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**Experimental Study of Bilateral Cooperation Under a Violent Conflict:
The Case of Israelis and Palestinians***

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Abstract

We investigate strategic interactions of Israelis and Palestinians within a controlled laboratory and an artificial field experiment. Our aim is to compare two potential influences on between-subject-pool cooperation: group identity and face-to-face encounter. In our first treatment we retrieve cooperation benchmarks prevailing *within* both subject pools. Then we measure cooperation levels and associated beliefs *between* Israelis and Palestinians. Treatment three assesses the influence of pre-play face-to-face encounter on cooperative behavior. We find that the degree of expected and actual cooperation within the Palestinian subject pool is significantly higher as compared to the respective levels found in Israel. In line with previous studies, cooperation decreases if subjects are paired with subjects from the other subject pool. Previously detected subject pool differences are not offset. The introduction of face-to-face communication dramatically increases the cooperation rates. The differences in contributions between Palestinians and Israelis are associated with differences in subjects' beliefs. Face-to-face encounter increases and balances beliefs and therefore enhances cooperation. We conclude that direct encounter can dominate the negative effect of group identity.

Keywords: Bargaining, Belief-structure, Israeli-Palestinian Conflict, International Cooperation, Prisoner's Dilemma

JEL Classification:A13, C72, C91, F51

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Introduction

The Israeli–Palestinian dispute appears to be among the best studied and thoroughly documented violent conflict situations of modern times (e.g., MOORE, 1991; TESSLER, 1994; QUANDT, 2005). Within the multitude of methodologically different approaches to investigate its causes, development, and potential prospects for resolution two main levels of analysis are generally distinguishable: on the one hand, there are studies that use aggregated data and focus on the strategic relations between involved actors and/or their interaction with international players. In this context, states or state-like actors are typically the subject of investigation and scholars conceptualize their research for instance with the help of one of the classical theories of international relations, most prominently realism (e.g., WALT, 1987; HINNEBUSCH, 2003). Whereas these approaches tend to focus more on the dispute over tangible resources (e.g., land, water, security), works on the other side of the spectrum put the individual or groups of individuals in the center of analysis. These works emphasize the importance of societal differences such as different narratives or cultural and societal backgrounds among the affected factions (BAR–TAL , 1990). In this regard, research in the area of intergroup–conflict as well as on different belief–systems present in the Israeli or Palestinian society has contributed to a better understanding of the mechanisms behind the conflict at a micro-level (ROUHANA & BAR-TAL 1998; BAR–TAL, RAVIV, & DGANI–HIRSH, 2008).

Yet, at the micro-level, many studies merely focus on mutual perceptions and attitudes among representatives from both sides or analyze interactions between Israeli Jews and (mostly) Israeli Arabs (e.g., BAR–TAL, RAVIV, & DGANI–HIRSH, 2008; MAOZ & MCCAULEY, 2009). Little has been done to actually observe Israelis and Palestinians in a controlled strategic situation in which both parties interact *within* and *between* their subject–pools even though this could help to confirm and better understand what has previously been predominantly described in a qualitative way.

One insightful exception is the experimental ultimatum bargaining study by SCHUBERT & LAMBSDOFF (forth.) conducted among Israeli and Palestinian students. In their study, Palestinian responders reacted to virtual offers from Israelis, i.e., the authors induced conflicting behavior. It was also investigated to which extent Palestinian responders display taste-driven discrimination against Israelis, i.e., give up material goods in order to avoid an interaction with an Israeli. They find that Palestinians are willing to accept unfair offers from their virtual Palestinian fellows, but reject such offers from Israelis. Moreover, the authors show that this behavior is moderated by subjects' political attitudes: Those Palestinians who adhere to a more moderate political movement within the occupied Palestinian territories, display a higher tendency to discriminate, while those who support military action against Israelis also reject low Palestinian offers. The authors argue that Palestinians voicing military attitudes might perceive unfair Palestinians as supporters of the occupying forces.

The present paper seeks to further fill the existing gap of empirical evidence on actual individual behavior in the Israeli-Palestinian conflict by taking a slightly different perspective. We get both - Israeli and Palestinian students - into an experimental setting and investigate their strategic interaction

and associated first-order beliefs in connection with actual behavior, i.e., what parties think about the other party's behavior. Investigating subjects' mutual beliefs is particularly important since it allows new insights on questions like: Which beliefs do Israelis and Palestinians form toward each other? Do Israelis and Palestinians adapt their cooperation behavior to these beliefs? Which beliefs emerge in an inter-group setting or with direct encounter? Can a direct encounter counter-balance negative effects of group identity on bilateral cooperation?

We conduct our study in a controlled and balanced social dilemma setup in which bilateral cooperation can increase the mutual benefit, i.e., in our setup, both parties can gain when they cooperate at the risk of being exploited. We intentionally abstract from potential confounding factors like differences in bargaining power (e.g., due to differences in outside options at hand or economic power), inter-personal dependencies (e.g., due to commitment and hierarchies prevailing within subject-pools), or face-saving (e.g., deciding in public vs. deciding in private), typically present in real-life encounters. Observing behavior in such environment allows valuable insights on underlying determinants of cooperation prevailing within and between the subject-pools under investigation. Furthermore, we are able to draw some conclusions about the interplay of subject-pool dependency and strategic interaction of Israeli and Palestinian representatives.

