with 10 tokens and has to decide how many of them to keep and how many to contribute to the public good (described as a 'project' to participants). Each token kept increases the own monetary payoff by one experimental currency unit (ECU). Each token contributed to the public good increases the payoff of each group member by 0.75 ECUs. The payoff function from the first stage is given by equation (1).

$$\pi_i^1 = 10 - g_i + 0.75 \cdot (g_i + g_j), \quad (1)$$

where g_i $(0 \leq g_i \leq 10)$ denotes the number of tokens contributed to the public good by group member *i* and g_j denotes the contribution of the partner *J*.

The social dilemma game with punishment options consists of two stages, of which the first one is identical to the above description. In the second stage, participants can see the contribution of the other member of the matching-group and are given the opportunity to assign costly punishment points to the other group member. Participants could assign up to 5 punishment points. Each punishment point costs the punisher 1 ECU and the recipient of the punishment 3 ECUs. Thus, the cost-to-impact ratio is 1:3. The total payoff from both stages is computed as follows:

$$\pi_i = \pi_i^1 - p_{ij} - 3 \cdot p_{ji}, \quad (2)$$

where π_i^1 denotes group member *i*'s payoff from the first (contribution) stage, p_{ij} the punishment points group member *i* assigns to the partner *j*, and p_{ji} the punishment points group member *i* receives from the partner *j*. Note that in case of negative payoffs, participants would cover losses from earnings made in other parts of the experiment and the show up fee. However, all participants ended up with positive total earnings from the experiment.

Conditional on each participant i being motivated to maximize equation (2), the unique subgame perfect equilibrium requires that participants free-ride completely in the first stage and refrain completely from punishing in the second stage.

3.2 Experimental treatments

Our experimental design consists of three between-subjects treatments, which vary according to whether the participants in a session were only Syrians, only Lebanese or consist of both Syrians and Lebanese. We refer to the resulting treatments as "Only Syrians", "Only Lebanese" and "Mixed", respectively.

The experiment was conducted via pen and paper. Participants played the first three rounds of the public goods game without punishment followed by three rounds of the game with punishment.[7] We employed a partners matching protocol, whereby the group composition remains the same throughout the experiment. This allows us to observe the dynamics of cooperative behavior and how having experience of the no-punishment game affects behavior in the punishment game (in terms of contributions and assignment of sanctions). As behavior in the no-punishment game was our primary concern in this paper, we kept the order of the two games constant. In our econometric analysis, we control for participants' experience in the public goods game without punishment, when analyzing behavior in the public goods game with punishment. Furthermore, we provide incentives to participants in order to elicit their beliefs about their partner's contribution and their expectations of being punished. Specifically, beliefs about the partner's contribution behavior were elicited at the end of each round (and prior to participants receiving feedback about the within-round behavior of the partner). In the punishment game, we additionally elicited beliefs about expected punishment after participants had decided on their own punishment decisions. Accurate beliefs were paid 1 Experimental Point exchanged at a prespecified rate mentioned at the beginning of the instructions.

3.3 Recruitment and procedures

We conducted the experiment in the Aley region, governorate of Mount-Lebanon, as it possesses some characteristics that makes it a suitable location for the research at hand. Firstly, Aley is an urban area and among the top 10 most populous towns of Lebanon. Secondly, the area has a long history of circular Syrian migration. Syrian workers historically travelled to this area to work in construction and agriculture, as they have strong ties and a large community that helps them find work. Thirdly, the area is sufficiently close (15km) to the capital, Beirut, to be accessible, while offering affordable housing. It is also less than 50 km from the Lebanese-Syrian border making it an easy destination for refugees to reach. For these reasons, the area is home to more than 6000 registered Syrian refugees (according to UNHCR – this is an underestimate of the refugee population as many are not registered).[8]

[7] Due to time and practical constraints, as the experiment was conducted with paper and pencil, we chose a compact implementation of three rounds for each game, unlike previous literature on public good games that normally has subjects participate for ten or more rounds. We also simplified matching such that each group consists of two group members.

[8] In our study, Syrian participants are mainly of recent refugees: 88% arrived after 2011 (onset of civil war in Syria) and 72% are registered with UNHCR.

The main difficulty in sampling in Lebanon is the lack of a census or a robust sampling frame that ensures representativeness of our sample, as such, we refrain from claiming representativeness. To identify our participants, we advertised our experiment around 10 days before we started the fieldwork in early November 2017. We randomly assigned participants into two types of sessions: homogeneous sessions (Lebanese only or Syrians only) and mixed sessions (approximately equally split between Lebanese and Syrians).[9] The experiment was carried out by one of the authors (BM, who speaks Arabic fluently), with the help of four local assistants (two Lebanese and two Syrians), and followed a common script and protocol in all sessions. The experimental sessions took place in a large hall of a school in Aley. We ran a total of 14 sessions (4 Syrian only, 3 Lebanese only, and 7 Mixed sessions). On average, a session involved 22 participants.

When participants arrived, they were all asked to sign a consent form and read an information sheet before entering the hall where the experiment was held. We then asked participants to randomly draw a numbered ticket, which corresponded to their particular seat and desk. The desks in the room where the experiment took place were arranged such that participants could not sit close to each other.

Since our treatment relies on participants' awareness of the ethnic composition of the group, we devised an exercise that would make it salient in a subtle way. The premise of the exercise is - due to the similarity in physical appearance between Lebanese and Syrians - to rely on the most salient difference between the two groups: their accent in Arabic. The exercise consisted of showing to participants pictures of products (printed on laminated sheets) that individuals would usually see or purchase on a daily basis in their local shops. Each participant was asked to say aloud the name of the product that they draw from the list and quote its price as they see it in the market. They were explicitly told that there is no correct answer to the question and that the answers to their question would not affect their payoff. The exercise was framed as an icebreaker and a way to observe participants' awareness of the local economic conditions.

After this 'icebreaker', the participants were handed the instructions of the public goods game without punishment, and the coordinator read the instructions aloud.[10] They were then asked

[9] Due to logistic complexities, we were not always able to ensure that in mixed sessions the groups were exactly split in half between Lebanese and Syrian participants. On average mixed sessions had 57% Syrian participants and the range was between 50% and 62%.

[10] Experimental instructions can be found in Appendix 2. An example decision sheet (for Round 1 of the experiment) is included in Appendix 3.

to practice how their payoffs are calculated and were explicitly told that their answers would not affect their payoff. We paid close attention that all participants had understood the game; indeed, the experiment did not proceed until all participants answered correctly the control questions. This ensured that all participants had understood the mechanics of the payoff function. Upon completion of the three rounds of the public goods game without punishment, further instructions about the public goods game with punishment were handed out. The second part of the experiment proceeded after participants had correctly answered control questions to ensure comprehension.

In the instructions, we informed participants that one round of each game would be randomly chosen by public draw to determine their actual monetary gains. Feedback in-between rounds was given in written form. Participants were asked to complete a short questionnaire, while we computed their payoffs and prepared an envelope with their money in cash. Average payment was $16, which is slightly more than the median daily income of Syrian refugees in Lebanon[11] and about 75% of the daily minimum wage in Lebanon. Sessions lasted on average 2 hours.

4. Hypotheses

This section formulates behavioral hypotheses that we seek to test in the public goods games we conducted. In the following, our hypotheses refer to both the public goods game without and with punishment opportunities.

If we assume that individuals are exclusively self-interested, they will always defect (i.e. contribute nothing) in the public goods game, since defection is a dominant strategy. Similarly, a selfish individual would never punish another player as punishment is monetarily costly. However, there is by now a well-established literature (as surveyed in Fehr and Schmidt, 2006) showing that individuals deviate from what standard economic theory – assuming selfishness and rationality – would predict. Related to our public goods game environments, an expansive literature in economics has shown that individuals, to some extent, are willing to cooperate and engage in costly punishment activities (for an overview, see Chaudhuri, 2011).

To understand the role of group membership for intergroup relations and behavior, we draw on the social identity theory (Tajfel and Turner, 1979), which has spawned a large literature in

[11] The median daily income for a Syrian worker in Lebanon is approximately 20,800 Lebanese Pounds (which is around 14 USD at the 2017 exchange rate), according to the ILO (2014).

psychology and sociology. In economics, social identity was introduced and formalized more recently by Akerlof and Kranton (2000). Experimental evidence indicates that individuals have group-specific preferences in their cooperative behavior when either "minimal groups" (e.g., Eckel and Grossman, 2005; Chakravarty and Fonseca, 2014) or naturally occurring social groups (e.g., Goette et al., 2012) are considered. Specifically, it has been shown that groups with common identities exhibit higher cooperation levels compared to groups consisting of members with fragmented, heterogeneous identities (Ruffle and Sosis, 2006; Habyarimana et al., 2007; Goette et al., 2006; Castro, 2008; Alexander and Christia, 2011). This leads us to formulate our first hypothesis.

Hypothesis 1. Homogeneous groups contribute more than mixed groups.

The following two hypotheses refer to the public good game with punishment opportunities. Starting with the assignment of punishment, we expect that this will be affected across homogeneous and mixed groups as a result of their cooperative attitudes. This hypothesis mirrors in-group favoritism (that is, homogeneous groups punish less harshly own group members, following their higher cooperation levels). Similarly, lower contribution levels for outgroups is expected to lead to harsher punishment. This leads us to our second hypothesis.

Hypothesis 2. Homogeneous groups punish less harshly than mixed groups.

As a final step, we derive hypotheses relating to groups' welfare as measured by their average net earnings from the public goods games. Existing experimental evidence shows that the assignment of costly punishment is detrimental in individuals' welfare, especially in the short run (e.g., Gaechter et al., 2008). Since, in our environment, the assignment of punishment is monetarily costly both for the person who assigns and receives punishment points, we anticipate that if homogeneous groups exhibit higher cooperation rates (as specified in *Hypothesis 1*) and assign significantly less harsh punishment than mixed groups (following *Hypothesis 2*), then we expect homogeneous groups to have higher earnings than mixed groups. We formulate our third hypothesis.

Hypothesis 3. Homogeneous groups earn more than mixed groups.

