

# Actions and Beliefs in a Trilateral Trust Game Involving Germans, Israelis and Palestinians

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## Abstract

In this paper we report a trilateral trust game with players from Germany, Israel and Palestine. The main finding is that no systematic discrimination among participants from and towards specific countries is detected. However, significantly different levels of trust and reciprocity exist in the different national cultures. A second important result of this study is that decision makers' expectations on trust behavior match with the actual behavior of participants of their own country. We conclude from our observations that subjects' past experience in trust-game like situations within their social environments shapes expectations regarding the behavior of their own country people in the laboratory and affect their own behavior in the trust game. Consequently, we conclude that arising conflict might not be exclusively triggered by past experiences with other's group members and their reputation but dominantly by prevailing social norms within these societies. This might lead to mutual misinterpretation of actions based of biased beliefs thus enforcing distrusting behavior among different countries' players.

**JEL Classification:** C7, C72, C81, C91, F00, O57

**Keywords:** trust, reciprocity, expectations, inter-cultural experiments, social preferences

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# 1 Introduction

The impact of culture and social background on trust behavior has been investigated in the recent experimental and empirical literature (e.g. Roth et al. 1991, Buchan et al. 1997, Croson et al. 1999, Anderson et al. 2000, Henrich 2000, Henrich et al. 2001, Koford 2001, Danileson and Holm 2002, Buchan et al. 2002, 2004, Lazzarini et al. 2004). Most studies, however, exclusively focus on cross-cultural comparisons with no actual interactions of subjects located in different countries/cultures. Only a very small number of experimental contributions include strategic decision making in an intercultural context (Boarini 2002, Willinger et al. 2003, Bornhorst et al. 2004, Chuah et al. 2004, Walkowitz 2004, Walkowitz et al. 2005). The limited empirical evidence of cross-border interactions in experimental settings is surprising, in particular, because globalization increasingly leads to interactions between subjects from various national cultures holding specific sets of norms, values and attitudes. Clashing together, the variety of behavioral mechanisms and interpretation patterns of decision makers can lead to conflicts and inefficient outcomes which might not necessarily result from intended non-cooperative behavior. Instead, learned and stamped culture-specific behavioral characteristics lead to mutual misunderstandings and frictions.

The purpose of this paper is to study the relationship between trust, reciprocity and expectations within a multi-national experimental lab environment and to assess whether differences in observed behavior and stated beliefs exist. Based on existing cross cultural experimental studies that compare country-specific features we do the next logical step and investigate how decision makers behave in actual interactions. Our trilateral study involves German, Israeli and Palestinian<sup>1</sup> participants. This allows us to generate a subject group of three distinct cultures on the East-West scale. Contributing to the cultural distance between the three groups is also the fact that the dominating religion in the three nationalities is different (Christianity for Germans, Judaism for Israelis and Islam for Palestinian). However, there are additional dimensions to our choice of this particular combination of nationalities. Both the Jewish-German history of the Holocaust as well as the current political situation between Israelis and Palestinians may affect subjects' behavior in bilateral interactions, and we will be able to study these interesting effects. Because our matching will involve all possible pairs of nationalities we will be able to

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<sup>1</sup>A Palestinian state does not exist. Most of our subjects are officially citizens of the states of Jordan and Israel. Nevertheless, we will refer to them as Palestinians.

control for these effects. We analyse individuals' country/culture-specific trust and reciprocity behavior, their perception of own-country and foreign-country players their stated beliefs on the matched player's behavior and their behavior towards foreign players in an intercultural strategic trust game setting.

The applied design is a modification of the sequential trust game (Berg et al. 1995) where a sender<sup>2</sup> can transfer any part  $a$  of his  $X$  endowment to a responder. While being transferred,  $a$  is tripled by the experimenter. The responder receiving  $3a$  can finally back-transfer any amount  $b$  to the sender. In our setup, each participant sequentially plays the trust game with one member of her own country as well as with one member of each of the other two countries. In addition to transfers and backtransfers, we elicit senders' beliefs on responders' backtransfers and responders' beliefs on senders' transfers for each of the three countries involved. The beliefs form the basis for our analyzing trust and reciprocity norms in the three countries.

One main finding of this paper is that senders' and responders' expectations match actual behavior of fellow-country participants with the opposite player type noticeably well. They, however, mis-anticipate behavior outside their own country typically assigning to foreign subjects the same behavior they expect from fellow-country persons. While, for instance, responders seem to predict senders' behavior from their own country quite well they fail to predict senders' behavior in the other countries. By expecting foreign senders to behave the same as senders from their own country, responders ignore the significant differences between countries. This gives rise to dramatic interactions, in particular between Israelis and Palestinians where both senders' transfers and responders' expectations are quite polar. An Israeli sender meeting a Palestinian responder is likely to transfer rather little - not so much because the responder is a Palestinian but because the general tendency among Israelis is to transfer little. The Palestinian responder on the other hand, expecting a high transfer from all senders and not just from Palestinians will obviously be quite disappointed. The false inference such responder might make is that Israelis sharply discriminate against Palestinians in the game. A similar dramatic interaction (but a rather much more positive one) can arise when a Palestinian sender meets an Israeli responder. Here, the Israeli who's expecting to get a very small transfer (again influenced by his expectations on his own country men) will be surprised to discover a very generous transfer

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<sup>2</sup>In what follows, we denote the sender as male and the responder as female.

he may interpret as a good will gesture.

Further important results are the following:

First, we find a substantial evidence for active trust and reciprocity behavior across borders within all sender/responder-matchings.

Second, like previous cross-cultural studies, we encountered significant differences between countries in terms of trust and reciprocity behavior levels. Palestinian senders transfer the highest amounts on average, followed by Germans. Israelis send the least. Stated beliefs on trust behavior shows the same pattern with Palestinians expressing highest beliefs and Israelis stating lowest beliefs. Likewise, Palestinian subjects display the highest reciprocity level among the three involved populations by back-transferring highest amounts. Thus, differences between countries in reciprocity behavior seem to match well with the differences in trust behavior. This suggests that part of the difference between senders' behavior across the three countries stems from the different standards prevailing in the three countries as to pay-back behavior. This claim receives further support when we observe senders' expectations regarding responders' back-transfer behavior. Palestinian senders have substantially higher expectations concerning pay-back behavior than both Israelis and Germans who do not differ significantly in terms of their expectations. Again, except Palestinians, whose expectations towards Palestinians are much higher than actual back-transfers of their fellow-country responders, responders' behavior very well matches the expectations of fellow-country senders.

Third, in general, senders do not discriminate substantially. There is some slight discrimination by Germans against fellow-country responders. In reciprocity behavior we find that Israelis slightly favor fellow-country senders and Palestinians discriminate Israelis and Palestinians in favor of German senders. In addition, Israeli responders expect slightly lower transfers from Palestinians compared to German and Israeli senders. Moreover, German senders believe to get back higher percentages from Palestinians than from German- and Israeli-responders. Israelis expect lower back-transfers from Palestinians than from German and Israeli senders. Finally, Palestinian senders believe to receive lower percentages from Israeli than from German and Palestinian responders.

Forth, no country's responders receive systematically lower amounts compared to the other countries. This finding reflects also in responders' beliefs. Furthermore, German responders get smaller amounts from fellow-country and Israeli senders compared to Pales-

tinians. Israeli responders also receive smaller amounts from fellow-country senders. They are trusted most by Palestinians. Palestinians are trusted more by Germans and Palestinians than by Israelis. Moreover, Palestinians expect significantly higher transfers from Israeli and fellow-country senders than Germans and Israelis do. For reciprocity, Palestinian senders received significantly lower back-transfers compared to Germans and Israelis. Germans receive higher back-transfers from fellow-country senders than from Israelis. Israelis receive higher amounts back from Palestinians compared to Israelis and Germans. Contrary, Palestinians get lower amounts back from Israelis compared to fellow-country senders. Palestinians receive higher percentages back from German responders than from Israelis. Senders' expectations on back-transfers show that Germans are expected to make higher back-transfers than Israelis and Palestinians. Palestinian senders expect higher back-transfers from Germans than Germans and Israelis do. Towards Israelis, Palestinian senders expect significantly higher back-transfers than Germans and Israelis. Towards Palestinians, German senders believe in higher pay-backs than Israelis do, and Palestinians expect higher percentages from fellow-country senders than Israelis and Germans expect.

Fifth, a bilateral crossing of on the one hand action data and on the other hand belief data shows that for trust behavior Israelis and Palestinians face a significant discrepancy of mutual trust contrasting low Israeli and high Palestinian transfers. This discrepancy is also found in mutual beliefs. Considering reciprocity a similar constellation is detected. Again, Israelis and Palestinians face a significant discrepancy in their bilateral reciprocity behavior with Israelis responders making lower and Palestinian responders making higher back-transfers. This finding hold for stated beliefs too. Furthermore, in actual reciprocity and stated beliefs, the gap between Germans and Palestinians is substantial.

Sixth, contrasting actions and beliefs bilaterally, senders's transfers and responders' back-transfers to matched players and matched players' beliefs on these transfers and back-transfers again differ substantially for Israelis and Palestinians. Israelis do not meet Palestinian expectations whereas Palestinians outperform them. The same finding holds for Palestinians and Germans. In trust behavior Palestinians outperform German beliefs on a low significance level. For reciprocity, German responders back-transfer significantly less to Palestinian senders than what Palestinian senders expect from them. Palestinian back-transfers, however, exceed German expectations significantly. However, Palestinian

senders overestimate their country-mens' reciprocity, too. Furthermore, Israeli senders slightly overestimate German back-transfers.

Seventh, to study the effect of trust and reciprocity on actual payoffs we examine each country's earnings in intra-cultural and inter-cultural interactions, i.e. when subjects play with players from their own country. We find Palestinians to earn most in intra-cultural interactions both as senders and as responders. This follows directly from the fact that both the transfers and the back-transfers are higher for this national group. Israelis low transfers on the other hand leaves Israeli responders with the lowest payoff among the three groups, but Israeli senders earn more than German senders because of Germans low pay-back rate to their fellow-country senders. Altogether, responders on average made significantly higher payoffs than senders. Israelis, both senders and responders, achieved highest total payoffs, followed by Palestinians and Germans.

We conclude from our observations that subjects' past experience in trust-game like situations within their social environment shapes their roughly correct expectations regarding the behavior of their own country people in the laboratory and affect their own behavior in the intercultural trust game experiment. The different trust and reciprocity experience in the three countries can, for instance, emerge from different trust and reciprocity standards (see also Roth et al. 1991) or from the fact that the type of groups within which such interactions take place in the real life is different across the three countries.