Cooperation among individuals is one of the topics most excessively investigated in the experimental literature. One stream of these works investigates how cooperation can be maintained or increased by implementing institutions that allow subjects directly to reward or punish others (FALKINGER, 1996; FEHR & GÄCHTER, 2002; FEHR & ROCKENBACH, 2003; GÜREK, IRLENBUSCH, & ROCKENBACH, 2006; HERRMANN, THÖNI, & GÄCHTER, 2008). In our study, we focus on the moderators of strategic interaction of two very specific subject pools which have an history of armed conflict and – despite being located next to each other – different cultural backgrounds (HOFSTEDE, 2001). Contrary to the above literature, we will not induce explicit incentives to cooperate in order to examine subjects' original attitudes. Israeli and Palestinian subjects will interact in a symmetrical continuous prisoner's dilemma game where players select their strategies from a given continuous set of strategies. We apply three different treatments: Our first treatment seeks to retrieve intra-subject-pool cooperation benchmarks prevailing *within* the Israeli and the Palestinian subject-pool. The second treatment is conducted to measure cooperation levels and associated beliefs *between* Israeli and Palestinian subjects. We will examine to what extent cooperation behavior alters in inter-subject-pool interactions as compared to assessed intra-subject-pool standards. Moreover, we will explore to what extent inter-subject pool behavior is bound to subject pool affiliation and how much subjects adapt their choices to their expectations regarding the behavior of the foreign subject pool. Treatment three extends upon our second treatment as it provides insights on the influence of real pre-play face-to-face encounter – which seems to be of special interest given the background of a real-life conflict in which individuals are involved. We do this by bringing Israelis and Palestinians together in an artefactual field experimental setting.

Our work relates to studies investigating the effects of cultural affiliation, in-group favoritism, and communication on cooperation. There is a large body of studies with attribute behavioral differences found across countries to cultural influences (see, e.g., ROTH, PRASNIKAR, OKUNO-FUJIWARA, & ZAMIR, 1991; HENRICH, BOYD, BOWLES, CAMERER, FEHR, GINTIS, & MCELREATH, 2001; OOSTERBEEK, SLOOF, & VAN DE KUILEN, 2004; CARDENAS & CARPENTER, 2008, HERRMANN, THÖNI, & GÄCHTER, 2008; GOERG & WALKOWITZ, 2010). However, there is only a small amount of truly inter-cultural experimental studies (see for a survey, MATSUMOTO & HWANG, 2011) which in general suggest that inter-cultural interactions are less cooperative and more competitive. So far, to the best of our knowledge, no study – besides our companion paper on trust (see GOERG, HENNIG-SCHMIDT, SELTEN, WINTER, & WALKOWITZ, 2013) – directly discusses how beliefs and observed behaviors in strategic situations interrelate. This seems surprising given the potential explanatory power of cultural-dependent mutual beliefs. In the context of this paper, the attachment to one city and university (i.e., Israelis are students from the Hebrew University in Jerusalem; Palestinians are students from the Al-Quds University in Abu-Dis) clearly defines group affiliation.

In recent decades substantial research has also been conducted on group identity and how it affects cognition and behavior (e.g., TAJFEL & TURNER, 1979, 1986; BORNSTEIN, 2003; CHARNESS, RIGOTTI, & RUSTICHINI, 2007). More specifically, studies investigating in-group favoritism in prisoner's dilemma games regularly show that cooperation is higher within than across groups (refer to YAMAGISHI, JIN, & KIYONARI, 1999, for a survey on this literature). This effect seems to be quite robust: it appears within and between natural groups (e.g., different in race, see WILSON & KAYATANI, 1968), working groups (e.g., platoons of the Swiss army, as in GOETTE, HUFFMAN, & MEIER, 2006), and even across purely artificial groups generated by the minimal-group-paradigm (e.g., YAMAGISHI & KIYONARI, 2000; CHEN & LI, 2009)¹.

Moreover, during the last five decades a vast body of literature accumulated which demonstrates that communication enhances cooperation in social dilemma games like the prisoner's dilemma or the trust game (e.g., DUFFY & FELTOVICH, 2002; BUCHAN, JOHNSON, & CROSON, 2006). This effect seems to be stronger if subjects can see each other and engage in face-to-face communication (e.g., BOHNET & FREY, 1999; for reviews, refer to SALLY, 1995, and BALLIET, 2010).

We add to the above literature in the following respects: The first aim of this study is to reconfirm the social distance paradigm by investigating cooperative behavior between subjects who belong to two culturally distinct populations that are involved in a real-life violent conflict – instead of an artificially induced one. The second aim of this study is to take a more elaborated look at subjects' beliefs on others' behaviors and their potential influence on actions. More specifically, we investigate i) the beliefs that are formed within the two societies and how they guide behaviors, ii) whether and how they change in between-subject pool interactions, and iii) how real pre-play face-to-face encounter affects beliefs and behaviors. In the context of the literature on in-group favouritism and

¹ The *minimal group paradigm* generates artificial groups by, e.g., assigning one part of the subjects to paintings of one artist (e.g., KLEE) and the other part of the subjects to paintings of a different artist (e.g., KANDINSKY).

communication, we expect cooperation levels to be higher within as compared to inter-subject pool interaction. This difference is expected to be also reflected in subjects' first order beliefs. Furthermore, we expect pre-play encounter to alter subjects' beliefs and enhance cooperation by dominating a group identity effect.

Our results can be summarized as follows: 1) The general degree of cooperation and associated beliefs within the Palestinian subject pool are found to be significantly higher as compared to the level of cooperation prevalent in the Israeli subject-pool. 2) In line with previous findings, cooperation and associated beliefs decrease if subjects are paired with subjects from the other subject pool. Yet, subject pool differences are still observable and beliefs seem still to be shaped by the observed level of cooperation prevailing in the respective societies. 3) The introduction of a face-to-face encounter substantially increases cooperation rates even among our specific subject pools. 4) Our results suggest that the differences in contributions between Palestinians and Israelis are mainly driven by differently shaped beliefs and that face-to-face encounter may increase and balance those beliefs and thus offset a group-identity effect.