Table 1. Participants' Descriptive Statistics

	Homogenous						Mixed			
Variable	**Syrian Only**		**Lebanese Only**		**All Mixed**		**Syrian**		**Lebanese**	
	(1)		**(2)**		**(3)**		**(4)**		**(5)**	
Female	**0.56**	(0.50)	**0.52**	(0.50)	**0.48**	(0.50)	**0.45**	(0.50)	**0.52**	(0.50)
Age	**29.67**	(9.12)	**26.83**	(10.87)	**30.35**	(11.03)	**31.53**	(10.84)	**28.72**	(11.17)
Education										
No Education	**0.01**	(0.11)	**0.00**	(0.00)	**0.00**	(0.00)	**0.00**	(0.00)	**0.00**	(0.00)
Primary	**0.53**	(0.50)	**0.00**	(0.00)	**0.20**	(0.40)	**0.31**	(0.46)	**0.06**	(0.24)
Secondary	**0.25**	(0.43)	**0.31**	(0.47)	**0.34**	(0.47)	**0.41**	(0.49)	**0.23**	(0.43)
University	**0.17**	(0.38)	**0.68**	(0.47)	**0.45**	(0.50)	**0.25**	(0.44)	**0.71**	(0.46)
No Answer	**0.04**	(0.19)	**0.01**	(0.12)	**0.02**	(0.13)	**0.03**	(0.18)	**0.00**	(0.00)
Marital Status										
Single	**0.56**	(0.50)	**0.17**	(0.38)	**0.47**	(0.50)	**0.65**	(0.48)	**0.22**	(0.42)
Married	**0.30**	(0.46)	**0.77**	(0.42)	**0.49**	(0.50)	**0.27**	(0.45)	**0.78**	(0.42)
Other	**0.14**	(0.35)	**0.06**	(0.23)	**0.04**	(0.20)	**0.07**	(0.26)	**0.00**	(0.00)
# of Children	**1.61**	(1.78)	**0.37**	(1.03)	**1.32**	(2.01)	**1.69**	(2.11)	**0.81***	(1.76)
Religion										
Sunni	**0.74**	(0.44)	**0.00**	(0.00)	**0.40**	(0.49)	**0.68**	(0.47)	**0.01**	(0.12)
Druze	**0.19**	(0.40)	**0.79**	(0.41)	**0.43**	(0.50)	**0.15**	(0.36)	**0.81**	(0.39)
Other	**0.06**	(0.25)	**0.21**	(0.41)	**0.17**	(0.38)	**0.17**	(0.38)	**0.17**	(0.38)
No Answer	**0.05**	(0.22)	**0.18**	(0.39)	**0.16**	(0.37)	**0.16**	(0.37)	**0.16**	(0.37)
Traits										
Share Known	**21.55**	(37.88)	**20.53**	(18.96)	**19.29**	(34.22)	**18.56**	(32.47)	**20.29**	(36.70)
Trusting	**0.13**	(0.34)	**0.17**	(0.38)	**0.15**	(0.36)	**0.18**	(0.39)	**0.12**	(0.32)
Risk taking	**4.52**	(3.61)	**3.13**	(2.62)	**4.50**	(3.24)	**4.72**	(3.49)	**4.19****	(2.86)
N	73		71		162		94		68	

Notes: Means are reported in bold and standard deviations in parentheses. Statistical differences are calculated separately for Syrians in mixed groups (1) compared to Syrians in Homogenous groups (4), and for Lebanese in mixed groups (5) compared to Lebanese in Homogenous groups (2). The difference between mixed and homogeneous groups, by nationality, is based on a regression of the outcome variable on a 'mixed' dummy. Significant differences are shown using $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. Trust and risk taking have been elicited through the following survey questions: 1- Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (Binary Options: a) Most people can be trusted. b) Need to be very careful. and 2- Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please use the following scale, where the value 0 means: "risk averse" and the value 10 means: "fully prepared to take risks".

5. Data Description

Our sample consists of 312 participants, 78 of whom were randomly assigned to Syrian-only sessions, 70 to Lebanese-only sessions, and 164 to Mixed sessions.[12] The regression analysis below is based on the 306 participants that completed the end-of-experiment survey, while for the non-parametric tests we use the full sample.[13]

Table 1 shows the descriptive statistics of the survey variables based on the sample of 306 participants. As can be seen, participants are on average about 30 years of age, while the gender composition is balanced. With regard to education, there are some notable differences across the two groups, with the Lebanese participants being more likely to have acquired University education than the Syrians. Also, in terms of religion, Lebanese participants are mostly Druze, which is a characteristic of the Aley region, whereas the Syrian refugees are mostly Sunni.[14] While this is an important difference, this is also reflective of the nature of interactions of refugees with their host communities. Given Lebanon is diverse and fragmented along sectarian divides, geographic areas have substantial religious and sectarian concentrations. In addition, Syrians are predominantly Sunni, making religion strongly correlated with nationality. However, given that religion is not a visible characteristic, and the difficulty in making the religion salient without inducing an experimenter demand effect, we focus on the difference in nationalities as a driver for differences in behavior.

We performed balance tests to check whether Lebanese participants in the mixed sessions were similar in observable characteristics to Lebanese participants in homogeneous sessions, and similarly for Syrian refugee participants. We find that the two treatment groups were balanced in most observable characteristics, with only a few exceptions. In particular, among Lebanese participants, there are differences in risk-raking and number of children across mixed and homogeneous groups. For education, we reject the null hypothesis of independence of the education categories and treatment status for Syrians ($\chi^2\ test$; p-value=0.042), but not for Lebanese participants. We also fail to reject independence for marital status and religion in both groups. In any case, we control for all of these variables in our regression analysis below. To control for the pre-existing network, we also include a variable that measures the number

[12] The mixed treatment had more participants, as we wanted to have roughly equal number of participants of each nationality in the two treatments.
[13] For individuals missing values on age (17 individuals), risk taking (7 individuals), and trust (5 individuals) variables, we imputed the missing information by taking the average of the variable by gender and nationality.
[14] Although overall Syrians and Lebanese share similar religions, geographic clustering along religious lines is prevalent in Lebanon. Our sample of Lebanese participants is representative of the Aley region.

of people known to a participant in a particular session as a proportion of the total number of people of their same nationality in that particular session. On average, participants know 20% of other participants in a session, and we find no significant differences across treatment groups.[15]

6. Results

In presenting our results, we first discuss participants' contribution behavior in the public goods game without and with punishment. Following this, we analyze punishment behavior in the public goods game with punishment. We then explore individuals' welfare (as measured by their net average earnings) across treatments. Finally, we examine the correlation between cooperation and beliefs.

6.1 Contribution behavior

Figure 1 shows the time series of average contributions across treatments for the public good game without and with punishment. We treat average total contributions in each matched group as the independent unit of observation in the analysis that follows.[16] We first focus our discussion on contribution behavior in the no-punishment game (Panel A of Figure 1).[17] We observe that in "Only Syrian" and "Mixed" treatments average contributions decline over time, while in "Only Lebanese" treatment they remain relatively stable.[18] The observed decaying pattern of contributions as the game is repeated is in line with the vast majority of existing studies on linear public goods games without punishment (see Chaudhuri, 2011 for an overview). Interestingly, we find that this is not the case in the "Only Lebanese" treatment, suggesting that possibly these participants have a stable notion of how much to contribute. We

[15] We construct this variable to control for the number of people whom the participant knows in person before attending this experiment by asking "How many participants in this session/meeting do you know by name?". We divide this by the number of participants of the same nationality in that session because it is more likely that a person would know other people of the same nationality. For homogenous sessions the denominator is equal to the number of people of the same nationality, while for mixed sessions it will be approximately half. Therefore, differences in the proportion between the mixed and homogenous groups would show a mechanical difference in proportions. The definition of the denominator does not affect our results, on the contrary it amplifies the network effect within the session as a control.

[16] In the "Only Lebanese" treatment, we have 35 matching groups; in the "Only Syrians" treatment, we have 39 matching groups; and in the "Mixed" treatment we have 82 matching groups.

[17] Figure A1 in Appendix 1 presents histograms of contributions across rounds for each treatment in the no punishment game.

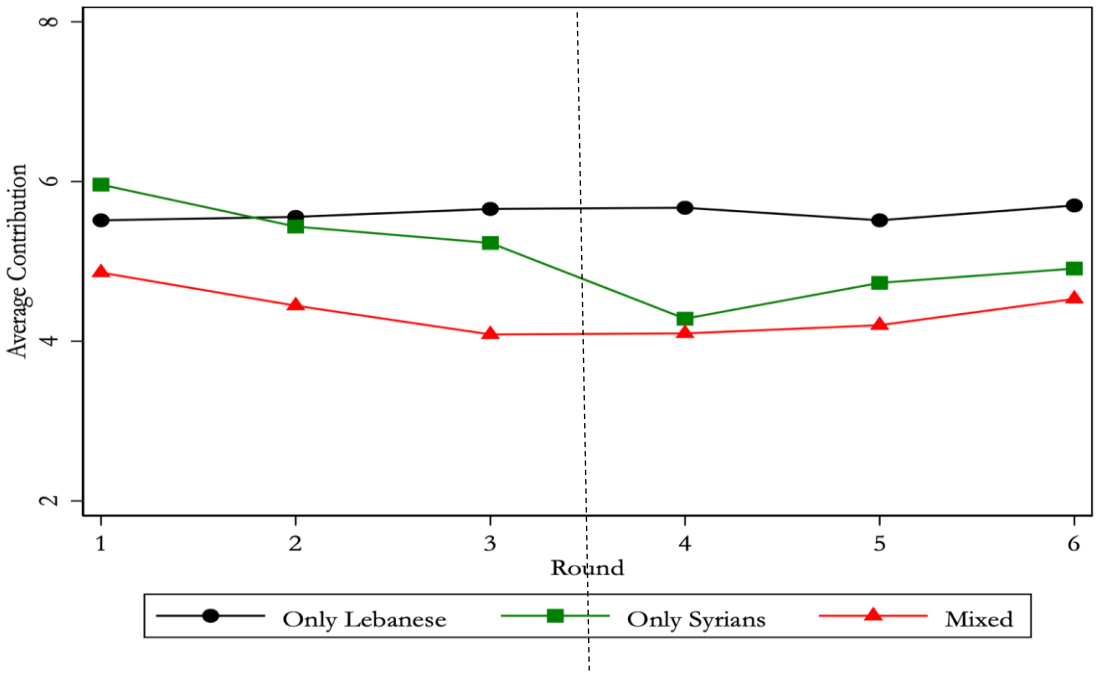
[18] Specifically, when we regress contribution on a linear period trend in each treatment separately, we find that the coefficient of the "period" variable is negative and statistically significant in the "Only Syrian" and "Mixed" treatments. For the "Only Lebanese" treatment, "period" is significant at conventional levels.

also see in Panel A of Figure 1 that contribution levels are very similar comparing treatments: "Only Syrian" to "Only Lebanese".

Table 2 shows the average absolute level of contributions and the average beliefs about partners' contribution in each treatment. Turning to differences across treatments, we find that, in the two homogeneous treatments, average contributions are higher compared to those in the mixed groups. In particular, across all rounds, average contributions in the "Only Syrians" ("Only Lebanese") treatment are equal to 5.54 (5.58) tokens, respectively. In contrast, in the "Mixed" treatment, groups contribute on average 4.46 tokens.

Figure 1. Average contributions over rounds across treatments in the public goods game without and with punishment

No Punishment (Panel A) *Punishment (Panel B)*



Note: Unit of analysis is average contributions at the matched group level.