The remainder of this paper is organized as follows: In the next section 2, we describe the design and methods of the trilateral trust game experiment. The procedure is explained in detail in section 3. In section 4, we present our results. Section 5 investigates and compares performance of each country. In the final section 6 we discuss our findings and conclude.

## 2 Experimental Design and Methods

The present trust experiment is a trilateral adaption of the usual sequential protocol for running investment game experiments (Berg et al. 1995). A sender and a responder first get an endowment  $X=10$  ECU (Experimental Currency Unit), the exchange rate being 1 ECU=0.50 \$ in each country<sup>3</sup>. The responder can save this amount and receives it at the

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<sup>3</sup>During the experiment, we applied this exchange rate to all participants. Since all decision makers must face the same reference currency exchange rates are not adapted to local purchasing power. We paid

end of the experiment. The sender can transfer any integer  $a \in [0, 1, \dots, X - 1, X]$  to an anonymously matched responder of his own or one of the two other countries. Each transfer  $a$  is tripled by the experimenter the responder receiving  $3a$  for each  $a$  transferred by the sender. The responder then freely decides to back-transfer any integer  $b \in [0, 1, \dots, 3a - 1, 3a]$  to the sender. The only sub-game perfect equilibrium for this game is  $b^* = a^* = 0$ . Thus, the sender will transfer  $a = 0$  because he anticipates the responder's rational choice  $b = 0$ . The transfer  $a$  can be interpreted as the sender's trust towards the responder. Likewise, the back-transfer  $b$  represents the responders' reciprocity towards the sender.

In separated subject pools, organizational problems arise in multi-person multi-stage experiments like the trust game described above. The crucial constraint is the interdependence of the sequential choices at the three locations involved in the trilateral experiment. The responder located in one country is not able to make her back-transfer decision without being informed about the transfer of the sender situated in another country. We solve this problem of sequential interdependence by applying ELD<sup>4</sup>, a method combining several experimental features. It was first applied by Walkowitz (2004), see also Walkowitz et al. (2005). In the trilateral experiment, ELD owns the following features:

1. *Strategy method* (Selten 1967): This method allows to organizationally disconnect the second stage of the game from the first stage. By having the responder state her back-transfer for each possible transfer of the sender, the sequential two-person two-stage game is converted into a two-person normal-form one-stage game for each player. These correlated games can be played independently at different locations and different points in time. For applications of the strategy method see also Güth et al. (2003) and Bellemare et al. (2005), Brandts and Charness (2000).

2. *Pen-and-paper*: We use pen-and-paper to make the experimental design independent of equipment and software compatibility. First of all, start-up costs are reduced. Second, the experiment can be run in a non-laboratory environment like a classroom. This is especially important when running experiments in the trilateral context where a common hardware and software standard is not available. Finally, pen-and-paper creates transparency as to the experimental procedures enhancing the credibility for participants not used to experimental methods.

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subjects an locally adapted show up fee to meet this concern.

<sup>4</sup>ELD is the abbreviation for 'Experimenting over a Long Distance'.

3. *Remote-control organization:* A central unit, the Chief Experimenter (CE) is responsible for overall planning and controlling the experiment. In the trilateral experiment, CE was located in Bonn. Local experimenters (LEs) are in charge of organizing and running the sessions in Jerusaelm and Bethlehem. CE instructs all LEs in advance in personal meetings. By a detailed procedural script and an extensive instruction manual CE controls and checks LEs' understanding of the rules of the game. Thereby, equivalent experimental conditions in all three locations are ensured. Instructions and decision sheets identical up to translation into the local languages are prepared by CE applying the back-translation method (Brislin 1970). CE ex-ante codes and prepares the decision sheets and randomly matches players across subject pools. All material is shipped to the corresponding LEs well in advance of running the experiment.

Before the experiment starts, participants at each location are provided with a personal identification code by random draw. The code constitutes a predefined order of matching across countries, not noticeable for participants. Moreover, the code ensures full anonymity by a double-blind procedure. Subjects then make their choices on decision sheets marked with their code number and displaying their counterpart's pool affiliation. All matchings are played one-shot. All sessions in all locations having been finished, CE collects the data, computes payoffs and transfers this information to all LEs. Finally, subjects are paid out by LEs two to three days after the last session of the trilateral experiment has been finished.

In intercultural research, it is advisable to work with local experimenters in each national laboratory in order to avoid self-presentation and face-saving effects (Bond and Hwang, 1995) as well as possible negative effects of foreign experimenters.

### 3 Experimental Procedure

The trilateral experiment was run simultaneously at *BonnEconLab* - the Laboratory for Experimental Economics at the University of Bonn, Germany, at *RatioLab* - the Laboratory for the Study of Interactive Decision Making at the Hebrew University of Jerusalem, Israel, and at Bethlehem University, Palestine. 90 students majoring in different disciplines at the above universities participated. Subjects were recruited by campus advertisements<sup>5</sup> promising a monetary reward for participation in a decision-making

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<sup>5</sup>In Germany, subjects were recruited by the online recruiting system ORSEE (Greiner 2004).

task. We strictly controlled for participants' nationalities in order to exclude foreign players from national subject pools. In each of the three countries, we ran a sender session and a responder session with 15 participants each (see table 1).<sup>6</sup> A study by Goerg et al. (2006) gives no evidence, however, for intracultural subject pool differences using participants of three German universities (Berlin, Bonn, and Jena) in a 3-person ultimatum game. We therefore, set a starting point in investigating trust and reciprocity behavior in intercultural settings based on the assumption of equally distributed trust attitudes across national regions.

Country	City	Session	Player type	# subjects
Germany	Bonn	1	sender	15
		2	responder	15
Israel	Jerusalem	3	sender	15
		4	responder	15
Palestine	Bethlehem	5	sender	15
		6	responder	15

**Table 1:** Features of the trilateral experiment

Each German, Israeli or Palestinian participant played the trust game with one member of his/her own country as well as with one member of the other two countries, making choices in three subsequent decision rounds. Thus, each player interacted with one subject of any of the three national subject pools. In each round, any player was endowed with  $X=10$  ECU with each sender making a transfer  $a$  and each responder deciding on a back-transfer  $b$ . Participants kept their player type throughout the experiment. A player's total payoff was the sum of the payoffs over all three decision rounds.

To implement the trilateral environment and to enhance the credibility of the intercultural interactions, we informed players about the involved countries during the introduction of the experiment. To avoid demand effects during the experimental process they

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<sup>6</sup>We had to restrict the number of independent observations to 15 due to limited availability of subjects at Bethlehem University. Moreover, we confined our analysis to one university per country because it was not possible to include a second Palestinian university into our study. We are aware of the fact that our experimental design does not answer the question whether the observed behavioral differences are due to the intercultural design. However, all decision makers operated under same conditions, interacting with subjects stemming all from other universities. Moreover, we find no substantial and consistent discrimination of foreign players.

only received the names of the participating universities. Due to political, organizational and technical constraints, the experiment could not be run at exactly the same time at all locations. We, therefore, conducted sessions on three consecutive days in December 2004. In each location, LEs ran the two sessions within one day.

The instructions of the above trust game were read aloud and explained in detail to the experimental subjects. Questions were asked and answered in private<sup>7</sup>. We took great care to ensure that participants understood the game and the underlying incentive structure. After subjects had read the instruction, for which they had plenty of time, they had to answer four control questions that tested their understanding of the decision situation. We did not proceed in the experimental protocol until all subjects had answered all questions correctly. Thus, we can safely assume that people completely understood the game and its features.

After subjects had answered the control questions, senders had to make their transfer choice and responders had to make their back-transfer decision. For each decision round, subjects were provided with a separate decision sheet to inhibit changing prior decisions or recouping information from previous choices. We then asked responders to guess senders' transfers  $a$ , and we asked senders to guess responders' back-transfers  $b$  for every potential  $a$ . When making their transfer or back-transfer decisions, subjects did not know about the subsequent estimation task. We decided on this timing of events because we wanted to avoid subjects' decisions being influenced by the subsequent belief elicitation<sup>8</sup>.

Participants played the game only once against a counterpart from each subject pool without being informed about their income before the very end of the entire experiment. Subjects took their decisions in complete anonymity from the other participants. All participants were fully informed on all features of the experimental design and the procedures. Sessions lasted for about 90 minutes including the reading of instructions. On average, subjects earned 24 USD (without show up fee).

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<sup>7</sup>See Appendix A for the instruction in English language.) Instructions in German, Hebrew and Arabic are available from the authors upon request.

<sup>8</sup>We are aware of the fact that stated beliefs can be biased by prior decisions already undertaken. However, the experiment is set up as an one-shot interaction, which by definition rules out belief adjustments, reputation building, and trigger strategies that rely on sanctioning in a (finitely) repeated game. Moreover, since actual unbiased decisions are more valuable for our analysis we agreed upon this procedure.

## 4 Results

We start the result section with an overview on the procedure of our analysis. This seems advisable for the sake of understandability because the combinatorics of three countries, senders and responders, as well as choices and beliefs might make it difficult for the reader to follow up on the analysis. Table 2 gives an outline on the structure of our analysis. We first focus on senders' transfers in subsection 4.1 (column 3 in table 2). In subsection 4.2 (column 4), we study responders' beliefs on senders' transfers. In subsection 4.3 (column 5), we investigate responders' back-transfers, and finally, in subsection 4.4 (column 6), we analyse senders' beliefs on responders' backtransfers.