The remainder of the paper is organized as follows: In the next section, we carefully describe our experimental design, the implemented treatments and our procedures. In section three, we present the results of our study. Section four concludes the paper.

2 Experimental Design, treatments and procedures

2.1 Basic Experimental design

To experimentally implement strategic symmetry, we use a continuous prisoner's dilemma game with positive externalities (PDP) as applied in GOERG & WALKOWITZ (2010). In this two-person game, players simultaneously choose an individual level of cooperation from a given range of possible strategies. In contrast to the classical prisoner's dilemma game, the choice of cooperation is not dichotomous, but continuous, i.e., players can select distinct levels of co-operation. A higher level of cooperation creates a higher positive externality to the matched player's payoff. At the beginning of the game, two randomly matched players i and j obtain an initial endowment $X_i = X_j = 10$. Each player then has the opportunity to transfer an integer part $a \in \{0, 1, \dots, 10\}$ to the opposite player. Each positive amount a which is transferred to the paired player is doubled by the experimenters yielding an efficiency gain. Both players' payoffs consist of their initial endowment minus the transferred amount a plus the obtained (doubled) amount from the opposite player. Formally, player i 's payoff function is given by: $\pi_i = 10 - a_i + 2a_j$, with $a_i, a_j \in \{0, 1, \dots, 10\}$. Player j 's payoff is calculated analogously. The only Nash equilibrium is given for $a_i^* = a_j^* = 0$; a rational player i anticipates player j 's rational transfer $a_j = 0$ and will therefore also choose $a_i = 0$. The collective optimal choice is $\hat{a}_i = \hat{a}_j = 10$ since it maximizes the over all payoff $\Pi = \pi_i + \pi_j$.

2.2 Experimental Treatments

To investigate the effects of subject pool affiliation, strategic interaction between individuals from different subject pools, and pre-play encounter on cooperative actions and associated beliefs, we implement three different treatments, which are described in the following (see Table 1 for descriptive details):

1) *Intra-subject pool cooperation treatment (T1)*: In T1 each experimental subject is randomly matched with a player from her own subject pool, i.e., Israelis only interact with Israelis, Palestinians only interact with Palestinians. Our setting in T1 establishes an anonymous and strategically symmetrical setting involving comparable student samples acting separately in their local environments. T1 is designed to retrieve separated intra-subject pool cooperation benchmarks – both for actual transfers and associated beliefs – prevailing *within* our Israeli and Palestinian subject pools.² We will also investigate whether players' beliefs reflect actual behavior of their countrymen.

2) *Inter-subject pool cooperation treatment (T2)*: At each location, the PDP is played simultaneously as an inter-subject pool cooperation game. Contrary to T1, each experimental subject is randomly matched with one subject from the other subject pool. Hence, in T2, Israelis only interact with Palestinians, and Palestinians only interact with Israelis. Our second treatment is carried out to measure cooperation levels and associated beliefs in symmetric strategic interactions *between* Israeli and Palestinian subjects. Systematically substituting the affiliation of the interaction partner, T2 allows us observing to what extent actual choices and beliefs alter in inter-subject pool interactions, as compared to assessed intra-subject pool standards. It also sheds light on the type of notion our subjects possess regarding their respective interaction partners' behavior. We will explore whether and how they adapt their choices accordingly. We will also investigate to what extent actions and beliefs are potentially biased towards intra-subject pool standards of co-operation.

3) *Inter-subject pool cooperation treatment with previous encounter (T3)*: Treatment three extends upon T2. Based on the similar strategic interaction, it provides insights on the influence of subjects' actual pre-play face-to-face encounter on cooperative actions and associated beliefs in an artefactual field experiment setting. Keeping strategic symmetry and the type of decision makers constant, we partly abandon anonymity and allow direct encounter before cooperation levels are mutually chosen anonymously.

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2.3 Procedures

All experimental sessions for T1, T2, and T3 were run within one week by local helpers, comprehensively instructed in advance and supported by the authors, who were present at the

² The data from T1 has partly already been discussed in GOERG & WALKOWITZ (2010) in the context of framing effects in different subject pools.

locations, but stayed in the background during the experimental sessions.³ To avoid translation errors regarding the task and the procedure, instructions were translated by native speakers from German into the corresponding language and afterwards back-translated into German by a different person, respectively (BRISLIN, 1970).⁴ The PDP was played one-shot applying the pen and paper method. We have chosen a one-shot setup to avoid confounding subject pool-dependent behavior with strategical issues and to elicit choices only conditioned on subjects' experiences and non-updated beliefs. All subjects were students majoring in different disciplines, either at the Hebrew University in Jerusalem (Israel) or the Al-Quds University in Abu-Dis (West-Bank). Students participated only in one of our treatments.

Sessions for T1 and T2 were conducted at the RatioLab of the Hebrew University and in a prepared classroom at the Al-Quds University involving 20 students from different disciplines per treatment and university. Subjects were recruited via public announcements placed in the universities. After subjects arrived in the laboratory, they drew a random code number and were seated at separated desks, both guaranteeing anonymity. Subjects were not allowed to communicate. In case of any question they had to raise their hand such that the experimenter could come and help. The experiment started after all subjects had read the distributed instructions and all individual questions regarding the structure of the game had been answered. Instructions included a short list of initial test questions; only after each subject had correctly answered these questions decision sheets were handed out and the experiment started. Subjects were randomly matched in dyads of two. In T1 a dyad consisted of two subjects from the same subject pool, in T2 one subject was Israeli, the other one was Palestinian. For showing up for the experiment, each student received a fixed payment of 25 NIS. During the experiment, all transfers were denoted in *Talers*. The exchange rate from Taler to NIS was 1 Taler = 2.5 NIS. Subjects were endowed with $X = 10$ Talers in the opening of the game. In T2 we informed the students about the other session being conducted simultaneously, about the fact that the other subjects are also students from different disciplines, and about the name of the university and the city it was placed in. After subjects had completed the main task we collected their decisions and transferred them via e-mail and telephone to the experimenter from the other location, respectively. This procedure was visible for the students.