Our non-parametric analysis shows that average contributions are statistically significantly different when we compare the "Only Syrians" with the "Mixed" treatments ($p = 0.006$) and the "Only Lebanese" with the "Mixed" treatments ($p = 0.002$).[19] However, we find insignificant differences in terms of contribution behavior when we compare the "Only Syrians" with the

[19] All tests reported in this section are two-sided Mann-Whitney tests. We use the group level as the unit of independent observation, as we implemented a partners' matching protocol in the experiment.

"Only Lebanese" treatments (p = 0.935). This indicates that homogeneous groups contribute similarly to the public good but significantly more when compared to mixed groups, thus providing support for Hypothesis 1.

We next turn to the analysis of beliefs about partners' contribution across treatments. Specifically, we observe that across all rounds, average beliefs in the "Only Syrians" ("Only Lebanese") treatment are equal to 5.72 (5.46) tokens, respectively. In contrast, in the "Mixed" treatment, participants expect partners to contribute, on average, 4.84 tokens. When we test for treatment differences in beliefs about partners' contribution behavior, we obtain a similar pattern across treatments. In particular, we find that participants, on average, believe that their partners will contribute more when we compare the "Only Syrians" with the "Mixed" treatments (p = 0.020) and the "Only Lebanese" with the "Mixed" treatments (p = 0.055). However, we find insignificant differences in terms of average beliefs about partners' contribution behavior when we compare the "Only Syrians" with the "Only Lebanese" treatments (p = 0.704). This implies that in homogeneous groups participants have similar beliefs about partners' contribution, and importantly, they expect their partners to contribute a larger amount of tokens to the public good compared to mixed groups. Taken together, this analysis indicates that contribution behavior and beliefs about partners' contribution behavior are significantly lower in mixed groups compared to homogeneous groups.

Table 2. Contributions and beliefs in the no-punishment public goods game

Treatments	Average absolute levels of contribution	Average beliefs about partners' contributions
Only Syrians (N=39 MG)	5.54 (1.99)	5.72 (1.80)
Only Lebanese (N=35 MG)	5.58 (1.55)	5.46 (1.29)
Mixed (N=82 MG)*	4.46 (2.07)	4.84 (1.87)

Notes: Standard deviations in parentheses. Analysis is done at the MG (matching-group) level (total MG's N=156), the actual number of respondents is N=312. * Individual level contribution means by nationality within the mixed sessions are 4.06 (s.d. 2.81) for Lebanese participants, and 4.77 (s.d. 3.01) for Syrians participants, and belief means are 4.73 (s.d. 2.78) and 4.92 (s.d. 2.87), respectively.

We next perform regression analysis to check for the robustness of the treatment differences identified in the earlier non-parametric tests. In what follows, since contribution behavior and beliefs about partners' contributions do not differ significantly between the "Only Syrians" and the "Only Lebanese" treatments, we pool these treatments under "Homogeneous" treatment and compare behavior in relation to the "Mixed" treatment consisting of both Syrians and Lebanese. We test more formally for differences in contribution behavior and beliefs about partners' contribution behavior across treatments using the following specification:

$$Y_{it} = a_0 + a_1 Mixed_i + \boldsymbol{\beta}'\boldsymbol{X} + \gamma_t + u_{it}, \quad (3)$$

where Y is the outcome of interest of participant i: either the contribution made by a subject or their beliefs about partner's contribution.[20] $Mixed_i$ is an indicator for whether subject i is in a mixed nationality session, γ_t are round dummies, which capture time patterns that may emerge from repeated play, while X is a vector of covariates that capture demographic characteristics (such as sex, age, education levels, marital status, number of children, religion, and nationality), and other experimentally elicited attributes (trust and risk taking).[21] We also control for the number of participants that an individual reports to know by name in a given session as a proportion of the total number of co-nationals in a session, as this network effect could be influencing cooperative behavior.[22] Also, as the gender composition of the group is visible and participants might be reacting to it we control for the share of female participants in a session. Finally, u_{it} is the error term. We estimate (3) using individual random effects and cluster standard errors at the matching group level.[23]

[20] In Section 6.3, we provide a more detailed discussion of how contribution behaviour and beliefs correlate for homogeneous and mixed groups in each game separately.

[21] We elicited trust and risk taking through the following survey questions: 1- Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (Binary Options: a) Most people can be trusted. b) Need to be very careful.) and 2- Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please use the following scale, where the value 0 means: "risk averse" and the value 10 means: "fully prepared to take risks".

[22] We check the robustness of our result to an alternative definition of this variable – the number of people an individual knows as a proportion of the total number of participants in a session – and it does not affect our results.

[23] Using a Tobit model yields very similar results (see Table A1 for the contributions in the no-punishment game, Table A2 for the contributions in the punishment game, and Table A3 for the punishment assignment, in Appendix 1).

Table 3. Contributions and beliefs in the no-punishment public goods game: Regression analysis

	All sample		Lebanese sub-sample		Syrian sub-sample	
	Contributions	Beliefs	Contributions	Beliefs	Contributions	Beliefs
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-0.98***	-0.72**	-1.46***	-0.94**	-0.40	-0.60
	(0.32)	(0.28)	(0.42)	(0.39)	(0.47)	(0.41)
Round 2	-0.34**	-0.19	-0.12	0.09	-0.53**	-0.42**
	(0.16)	(0.15)	(0.24)	(0.21)	(0.23)	(0.20)
Round 3	-0.54***	-0.22	-0.13	0.09	-0.88***	-0.48*
	(0.19)	(0.19)	(0.31)	(0.32)	(0.23)	(0.25)
Lebanese	-0.81*	-0.28				
	(0.43)	(0.40)				
Risk taking	-0.03	-0.02	-0.08	-0.06	0.01	-0.00
	(0.05)	(0.04)	(0.07)	(0.06)	(0.06)	(0.05)
Trusting	0.31	0.11	-0.15	-0.33	0.97*	0.58
	(0.37)	(0.34)	(0.45)	(0.41)	(0.53)	(0.56)
Share known	0.00	0.00	0.00	-0.00	0.01	0.00
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
% Female	0.01	0.00	0.01	-0.01	0.01	0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
N	918	918	417	417	501	501

Notes: Random Effects estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include: sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10), *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. % Female participants is the share of female participants in the experimental session. Treatment effects robust to different sets of control variables. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Two main observations stand out from the regression analysis reported in Table 3. First, starting with column (1), we find that the coefficient of the variable "Mixed" is statistically significant at the 1% level and has a negative sign, implying that participants in the mixed groups contribute fewer tokens to the public good compared to participants in the homogeneous

groups.[24] By looking separately at the Lebanese and Syrian sub-samples, as shown in columns (3) and (5), we find that the lower contribution levels are due to Lebanese participants contributing significantly less in the mixed groups compared to the homogeneous groups. For the Syrian sub-sample, we find that the coefficient of the "Mixed" treatment is smaller (in absolute value) and is not statistically significant at conventional levels. Thus, the reduction in cooperation in the mixed treatment is driven by the behavior of Lebanese participants.

In addition, we observe the same treatment differences concerning participants' beliefs about their partner's contribution behavior as shown in Columns (2), (4) and (6). Specifically, participants in the mixed groups expect that partners will contribute less compared to participants in the homogeneous groups.[25]

We next turn our attention to the analysis of behavior in the public goods game with punishment. Panel B of Figure 1 shows the time series of average contributions in this game across treatments.[26] We observe that in all three treatments average contributions remain relatively stable over time, with a slight increase for the "Only Syrian" and the "Mixed" treatment.[27] The average contributions also remain lower in the "Mixed" treatment compared to the two homogeneous treatments.

Table 4 reports average contribution and beliefs about partners' contribution in the punishment game. Prior to analyzing treatment differences, we look at whether the presence of punishment increases contributions as compared to the contribution levels in the no-punishment game. Overall, we observe that, when we pool across all three treatments, compared to the no-punishment game, average contributions significantly decrease in the presence of costly sanctioning (sign rank test; $p = 0.024$).[28] This significant difference is driven by the observation that average contributions are significantly lower in the "Only Syrians'' treatment ($p = 0.013$). This is not the case, however, for the "Only Lebanese" ($p=0.819$) and for the "Mixed"

[24] When we include, as a separate regressor, the difference between own and counterpart's contribution in the previous period, our main finding that contributions are lower in mixed than in homogeneous groups remains robust.
[25] We find similar patterns when restricting the analysis to the very first period of the no-punishment game (see Table A4 in Appendix 1).
[26] Figure A2 Appendix 1 presents histograms of contributions across treatments and rounds in the punishment game.
[27] Specifically, when we regress contribution on a linear period trend in each treatment separately, we find that the coefficient of the "period" variable is not statistically significant in any of the three treatments.
[28] We also compare average contributions of period 3 of the no-punishment game, with average contributions of period 1 of the punishment game (i.e. before punishment is exercised but with the knowledge of the presence of punishment), and find that contributions are lower in the punishment game than in the no-punishment in Syrian-only sessions, not statistically different in Lebanese-only sessions, and significantly lower in mixed sessions.

treatments (p = 0.107), where average contributions are not significantly different between the no-punishment and the punishment game. The relatively flat trajectory of contributions in the punishment game might be due to the following reasons: (i) there is evidence (Hermann et al., 2008; Gächter et al., 2010) that antisocial punishment in public good games tends to undermine the role of punishment in raising contributions, and in our sample we do find evidence of antisocial punishment; (iii) in our design, group composition remained the same throughout the 6 rounds of the experiment, and there were two members in a group. In addition, the fact that feedback about contributions was provided allows the potential formation of reputations as one group member can identify from whom the assignment of punishment comes. This may lead to counter-punishment effects as subjects can take revenge from those who have punished them in the previous period. Existing evidence from public good games (see Denant-Boemont et al., 2007; Nikiforakis 2008) shows that the presence of counter-punishment weakens subjects' willingness to cooperate.

Our next step is to test for differences in contribution behavior across treatments when punishment opportunities are available. Following our observations from the no-punishment game, we compare behavior between homogeneous and mixed groups.[29] We find that average contributions in the homogeneous groups when pooled together are significantly higher than in the "Mixed" treatment (5.33 versus 4.28; p = 0.013).

When we examine differences in beliefs about partners' contributions across treatments, we also find that homogeneous groups when pooled together expect that partners contribute significantly higher amounts to the public good than participants' average beliefs in the "Mixed" treatment (p = 0.018).[30] However, the above analysis does not control for potential effects that may influence contribution behavior in the punishment game, such as, demographic variables or experience stemming from playing first the no-punishment game.

[29] We note that behavior in the no-punishment game is cleaner in the sense that participants have no experience of any other game unlike behavior in the punishment game, which may be affected by the history of play in the no-punishment game that preceded.

[30] In particular, Lebanese participants' expectations on others' contribution in the 'Only Lebanese' treatment do not differ significantly than Syrians in the 'Only Syrians' treatment (p = 0.505) but are significantly more in the 'Mixed' treatment (p = 0.013). On the other hand, Syrian participants in the 'Only Syrians' treatment do not differ significantly in expectations compared to participants in the 'Mixed' treatment (p = 0.167).