		<b>Senders:</b>	<b>Responders:</b>	<b>Responders:</b>	<b>Senders:</b>
		<b>Transfers <math>a</math></b>	<b>Beliefs <math>\bar{a}</math></b>	<b>transfers <math>b</math></b>	<b>Beliefs <math>\bar{b}</math></b>
	<b>Subsection</b>	<b>4.1</b>	<b>4.2</b>	<b>4.3</b>	<b>4.4</b>
<b>Step</b>	<b>Analysis</b>				
<b>A.</b>	<b>Cumulated choices of all countries</b>	1.A	2.A	3.A	4.A
<b>B.</b>	<b>Aggregated choices of each country</b>	1.B	2.B	3.B	4.B
<b>C.</b>	<b>Choices from one country</b>	1.C	2.C	3.C	4.C
<b>D.</b>	<b>Aggregated choices to each country</b>	1.D	2.D	3.D	4.D
<b>E.</b>	<b>Choices to one country</b>	1.E	2.E	3.E	4.E
<b>F.</b>	<b>Bilateral choices</b>	1.F	2.F	3.F	4.F
<b>G.</b>	<b>Actions vs. beliefs of one country</b>		2.G		4.G
<b>H.</b>	<b>Actions vs. beliefs of two countries</b>		2.H		4.H

**Table 2:** Structure of analysis

Table 2 shows the analytical structure within subsections 4.1 to 4.4 and step of analysis A to H. In step A, we investigate cumulated transfers and back-transfers [1.A,

3.A] and corresponding beliefs [2.A, 4.A] of all countries to get a total overview on trust and reciprocity behavior as well as on stated expectations. In B, we analyse aggregated transfers and back-transfers [1.B and 3.B], as well as aggregated beliefs [2.B, 4.B] of each country to compare the general level of trust and reciprocity and their expectations across countries. In this case, we speak of aggregated behavior if we compare all choices or stated beliefs by one population across countries, *independent* of matched partners. To check for discrimination effects, we in C investigate behavior [1.C, 3.C] and beliefs [2.C, 4.C] from one specific country to players of all populations. In D, we study aggregated actions [1.D, 3.D] and beliefs [2.D, 4.D] to a specific country to compare the level of trust and reciprocity to countries. We now speak of aggregated behavior if we compare actions or stated beliefs *dependent* on specific matched partners. In E, we take a closer look at actions [1.E, 3.E] and beliefs [2.E, 4.E] to a specific country’s population to again check for discrimination effects to this country. We in F then focus on bilateral actions [1.F, 3.F] and beliefs [2.F, 4.F], i.e. we directly compare exchanges and expectations between specific two involved countries. In G, we contrast actions and beliefs of participants from the same country [2.G, 4.G] to analyze whether beliefs are shaped by country-specific values and norms. Please note that information on exchanges and expectations are derived independently from different individuals. Consistency of choices and beliefs might be indicative of culture-specific values and norms. Finally, in H, we contrast actions and beliefs of participants from two different matched country [2.H, 4.H]. Inconsistency of choices and beliefs might be indicative for conflict situations when expectation are underperformed or outperformed by one party. In the following analysis, each step A to H will be indicated with the corresponding code from table 2. For instance, [1.A] means cell 1.A in table 2 where we analyse senders’ transfers (trust behavior) aggregated over all countries. For the sake of brevity, we omit the reference to table 2. Moreover, we use abbreviations **G**, **I**, and **P** for the identification of Germans, Israelis, and Palestinians. In general, we analyse the data according to the alphabetical order of the country names. Moreover, we denote senders’ transfers also as trust behavior. Responders’ back-transfers are also referred to as reciprocity. All statistical tests are two-sided.

#### ***4.1 Senders: Transfers a***

According to our agenda, we first analyse sending behavior aggregated over all countries [1.A].

**Observation [1.A]:** *Aggregated sending behavior aggregated over all countries is substantially different from zero.*

SUPPORT: On average, 5.1 ECU are transferred to responders, with median = 5, mode = 5 and sd = 3.2. In **G**, 86.7% of the senders do invest a positive amount, in **I** the percentage is 66.7%, and in **P** it is even 100%. Thus, standard game theoretic prediction  $\hat{a} = 0$  is to be rejected for all countries and for all matchings. This is in line with the literature (e.g. Berg et al. 1995). It is astonishing, however, that subjects show substantially high trusting behavior also in the inter-cultural context. Remember that they were not provided with any information about matched player's characteristics in addition to their university affiliation. Moreover, the size of transfers is remarkable given the historical and political background of participating countries, in particular of **G** and **I** as well as of **I** and **P**.

In a next step we analyse aggregated transfers *from* each country [1.B]. Table 3 shows senders' average transfers  $a$  and responders's average beliefs  $\tilde{a}$  on senders' transfers  $a$  from and to the three countries. Column (VI) shows aggregated transfers and beliefs *to* a specific country. Lines (7) and (8) display the corresponding transfers and beliefs *from* a specific country.

Population		Measure	to G	to I	to P	to all countries
		(A)	(B)	(C)	(D)	(E)
(1)	<b>from G</b>	$a$	4.4	5.2	5.6	5.1
(2)		$\tilde{a}$	4.8	4.5	4.7	4.7
(3)	<b>from I</b>	$a$	3.9	3.9	2.9	3.6
(4)		$\tilde{a}$	4.8	4.2	3.7	4.2
(5)	<b>from P</b>	$a$	6.9	6.2	6.7	6.6
(6)		$\tilde{a}$	6.5	6.9	7.7	7.0
(7)	<b>from all countries</b>	$a$	5.1	5.1	5.1	
(8)		$\tilde{a}$	5.4	5.2	5.4	

**Table 3:** Average senders' transfers  $a$  and average responders' beliefs  $\tilde{a}$  on transfers  $a$  across countries

**Observation [1.B]:** *Aggregated trust is significantly different across countries.*

SUPPORT: Transfers are significantly different across countries ( $p=0.000$ , Kruskal-Wallis test). Highest transfers are made by **P** (6.6 ECU), followed by **G** (5.1 ECU), with lowest trust being shown by **I** (3.6 ECU) (table 3) yielding the relation  $a_{\mathbf{P}} > a_{\mathbf{G}} > a_{\mathbf{I}}$ . See figure 1a for country-specific frequency distributions of  $a$ . A pairwise analysis of individual transfers shows highly significant differences as well, with  $p=0.040$  for **G** vs. **I**,  $p=0.022$  for **G** vs. **P** and  $p=0.000$  for **I** vs. **P** (Mann-Whitney-U test).

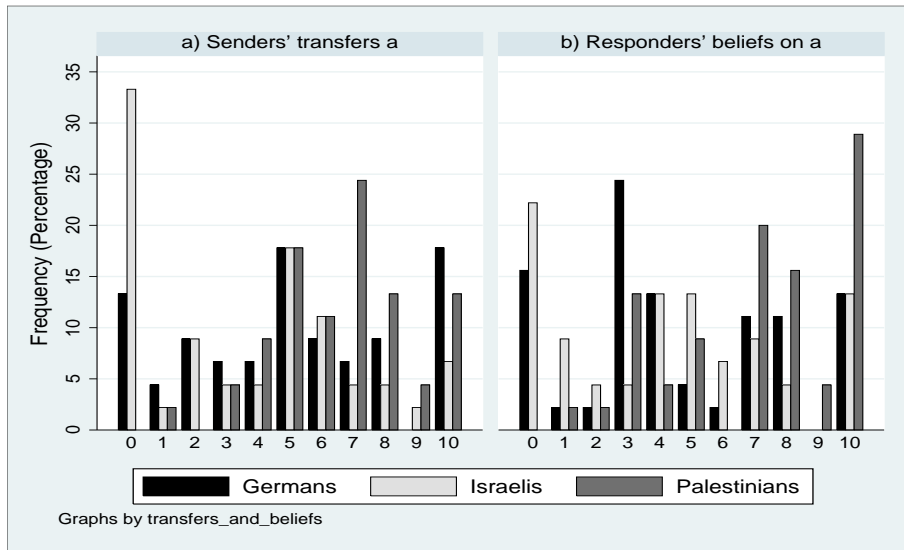


Figure 1a, b: Distribution of a) senders' transfers  $a$  and b) responders' beliefs on transfers  $a$  per country

In the following we take a closer look at country-specific transfers starting with sending behavior *from* one country [1.C]. Only in this Part of our analysis we can control for pure discrimination effects since senders are able to discriminate among three matched responders.

**Observation [1.C]:** *G-senders significantly discriminate fellow-country responders in favor of P. I and P-senders display no discrimination.*

SUPPORT: **G** on average transfer most to **P** (5.6 ECU), second most to **I** (5.2 ECU), and least to **G** (4.4 ECU) thereby discriminating compatriots against **P** ( $p=0.040$ , Wilcoxon signed ranks test). **I**, however, transfer the same amount to **G** and **I** (3.9 ECU), but only 2.9 ECU to **P** being the smallest transfer in our study. **I** do not discriminate against or in favor of one country. Neither do **P**. Yet, **P** make the highest transfers of all three countries giving on average 6.9 ECU to **G**, 6.7 ECU to **P**, and 6.2 ECU to **I**.

We now turn to aggregated trust behavior *towards* countries [1.D].

**Observation [1.D]:** *No country's responder group receives significantly smaller amounts compared to the other countries.*

SUPPORT: No country is found to be favored or discriminated by the other countries ( $p=0.771$ , Friedman test). On average, 5.1 ECU are transferred to participants of each country yielding  $a_G \approx a_I \approx a_P$ .

Next, we analyse transfers towards a *specific* country [1.E].

**Observation [1.E]:** *G-responders receive significantly smaller transfers from fellow-country senders compared to P. They are less trusted by I than by P. I-responders receive significantly smaller amounts from fellow-country senders, they are trusted most by P. P are trusted more by G and P than by I.*

SUPPORT: G-responders receive significantly smaller amounts from their compatriots and by I-senders compared to P-senders ( $p=0.036$  and  $0.003$ , respectively, Mann-Whitney-U test). G-responders are given most (6.9 ECU) by P, second most by G (4.4 ECU) and least by I-senders (3.9 ECU). I-responders receive the highest amounts from P-senders (6.2 ECU). G transfer 5.2 ECU to I, and I 3.9 ECU to their compatriots. Surprisingly, P-senders transfer significantly higher amounts towards I than I themselves ( $p=0.080$ , Mann-Whitney-U test).

Transfers to P are significantly different across countries ( $p=0.009$ , Kruskal-Wallis test). P-responders receive the highest transfers from fellow-country senders (6.7 ECU), followed by G (5.6 ECU) and I (2.9 ECU). A pairwise comparison yields no difference in individual P and G-transfers to P. Yet, there is a difference in I- and P-transfers as well as in I- and G-transfers to P ( $p=0.003$  and  $p=0.034$  respectively, Mann-Whitney-U test).

Finally, we focus on *bilateral* exchanges within the trilateral context [1.F], i.e., we directly compare transfers between countries.

**Observation [1.F]:** *I and P face a significant discrepancy of mutual trust with low I and high P transfers.*

SUPPORT: While the individual amounts G transfer to I (P) are not different from the amounts I (P) transfer to G, with an average transfer of 5.2 ECU (5.6) and 3.9 (6.9), I

and **P** face the largest discrepancy of mutual transfers in any of the trilateral matchings. **I** on average transfer 2.9 ECU to **P** being the lowest country-specific transfer in our experiment. On the other hand, **P** on average transfer 6.2 ECU to **I**-responders. This difference is highly significant ( $p=0.008$ , Mann-Whitney-U test). Thus, bilateral analysis yields even more divergent results than the uni-directional investigations above.