After running the main experiment, two questionnaires were handed out. In the first questionnaire, we asked subjects for their beliefs on the behavior of the matched player. Correct beliefs were rewarded with an addition of 1 Taler. The second questionnaire covered individual difference variables like age, gender, and trust attitude taken from the World-Values-Survey⁵. At the end of the sessions, the outcome for each subject was calculated, converted into NIS, and paid out.

³ We followed this procedure to minimize potential experimenter demand effects which would have been potentially higher if one of the authors had conducted the experiments because of cultural attribution, i.e., foreigners might be perceived differently across locations. Moreover, if a local runs the experiments, there are no language issues and culture is not primed. Instructions were written in a neutral language and given either in Hebrew or Arabic.

⁴ For an English translation of the instructions, refer to Appendix A.

⁵ Question V94: "*Generally speaking, would you say that most people can be trusted or that you can't be too careful in*

Experimental sessions for T3 took place at the *Imperial Hotel* located in the Old City of Jerusalem. Twelve Israeli and twelve Palestinian subjects were involved.⁶ Arriving separately at the hotel, subjects were situated in different rooms according to their subject-pool affiliation. Within each room, subjects were guided by a local experimenter (either Israeli or Palestinian, respectively). Communication among subjects was strictly forbidden. Upon arrival, each subject received an individual code. According to this code, subjects were randomly paired across rooms. For the strategic interaction, two different local experimenters (Israeli or Palestinian) picked up the matched Israeli and Palestinian students and accompanied them to two different preparation rooms. There, both subjects received the PDP instructions. After a preparation time of ten minutes, both subjects were led to the encounter room. In this room, they were seated at a table in front of each other and had ten minutes' time to discuss their decisions in the upcoming PDP. The language applied in the discussions was typically English. After the meeting had ended, both subjects returned to their preparation rooms and decided on the actual transfers. In advance, subjects were informed that after the discussion i) subjects would not face the other subject again in the course of this experiment, ii) subjects would only be informed about the decision of the matched subject when receiving the payoffs in two different rooms, and iii) subjects from the two locations would leave the hotel separately. Recruiting procedures, payout procedures, initial endowments and conversion rates were similar to T1 and T2. However, subjects received an extra show up fee of 25 NIS for coming to the hotel and accounting for the additional length of the experiment.

3. Results

3.1 Intra-subject pool cooperation

We will start our analysis by looking at intra-subject pool cooperation levels and associated beliefs gathered in T1. This allows us to get independent and controlled evidence on cooperation standards prevalent in our Israeli and Palestinian subject pools. Table 2 and Figure 1 give the aggregated statistics for T1; for the distribution of behavior, please refer to Figure 2 in the appendix.

If matched with other Israeli players, Israelis transfer on average 4.4 (median = 4, $SD = 2.95$) Talers. In Abu-Dis, this amount is significantly higher: Palestinian subjects transfer on average 7.1 (median = 7, $SD = 2.36$) Talers to their own countrymen ($p < .01$, Fisher-Pitman permutation test for two independent samples⁷). The same pattern can be found in associated beliefs: Israeli players on average believe to receive 3.4 (median = 4, $SD = 2.5$) Talers from Israeli players; Palestinians expect to get on average 6.3 (median = 5, $SD = 2.54$) Talers from their own countrymen ($p < .001$, FI).

dealing with people?"

⁶ Due to the complexity of bringing Palestinian subjects to the location of the experiment only 12 Palestinian subjects could take part in T3. We adapted the number of Israeli subjects accordingly in order to balance the sample.

⁷ In the following denoted as *FI*. All statistical tests are carried out two-sided.

--- Please enter TABLE 2 here ---

In Abu–Dis, actual transfers and beliefs do not differ significantly ($p = .311$, Fisher–Pitman permutation test for paired replicates⁸); Israeli subjects have somewhat lower beliefs compared to what they actually transfer ($p = .049$, FP). In Jerusalem, we find transfers to be significantly correlated with beliefs (Spearman’s $\rho = .73$, $p < .001$). Taken together, this gives us our first result:

Result 1: *When interacting with players from their own subject pool, Palestinians display a significantly higher level of cooperation compared to Israelis. The level of Palestinians’ associated beliefs corresponds to intra–subject pool transfers. Israelis’ associated beliefs are correlated with transfers.*

--- Please enter FIGURE 1 here ---

3.2 Inter–subject pool cooperation

Our first result delivers evidence on different cooperation standards in our Israeli and Palestinian subject pools. In our second treatment, strategic interplay among subjects from two different locations is captured keeping everything else constant. T2 allows us to observe the extent to which actual choices and beliefs differ in Israelis’ and Palestinians’ inter–subject pool interactions. In addition, we are able to see if subjects correctly anticipate counterparts’ actual behavior, whether and to what extent inter–subject pool behaviors are related to exposed beliefs, and the observed intra–subject pool cooperation benchmarks.