Table 4. Contributions and beliefs in the public goods game with punishment

Treatments	Average absolute levels of contributions	Average beliefs about partners' contributions
Only Syrians (N=39 MG)	4.64 (2.31)	5.18 (2.18)
Only Lebanese (N=35 MG)	5.63 (2.10)	5.50 (2.04)
Mixed (N=82 MG)*	4.28 (2.40)	4.60 (2.29)

Notes: Standard deviations in parentheses. Analysis is done at the MG (matching-group) level (total MG's N=156), the actual number of respondents is N=312. * Individual level contribution means by nationality within the mixed sessions are 4.21 (s.d. 3.35) for Lebanese participants, and 4.37 (s.d. 3.12) for Syrians participants, and belief means are 4.21 (s.d. 3.35) and 4.37 (s.d. 3.12), respectively.

In Table 5, we present regression analysis of the contributions and beliefs in the public goods game with punishment. In addition to the control variables used in the regression analysis of the no-punishment game as reported in Table 3, we control for differences in earnings from the no-punishment game, as these may affect contribution behavior in the punishment game (recall that participants were provided with feedback at the end of each round in the no-punishment game).

Our main finding from Table 5 is that mixed groups contribute significantly less than homogeneous groups, as indicated by the coefficient of the variable "Mixed", which has a negative sign and is statistically significant (see column 1).[31] We also observe that beliefs remain lower in mixed groups compared to the homogeneous ones (as shown in column 2). These significant effects are primarily driven by the behavior of Lebanese participants (see columns 3-4). When considering the Syrian sub-sample, we observe that the coefficients of the "Mixed" variable are not significant neither for the contribution (column 5) nor for the beliefs (column 6) regressions. Finally, we find that contributions and beliefs weakly increase over the rounds in the punishment game among Lebanese participants.

Our first result is summarized below.

[31] Our finding that contributions are lower in mixed than in homogeneous groups remains robust, when we include, as a separate regressor, the difference between own and counterpart's contribution in the previous period.

Table 5. Contributions and beliefs in the public goods game with punishment: Regression analysis

	All sample		Lebanese sub-sample		Syrian sub-sample	
	Contributions	Beliefs	Contributions	Beliefs	Contributions	Beliefs
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-0.79**	-0.77**	-1.28***	-1.01**	-0.24	-0.62
	(0.40)	(0.37)	(0.48)	(0.47)	(0.53)	(0.48)
Round 2	0.08	0.28*	0.19	0.42	-0.01	0.16
	(0.15)	(0.16)	(0.25)	(0.27)	(0.20)	(0.19)
Round 3	0.34*	0.41**	0.55*	0.57**	0.17	0.27
	(0.18)	(0.18)	(0.31)	(0.28)	(0.21)	(0.23)
Lebanese	0.38	-0.32				
	(0.46)	(0.50)				
Risk taking	-0.01	0.01	-0.05	-0.00	0.02	-0.01
	(0.05)	(0.05)	(0.07)	(0.07)	(0.06)	(0.06)
Trusting	0.19	0.02	0.19	0.05	0.23	0.00
	(0.43)	(0.42)	(0.46)	(0.50)	(0.72)	(0.71)
Share known	-0.00	-0.01*	0.00	-0.01	-0.00	-0.01
	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
% Female.	0.00	0.01	-0.00	0.01	0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Diff. No Pun. Earning	0.57***	0.04	0.69***	-0.02	0.53***	0.09
	(0.04)	(0.07)	(0.10)	(0.10)	(0.07)	(0.10)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
N	918	918	417	417	501	501

Notes: Random Effects estimates. Standard errors in parentheses are clustered at the matching group level. Other controls include: sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10). *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. *Diff. No Pun. Earning*: Average difference in earnings between the partners in the three rounds of the public goods game without punishment. Treatment effects robust to different sets of control variables. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

RESULT 1. *In the public goods game without and with punishment, average contributions are significantly higher in the homogeneous groups compared to the mixed groups. We find the same treatment differences when we examine beliefs about partners' contributions. These patterns are driven by the behavior of Lebanese participants.*

6.2 Punishment behavior

Figure **2**2 shows the average punishment points assigned by the punisher to their partner as a function of partner's deviation from the punisher's contribution. In Figure **2**2, each dot represents a single observation which is the average punishment across all rounds at a particular deviation interval as indicated in the horizontal axis. Negative (positive) deviation intervals refer to cases where the punished group member's contribution is less (more) than the punisher's contribution.

A visual inspection of Figure **2**2 suggests that for the negative deviation interval, the punishment function has the anticipated negative slope - implying harsher punishment for larger negative deviations from the punisher's contribution behavior - as previous literature on public goods games with punishment would suggest. Regarding the non-negative deviation interval, we find the substantial use of anti-social punishment. Participants are prepared to punish positive deviations from the punisher's contribution both in the homogeneous and in the mixed groups. This observation is in line with Herrmann et al. (2008) who also document the widespread punishment of co-operators in Middle East cities (e.g., Riyadh, Muscat).

Figure 2. Punishment as a function of deviation from punisher's contribution across treatments

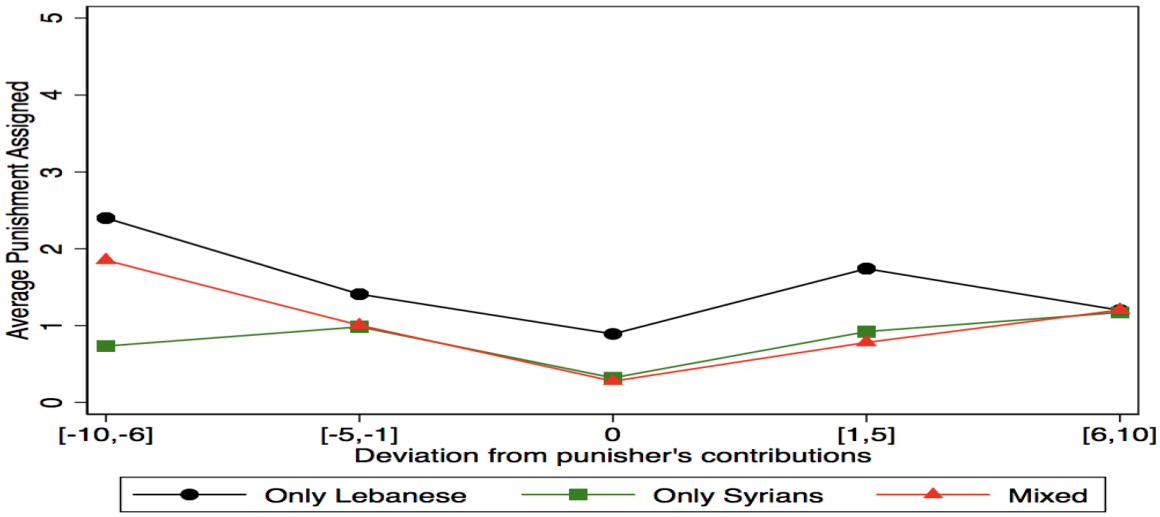


Table 6. Punishment assigned in the public goods game with punishment: Regression analysis

	All sample		Lebanese sub-sample		Syrian sub-sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-0.32**	-0.38**	-0.67***	-0.55*	-0.02	-0.15
	(0.14)	(0.17)	(0.20)	(0.29)	(0.18)	(0.21)
Abs. Negative Dev.	0.11***	0.09**	0.16***	0.20**	0.09***	0.06*
	(0.03)	(0.04)	(0.06)	(0.09)	(0.03)	(0.03)
Positive Dev.	0.09***	0.08**	0.17***	0.19***	0.04	0.03
	(0.03)	(0.04)	(0.05)	(0.07)	(0.03)	(0.03)
Mixed × Abs Neg Dev		0.03		-0.06		0.06
		(0.06)		(0.11)		(0.07)
Mixed × Pos Dev		0.02		-0.05		0.03
		(0.05)		(0.10)		(0.05)
Round 2	-0.00	-0.00	0.02	0.02	-0.00	-0.01
	(0.07)	(0.07)	(0.13)	(0.14)	(0.08)	(0.08)
Round 3	0.07	0.08	0.09	0.07	0.08	0.09
	(0.10)	(0.10)	(0.18)	(0.18)	(0.10)	(0.10)
Lebanese	0.47**	0.47**				
	(0.23)	(0.23)				
Risk Taking	0.00	0.00	0.04	0.04	-0.00	-0.00
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Trusting	0.18	0.18	0.41	0.43	0.01	0.03
	(0.20)	(0.20)	(0.29)	(0.28)	(0.26)	(0.26)
Share known	-0.00	-0.00	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
% Female	-0.01**	-0.01**	-0.02***	-0.02***	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Diff. No Pun. Earning	0.02	0.02	0.04	0.04	0.01	0.01
	(0.03)	(0.03)	(0.05)	(0.05)	(0.03)	(0.03)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
N	840	840	402	402	438	438

Notes: Random Effects estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include: sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10). *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No).Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. *Diff. No Pun. Earning*: Average difference in earnings between the partners in the three rounds of the public goods game without punishment. *Abs Neg Dev*: Absolute negative deviation of partners from own contribution. *Positive Dev*: Positive deviation of partner from own contribution. Treatment effects robust to different sets of control variables. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6 assesses the determinants of the assignment of punishment. To do so, we report random effects regressions with the assignment of punishment by a participant being the dependent variable. In addition to the control variables reported in Tables 3 and 4, we include as independent variables: "Player *j*'s absolute negative (contribution) deviation" and "Player *j*'s positive (contribution) deviation". Note that all deviations are calculated with respect to the punisher's contribution. We include "absolute negative deviation" and "positive deviation" as separate regressors, as measures of pro-social and anti-social punishment respectively, since these two different sorts of deviation elicit different punishment responses as shown in Figure 3. The variable "absolute negative deviation" is the absolute value of the actual deviation of subject *j*'s contribution from the punisher's contribution, when subject *j*'s contribution is below the punisher's contribution; and zero otherwise. The variable "positive deviation" is constructed in an analogous way. As before, the dummy variable "Mixed" equals 1 for the mixed treatment and 0 otherwise. We also included two interaction terms, which indicate whether the slope of the punishment function differs with respect to negative and positive deviations across our treatments. To gain a better understanding of the punishment patterns, we report regressions for the whole sample (columns 1 and 2) as well as the Lebanese (columns 3 and 4) and the Syrian sub-samples (columns 5 and 6), separately.

We first observe that, across most of the columns, participants punish significantly both negative and positive deviations from the punisher's contribution. Specifically, the coefficient of the variable "Absolute negative deviation" has a positive sign and is statistically significant, indicating that the more a participant negatively deviates from the punisher's contribution, the harsher the punishment is. Interestingly, except for significant levels of social punishment, we also observe that participants engage in anti-social punishment. The coefficient of the variable "Positive deviation" has a positive sign and is statistically significant in the whole sample and the Lebanese sub-sample. This suggests that the more a subject positively deviates from the punisher's contribution, the harsher the punishment is. We also find that the anti-social punishment behavior does not vary significantly across treatments, as shown by the interaction of the positive and negative deviations with the "Mixed treatment" (columns 2, 4, and 6). When we examine differences in how participants use punishment across treatments, the results indicate that participants assign significantly less punishment in mixed groups compared to homogeneous groups, as suggested by the negative and statistically coefficient of the dummy variable "Mixed".