To conclude this subsection we sum up our observations in the following result:

**[Result 1]:** (A) *Within the inter-cultural set-up senders display substantially positive trusting behavior in all matchings which leads to the rejection of standart game theoretic assumptions.* (B) *On the cross-national level, aggregated trust is significantly different across countries with Palestinians transferring the highest amounts and Israelis transferring the lowest amounts.* (C) *In sending behavior from a specific country only partial discrimination is detected: German senders discriminate fellow-country responders in favor of Palestinians. Israeli and Palestinian senders display no such discrimination.* (D) *Furthermore, no country's decision maker receive systematically lower amounts compared to the other countries.* (E) *However, German responders get smaller amounts from fellow-country senders compared to Palestinians. They are also less trusted by Israelis than by Palestinians. Israeli responders also receive smaller amounts from fellow-country senders. They are trusted most by Palestinians. Palestinians are trusted more by Germans and Palestinians than by Israelis.* (F) *Finally, in bilateral comparison, we find that Israelis and Palestinians face a significant discrepancy of mutual trust with low Israeli and high Palestinian transfers.*

#### 4.2 Responders: Beliefs $\tilde{a}$ on senders' transfers

In this subsection, we analyse responders' beliefs  $\tilde{a}$  on senders' transfers  $a$ .

We first start to analyse responders beliefs aggregated over all countries [2.A].

**Observation [2.A]:** *Beliefs on sending behavior aggregated over all countries are substantially different from zero.*

SUPPORT: Responders believe that on average (5.3 ECU) will be transferred, with median = 4.8, mode = 4.8 and sd = 1.37. In **G** and **I**, 86.7% of the responders do believe in a positive transfer, in **P** all responders (100%) assume a positive senders' transfer.

As a next step, we analyse aggregated beliefs *from* each country [2.B].

**Observation [2.B]:** *Aggregated responders' beliefs on senders' transfers are significantly different across countries.*

SUPPORT: Aggregated beliefs  $\tilde{a}$  on transfers are significantly different across countries ( $p=0.000$ , Kruskal Wallis test). Highest beliefs are stated by **P** (7.0 ECU), second highest by **G** (4.7 ECU), and lowest by **I** (4.2 ECU). Thus, the same relation holds for beliefs as for transfers, namely  $\tilde{a}_{\mathbf{P}} > \tilde{a}_{\mathbf{G}} > \tilde{a}_{\mathbf{I}}$  (see table 3 and figure 1b).

In the following, we take a closer look at country-specific beliefs *from* one country [C.2]. Again, in this Part of our analysis we can control for pure discrimination effects since responders are able to discriminate among three matched senders.

**Observation [2.C]:** *Beliefs of G, I and P are not significantly discriminating.*

SUPPORT: **G**- and **P**-responders display no discrimination. **I**-responders only on average expect lower transfers from **P**-senders (3.7) than from **G**- and **I**-senders (4.8 ECU and 4.2 ECU respectively).

We now turn to aggregated beliefs *towards* countries [2.D].

**Observation [2.D]:** *Aggregated responders' beliefs towards countries do not differ. No country is believed to make higher or smaller transfers.*

SUPPORT: We find no differences in aggregated beliefs towards countries. On average, a transfer of 5.4 ECU is expected from **G**- and **P**-senders, and of 5.2 ECU from **I**-senders yielding the relation  $\tilde{a}_{\mathbf{G}} \approx \tilde{a}_{\mathbf{I}} \approx \tilde{a}_{\mathbf{P}}$ .

Next, we analyse beliefs towards a *specific* country [2.E].

**Observation [2.E]:** *Beliefs towards G-senders are not different among countries. P, however, expect significantly higher transfers from I and fellow-country senders than G and I do.*

SUPPORT: Beliefs towards **G**-senders are not different among countries. **G**-responders expect a transfer of 4.8 ECU, **I**-responders of 4.8 ECU, and **P**-responders of 6.5 ECU. Beliefs on **I**-transfers are significantly different, however ( $p=0.065$ , Kruskal Wallis test).

**P**-responders expect significantly higher transfers (6.9 ECU) than **G**- (4.5 ECU) and **I**-responders (4.2 ECU). Beliefs towards **P**-senders are different as well ( $p=0.005$ , Kruskal Wallis test). **P**-responders expect significantly higher transfers (7.7 ECU) from fellow-country senders than **G**- (4.7 ECU) and **I**-responders (3.7 ECU).

We now focus on *bilateral* comparisons of beliefs within the trilateral context [2.F], i.e., we directly compare beliefs between countries.

**Observation [2.F]:** *I and P face a significant discrepancy of mutual beliefs on transfers, with low I and high P expectations.*

SUPPORT: As for transfers, a bilateral comparison of beliefs about transfers shows broad discrepancies. While individual beliefs of **G** and **I** as well as those of **G** and **P** do not significantly differ, beliefs of **I** and **P** do ( $p=0.008$ , Mann-Whitney-U test). **I**-responders expect a transfer of 3.7 ECU from **P**-senders being the lowest overall belief on transfers in the experiment. **P**-responders, on the other hand, expect **I**-senders to back-transfer 6.9 ECU.

Next, we compare stated beliefs and actual transfers from one country's decision makers [2.G]. Remember, that the information on senders' transfers and responders' beliefs on these transfers are derived independently from different experimental subjects. A correspondence of transfers and beliefs within a country would point to the existence of norms within this country. Moreover, a difference between countries in the level of correspondence would indicate the existence of country-specific norms.

**Observation [2.G]:** *Responders expect a similar trusting behavior as fellow-country senders actually show.*

SUPPORT: Comparing senders' transfers and responders beliefs country-wise, we find no statistical difference ( $p=0.537, 0.393, 0.873$ , Mann-Whitney-U test). Responders expect the same amounts as senders from their subject pool actually transfer. This is a striking result given that transfers and beliefs are derived from individuals deciding independently of each other (see diagonal of table 4). Moreover, contrasting individually one country's sender's intra-cultural transfers with stated responders' beliefs of this country concerning the transfers from foreign senders no significant differences can be detected for **G**, **I** and **P**.

We finally analyse the implications of our findings in inter-cultural interactions with regard to discrepancies in trust and beliefs. To this end, we compare average country-specific transfers  $a$  to a specific population with the expectations  $\tilde{a}$  stated by this population [2.H]. Table 4 shows pairwise comparisons of transfers/beliefs and whether the differences are significant.

	<b>Population</b>	<b>G <math>\tilde{a}</math></b>	<b>I <math>\tilde{a}</math></b>	<b>P <math>\tilde{a}</math></b>
		(A)	(B)	(C)
(1)	<b>G a</b>	4.4/4.8	5.2/4.8	5.6/6.5
(2)	<b>I a</b>	3.9/4.5	3.9/4.2	2.9/6.9***
(3)	<b>P a</b>	6.9/4.7*	6.2/3.7**	6.7/7.7

**Table 4:** Average country-specific transfer  $a$  to matched players and their expectations  $\tilde{a}$  (\*, \*\*, \*\*\*: significant at 10%, 5%, 1%-level, Mann-Whitney-U test)

**Observation [2.H]:** *Senders’s transfers to matched players and matched players’ beliefs on these transfers are significantly different for I and P. I do not meet P expectations whereas P outperform them. The same holds for P transfers compared to G beliefs, yet on a lower significance level.*

SUPPORT: **G**-transfers do not mismatch foreign expectations. **I** expect on average 4.8 ECU from them ( $p=0.815$ , Mann-Whitney-U test) and receive on average 5.2 ECU, **P** expect on average a **G**-transfer of 6.5 ECU and receive on average 5.6 ECU ( $p=0.490$ , Mann-Whitney-U test). Similarly, **I** meet **G** expectations. **G**, on average expect to get a transfer of 4.5 ECU and actually receive on average 3.9 ECU from **I** ( $p=0.672$ , Mann-Whitney-U test). Contrary, a bilateral comparison of transfers and beliefs shows a dramatic discrepancy in the **I/P**-matching. On the one hand, **I**-senders on average transfer 2.9 ECU to **P**-responders while **P**-responders expect 6.9 ECU. This difference is highly significant ( $p=0.002$ , Mann-Whitney test). On the other hand, **P**-senders transfer on average 6.2 ECU to **I**-responders who expect a significantly lower amount of only 3.7 ECU ( $p=0.037$ , Mann-Whitney test). Furthermore, **P** slightly outperform **G** expectations (4.7 ECU) with average transfers of 6.9 to them ( $p=0.055$ , Mann-Whitney-U test).

To conclude this subsection we sum up our observations in the following result:

**[Result 2]:** (A) *Within the inter-cultural set-up responders substantially expect positive transfers from senders. (B) On the cross-national level, aggregated beliefs on senders’*

transfers are significantly different across countries with Palestinians stating the highest beliefs on matched players's transfers and Israelis stating lowest beliefs on matched players' transfers. (C) Germans, Israelis and Palestinians do not discriminate in their exposed expectations. Israeli responders on average expect lower transfers from Palestinians than from German and Israeli senders. (D) No country's sender group is believed to systematically transfer smaller or higher amounts. (E) Beliefs towards German senders are not different among countries. Contrary, Palestinians expect significantly higher transfers from Israeli and fellow-country senders than Germans and Israelis do. (F) In bilateral comparisons of mutual beliefs, we find that Israelis and Palestinians face a significant gap, with low Israeli and high Palestinian expectations. (G) Furthermore, we find that one country's responders expect a similar trusting behavior as fellow-country senders actually show. (H) Finally, by comparing responders' beliefs and senders' transfers we observe, that senders's transfers to matched players and matched players' beliefs on these transfers are significantly different for Israelis and Palestinians. Israelis do not meet Palestinian expectations whereas Palestinians outperform them. The same holds for Palestinian transfers compared to German beliefs, yet on a lower significance level.

### 4.3 Responders: Back-transfers $b$

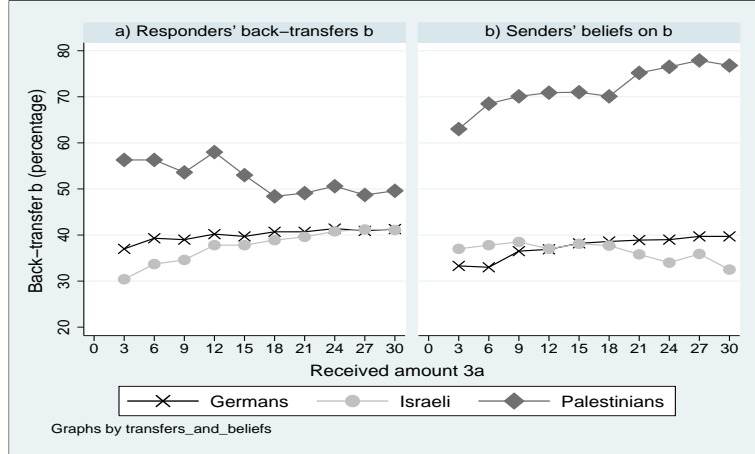
In this subsection, we analyse responder's reciprocity behavior. For our investigation we apply the complete dataset from response vectors gained by the strategy method. In the experimental design each back-transfer  $b$  is an absolute value. In the following, for the sake of clarity and comparableness  $b$  is displayed as the percentage value relative to  $3a$ , for any  $a > 0$ .