On average, Israeli subjects transfer 3.2 (median = 2, $SD = 3.14$) Talers to subjects from Abu–Dis, whereas subjects from Abu–Dis send 5.15 (median = 5, $SD = 3.08$) Talers to Israelis located in Jerusalem (see Table 2 and Figure 1). As for intra–subject pool transfers, chosen amounts differ significantly between the two locations ($p < .062$, FI). We again observe a similar pattern in associated beliefs: Israeli players on average believe to receive 2.75 (median = 2, $SD = 2.34$) Talers from Palestinian players; Palestinians expect to receive on average 5.3 (median = 5, $SD = 2.79$) Talers from Israelis ($p < .01$, FI). In both subject pools, actual transfers and beliefs do not differ significantly (both $p > .45$, FI). Moreover, transfers and associated beliefs are significantly correlated in Jerusalem ($\rho = .60$, $p < .01$) and Abu–Dis ($\rho = .72$, $p < .001$). It is noticeable that Palestinians’ inter–subject pool transfers to Israelis (5.15) are on average still higher than Israeli intra–subject pool contributions (4.4). This evidence leads to the second result:

Result 2: *When interacting with subjects from the other subject pool, Palestinians display a significantly higher level of cooperation compared to Israelis. Associated beliefs do not differ from – and are significantly correlated with – inter–subject pool transfers.*

⁸ In the following denoted as FP.

In order to investigate whether inter–subject pool behavior is potentially shaped by the intra–subject pool cooperation levels detected above, we now compare inter–subject pool transfers with intra–subject pool cooperation levels. In addition, we will explore if experimental subjects correctly anticipate behavior in the other subject pool, respectively. As we have already shown, associated beliefs are correlated with transfers in both subject pools – a mismatch between beliefs in the opponents’ behavior and her actual actions might lead to negative or even positive surprises on the part of the foreign opponent.

In Jerusalem, subjects on average transfer 4.4 Taler if they are matched with players from their own subject pool whereas they contribute 3.2 Talers if they are matched with a Palestinian. Although inter–subject pool transfers are on average somewhat lower, this difference does not reach statistical significance ($p = .238$, FI). In Abu–Dis, we observe a comparable tendency: subjects on average transfer 7.1 Talers to Palestinians. On the contrary, they send on average 5.15 Talers when they are matched with Israelis, which represents a significant drop in transfers ($p < .05$, FI). Comparing inter–subject pool beliefs in the other party’s transfers and their actual transfers shows that Israelis significantly underestimate (2.75 vs. 5.15 Talers) and Palestinians overestimate (5.3 vs. 3.2 Talers) the amounts transferred to them, respectively (both $p < .05$, FI). In addition, beliefs in both subject pools decline on average in relation to the the intra–subject pool situation. Consequently, we formulate our third result:

Result 3: *When interacting with subjects from the other subject pool, cooperation levels and associated beliefs decline. Associated beliefs do not match the cooperation standards prevalent in the foreign subject pool.*

3.3 Inter–subject pool cooperation with previous encounter

In T1 and T2, we have explored – within anonymous and strategically symmetrical settings – the level of bilateral cooperation prevailing within and between subject pools. Now, with treatment T3, we want to study the influence of a previous face-to-face encounter on inter–subject pool cooperation and associated beliefs within an artefactual field experiment setting.

In all but two of the twelve matching groups both subjects transferred the whole amount ($a = 10$). Therefore, the mean transfers of T3, given in Table 2, show that the introduction of a face-to-face encounter – also in this specific situation which enrolled subjects from two conflicting societies – increases mutual transfer levels substantially. Israeli subjects transferred 8.33 (median = 10, $SD = 3.37$) Talers to matched Palestinian subjects. Likewise, Palestinians sent 8.75 (median = 10, $SD = 2.73$) Talers to their Israeli counterparts. Thus, no significant difference between transfers from Israeli and Palestinian subjects is observed in T3 ($p = .750$, FI; see also Figure 1). As in T2, we find associated beliefs to fit behaviors: Israeli players on average expect to receive 8.5 (median = 10, $SD = 3.12$) Talers from Palestinian players; Palestinians expect to receive on average 8.83 (median = 10, $SD = 2.21$) Talers from Israelis (both $p > .10$, FP). Like in T2, transfers and associated beliefs are highly

and significantly correlated (both $\rho > .99$, $p = .000$). Moreover, comparing transfers and associated beliefs across T3 and T2 shows significantly higher levels of (expected) cooperation in T3 (all $p < .001$, FI). Consequently, a face-to-face encounter increases and balances cooperation levels and beliefs between Israeli and Palestinian students. The cooperation levels with direct encounter also dominate the ones with anonymous intra-subject pool interaction, as a comparison of transfers and beliefs across T3 and T1 shows (all $p < .10$, FI). Taken together, this yields our fourth result:

Result 4: *When interacting with subjects from the other subject pool, cooperation levels on average increase when subjects have a face-to-face encounter before deciding.*

We now complement our non-parametric analyses with a set of regression analyses, adding controls for other potential influences on observed behaviors. Table 3 gives the results of the estimated models using Tobit models to explain actual transfers.⁹ Models 1, 2, and 3 confirm our previous results and show that the results are robust to adding controls for age, gender, and individual trust attitude¹⁰:

i) we find transfers to be higher in Abu-Dis, ii) cooperation decreases when subjects are matched with a subject from the foreign subject pool, and iii) cooperation increases with pre-play encounters.¹¹

--- Please enter TABLE 3 here ---

Furthermore, as Model 4 demonstrates, transfers might be enhanced by associated beliefs: controlling for beliefs shows them to be positively correlated with elicited cooperation levels. However, at the same time, subject pool differences in cooperation levels are no longer significant when controlling for beliefs. Furthermore, the negative influence of being matched with a foreign subject decreases and is only weakly significant. The positive impact of pre-play encounter and trust attitudes remains significant.