Taken together with our Result 2, where we observed that mixed groups contribute significantly less than homogeneous groups, our finding that the mixed groups punish significantly less than the non-mixed groups suggests that the norm of sustaining high contributions may be less important in mixed groups. In other words, in the mixed treatment, we observe that participants display lower willingness to deviate from the dominant selfish strategy compared to homogeneous groups. Overall, this suggests that norm compliance and norm enforcement is more difficult to occur in mixed groups.

Our second result is summarized below.

RESULT 2. *In the public goods game with punishment, average punishment assigned is significantly lower in mixed groups compared to homogeneous groups. We also observe the use of antisocial punishment. These patterns are driven by the behavior of Lebanese participants.*

Our findings from the previous sections reveal significant differences in how participants contribute and assign punishment points across treatments. We further investigate the implications that these differences have for participants' welfare, as measured by their average net earnings in each of the two games we considered. Table 7 presents average earnings by treatment in the public goods game with punishment, while Table A5 in the Appendix reports regression estimates of equation (3) with earnings as the dependent variable. We find that earnings are significantly lower in the mixed groups, in the contribution stage of the punishment game. However, we find that there are no significant differences in total earnings between the mixed and the homogeneous treatments (if anything earnings are slightly higher in the mixed treatment but the difference is not statistically significant). This is because, as we have seen above, mixed groups assign significantly less punishment than homogeneous groups, so overall, total earnings (from both the contribution and punishment stage) among mixed and homogeneous groups do not differ significantly.

Our third result is summarized below.

RESULT 3. *Average earnings are significantly lower in mixed groups compared to homogeneous groups in the public goods game with punishment, when we only consider earnings from the contribution stage. If we consider total earnings including costs of punishment, there are no differences between homogeneous and mixed groups.*

Table 7. Breakdown of earnings by treatment

	Punishment	
	Homogeneous	Mixed
Total earnings	8.46 (5.80)	8.98 (4.90)
Earnings after contribution	12.50 (2.22)	12.13 (2.27)
Punishment costs	-4.05 (5.12)	-3.15 (4.28)

Notes: Earnings are measured in ECUs. Standard deviations in parentheses.

6.3 Contributions and beliefs about partner's contributions

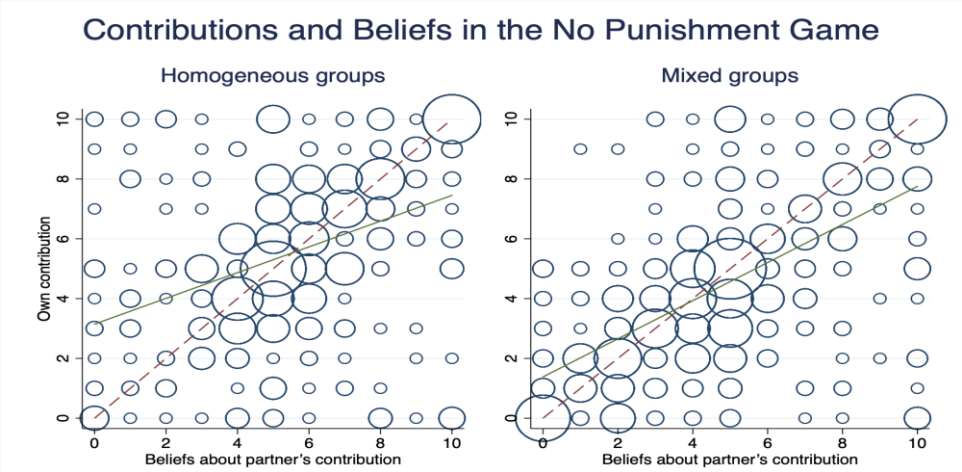
We next investigate whether participants' own contributions are conditioned on beliefs about their partner's contributions (Fischbacher et al., 2001; Fischbacher and Gaechter, 2010), and whether this varies across treatments. Figure 3 shows the correlation between beliefs and contributions in the two games, for each treatment separately. The vertical axis indicates own contributions and the horizontal axis indicates beliefs about the partner's contribution. Each dot represents a combination of contributions and beliefs and the size of the dots is proportional to the number of observations that correspond to that combination. The dashed line corresponds to the 45 degree line, meaning contributions and beliefs are perfectly matched and the solid line represents the estimated linear relationship between beliefs and contributions.

As shown in Figure 3, focusing on the no-punishment game, we find that contributions and beliefs are positively correlated in both treatments (for the homogeneous treatment, corr. coeff. ρ=0.43; for the mixed treatment, corr. coeff. ρ=0.64), which is in line with previous findings from public goods games (for an overview, see Chaudhuri, 2011). However, there are significant differences in both the intercept and the slope of the lines across treatments. In particular, in the homogeneous treatment the intercept is higher, suggesting that participants contribute more in this treatment when they believe that the partner does not contribute anything, than those with similar beliefs in the mixed treatment (35% of endowment versus 15%). This suggests that participants in the homogeneous groups are more unconditionally cooperative. As the expectation of the partner's contribution increases, participants in mixed groups respond by contributing more than those in the homogeneous treatment (the regression line is steeper), which is consistent with them being conditionally cooperative. To formally test for whether these differences across treatments are significant, we estimated random effects regressions with standard errors clustered at the matching-group level (see Table A6 in

Appendix 1).[32] These regressions indicate that contributions and beliefs are highly correlated in both treatments; however, there are also significant treatment differences in terms of the intercept (the coefficient of "Mixed" is negative and statistically significant) and the slope (the coefficient of the interaction term is positive and statistically significant) in the no-punishment game.[33]

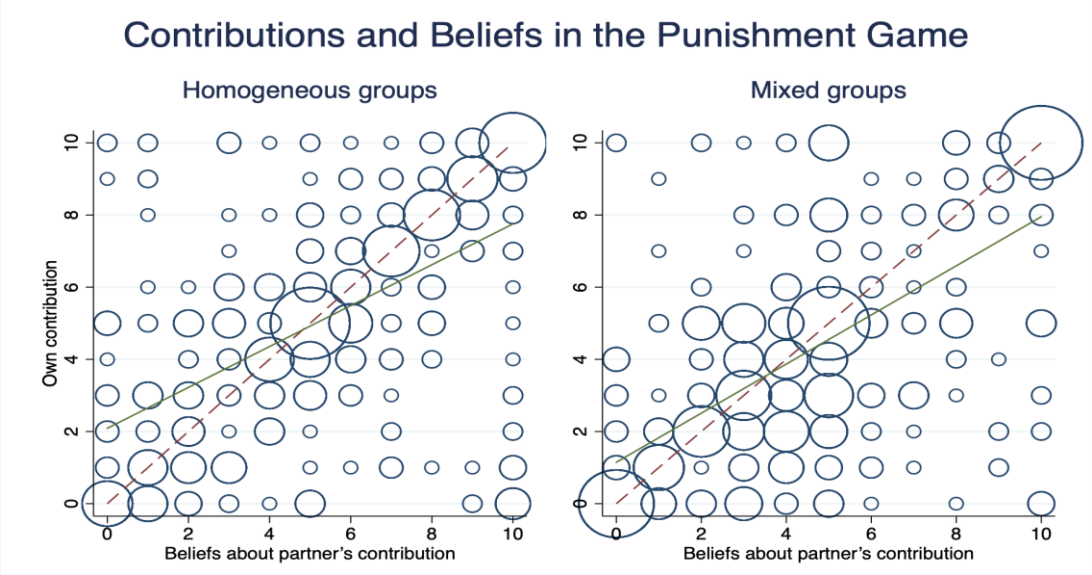
To summarise, based on the above evidence we can surmise that, in the homogeneous treatment, cooperation appears to be driven more by an unconditional relationship between contribution and beliefs, which could be attributed to altruistic motives. In contrast, participants' contribution behaviour in the mixed treatment is more strongly conditioned on their beliefs about their partner's behaviour, suggesting a pattern of reciprocal behaviour. However, combined with our earlier observation that average beliefs about other's contribution behaviour are lower in the mixed than in the homogeneous groups, we observe lower average contributions in the former treatment.

Figure 3. Correlation between contributions and beliefs about partner's contributions



[32] The dependent variable in these regressions is subject i's contribution and as independent variables we include subject i's beliefs about their partner's contribution, a treatment dummy for being in a "Mixed" group, and their interaction.

[33] When looking at the relationship between contributions and beliefs in the punishment game, we observe that again contribution behavior and beliefs about other's contributions are highly and positively correlated in both treatments (for the homogeneous treatment: corr. coif. ρ=0.57; for the mixed treatment: corr. coeff. ρ=0.68). However, the difference in the slopes is less marked (see Table A6, columns 5-6, in Appendix 1).



Note: Each dot represents a combination of contributions and beliefs about partner's contributions. The size of the dots is proportional to the number of observations that correspond to that combination. The dashed line corresponds to the 45 degree line and the solid line represents the estimated linear relationship between contributions and beliefs.

6.4 Auxiliary evidence

Our results are further supported by qualitative evidence based on survey data that we collected. In particular, at the end of the experiment we administered a short questionnaire to participants covering questions related to individual characteristics and attitudes toward the other group, among others. The self-reported measures of cooperation suggest that Lebanese are significantly less likely to cooperate with Syrians than Syrians are to cooperate with Lebanese.[34] Thus, the self-reported measures of intergroup cooperation align with the behavior we observe in the experiment.

Furthermore, according to a national survey (UNDP, 2018), only 25% of respondents described their relations with the other group as positive or very positive in 2017 – which is when our experiment took place. In the Aley district, which is where we carried out our experiment, the report reveals that 24.2% of Lebanese and 9.5% of Syrians disagree that the two nationalities are able to work together to solve problems they have in their community. In addition, the perception of Lebanese people is such that 65% of the respondents believe that Syrians have contributed to increased crime and violence in this district, and 85% agree that the Syrians are

[34] In the survey, the question on cooperation ("How likely are you to cooperate with Syrians (Lebanese)?" for Lebanese (Syrian) respondents) is measured on a three-point scale (likely – unlikely). The χ^2 test indicates a statistically significant correlation between nationality and this measure of cooperation at 1% significance level.

placing strain and pressure on their public resources. There is also a clear dichotomy in the two groups' assessment of the quality of relations between the two. Indeed, around 80% of Lebanese people think that the relations are not positive, while 48% of Syrians think the same. These survey-based attitudes reveal a substantial lack of trust toward Syrian refugees, which might explain why Lebanese participants in the public goods game are less cooperative in mixed groups. Thus, the overall survey evidence collected from our sample and from a nationally representative sample is aligned with our experimental findings and provides us with further reassurance about the internal and external validity of the study.