According to our research agenda, we start with analysing reciprocity behavior aggregated over all countries [3.A].

**Observation [3.A]:** *Back-transfer behavior aggregated over all countries is substantially different from zero.*

SUPPORT: In 83% of all possible cases (when  $a > 0$ ) a positive back-transfer was realized. On average, 43.3% of the received transfer  $3a$  is back-transferred to the senders, with median=44.4%, mode=0 and sd=29.0. As with transfers  $a$ , the game theoretic prediction

$\hat{b} = 0$  is to be rejected for all countries and for all matchings. We also observe different levels of reciprocity in the three countries. See figure 2a for country-specific frequency distributions of individual back-transfer vectors  $b$ .



**Figure 2a, b:** a) Responders' back-transfers  $b$  and b) senders' beliefs  $\tilde{b}$  on back-transfers  $a$  as a percentage of  $3a$  per country

In a next step we analyse aggregated reciprocity levels *from* each country [3.B]. Table 5 shows responders' average back-transfers  $b$  and sender's average beliefs  $\tilde{b}$  on responders' back-transfers  $b$  from and to the three countries. Column (VI) shows aggregated back-transfers and beliefs *to* a specific country. Lines (7) and (8) display the corresponding back-transfers and beliefs *from* a specific country.

	Population	Measure	to G	to I	to P	to all countries
			(B)	(C)	(D)	(E)
(1)	<b>from G</b>	$b$	40.3	38.6	41.1	40.0
(2)		$\tilde{b}$	36.1	36.2	39.9	37.4
(3)	<b>from I</b>	$b$	37.0	40.1	35.6	37.6
(4)		$\tilde{b}$	41.0	40.3	28.0	36.4
(5)	<b>from P</b>	$b$	56.9	51.1	49.1	52.4
(6)		$\tilde{b}$	75.6	66.2	74.2	72.0
(7)	<b>from all countries</b>	$b$	44.8	43.3	41.9	
(8)		$\tilde{b}$	50.9	47.6	47.4	

**Table 5:** Average responders' back-transfers  $b$  and senders' beliefs  $\tilde{b}$  on back-transfers  $b$  across countries as a percentage of  $3a$

**Observation [3.B]:** *Aggregated reciprocity levels are significantly different across countries.*

SUPPORT: Aggregated back-transfers are significantly different across countries ( $p=0.000$ , Kruskal Wallis test). Highest pay-backs are made by **P** (52.4%), followed by **G** (40.0%) with lowest reciprocity shown by **I** (37.6%). This yields the relation  $b_{\mathbf{P}} > b_{\mathbf{G}} > b_{\mathbf{I}}$  being consistent with our findings on trusting behavior. A pairwise analysis of individual back-transfers shows highly significant differences for all matchings with  $p=0.002$  for **G** vs. **I**,  $p=0.000$  for **G** vs. **P**, and  $p=0.000$  for **I** vs. **P** (Mann-Whitney-U test).

In the following, we next take a closer look at country-specific back-transfers *from* one country [3.C]. Only in this Part of our analysis we can control for pure discrimination effects since responders are able to discriminate among three matched senders.

**Observation [3.C]:** *G-responders show no tendency to discriminate. Reciprocity of I is significantly smaller towards G and P than towards fellow-country senders. P discriminate I and P in favor of G senders.*

SUPPORT: **G**-responders on average back-transfer most to **P** (41.1%), second most to **G** (40.3%), and least to **I** (38.6%) thereby not discriminating across countries ( $p=0.647$ , Friedman-test). **I** back-transfer most to their compatriots (40.1%), 37.0% to **G**-senders and least towards **P** (35.6%). On average, significantly lower percentages are back-transferred to **G** compared to **I** and **P** ( $p=0.002$ ,  $p=0.000$ , respectively, Wilcoxon signed-ranks test) **P** back-transfer higher percentages to **G** (56.9%) compared to **I** (51.1%) and **P** (49.1%). On average, **I**- and **P**-senders receive significantly lower back-transfers compared to **G** ( $p=0.007$ ,  $p=0.000$ , respectively, Wilcoxon signed-ranks test).

We now turn to aggregated reciprocity behavior *towards* countries [3.D].

**Observation [3.D]:** *In general, P-senders receive significantly lower back-transfers compared to G and I-senders.*

SUPPORT: We observe significantly different individual back-transfer levels towards countries ( $p=0.001$ , Friedman test). A pairwise comparison of individual back-transfers confirms this finding. **P**-senders receive significantly smaller percentages back than **G** and **I** ( $p=0.001$ ,  $p=0.015$ , respectively, Wilcoxon signed rank-test). **G**-senders on average receive the highest percentage back (44.8%), followed by **I** (43.3%) and **P** (41.9%)

This yields the relation  $b_{\mathbf{G}} > b_{\mathbf{I}} > b_{\mathbf{P}}$ .

Next we analyse back-transfers to a *specific* country [3.E].

**Observation [3.E]:**  $\mathbf{G}$ -senders receive higher back-transfers from fellow-country senders than from  $\mathbf{I}$ .  $\mathbf{I}$  receive significantly higher back-transfers from  $\mathbf{P}$  compared to  $\mathbf{I}$  and  $\mathbf{G}$ . Contrary,  $\mathbf{P}$  receive significantly lower amounts back from  $\mathbf{I}$  compared to fellow-country responders.  $\mathbf{P}$  receive higher percentages back from  $\mathbf{G}$ -responders than from  $\mathbf{I}$ .

SUPPORT:  $\mathbf{G}$ -senders receive the highest percentages from  $\mathbf{P}$ -responders (56.9%) whereas  $\mathbf{G}$  back-transfer 40.3% and  $\mathbf{I}$  37.0% to  $\mathbf{G}$ . This difference is highly significant, with  $p=0.000$  for both  $\mathbf{P}$  vs.  $\mathbf{G}$  and  $\mathbf{P}$  vs.  $\mathbf{I}$  (Mann-Whitney-U test).  $\mathbf{G}$  back-transfer significantly higher percentages to fellow-country senders than  $\mathbf{I}$  do (0.039, Mann-Whitney-U test). Nearly the same pattern holds for  $\mathbf{I}$  who receive the highest percentages from  $\mathbf{P}$  (51.1%), followed by  $\mathbf{I}$  (40.1%) and  $\mathbf{G}$  (38.6%). Again,  $\mathbf{P}$  back-transfer significantly more to  $\mathbf{I}$  compared to  $\mathbf{I}$  and  $\mathbf{G}$  ( $p=0.005$ ,  $p=0.008$ , respectively, Mann-Whitney-U test).  $\mathbf{P}$  receive most from their compatriots (49.1%).  $\mathbf{G}$  back-transfer 41.1% to  $\mathbf{P}$ , followed by  $\mathbf{I}$  with 35.6%.  $\mathbf{P}$  show significantly higher reciprocity behavior towards their compatriots than  $\mathbf{I}$  do ( $p=0.000$ , Mann-Whitney-U test). Likewise,  $\mathbf{G}$ -responders back-transfer significantly higher percentages to  $\mathbf{P}$  than  $\mathbf{I}$  do ( $p=0.003$ , Mann-Whitney-U test).

Finally, we focus on bilateral exchanges of reciprocity within the trilateral context [F.3], i.e., we directly compare back-transfers between countries.

**Observation [3.F]:**  $\mathbf{G}$  and  $\mathbf{P}$ , as well as  $\mathbf{I}$  and  $\mathbf{P}$  face a significant discrepancy in their bilateral reciprocity behavior, with  $\mathbf{G}$ - and  $\mathbf{I}$ -responders making lower and  $\mathbf{P}$ -responders making higher back-transfers.

SUPPORT:  $\mathbf{G}$  and  $\mathbf{I}$  do not back-transfer significantly different percentages towards each other. Yet,  $\mathbf{G}$  and  $\mathbf{P}$  as well as  $\mathbf{I}$  and  $\mathbf{P}$  face a significant discrepancy in their bilateral reciprocity behavior (both  $p=0.000$ , Mann-Whitney-U test). While  $\mathbf{P}$  back-transfer 56.9% to  $\mathbf{G}$ ,  $\mathbf{G}$  return only 41.1%.  $\mathbf{I}$  while getting on average 51.1% back from  $\mathbf{P}$  only pay 35.6% back to them.

To conclude this subsection we sum up our observations in the following result:

**[Result 3]:** (A) In our inter-cultural experiment we find that aggregated responders' back-transfer behavior is substantially different from zero. (B) Comparing the significantly

different aggregated national levels of reciprocity shows that Palestinians back-transfer the highest amounts. Israelis transfer the lowest amounts back. (C) On the country-specific level German responders show no tendency to discriminate. Reciprocity of Israelis is significantly smaller towards Germans and Palestinians than towards fellow-country senders. Palestinians discriminate Israelis and Palestinians in favor of German senders. (D) In general, Palestinian senders receive significantly lower back-transfers compared to Germans and Israelis. (E) Germans receive higher back-transfers from fellow-country senders than from Israelis. Israelis receive higher amounts back from Palestinians compared to Israelis and Germans. Contrary, Palestinians get lower amounts from Israelis compared to fellow-country responders. Palestinians receive higher percentages back from German responders than from Israelis. (F) Finally, Germans and Palestinians, as well as Israelis and Palestinians face a significant discrepancy in their bilateral reciprocity behavior, with German and Israelis responders making lower and Palestinian responders making higher back-transfers.

#### 4.4 Senders: Beliefs $\tilde{b}$ on responders' back-transfers

In this subsection, we analyse sender's beliefs on responders' back-transfers. We use the complete dataset on response vectors gained by the strategy method. We calculate beliefs as we did with back-transfers in subsection 4.3.

We first start to analyse senders' beliefs aggregated over all countries [4.A].

**Observation [4.A]:** *Senders' beliefs on back-transfer behavior aggregated over all countries is substantially different from zero.*

SUPPORT: In 88.7% of all possible cases (when  $a > 0$ ) a positive back-transfer is expected. Senders believe that on average 48.6% relative to  $3a$  will be back-transferred, with median = 45.8% mode = 33.3% and sd = 29.1%. As with back-transfers  $b$ , the game theoretic prediction  $\hat{b} = 0$  is to be rejected for all countries and for all matchings. We also observe different levels of expected reciprocity in the three countries. See figure 2b for country-specific frequency distributions of individual back-transfer vectors  $\tilde{b}$ .

As a next step we now take a look at aggregated beliefs of senders on reciprocity behavior in each country [4.B]. Table 5 shows the average expected back-transfers  $\tilde{b}$  for all countries and matchings.