This again underlines the potential importance of beliefs in observed behaviors: Model 4 delivers one potential explanation *why* Palestinian transfers are significantly higher as compared to the Israeli ones: Palestinians in general have higher expectations concerning the contribution of the matched player. Consequently, the coefficient for subject pool affiliation loses significance when controlling for these beliefs. One interpretation of this result is that Palestinians are not intentionally more cooperative in general – what could have been conjectured from our previous findings. In fact, as shown above, they form higher (and incorrect) expectations against Israelis which in turn significantly guide their choices.

⁹ Our sample consists of censored data, 10 observations are left-censored ($a = 0$), 28 observations are right-censored ($a = 10$), and 66 observations are uncensored. To take this censored structure of our data into account, we apply Tobit regressions to the data. However, OLS regressions yield very similar results.

¹⁰ While the general trust attitudes do not differ significantly between our subject pools ($p = .359$, two-sided Fisher's exact test), they are significantly and positively correlated with transferred amounts.

¹¹ Observations are clustered for independent observations; each pair with pre-play encounter is clustered.

4 Conclusion

The aim of the present paper was to study actual behavior of individuals belonging to societies involved in a real long-lasting violent conflict. More specifically, we investigated 1) whether ordinary people (in our case students) from these societies are able and willing to cooperate when both parties can benefit from cooperation, 2) how beliefs potentially guide behaviors in interactions with own countrymen and foreign players, and 3) whether face-to-face encounter positively influences mutual perceptions and in turn cooperation behaviors.

While the artifacts of the Israeli–Palestinian conflict can be seen as one obstacle to sustainable cooperation between the two involved groups a second potential challenge becomes evident from our experiments: cooperation levels prevalent within the two subject pools differ: comparing the intra–subject pool cooperation levels, significantly higher cooperation is observed among the Palestinians compared to the Israeli subjects. In the light of the above cited literature on cultural differences this may not come as a surprise. However, this pattern also persists if subjects are interacting across subject pools although transfers significantly drop. Cooperative behavior towards foreign players is significantly higher in the Palestinian subject pool than in the Israeli subject pool. Our analyses reveal that this higher cooperation level is not a sign of pure altruism, but potentially induced by more positive beliefs about matched players’ behavior. In other words, the Palestinian subjects not only exhibit higher transfers, but they also expect higher transfers from their matched opponents. Our data suggest that these attitudes are shaped by their in-group experience. Whereas we observe seemingly belief–driven differences in cooperation levels between the two subject pools, being matched with subjects from a foreign subject pool still lowers the willingness to cooperate at both locations. This finding is in line with the literature on cooperation between in-and-out groups (cf. YAMAGISHI, JIN & KIYONARI, 1999). The downward shift of cooperation levels can also be explained by lowered beliefs: at both locations, subjects are more cautious when matched with foreign subjects, consequently choosing lower cooperation levels. Yet, the downfall of cooperation if matched with a foreign subject cannot only be compensated, but even surmounted by pre-play face-to-face encounter. With face-to-face encounter, upfront cooperation levels increase significantly for subjects from both locations. Thus, in our experiment, encounter apparently leads to mutual agreement and more balanced beliefs in the desired behavior. To some extent, this finding may not appear surprising and confirms previous works on the impact of communication on cooperation in social dilemma situations (cf. BICCHIERI & LEV–ON, 2007). However, given the magnitude of the protracted and violent conflict our subject-pools are involved in, we believe this to be a strong result.

Our study further underlines the importance of the relationship among beliefs and actions in cooperation situations. Observed higher beliefs after face-to-face encounter stand in line with the findings from studies on the contact hypothesis (ALLPORT, 1954; AMIR, 1969; SHERIF, 1966), which

states that intergroup contact can reduce prejudices.¹² Nevertheless, a question that remains open is the difference in beliefs across our two subject pools. We conjecture that differences in the cultural background of our involved subject-pools might help explain this gap. Our Palestinian students are embedded in a more collectivistic society compared to Israelis who are described as being individualistic. In an individualistic society, ties between individuals are loose and people are expected to look out for themselves (HOFSTEDE, 2001). Furthermore, Arabic countries have often been characterized as being saliently familiar, i.e., interpersonal solidarity and fairness are central values in these countries (ROSENFELD, 2002). In contrast, a series of studies has illustrated that individualists often behave more competitively and outcome-oriented in cooperation settings compared to people from collectivistic societies (e.g., BUCHAN, JOHNSON, & CROSON, 2006; CARPENTER, DANIERE, & TAKAHASHI, 2004; CHUAH, HOFFMANN, JONES, & WILLIAMS, 2007; HEMESATH & POMPONIO, 1998; HENNIG-SCHMIDT, LI, & YANG, 2008). This difference might be even more pronounced by the fact that the Israeli society is described as rather fragmented and that mutual trust depends on group affiliation (see GNEEZY & FERSHTMAN, 2001). These notions seem also to be reflected in our data. Moreover, in their paper on social preferences and beliefs in voluntary cooperation and its decline, FISCHBACHER & GÄCHTER (2010) find in a public-goods game setting that beliefs about others' average contributions decline because contributions had declined, and not vice versa – which might also support our conjecture on subject–pool differences in beliefs: even though belief updating is inhibited within our study, Palestinians might have experienced more positive previous interactions with their compatriots in the past, which in turn shaped their average beliefs such that they expect higher levels of cooperation from them and also from Israelis and eventually cooperate more often based on these beliefs.