7. Conclusion

There has been a recent interest in the impact of hosting refugees, after the Syrian conflict and the displacement of million Syrians into neighboring countries and further afield. Yet, little is known about the preferences for intergroup cooperation of refugees and their hosting communities. This paper examines cooperation and reciprocity of Syrian refugees and the Lebanese hosting community using a lab-in-the-field experimental methodology. Cooperation across groups is important for the provision of public goods and for having a stable and harmonious society. Also, our context is interesting given the co-existence of cultural/linguistic similarities and a historically turbulent relationship between the two countries.

Our results reveal that, on average, contributions are higher in homogeneous groups than in mixed groups. These results are driven mainly by the hosts (Lebanese participants), who exhibit a stronger tendency to reduce contributions in mixed groups. In terms of punishment, we find a substantial degree of antisocial punishment, especially for Lebanese, who tend to punish significantly less in mixed groups compared to in homogeneous groups. Also, we find that behavior in mixed groups is more consistent with conditional cooperation than in homogeneous groups. This suggests that for the hosts, although as expected there is greater cooperation toward own group, there is also less willingness to punish out-group defectors.

Overall, our findings indicate that the mixing of the two groups leads to lower contributions to the public good, making individuals worse-off, and also that sanctions are not able to redress this lack of cooperation. Importantly, behavior is not symmetric across the two groups, as it is the host community that shows less cooperation toward the refugees. Therefore, although the host community and refugees share a common language in this context, our evidence points to reduced cooperation between the two populations. This is somewhat surprising because

typically language is seen as a policy tool that facilitates the integration and co-operation between refugees and the host community. Thinking more broadly, it suggests that in other countries that host a large number of refugees and where the cultural distance between refugees and hosts may be more pronounced, sustaining intergroup cooperation would be challenging. More evidence on this would be particularly welcome. Also, a fruitful avenue for future research would be to assess whether interventions aimed at increasing intergroup contact, trust and co-operation would help to reduce outgroup biases and increase public good provision, which are important for the well-being of refugees and their hosting communities.

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Appendix for "Cooperation in a Fragmented Society: Experimental Evidence on Syrian Refugees and Natives in Lebanon"

For online publication

Appendix 1. Additional analysis

Tables A1- A3 present the robustness analysis of Tables 3, 5, and 7 in the main draft but using Tobit as an estimation method to account for the fact that the outcome variables are censored between 0 and 10 for contributions and beliefs, and 0 and 5 for punishment assignment.

Table A1. Contributions and Beliefs Without Punishment

	All sample		Lebanese sub-sample		Syrian sub-sample	
	Contributions	Beliefs	Contributions	Beliefs	Contributions	Beliefs
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-1.06***	-0.77**	-1.58***	-1.03**	-0.38	-0.64
	(0.38)	(0.32)	(0.48)	(0.43)	(0.57)	(0.48)
Round 2	-0.43**	-0.25	-0.12	0.12	-0.72**	-0.57**
	(0.20)	(0.18)	(0.29)	(0.25)	(0.30)	(0.25)
Round 3	-0.70***	-0.30	-0.23	0.06	-1.10***	-0.61**
	(0.23)	(0.22)	(0.37)	(0.35)	(0.31)	(0.30)
Lebanese	-0.96*	-0.33				
	(0.52)	(0.46)				
Risk taking	-0.04	-0.03	-0.10	-0.06	0.01	-0.01
	(0.06)	(0.05)	(0.07)	(0.07)	(0.08)	(0.06)
Trusting	0.35	0.09	-0.26	-0.39	1.21*	0.67
	(0.42)	(0.39)	(0.47)	(0.43)	(0.63)	(0.66)
Share known	0.00	0.00	0.00	-0.00	0.01	0.01
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
% Female	0.01	0.01	0.01	-0.02	0.02	0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
N	918	918	417	417	501	501

Notes: Tobit estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10). *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. % Female is the share of female participants in the experiment session. Treatment effects robust to different sets of control variables. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A2. Contributions and Beliefs with Punishment

	All sample		Lebanese sub-sample		Syrian sub-sample	
	Contribution	Beliefs	Contribution	Beliefs	Contribution	Beliefs
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-0.78	-0.84*	-1.26**	-1.00*	-0.20	-0.74
	(0.51)	(0.45)	(0.60)	(0.57)	(0.68)	(0.58)
Round 2	0.06	0.37*	0.20	0.53	-0.06	0.23
	(0.20)	(0.20)	(0.31)	(0.33)	(0.26)	(0.26)
Round 3	0.45*	0.57**	0.67*	0.75**	0.26	0.41
	(0.24)	(0.23)	(0.40)	(0.34)	(0.28)	(0.30)
Lebanese	0.46	-0.45				
	(0.59)	(0.63)				
Risk taking	-0.02	0.00	-0.08	0.00	0.01	-0.02
	(0.06)	(0.06)	(0.09)	(0.09)	(0.07)	(0.07)
Trusting	0.25	0.09	0.33	0.17	0.23	0.07
	(0.55)	(0.50)	(0.54)	(0.58)	(0.96)	(0.85)
Share known	-0.00	-0.01	0.00	-0.01	-0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
% Female	0.00	0.02	-0.00	0.01	0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diff. No Pun. Earning	0.71***	0.05	0.86***	-0.01	0.68***	0.12
	(0.06)	(0.09)	(0.14)	(0.13)	(0.09)	(0.12)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
N	918	918	417	417	501	501

Notes: Tobit estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10). *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. % Female participants are the share of female participants in the experiment session. *Diff. No Pun. Earning*: Average difference in earnings between the partners in the three rounds of the public good game without punishment. Treatment effects robust to different sets of control variables. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A3. Punishment Assignment in the Punishment PGG

	All sample		Lebanese sub-sample		Syrian sub-sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-0.86**	-1.25**	-1.57***	-1.52**	-0.22	-0.95
	(0.37)	(0.51)	(0.49)	(0.72)	(0.49)	(0.67)
Abs. Negative Dev.	0.26***	0.17*	0.36***	0.36**	0.23***	0.09
	(0.06)	(0.09)	(0.10)	(0.16)	(0.08)	(0.10)
Positive Dev.	0.26***	0.22**	0.41***	0.43***	0.16**	0.08
	(0.06)	(0.09)	(0.10)	(0.14)	(0.08)	(0.11)
Mixed × Abs Negative Dev		0.19		0.01		0.29*
		(0.12)		(0.20)		(0.15)
Mixed × Positive Dev		0.08		-0.05		0.19
		(0.12)		(0.19)		(0.14)
Round 2	-0.17	-0.17	-0.07	-0.07	-0.23	-0.23
	(0.17)	(0.17)	(0.30)	(0.30)	(0.20)	(0.20)
Round 3	-0.13	-0.10	-0.04	-0.05	-0.16	-0.12
	(0.22)	(0.22)	(0.40)	(0.40)	(0.25)	(0.25)
Lebanese	1.31**	1.29**				
	(0.62)	(0.62)				
Risk taking	0.00	0.01	0.04	0.04	-0.00	-0.00
	(0.05)	(0.05)	(0.08)	(0.08)	(0.06)	(0.06)
Trusting	0.38	0.41	0.70	0.71	0.05	0.16
	(0.48)	(0.48)	(0.59)	(0.59)	(0.68)	(0.68)
Share known	-0.00	-0.00	0.00	0.00	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
% Female	-0.03**	-0.03*	-0.06***	-0.06***	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diff. No Pun. Earning	0.07	0.07	0.09	0.09	0.03	0.03
	(0.07)	(0.07)	(0.12)	(0.12)	(0.09)	(0.09)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
N	918	918	417	417	501	501

Notes: Tobit estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10). *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. % Female participants are the share of female participants in the experiment session. *Diff. No Pun. Earning*: Average difference in earnings between the partners in the three rounds of the public good game without punishment, *Abs Negative Dev*: Absolute negative deviation of partners from own contribution, *Positive Dev*: Positive deviation of partner from own contribution. Treatment effects robust to different sets of control variables. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A4. Contributions and Beliefs without Punishment – Round 1

	Contributions	Beliefs	Contributions - Lebanese sub-sample	Beliefs - Lebanese sub-sample	Contributions - Syrian sub-sample	Beliefs - Syrian sub-sample
	(1)	(2)	(3)	(4)	(5)	(6)
Mixed	-0.80**	-0.51*	-1.25***	-0.66	-0.21	-0.39
	(0.32)	(0.30)	(0.47)	(0.45)	(0.48)	(0.50)
Lebanese	-1.01**	-0.80				
	(0.51)	(0.50)				
Risk taking	-0.06	-0.06	-0.02	-0.01	-0.07	-0.05
	(0.05)	(0.05)	(0.09)	(0.08)	(0.07)	(0.07)
Trusting	0.38	0.22	0.11	-0.18	0.91	0.75
	(0.41)	(0.44)	(0.65)	(0.63)	(0.61)	(0.70)
Share known	0.01	0.00	-0.00	-0.00	0.02*	0.01
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
% Female	0.00	-0.00	-0.01	-0.02	0.01	0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
N	306	306	139	139	167	167

Notes: Random Effects estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include: sex, age, education levels, marital status, religion, and number of children. *Risk taking:* "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10), *Trusting*: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. % Female is the share of female participants in the experiment session.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A5. Earnings in the no-punishment and punishment games: Regression analysis

	Total Earnings in Punishment Game	Earnings from Stage One of Punishment Game
	(1)	(2)
Mixed	1.02	-0.33*
	(0.66)	(0.20)
Round 2	0.10	0.03
	(0.32)	(0.07)
Round 3	-0.16	0.17*
	(0.42)	(0.09)
Lebanese	-1.10	-0.25
	(0.92)	(0.34)
Risk taking	0.06	-0.00
	(0.08)	(0.03)
Trusting	-0.02	0.04
	(0.68)	(0.24)
Share known	-0.01*	-0.00
	(0.01)	(0.00)
% Female	0.07***	0.01
	(0.02)	(0.01)
Diff. No	0.10	0.18***
Punish. Earning	(0.07)	(0.05)
Other Controls	Yes	Yes
N	918	918

Notes: Random Effects estimates. Standard errors in parentheses are clustered at the matching group level. Other control variables include: sex, age, education levels, marital status, religion, and number of children. Risk taking: "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (Scale 0-10), Trusting: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (Yes/No). Share known measures the ratio of the number of participants, known to the participant, to the number of people of their same nationality in a given session. % Female participants is the share of female participants in the experimental session. Treatment effects robust to different sets of control variables. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A6. Correlation between Contributions and Beliefs