**Observation [4.B]** *Aggregated beliefs of senders on responders' reciprocity levels are significantly different across countries.*

SUPPORT: Aggregated beliefs on reciprocity behavior  $\tilde{b}$  are significantly different across countries ( $p=0.000$ , Kruskal-Wallis test). Highest beliefs on back-transfers are stated by **P** who expect to get back 72.0% of the tripled transfer. **G** and **I** expect a back-transfer of 37.4% and 36.4%, respectively. Thus the same relation holds for beliefs as for back-transfers, namely  $\tilde{b}_{\mathbf{P}} > \tilde{b}_{\mathbf{G}} > \tilde{b}_{\mathbf{I}}$  (see table 5 and figure 2b).

In the following we take a closer look at country-specific beliefs from one country [4.C]. Again, in this Part of our analysis we can control for pure discrimination effects since senders are able to discriminate among three matched responders.

**Observation [4.C]:** ***G**-senders believe to get back higher percentages from **P** than from **G**- and **I**-responders. **I** expect lower back-transfers from **P** than from **G** and **I**-senders. **P**- senders believe to receive lower percentages from **I**- than from **G**- and **P**-responders.*

SUPPORT: **G**-senders discriminate in their beliefs about back-transfers ( $p=0.000$ , Friedman-test). They expect higher back-transfers from **P**-responders (39.9%) than from **G**- and **I**-responders ((36.1% and 36.2%, respectively). To the contrary, **I**-senders believe to get back significantly lower amounts from **P**-responders (28.0%) than from **G**- (41.0%) and **I**-responders (40.3%) ( $p=0.000$ , Friedman-test). Likewise, **P**-senders expect significantly lower back-transfers from **I**-responders (66.2%) than from **G**- (75.6%) and **P**-responders (74.2%) ( $p=0.000$ , Friedman-test).

We now turn to aggregated beliefs towards countries [4.D].

**Observation [4.D]:** *Aggregated senders' beliefs on reciprocity behavior towards countries show Germans to be expected to make higher back-transfers than Israelis and Palestinians.*

SUPPORT: There is a significant difference in aggregated senders' beliefs on reciprocity behavior towards countries ( $p=0.018$ , Friedman test). **G** are expected to transfer 50.9% back, whereas beliefs on **I** and **P** amount to 47.6% and 47.4%, respectively, yielding the relation  $\tilde{b}_{\mathbf{G}} > \tilde{b}_{\mathbf{I}} > \tilde{b}_{\mathbf{P}}$ .

Next, we analyse senders' beliefs towards a *specific* country [4.E].

**Observation [4.E]:** *P-senders expect higher back-transfers from G than G and I expect. Towards I, P-senders expect significantly higher back-transfers than G and I do. Towards P, G-senders believe in higher pay-backs than I do, and P expect higher percentages from fellow-country senders than I and G expect.*

SUPPORT: P-senders expect significantly higher back-transfers from G (75.6%) than G (36.1%) and I (41.0%) expect ( $p=0.000$ , Kruskal-Wallis test). Likewise, P-senders expect significantly higher back-transfers from I (66.2%) than G (36.2%) and I (40.3%) do ( $p=0.000$ , Kruskal-Wallis test). Towards P, beliefs are significantly different, too ( $p=0.000$ , Kruskal Wallis test). G-senders believe to receive significantly higher pay-backs (39.9%) than I do (28.0%). P (74.2%) expect significantly more than I (28.0%) and G (39.9% expect).

We now focus on *bilateral* comparisons of senders' beliefs within the trilateral context [4.F], i.e. we directly compare beliefs between countries.

**Observation [4.F]:** *G and P, as well as I and P face a significant discrepancy of mutual beliefs on reciprocity behavior, with lower G and I beliefs, and higher P expectations.*

SUPPORT: G and I do not show significantly different beliefs on reciprocity behavior towards each other. Yet, G vs. P ( $p=0.063$ , Mann-Whitney-U test), as well as I vs. P ( $p=0.034$ , Mann-Whitney-U test) face a significant discrepancy in beliefs on mutual reciprocity. While P expect an average back-transfer of 75.6% from G, G believe to get back only 39.9% from P. I expecting to receive 28.0% back from P are believed to transfer back 66.2% to P.

Next, we compare stated beliefs and actual back-transfers from one country's decision makers [4.G]. Again, please note that the information on senders' transfers and responders' beliefs on these back-transfers are derived independently from different experimental subjects. Like for transfers a correspondence of transfers and beliefs within a country would point to the existence of norms within this country. Moreover, a difference between countries in the level of correspondence would indicate the existence of country-specific norms.

**Observation [4.G]:** *G- and I-senders expect a similar reciprocity behavior as fellow-country responders actually show. P-senders overestimate reciprocity behavior of fellow-*

country responders.

SUPPORT: Comparing **G**-responders back-transfers (40.3%) and **G**-senders beliefs (36.1%), we find no statistical difference ( $p=0.123$ , Mann-Whitney-U test). For **I**-senders holds the same finding. They expect to get back on average 40.1% and **I**-responders actually back-transfer 40.3% ( $p=0.313$ , Mann-Whitney-U test). **P**-senders expect significantly higher back-transfers (74.2%) from fellow-country responders than they actually return (49.1%) ( $p=0.000$ , Mann-Whitney-U test)(see diagonal of table 7). Contrasting individually one country’s responder’s intra-cultural back-transfers with stated senders’ beliefs of this country concerning the back-transfers from foreign responders no significant differences can be detected for **G**. **I** back-transfer relatively higher amounts to **I** than they expect to receive from **P**. Moreover, **P** state significantly higher beliefs towards matched players from **G** and **I** than own-country men actually back.transfer.

We finally analyse the implications of our findings in inter-cultural interactions with regard to discrepancies in reciprocity and beliefs. To this end, we compare the average country-specific back-transfer  $b$  to a specific population with the expectations  $\tilde{b}$  stated by this population [4.H]. Table 7 shows pairwise comparisons of back-transfers/beliefs and whether the differences are significant.

	Population	$\tilde{G}b$	$\tilde{I}b$	$\tilde{P}b$
		(A)	(B)	(C)
(1)	<b>G</b> $b$	40.3/36.1	38.6/41.0*	41.1/75.6***
(2)	<b>I</b> $b$	37.0/36.2	40.1/40.3	35.6/66.2***
(3)	<b>P</b> $b$	56.9/39.9***	51.1/28.0***	49.1/74.2***

**Table 7:** Average country-specific back-transfers  $b$  to foreigners and foreigners’ expectations  $\tilde{b}$  (in %) (\*, \*\*, \*\*\*: significant at 10%, 5%, 1% level, Mann-Whitney-U test)

**Observation [4.H]:** Responder’s back-transfers to foreigners and senders’ beliefs on these back-transfers are significantly different for all matchings involving **P**. Foreign and **P**-responders back-transfer significantly less to **P**-senders than what **P**-senders expect. **P** back-transfers, however, exceed foreign expectations significantly. Furthermore, **I**-senders slightly overestimate **G** back-transfers.

SUPPORT: Bilateral comparisons of back-transfers and beliefs show a weakly significant difference in the **G/I** matchings ( $p=0.056$ , Mann-Whitney-U test) (see table 7). Yet, a

dramatic discrepancy exists when **P** are involved. On the one hand, **G** and **I** senders transfer highly significantly less to **P** responders than what **P** responders expect ( $p=0.000$ , Mann-Whitney-U test). On the other hand, **P**'s back-transfers highly significantly exceed what **I** and **G** expect.

To conclude this subsection we sum up our observations in the following result:

**[Result 4]:** (A) *In our inter-cultural experiment we find that senders' beliefs on back-transfer behavior aggregated over all countries is substantially different from zero.* (B) *Aggregated beliefs of senders on responders' reciprocity levels are significantly different across countries with Palestinians stating the highest beliefs on matched players's back-transfers and Israelis stating lowest beliefs on matched players' back-transfers.* (C) *German senders believe to get back higher percentages from Palestinians than from German- and Israeli-responders. Israelis expect lower back-transfers from Palestinians than from German and Israeli senders. Palestinian senders believe to receive lower percentages from Israeli than from German and Palestinian responders.* (D) *Aggregated senders' beliefs on reciprocity behavior towards countries show Germans to be expected to make higher back-transfers than Israelis and Palestinians.* (E) *Palestinian senders expect higher back-transfers from Germans than Germans and Israelis do. Towards Israelis, Palestinian senders expect significantly higher back-transfers than Germans and Israelis. Towards Palestinians, German senders believe in higher pay-backs than Israelis do, and Palestinians expect higher percentages from fellow-country senders than Israelis and Germans expect.* (F) *Germans and Palestinians, as well as Israelis and Palestinians face a significant discrepancy of mutual beliefs on reciprocity behavior, with lower Germans and Israeli beliefs and higher Palestinian expectations.* (G) *German and Israeli senders expect a similar reciprocity behavior as fellow-country responders actually show. Palestinian senders overestimate reciprocity behavior of fellow-country responders.* (H) *Responder's back-transfers to foreigners and senders' beliefs on these back-transfers are significantly different for all matchings involving Palestinians. Foreign and Palestinian responders back-transfer significantly less to Palestinian senders than what Palestinian senders expect from them. Palestinian back-transfers, however, exceed foreign expectations significantly. Furthermore, Israeli senders slightly overestimate German back-transfers.*

## 5 Performance

In this section, we analyse subjects' actual performance. For this step we do not take the responder's complete response vector into account but only consider the actual back-transfer  $b_{3a}$  given actual transfers  $a \geq 0$ .

As for discussion of the responders' total response vector we find that highest back-transfers are made by **P** (53.1%) followed by **G** (41.0%). **I** transferred the lowest percentage (39.0%) yielding the relation  $\bar{b}_{\mathbf{P}} > \bar{b}_{\mathbf{G}} > \bar{b}_{\mathbf{I}}$  (table 8). Looking at country-specific reciprocity behavior in direct matchings *from* one country, **G** on average back-transfer most to **P** (42.0%), followed by **G** (41.4%) and **I** (39.0%). **I** back-transfer the highest percentage to fellow-country senders (43.3%). Second highest amounts are given to **P** (37.6%) and lowest reciprocity is shown towards **G** (37.1%). In contrast, **P** payed back 57.1% to **G**, 54.1% to **I** and 48.1% to their compatriots. These results confirm our findings on reciprocity behavior based on responders' strategy vectors.