From an applied perspective, our data suggest that in inter-cultural interactions agents should take into account the behavioral benchmarks of their opponents when evaluating and reacting on their behavior. This mutual updating of beliefs may enhance cooperative actions as it potentially mitigates negative surprises which might not be caused by a unsound intention but are attributable to cultural affiliation. Moreover, as our third treatment conveys, personal meetings also foster cooperation – even among opponents from subject-pools which are involved in a violent conflict. The sustainability of this cooperation enhancing effect is an interesting topic for future research.

A limitation of our our setup, is that we cannot clearly disentangle whether the differences across T1 and T2 are caused by differences in nationality or by differences in university affiliation. Therefore, we want to interpret our finding with some word of caution. An ideal benchmark for T1 would be retrieved from an intra-group treatment in which subjects from different universities but with identical group affiliation interact with each other. Due to the large organizational difficulties we faced when planning and conducting the experiment in the West-Bank, we were not able to involve a second

¹² Our face-to-face treatment fulfills the conditions which are necessary according to the contact theory to reduce prejudice: personal interaction, cooperative interdependence with equal status/power.

Palestinian university at the time of the experiment. However, data from a follow up (gift-exchange) study which involved two Israeli (Jerusalem, Beer Sheva) and two Palestinian universities (Abu-Dis, Ramallah) suggest that subjects do not discriminate their own countrymen as much as they do with foreign students, both located at a different university (see GOERG & WALKOWITZ, 2013). Further studies might include larger and more representative samples (HENRICH, HEINE, & NORENZAYAN, 2010) and use different environments to assess the validity of our findings.

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Appendix A: Instructions for the experiment

Introduction

Thank you for taking part in this experiment. Please read these instructions very carefully. It is very important that you do not talk to other participants for the duration of the entire experiment. In case you do not understand some parts of the experiment, please read through these instructions again. If you have further questions after this, please give us a sign by raising your hand out of your cubicle. We will then approach you in order to answer your questions personally.

To guarantee your anonymity, you will draw a personal code before the experiment starts. Please write this code on top of every sheet you use during this experiment. You will later receive your payment from this experiment by showing your personal code. This method ensures that we are not able to link your answers and decisions to you personally.

During this experiment you can earn money. The currency within the experiment is ‘Taler’. The exchange rate from Taler to CURRENCY is:

1 Taler = XX CURRENCY

Your personal income from the experiment depends on both **your own** decisions and on the decisions of **other** participants. Your personal income will be paid to you in cash as soon as the experiment is over.

During the course of the experiment, you will interact with a randomly assigned other participant. The assigned participant makes his or her decisions at the same point in time as you do. You will get no information on who this person actually is, neither during the experiment, nor at any point after the experiment. Similarly, the other participant will not be given any information about your identity. You will receive information about the assigned participant’s decision after the entire experiment has ended.

After the experiment, please complete a short questionnaire, which we need for the statistical analysis of the experimental data.

Description of the experiment

In this experiment, you are randomly matched with another participant. You act as **Person A**, and the randomly assigned other participant acts as **Person B**. You and Person B must simultaneously make a similarly structured decision.

Person A and Person B first receive an initial endowment of **10 Talers**.

You now have the opportunity to transfer any part of your endowment to Person B. You can only transfer integer amounts – thus, you can only choose amounts $a_A \in [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]$.

The amount you transfer to Person B is **doubled**. That means that Person B receives **twice the amount you have transferred** to him or her.

The randomly assigned participant acting as Person B is given exactly the same alternatives that you have been given. He or she also has the possibility to transfer any amount to you. The amount Person B transfers to you is also doubled. That means that **you receive twice the amount Person B has transferred** to you.

You will make your decisions **simultaneously**. During the course of the experiment, neither person receives any information concerning the decision of the other person.

How the income is calculated

Your personal income can be calculated as follows:

Initial endowment
– amount you choose to transfer to Person B
+ twice the amount b Person B transferred to you
= your personal income

Appendix B: Figures

--- Please enter FIGURE 2 here ---

TABLE 1—Treatments and subjects.

Treatment	(T1)		(T2)		(T3)	
Origin of transfer	ISR	PAL	ISR	PAL	ISR	PAL
Origin of receiver	ISR	PAL	PAL	ISR	PAL	ISR
Pre-play encounter	–	–	–	–	yes	Yes
Number of subjects	20	20	20	20	12	12
Mean age	25.7	22	23.3	21.7	23.9	24.8

ISR (PAL) denotes Israelis, in Jerusalem (Palestinians, in Abu-Dis).

TABLE 2 — Descriptive statistics for the treatments.

Treatment	(T1)		(T2)		(T3)	
Origin Transfer	ISR	PAL	ISR	PAL	ISR	PAL
Origin Receiver	ISR	PAL	PAL	ISR	PAL	ISR
Pre-play encounter	–	–	–	–	Yes	yes
Mean transfer	4.4	7.1	3.2	5.15	8.33	8.75
Median transfer	4	7	2	5	10	10
SD transfer	2.95	2.36	3.14	3.08	3.37	2.21
Mean belief	3.4	6.3	2.75	5.3	8.5	8.83

Note: ISR (PAL) denotes Israelis (Palestinians), in Jerusalem (Abu-Dis).