	Round 1 of No Punishment Game		No Punishment Game		Punishment Game	
	(1)	(2)	(3)	(4)	(5)	(6)
Belief	0.41***	0.41***	0.36***	0.45***	0.50***	0.51***
	(0.10)	(0.10)	(0.08)	(0.08)	(0.07)	(0.07)
Belief x mixed	0.36***	0.34***	0.19**	0.16*	0.11	0.10
	(0.12)	(0.12)	(0.09)	(0.09)	(0.09)	(0.10)
Mixed	-2.48***	-2.35***	-1.74***	-1.48***	-0.92*	-0.89*
	(0.67)	(0.68)	(0.54)	(0.53)	(0.47)	(0.51)
Controls	No	Yes	No	Yes	No	Yes
Constant	3.45***	3.03*	3.53***	4.39***	2.44***	3.46**
	(0.60)	(1.68)	(0.49)	(1.26)	(0.39)	(1.73)
N	306	306	918	918	918	918

Notes: OLS estimate for Round 1 in Column (1 and 2), Random Effects estimates for columns (3-6). Standard errors clustered at the matching group level are given in parentheses. Controls are the same as those presented in the main analyses: sex, age, education levels, marital status, religion, number of children, risk taking, trust, share of known participants, share of female participants, and round dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure A1. Distribution of Contributions across treatment and rounds in the public good game (PGG) without punishment

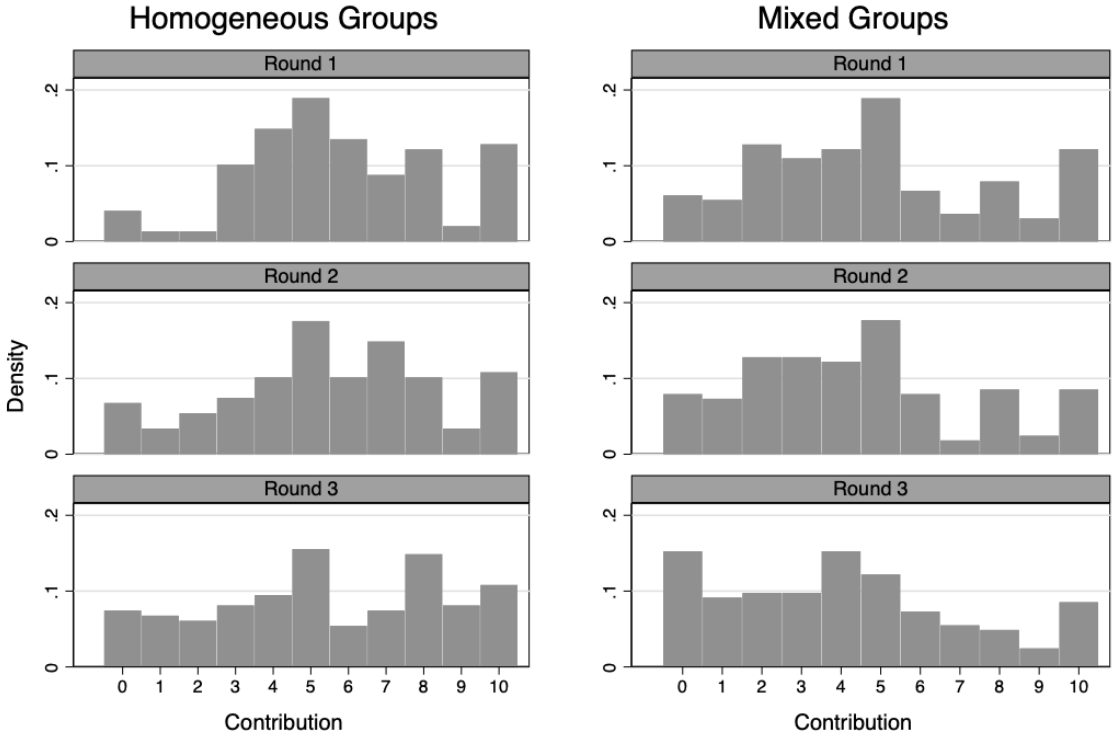
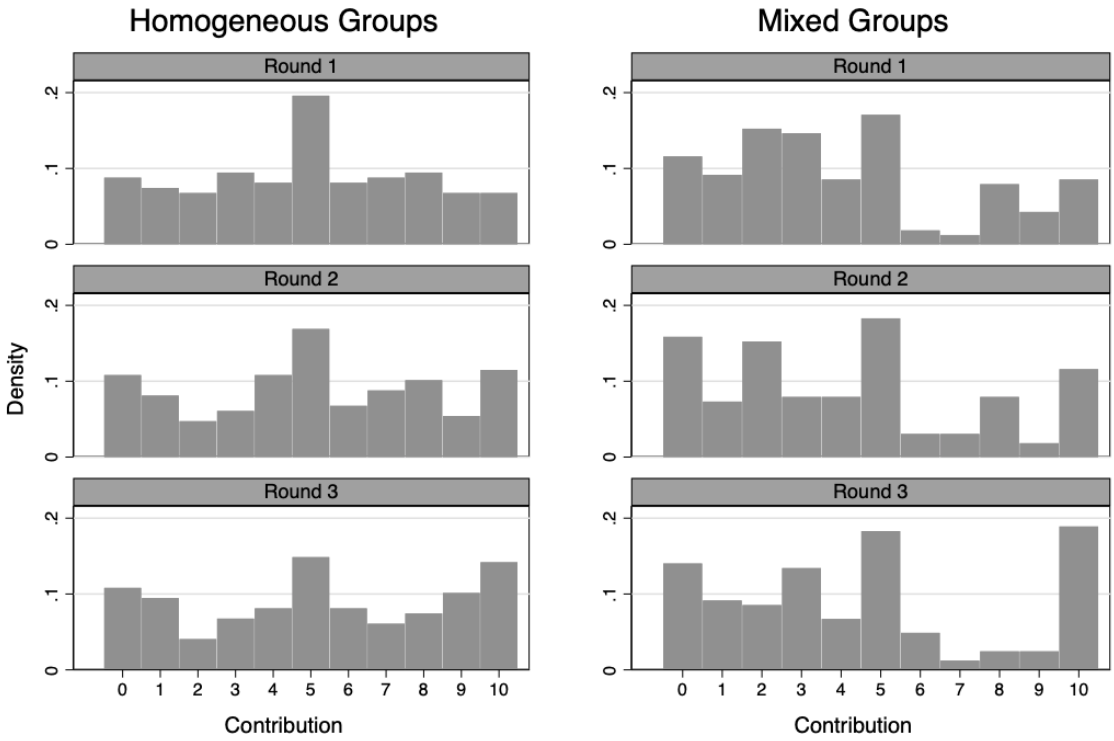


Figure A2. Distribution of Contributions across treatment and rounds in the public good game (PGG) with punishment



Appendix 2. Experiment Instructions (administered in Arabic language)

General Information

Good morning (afternoon)! Welcome to [name venue]. You have been invited to participate in a study of economic decision making. During this study, you will be asked to make a number of decisions and you will earn money, depending on the decisions made by you and other participants. Before we begin, there are a few administrative procedures that we need to follow. These will only take a few minutes. After this, we will let you enter the room and provide you with detailed information about today's study. First, we would like you to read carefully the information which we will circulate. This provides general information about our study and it is for your own records. If you have any questions, please let us know. Once you finish reading the information sheet, please fold the sheet so that we know you are done.

[For experimenter: Give out information sheet and wait until everyone is done. After a few minutes, ask: Have you all finished with the information sheet? Any questions?]

In this study, we need 20 participants. [For experimenter: Mention exactly the number of participants which is closest to an even number. For example, if there are 17 participants, say 'In this study we need 16 participants.'] Here there are in total X participants [For experimenter: Name the exact number of participants].

[For experimenter: if there are an odd number of participants]: This means that one participant will not be able to take part in today's study. The participant who will not take part will receive a show-up fee of $5. We will determine randomly which participant will not take part as follows. In this bucket, we have already put X [For experimenter: Name the exact number of participants] tokens. For our study, we need X-1 participants. Each one of you will have to randomly pick up one token from this bucket. The participant who will pick token numbered X will not be able to take part in the study and will receive the show-up fee of $5. The participants who will pick up a token from 1 up to X-1 will take part in today's study. Note that the number indicated in your token will correspond to the desk you will sit. We have also numbered the desks so that you can find your desk easily. If you have problems finding your desk, please let us know.

[For experimenter: if there is no odd number of participants]: In this bucket, we have already put X [For experimenter: Name the exact number of participants] tokens. Each one of you will have to randomly pick one token from this bucket. Note that the number indicated in your token

will correspond to the desk you will sit. We have also numbered the desks so that you can find your desk easily. If you have problems finding your desk, please let us know.

[For experimenter: Has each participant picked one token from the bucket sequentially].

[For experimenter: if there is an odd number of participants, pay the odd participant and ask him/her to sign the receipt].

Please keep the token for now. As a final step, we would like you to read a consent form and sign it. The consent form contains the same information you have seen before in the information sheet, but it is for our own records. You have to sign and date the form. We will also ask you to return the form back, just before you enter the room.

[For experimenter: Once everyone has signed the form:] OK, we are now ready to start. I will now call you one by one starting with participant with token number 1. As you enter the room, please return your token in the bucket and hand back the consent form. The number written on your token corresponds to the desk you will sit during the study. Please be quiet and once you are seated, remain silent until everyone has entered the room. If you have any questions at any point, raise your hand and one of us will come to your desk to answer your question. Thank you.

[For experimenter: Call participants in sequence starting with number 1, etc.]

General Instructions

This is a study in the economics of decision-making. The experiment has been funded by various research institutions. This experiment consists of three tasks. Each task is different and in each task you will be asked to make one or more decisions. You will receive new instructions for each task after everyone in the room has completed the corresponding task. Your decisions and the decisions of the other people will determine your total earnings in cash.

Activity Prompt

Before we begin the session, we would like you to participate in a simple activity in which we ask you to quote prices of various products.

Your prices do not need to be accurate and they can be an interval. If you are not sure at all what the price of the item is, you can choose another item.

Note that this activity has no bearing on the rest of the session and your payment.

[For experimenter: do the pictures activity]

Okay. Now we will begin the sessions. In the instructions, we will not speak in terms of Lebanese Pounds (L.L.) or US Dollars ($), but in terms of Experimental Points (EPs). Your entire earnings will, thus, be calculated in EPs. At the end of the session the total number of EPs you have earned will be converted to Dollars at the following rate: **2 EPs = 1 US Dollar ($)**. Any money that you make during the experiment will be paid to you, privately in cash, after the experiment ends. The experiment will last about 2 hours. Please keep perfect silence during the entire experiment, if you have a question, please raise your hand and one of us will go to your desk to answer it. Now, pay attention to the instructions below.

TASK 1

General information about Task 1

In this task, you will be randomly paired with another person in this room. This task will be repeated three rounds and you will remain paired with the same person during all three rounds. Your earnings depend on your decision and the decision of the person you are matched with.

You will be paid for one out of three rounds from this task. The round which will be relevant for your payment will be determined randomly at the end of the experiment. Each round is equally likely to be selected and you should take your decisions in each round seriously as these will affect your earnings from the experiment.