In general, responders (10.1 \$) make significantly higher payoffs than senders (5.8 \$) ( $p=0.000$ , Mann-Whitney-U test). This effect is due to the fact that on average responders do not share the *total* pie equally and back-transfer less than  $b = 2a$ . Aggregating senders' and responders' payoffs Israelis (8.2\$)- senders and responders - achieve highest total payoffs, followed by Palestinians (8.0 \$) and Germans (7.7 \$). Payoffs levels do not differ significantly across countries ( $p=0.900$ , Kruskal-Wallis test). Payoffs are not significantly differently distributed among countries according to the fact, that only slight discrimination effects could be detected (see table 9).

	Player	German	Israeli	Palestinian	$\emptyset$ total
		(A)	(B)	(C)	(D)
(1)	<b>Senders</b>	5.9	5.8	5.7	5.8
(2)	<b>Responders</b>	9.6	10.6	10.3	10.1
(3)	<b><math>\emptyset</math> total</b>	7.7	8.2	8.0	8.0

**Table 9:** Senders' and responders' average payoffs in \$

To study a further effect of trust and reciprocity on actual payoffs and the test whether culture-specific behavior within a country leads to superior income, we take a look at each country's earnings in intra-cultural interactions. Here, on average **P** earn most, both as senders (5.9 \$) and as responders (10.8 \$) because both the transfers  $a$  and the pay-backs  $b$

are highest compared to **G** and **I**. **I**'s low transfers leave **I** responders with the lowest payoff among the three groups (8.3 \$), **I** senders, however, earn more (5.6 \$) than **G** senders (5.3 \$) because of **G**'s low pay-back rate to fellow-country senders. However, differences in income are not significantly different among the three groups ( $p=0.246$ , Kruskal-Wallis test).

Did trust pay in the trilateral trust game? To answer this final question we first find, that on average more trust is more rewarded in absolute terms. Considering the back-transfer  $b_{3a}$  as a function of the received amount  $3a$  from the sender, with  $f(a, b) = \frac{b}{3a}$  and  $a \in [1, 2, \dots, 9, 10]$ , for all countries holds that  $f'(a, b) > 0$ , implying that more trust is rewarded more in absolute terms.

For relative rewarding we observe a different scenario: Whereas **G** and **I** do reward higher transfers  $a$  with relative higher back-transfers, yielding  $f''(a, b) > 0$ , **P** do the opposite. The bigger the amount  $3a$  **P** responders receive from the sender the smaller the back-transfer  $b_{3a}$  is in relative terms, yielding  $f''(a, b) < 0$ . This is striking, since **P**-senders do expect exactly the opposite - to be rewarded relatively more by sending relatively higher amounts. However, interestingly, even though Germany and Israeli do reward more trust relatively more, their absolute reciprocity level is much lower than the **P**-level, where we observe a descending rewarding function. Discriminating country-specific rewarding functions are not found.

To go one step further we calculate the rate of return  $R$  as a more precise measure for the success of a positive investment  $a > 0$ <sup>9</sup> (see table 10).

Population	to G	to I	to P	to all countries
	(A)	(B)	(C)	(D)
(1) <b>from G</b>	24.1	16.9	73.6	40.0
(2) <b>from I</b>	17.0	30.0	62.3	35.0
(3) <b>from P</b>	23.8	12.8	44.5	27.0
(4) <b>from all countries</b>	22.0	18.8	59.4	33.4

**Table 10:** Average rates of return in %.

Comparing return on investment rates for all matching shows that trusting **P**-responders yields a high return for all senders, especially for **G**- (73.6%) and **I**-senders

<sup>9</sup>The return on investment rate  $R$  is calculated as follows:  $R = [(\frac{Revenue}{Investment}) - 1] \cdot 100\% = [(\frac{b_{3a}}{a}) - 1] \cdot 100\%$ .

(62.3%). Trusting **I**, however, is a bad deal for **P**- and for **G**-senders because they receive the lowest (second lowest, respectively) overall return of 12.8% (16.9%). For **I**-senders it turned out to be a bad deal to trust **G** because of getting a return of only 17.0%.

## 6 Discussion and Conclusion

In this paper we reported a trilateral, inter-cultural trust game experiment involving senders and responders from Germany, Israel and Palestine. Based on existing cross-cultural experimental studies that aim to compare country-specific behavior we do a further step and investigate how decision makers behave in actual cross-border interactions. The purpose of this study was to study the relationship between trust, reciprocity and expectations within a multi-national experimental environment and to assess whether differences in observed behavior and stated beliefs exist. Furthermore, we were able to investigate whether positive or negative discriminating behavior in favor or against matched players was displayed. Moreover, the experimental protocol allowed us to directly compare actions and beliefs to assess whether culture-specific values and norms prevail in the trilateral context and influence subjects' decisions.

In our data we find a substantial evidence for active trust and reciprocity behavior across borders within all sender/responder-matchings. This strong evidence is also reflected in the beliefs concerning the opponent player's decisions. Thus, even within a totally anonymously conducted trust experiment where the opponent player's national affiliation and university name were the only information decision makers were provided with standard game theoretic predictions must be rejected. Additionally, we find that more trust is rewarded more in absolute terms. In relative terms, Germans and Israelis do reward higher transfers with relative higher back-transfers. Palestinians do the opposite.

Like previous experimental cross-cultural studies we find significantly different levels of trust and reciprocity aggregated on the national level. Palestinian decision makers, on average, transferred and back-transferred highest amounts to assigned players thereby showing highest trust and reciprocity levels compared to Germans and Israelis. Lowest transfers were made by Israeli first and second movers. The same pattern holds for stated beliefs on the opponent player's behavior. Palestinian responders expect highest transfers from assigned players and Palestinian senders expect highest back-transfers from their

counterparts. Israelis - both, senders and responders - display the lowest expectations. Our findings are confirmed by a more detailed analysis of back-transfer behavior and stated beliefs on this behavior. Although we find no consistent evidence for a unique back-transfer norm, we can say that German and Israeli on average tend to choose lower back-transfers whereas Palestinians display much higher back-transfers.

Investigating sending and back-transfer behavior of one specific country only partial discrimination was detected. Transfer behavior towards countries shows that no country's responders receive systematically lower amounts compared to the other countries. For reciprocity, Palestinian senders received significantly lower back-transfers compared to Germans and Israelis.

Comparing bilateral data shows that Israelis and Palestinians face a significant discrepancy of mutual trust contrasting low Israeli and high Palestinian transfers. This discrepancy is also found in mutual beliefs. Considering reciprocity behavior and beliefs a similar constellation is detected.

For senders actions and corresponding beliefs of responders we find a striking evidence that one country's responders expect a similar trusting behavior as fellow-country senders actually show. For reciprocity we present the same finding for Germans and Israelis. German and Israeli senders expect a similar reciprocity behavior as fellow-country responders actually show. However, Palestinian senders overestimate reciprocity behavior of fellow-country responders.

Finally, contrasting actions and beliefs bilaterally, senders's transfers and responders' back-transfers to matched players and matched players' beliefs on these transfers and back-transfers differ substantially for Israelis and Palestinians. Israelis do not meet Palestinian expectations whereas Palestinians outperform them. The same finding holds for Palestinians and Germans. For reciprocity, German responders back-transfer significantly less to Palestinian senders than what Palestinian senders expect from them. Palestinian back-transfers, however, exceed German expectations significantly. However, Palestinian senders overestimate their country-mens' reciprocity, too.

From our observations and results we conclude that understanding behavior in an inter-cultural set up and for the evaluation of scenarios like the Israeli-Palestinian relationship the analysis of prevailing social norms and attitudes is crucial. We find strong evidence in our data that mutual distrust is not only enhanced because of subjects' be-

liefs and information they hold about other players' behavior. It may also be enforced by social norms and mechanisms within their own societies (cf. Roth et al. 1991). As we have shown, the substantial gap between mutual transfers and back-transfers is not necessarily and exclusively triggered by discriminatory consideration but rather a reflection of social capital and standards within the observed populations. The fact that no substantial discrimination is detected in our experiment underlines this argument. Taken together, this might lead to serious misinterpretations and misunderstandings between involved parties and to retaliation and intensification of intercultural confrontations like the Israeli-Palestinian conflict. In more realistic repeated game situations actions widely accepted within a certain society might be perceived as distrustful, not trustworthy or even hostile signals triggering non-cooperative actions of both parties in future periods. In more-rounds-interactions Palestinians will be disappointed, since they expect a higher relative profit as more they trust, but exactly the contrary happens: as more they trust as less they get back in relative terms. We conclude that different social norms and attitudes could be the source for conflicts among nations and might lead to mutual distrust and, eventually, to the adaptation of social norms themselves.

A second finding that supports this argument is that subjects' intra-cultural past experience in trust-game like situations within their social environment shapes their roughly correct expectations regarding the behavior of their own country people in the laboratory. Furthermore, they wrongly anticipate actions from foreign players. In our data we find evidence that responders' expectations on matched player's trust behavior are shaped by culture-inherent values and norms and self-experiences on actions involving mutual trust. For all involved countries we can show that there is no statistical difference between stated beliefs of the responder group towards assigned country-men senders and actual intra-cultural trust behavior of the corresponding reference sender group from the same country. Moreover, responders, evaluating transfers from foreign partners, do not deviate substantially from own country-men's actual behavior in intra-cultural matchings. In addition, all sender groups do not significantly discriminate against foreigners. Summing up, we conclude that country-specific social norms influence belief building and lead to partly false inferences of opponent's behavior in interactions. Furthermore, in our cross-border experiment stereotyping seems to play a minor role in decisions making. Looking more closely on the variances in senders' actions of one country group and beliefs of the

responder group from the same country we find no substantial differences. Demonstrating significant lower variances in beliefs would be a hint for stereotyping influencing senders' reasoning - given that variances in actions and beliefs are not different in general (which is not the case). This surprising finding, together with the fact that we can show no discrimination in transfers and beliefs towards foreigners underlines our claim of culture-inherent values and norms affecting trust behavior substantially more than stereotypes and prejudices<sup>10</sup>. In trustworthiness behavior the representative country sample from Germany shows the same finding. For Germans we find that stated beliefs of the German sender group towards assigned German responders and actual intra-cultural trustworthiness behavior of Germans match quite well for all constellations. Moreover, German responders, evaluating transfers from foreign partners, do not deviate substantially from own country-mens' actual behavior in intra-cultural matchings. Furthermore, Germans display no discrimination behavior towards senders. Thus, again German behavior seems to be guided more by country-specific social norms than by stereotypes and prejudices towards assigned players. An analysis of the variances in actions and beliefs confirms this finding<sup>11</sup>. For Israelis' and Palestinians' trustworthiness and beliefs on trustworthiness this finding can not be confirmed. Israelis state lower beliefs towards Palestinian responders compared to Germans and Israeli. Variance in this belief is substantially lower than in the behavior displayed by Israeli responders. Thus, stereotyping might have influenced Israelis' trusting behavior. On the other hand, Palestinians' evaluation of assigned players' trustworthiness - regardless from which country - substantially exceeds actual back-transfer behavior of Palestinian responders.