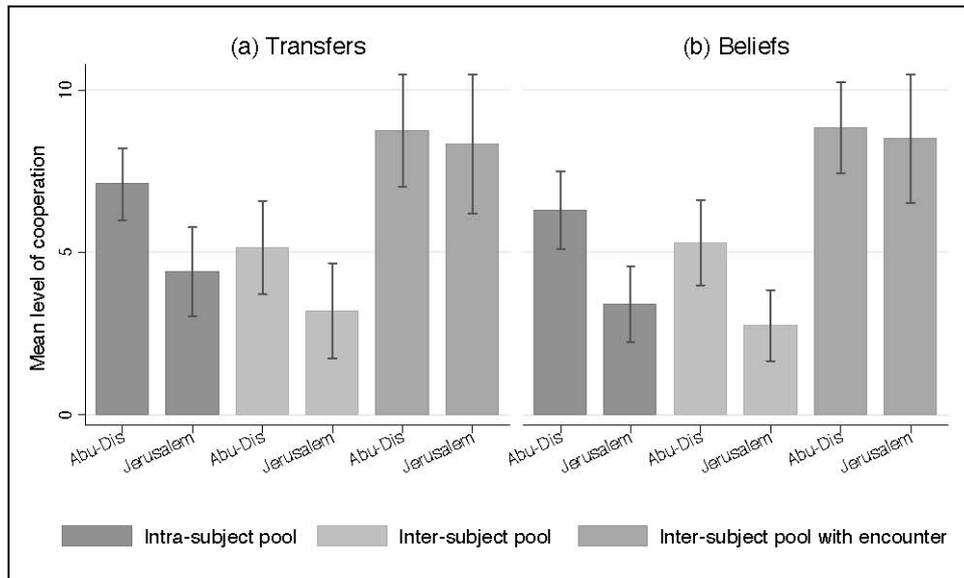


FIGURE 1 —Mean transfers, beliefs, and error bars per treatment and location.

TABLE 3— Tobit regression analyses predicting cooperation transfers.

Variables/Models	(1)	(2)	(3)	(4)
Abu-Dis	3.471***	3.107**	3.198**	0.938
	-1.23	-1.381	-1.219	-0.77
Foreign	-1.926**	-2.019**	-2.157**	-1.243*
	-0.862	-0.96	-0.872	-0.717
Encounter		7.295***	7.420***	2.504**
		-1.565	-1.478	-1.133
Trust Attitude			3.950***	2.498***
			-0.972	-0.72
Belief				0.979***
				-0.143
Gender (1=female)	0.118	0.0096	0.277	1.008
	-1.083	-1.166	-1.069	-0.869
Age	0.181	0.202	0.0124	-0.00519
	-0.211	-0.212	-0.174	-0.123
Constant	3.546***	4.137***	3.803***	2.729***
	-0.343	-0.438	-0.407	-0.317
Observations	80	104	104	104
Prob > chi2	0.00083	9.88E-06	1.28E-08	0

* $p \leq .1$, ** $p \leq .05$, *** $p \leq .01$

Models 2, 3, 4 with clusters for independent observations;

Data used for Model 1 is without the pre-play encounter.

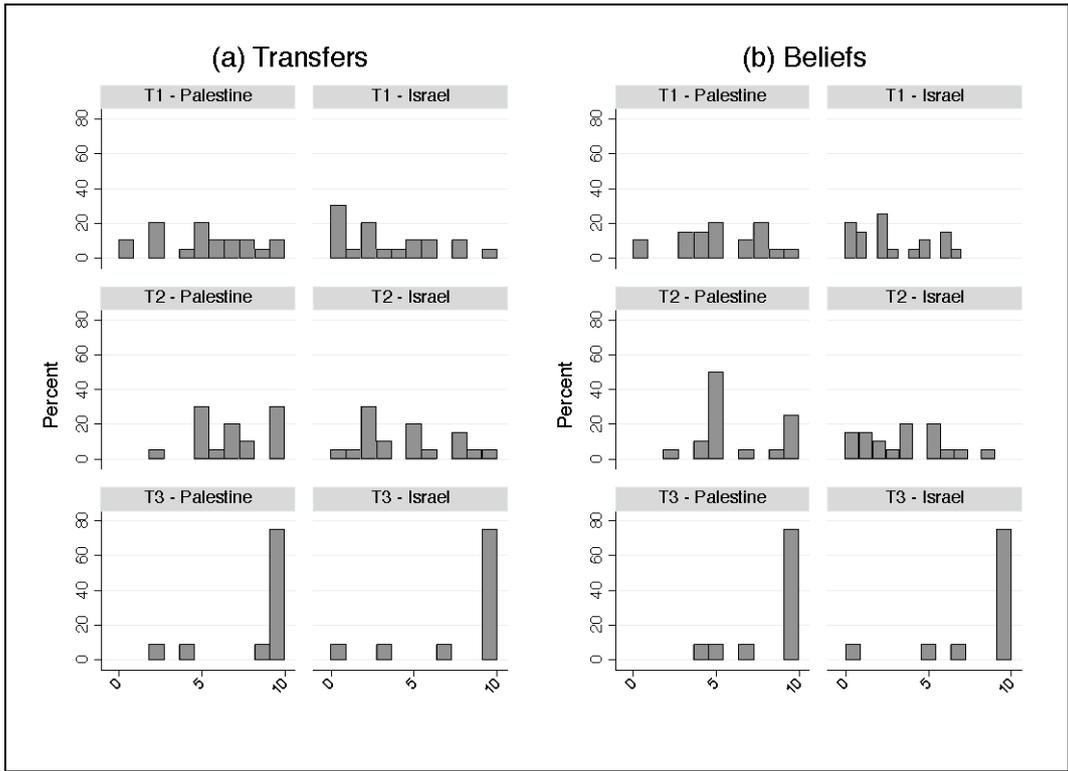


FIGURE 2 —Histogram for transfers and beliefs per treatment and location.