Detailed information about Task 1

Person A and Person B are given 10 Experimental Points each. In what follows we call this the "endowment". Each person's task is to decide how to use their endowment. Each person has to decide how much of the 10 Experimental Points s/he wants to contribute to a project (from 0 to 10) and how much to keep for her/himself.

Each person's earnings will be determined as follows:

Earnings = (10 – your contribution to the project) + 0.75 * (total contribution to the project made by you and the other person you are paired with)

This shows that your "Earnings" in this task consists of two parts:

1) Income from points kept: **(10 – your contribution to the project)**

2) Income from the project: **0.75 * (total contribution to the project)**

In order to explain the income calculation, we give you some examples. Please read them carefully.

Example 1:

Suppose that Person A contributes 0 Experimental Points to the project and Person B contributes 0 Experimental Points to the project. Nobody receives anything from the project, because no one contributed anything. Therefore, the total income of each person is 10 Experimental Points.

*Calculation of Person A's earnings: (10 – 0) +0.75 * (0) = 10*

*Calculation of Person B's earnings: (10 – 0) +0.75 * (0) = 10*

Example 2:

Suppose that Person A contributes 10 Experimental Points to the project and Person B contributes 10 Experimental Points to the project. The 'income from points kept' is 0 Experimental Points for each person, but each person receives an income from the project of 0.75 * 20 = 15.

*Calculation of Person A's earnings: (10 – 10) +0.75 * (20) = 15*

*Calculation of Person B's earnings: (10 – 10) +0.75 * (20) = 15*

Example 3:

Suppose that Person A contributes 5 Experimental Points to the project and Person B contributes 1 Experimental Point to the project. The 'income from points kept' is 5 Experimental Points for Person A and 9 Experimental Points for Person B. The total sum of contributions by Person A and Person B is 6 Experimental Points. Therefore, the income from the project for each person is 4.2 Experimental Points.

*Calculation of Person A's earnings: (10 – 5) + 0.75 * (6) = 9*

*Calculation of Person B's earnings: (10 – 1) + 0.75 * (6) = 13*

CONTROL QUESTIONS

Question 1:

Suppose that Person A contributes 4 Experimental Points to the project and Person B contributes 4 Experimental Points to the project.

What are the earnings for Person A (in Experimental Points)? _____

What are the earnings for Person B (in Experimental Points)? _____

Question 2:

Suppose that Person A contributes 0 Experimental Points to the project and Person B contributes 6 Experimental Points to the project.

What are the earnings for Person A (in Experimental Points)? _____

What are the earnings for Person B (in Experimental Points)? _____

Question 3:

Suppose that Person A contributes 10 Experimental Points to the project and Person B contributes 3 Experimental Points to the project.

What are the earnings for Person A (in Experimental Points)? _____

What are the earnings for Person B (in Experimental Points)? _____

Question 4:

Suppose that Person A contributes 5 Experimental Points to the project and Person B contributes 5 Experimental Points to the project.

What are the earnings for Person A (in Experimental Points)? _____

What are the earnings for Person B (in Experimental Points)? _____

TASK 2

General information about Task 2

In this task, you will be paired with the same person as in Task 1. This task will be repeated for three rounds and you will remain paired with the same person during all three rounds. Your earnings depend on your decision and the decision of the person you are matched with.

You will be paid for one out of three rounds from this task. The round which will be relevant for your payment will be determined randomly at the end of the experiment. Each round is equally likely to be selected and you should take your decisions in each round seriously as these will affect your earnings from the experiment.

Detailed information about Task 2

Task 2 consists of two stages, the structure of which is explained below.

Stage 1

The first stage is identical to Task 1 you just completed. To remind you:

Person A and Person B are given 10 Experimental Points each. We call this the "endowment". Each person's task is to decide how to use their endowment. Each person has to decide how much of the 10 Experimental Points s/he wants to contribute to a project (from 0 to 10) and how much to keep for her/himself.

Each person's earnings will be determined as follows:

Earnings from Stage 1 = (10 – your contribution to the project) + 0.75 * (total contribution to the project made by you and the other person you are paired)

After you decide how much to contribute to the project, the second stage follows.

Stage 2

At the second stage, you will see how much the other person in your group has contributed to the project. At this stage, you can reduce or leave unchanged the earnings from Stage 1 of other person in your group by assigning points. The other person in your group can also reduce or leave unchanged your earnings from Stage 1 if they wish to. This can be done as follows.

At the beginning of Stage 2, you must decide how many negative points to assign to the other person in your group. You can assign between 0 and 5 negative points to the other person. If you do not wish to change the earnings of the other person in your group then enter 0 in the large box of the decision sheet. If you do wish to decrease the earnings of the other person in

your group, enter instead the number of negative points (up to 5) that you wish to assign to them, preceded by a minus sign. For example, to assign 2 negative points, write –2 in the relevant box.

Assigning negative points is costly. For each negative point that you assign to the other person in your group, your own earnings will decrease by 1 Experimental Point. For each negative point that you assign to the other person in your group, you will decrease his/her earnings by 3 Experimental Points (unless their income is already exhausted). Your own earnings will be decreased by 3 Experimental Points for each negative point that is assigned to you by the other person in your group, except that, if all of your income from the first stage is exhausted as a result of negative points received, your income cannot be reduced any further by the other group member.

Therefore, your total income from this task is calculated as follows:

Total Earnings from Task 2 =

Earnings from Stage 1

– Number of negative points assigned by you to the other person in your group

– 3 * Number of negative points assigned to you by the other person in your group

In order to explain the income calculation, we give you some examples. Please read them carefully.

Example 1:

Suppose that, in Stage 1, Person A contributes 2 Experimental Points to the project and Person B contributes 0 Experimental Points to the project. The 'income from points kept' is 8 Experimental Points for Person A and 10 Experimental Points for Person B. The total sum of contributions by Person A and Person B is 2 Experimental Points. Therefore, the income from the project for each person is 1.4 Experimental Points.

In Stage 2, Person A assigns 0 points to Person B and Person B assigns 0 points to Person A.

*Calculation of Person A's earnings in Stage 1: (10 – 2) + 0.75 * (2) = 9.5*

*Calculation of Person B's earnings in Stage 1: (10 – 0) + 0.75 * (2) = 11.5*

*Calculation of Person A's total earnings: 9.5 – 0 – 3 * 0 = 9.5*

*Calculation of Person B's total earnings: 11.5 – 0 – 3 * 0 = 11.5*

Example 2:

Suppose that, in Stage 1, Person A contributes 5 Experimental Points to the project and Person B contributes 10 Experimental Points to the project. The 'income from points kept' is 5 Experimental Points for Person A and 0 Experimental Points for Person B. The total sum of contributions by Person A and Person B is 15 Experimental Points. Therefore, the income from the project for each person is 10.5 Experimental Points.

In Stage 2, Person A assigns 0 points to Person B and Person B assigns -4 points to Person A.

*Calculation of Person A's earnings in Stage 1: (10 – 5) + 0.75 * (15) = 16.25*

*Calculation of Person B's earnings in Stage 1: (10 – 10) + 0.75 * (15) = 11.25*

*Calculation of Person A's total earnings: 16.25 – 0 – 3 * 4 = 4.25*

*Calculation of Person B's total earnings: 11.25 – 4 – 3 * 0 = 7.25*

Example 3:

Suppose that, in Stage 1, Person A contributes 4 Experimental Points to the project and Person B contributes 8 Experimental Points to the project. The 'income from points kept' is 6 Experimental Points for Person A and 2 Experimental Points for Person B. The total sum of contributions by Person A and Person B is 12 Experimental Points. Therefore, the income from the project for each person is 8.4 Experimental Points.

In Stage 2, Person A assigns -1 points to Person B and Person B assigns -2 points to Person A.

*Calculation of Person A's earnings in Stage 1: (10 – 4) + 0.75 * (12) = 15*

*Calculation of Person B's earnings in Stage 1: (10 – 8) + 0.75 * (12) = 11*

*Calculation of Person A's total earnings: 15 – 1 – 3 * 2 = 8*

*Calculation of Person B's total earnings: 11 – 2 – 3 * 1 = 6*

CONTROL QUESTIONS

Question 1:

Suppose that, in Stage 1, Person A contributes 8 Experimental Points to the project and Person B contributes 8 Experimental Points to the project. In Stage 2, Person A assigns -2 points to Person B and Person B assigns 0 points to Person A.

What are the earnings for Person A from Stage 1 (in Experimental Points)? _____

What are the earnings for Person B from Stage 1 (in Experimental Points)? _____

What are the total earnings for Person A (in Experimental Points)? _____

What are the total earnings for Person B (in Experimental Points)? _____

Question 2:

Suppose that, in Stage 1, Person A contributes 0 Experimental Points to the project and Person B contributes 6 Experimental Points to the project. In Stage 2, Person A assigns 0 points to Person B and Person B assigns -5 points to Person A.

What are the earnings for Person A from Stage 1 (in Experimental Points)? _____

What are the earnings for Person B from Stage 1 (in Experimental Points)? _____

What are the total earnings for Person A (in Experimental Points)? _____

What are the total earnings for Person B (in Experimental Points)? _____

Question 3:

Suppose that, in Stage 1, Person A contributes 10 Experimental Points to the project and Person B contributes 3 Experimental Points to the project. In Stage 2, Person A assigns -2 points to Person B and Person B assigns -2 points to Person A.

What are the earnings for Person A from Stage 1 (in Experimental Points)? _____

What are the earnings for Person B from Stage 1 (in Experimental Points)? _____

What are the total earnings for Person A (in Experimental Points)? _____

What are the total earnings for Person B (in Experimental Points)? _____

Question 4:

Suppose that, in Stage 1, Person A contributes 5 Experimental Points to the project and Person B contributes 5 Experimental Points to the project. In Stage 2, Person A assigns -3 points to Person B and Person B assigns 0 points to Person A.

What are the earnings for Person A from Stage 1 (in Experimental Points)? _____

What are the earnings for Person B from Stage 1 (in Experimental Points)? _____

What are the total earnings for Person A (in Experimental Points)? _____

What are the total earnings for Person B (in Experimental Points)? _____

Appendix 3. Example decision sheet

Please, write your **code number** here: _____

TASK 1

Decision Sheet for Round 1:

Indicate in the box below how much of your endowment you would like to contribute to the project.

Your contribution to the project must be a whole number from 0 to 10.

If this round is randomly selected for your payment, you can earn additional money by predicting how much of his/her endowment the other person you are matched with will contribute to the project.

If your prediction is correct, you will receive an additional 1 EP.

How much of his/her endowment do you think the other person you are matched with will contribute to the project?

Your prediction must be a whole number from 0 to 10.

TASK 1

Code number:

_____

Example Feedback Sheet for Period 1:

You can now see the contribution to the project of the other person you are matched with.

Total contributions to the project: _____

The other person in your group contributed to the project: _____

The other person's earnings in Period 1: _____

You contributed to the project: _____

Your earnings in Period 1: _____