Why stated beliefs on trust behavior seem to be more determined by culture-specific parameters whereas discriminating beliefs on trustworthiness seem to be more influenced by stereotyping? Responders, evaluating senders' decisions are not exposed to a risky situation like senders are (c.f. Luhmann 1979, Ben-Ner and Puterman 2001, Cook and Cooper 2003) Senders can invest their only endowment to reach higher payoff by the donation of a generous responder in a future stage of the game. Thus, their decision is

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<sup>10</sup>Nevertheless, Germans do trust own country-men - which they might be able to assess better than foreigners - less than Israelis and Palestinians. However, this finding is not reflected in subjects' belief structure.

<sup>11</sup>German senders expect to get higher returns from Palestinians compared to Germans and Israelis but this fact has no correspondent in German sending behavior.

much more a risky involving high uncertainty about responder's behavior. Responders on the other hand have an assured income. Stating a belief they only guess, what they get, not what they *might get back*. This belief building process seems to be shaped by own populations standarts and norms. Contrary, the more uncomfortable position of the sender might lead to more diverse and differentiated beliefs on responders' behavior.

Further research should involve a repeated game set up to observe repeated interaction and the devolution of mutual exchange. Moreover, a promising desgin to study the interplay between intra-cultural values and norms and their impact on inter-cultural relationships involves complementary empirical methods. Personal values questionnaires (Schwartz 1992) and questionnaires on the importance of each value in one's culture (Fischer 2006) will shed more light on the context of personal values, culture-specific norms and behavior and beliefs displayed in inter-culture interactions. The completing experimental set-up is recommended to consist of two steps: First, running an intra-cultural baseline experiment that allows to control for culture-specific determinants of behavior. Second, independently and bilateraly run inter-cultural experiments to assess the impact of those culture-specific values, norms and attitudes detected in the baseline experiment on subjects involved in inter-cultural exchanges. Moreover, the interplay of personal values and own societie's norms and the influence of stereotypes and prejudices can be investigated.

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# Appendix

## A Instructions

### 1. Introduction

Thank you for participating in this international experiment. Please read the following instructions very carefully. If you have any questions, please raise your hand. We will then answer your question at your desk in private. During the experiment we will not answer any of your questions. In case you still have questions, please read these instructions again. During the whole experiment it is very important that you do not communicate with any of the other participants. We therefore ask you not to talk to each other.

To assure you anonymity and confidentiality you will have to randomly draw a code name before the experiment starts. When presenting this code name you will later on receive your payments from this experiment. By using this procedure, we are not able to assign answers and decisions made in the experiment to single persons.

In this experiment you can earn money. Your individual earnings from the experiment depend on your own decisions and on the decisions of other participants taken in the experiment. You will get your personal payments on December XX to XX, from XX to XX in XXXX. Please keep the code name and the code number handed out in this experiment carefully. It is necessary to receive your payment. Without code name and code number we cannot pay out your earnings.

Right after the experiment, you will receive a fixed fee of X\$ which is independent from the decisions you take in today's experiment. This fixed fee is paid in addition to the money you earned in the experiment.

During the experiment, you are involved into an interaction with a randomly assigned other participant. This randomly assigned participant takes his decisions at a different point in time than you do, without having knowledge about your decisions. You are not told who this other participant is, neither during the experiment nor in any point in time after the experiment. The persons who today participate with you in the experiment are not assigned to you.

After this introduction we will ask you some questions to check your understanding of the experimental rules. Then the experiment itself will start. After the experiment, we will ask you to fill in a questionnaire which we need for a statistical analysis of the experimental data.

### 2. The general design of the experiment

During the experiment, pairs of two participants are formed who interact throughout the whole experiment. These participants are called person A and person B from now on. All persons within one room either are all persons A or are all persons B. Thus, persons A and persons B cannot be in one room at the same time. All persons who participate with you in the experiment at this moment belong to the same type of

person.

The experiment consists of three decision rounds that are structured identically. Within these rounds, each participant takes decisions keeping the same role, either as person A or as person B.

At the beginning of each round, each person A and each person B receives an initial endowment  $X$  of 10 EGH (ECU=Experimental Currency Unit). The exchange rate from ECU to \$ is 1 ECU = 0,50 \$. Person B can save this money. She will be paid this amount at the end of the experiment, together with the payment of her experimental earnings.

Person A can now choose to either send an integer part, all or nothing of his initial endowment  $X$  to person B. This means, he can choose any integer  $a$  from the interval  $[0,10]$  of his initial endowment he wants to send to person B. Each amount  $a$  chosen by person A is tripled. Thus, person B does not receive the amount  $a$  originally sent by person A but she receives three times as much, i.e.  $3a$ .

*Here is an example: If person A sends 4 ECU, person B receives 12 ECU. If person A sends 6 ECU, person B receives 18 ECU.*

During the experiment, Person B is not told which amount  $a$  person A actually chose. Therefore, person B does not know how large  $3a$  actually is. Person B now has to decide how much she wants to transfer back to person A. Since person B does not know the actual amount  $a$  or  $3a$  respectively having been sent by person A she has to decide for each possible value of the tripled amount  $3a$  how much she wants to transfer back to person A. The amount person B transfers back to person A is  $b$ . Person B can decide whether she wants to transfer back an integer part, all or nothing of  $3a$  to person A. The amount  $b$  transferred back is not multiplied. Person A receives no information about person B's actual decisions during the experiment.

*Person B's decision table for one round looks as follows:*

Person A sent you $a$ :	You receive $3a$ :	Which amount $b$ do you want to transfer back?
0	0	
1	3	
2	6	
3	9	
4	12	
5	15	
6	18	
7	21	
8	24	
9	27	
10	30	

After B's decision on  $b$ , the first decision round has finished for both persons. The general procedure of the following second and third decision round corresponds to the procedure of the first decision round.

Actual payments of the experimental earnings of person A and person B are made after having finished all experimental sessions. By assigning person A's actual decision  $a$  to person B's decision  $b$  being valid for person A's actual decision  $a$ , individual payment for each round can be calculated.

Person A's individual profit  $G_A$  for one round is:

Initial endowment $X$
- amount $a$ sent
+ amount $b$ transferred back by person B
<b>= <math>G_A</math>, Person A's individual profit for one round</b>

Person B's individual profit  $G_B$  for one round is:

Initial endowment $X$
+ tripled amount $a$ , sent by person A
- amount $b$ transferred back by person B to person A
<b>= <math>G_B</math>, Person B's individual profit for one round</b>

Here is an example: Person A decides to send 4 ECU to person B in one round. Then, Person B receives 12 ECU. Person B decides to transfer 5 ECU back.

Person A's individual profit  $G_A$  for this round is:

Initial endowment $X$	10 ECU
- amount $a$ sent	-4 ECU
+ amount $b$ transferred back by person B	+5 ECU
<b>= <math>G_A</math>, Person A's individual profit for this round</b>	<b>=11 ECU</b>

Person B's individual profit  $G_B$  for this round is:

Initial endowment $X$	10 ECU
+ tripled amount $a$ , sent by person A	+12 ECU
- amount $b$ transferred back by person B to person A	-5 ECU
<b>= <math>G_B</math>, Person B's individual profit for this round</b>	<b>=17 ECU</b>

The individual total experimental payoff for each participant is calculated by the sum of the payoffs in all three rounds plus the show up fee of  $X$ € paid today.

### 3. The detailed experimental procedure

In the following, we precisely explain how the experiment proceeds and which consecutive decisions you have to take.

After having read this instruction very carefully, we will answer your questions in private. Please raise your hand if you have questions. Before the experiment starts, we again will ask all participants whether they fully understood the instructions of the experiment.

We then will give you a short exercise to check your understanding of the experimental rules. After having solved these quizzes, the experiment will start.

## **Start of the experiment**

At the beginning, each participant randomly draws a code name. You will need this code name for being paid your experimental earnings. Furthermore, it guarantees full anonymity. Please keep this code name very carefully.

Then, each participant randomly draws a decision sheet which is divided into three decision rounds. This decision sheet contains your personal code number and the random numbers of persons A or B assigned to you. Please note that the assignments of the person you are interacting with as well as the order of assignments of persons you are interacting with are randomized. On the slip with your code number there is an empty space. Please fill in your code name there.

### **Decision procedure for person A:**

#### *Round 1*

- You are told that you are person A
- Person A is paid an initial endowment of  $X=10$  EGH by the experimenters.
- Now person A is told that a person B was randomly assigned to him by the experimenters. Person A learns the name of the university and the country where the assigned person B is studying. With this participant, person A is interacting during this round.
- Person A now decides which amount  $a$  he actually wants to send to the randomly assigned participant B. He can choose any integer from the interval  $[0,10]$ .
- After having decided on  $a$ , the first decision round for person A has finished.

#### *Round 2*

The procedure of this decision round for person A is identical to the procedure of round 1. However, in this round a different interacting person B is randomly assigned to person A. This means that in this second round person A does not interact with the same person B from round 1.

#### *Round 3*

The procedure of decision round 3 for person A is identical to the procedure of the previous rounds 1 and 2. However, again a different interacting person is randomly assigned to person A. This means that in this third round, person A does not interact with one of the persons B in rounds 1 or 2. During the whole experiment, each person interacts with an assigned person B only once.

*The experiment has now finished for person A.*

### **Decision procedure for person B:**

#### *Round 1*

- You are told that you are person B
- Person B is paid an initial endowment of  $X=10$  ECH by the experimenters. Person B owns this amount and can save it. She will be paid this amount later, together with the payment of her experimental earnings.
- Now person B is told that a person A was randomly assigned to her by the experimenters. Person B learns the name of the university and the country where the assigned person A is studying. With this participant, person B is interacting during this round.
- Person B is now asked which amount she wants to transfer back to person A for each possible value of  $3a$ . Person B now indicates an integer for all 11 possible amounts of  $3a$  concerning the amount  $b$  person B wants to transfer back to person A.
- After having decided on  $b$ , the first decision round for person B has finished.

*Round 2*

The procedure of this decision round for person B is identical to the procedure of round 1. However, in this round a different interacting person A is randomly assigned to person B. This means that in this second round person B does not interact with the same person A from round 1.

*Round 3*

The procedure of decision round 3 for person B is identical to the procedure of the previous rounds 1 and 2. However, again a different interacting person is randomly assigned to person B. This means that in this third round, person B does not interact with one of the persons A in rounds 1 or 2. During the whole experiment, each person interacts with an assigned person A only once.

*The experiment has now finished for person B.*

At the end of the experiment we would like you to answer some questions which we need for the statistical analysis of this experiment.