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Inter-group interaction and attitudes to migrants

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Inter-group interaction and attitudes to migrants[*]

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Abstract

We report results from a randomized field experiment conducted in the Tigray region of Ethiopia, which tests the impact of interaction with migrants on host community members' attitudes towards migrants. In three treatment groups, host community members were randomly paired with a migrant from a nearby refugee camp to play an incentivized guessing game. In the first of these treatments, the game was neutral in content, in the second it introduced subtle cues to economic matters, and in the third subtle cues to ethnic identity. In a fourth treatment, host community members were paired with other host community members to play the neutral game, and in the control condition host community members did not interact with anyone. The results show that, compared to the control group, interaction with a migrant significantly improved attitudes towards them. Subtle cues to economic matters or identity did not diminish this effect. However, we see similar effects on attitudes to migrants in the treatment group where hosts interacted with other hosts, which suggests that the effects are driven by human interaction in general, rather than by interacting specifically with a migrant. The effects of interaction are not much affected by the characteristics of the paired hosts and migrants, though host respondents in low skill occupations appear to respond more favourably to the treatments. Interestingly, however, we find no effects of the treatments on how migrants believe they are perceived by host community members.

Keywords: Inter-group contact, migration, attitudes to migrants

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1. Introduction

Migration increases diversity in destination communities in terms of the geographical origin of residents and typically also in identity traits correlated with origin, such as culture or ethnicity (Putnam, 2007). While a number of studies suggest that the effects of migration on host communities are largely positive (Alix-Garcia et al. 2018; Tabellini, 2020), migration can also be associated with social tension and conflict (Burke et al., 2015; Hsiang et al., 2013). Tensions can arise if migrants are perceived to be in competition with locals over jobs or resources, or to pose a threat to local culture or identity, with empirical studies suggesting that the latter of these mechanisms is more important (Sniderman et al., 2004; Hainmueller and Hopkins, 2014). Recent evidence suggests that negative attitudes towards migrants may be particularly likely to form in situations where there is substantial exposure to migrants but little direct interaction with them (Enos, 2014; Hangartner et al., 2019). Moreover, it is possible that in cases of substantial social segregation of host and migrant community members, attitudes towards the other group may deteriorate over time as each group retreats into its own echo chamber (Sunstein, 2002), amassing in-group bonding rather than inter-group bridging social capital (Putnam, 2000).

A potential remedy for conflict and negative attitudes towards the out-group is to create bridges, to encourage and facilitate interaction across group boundaries. Inter-group contact theory posits that interaction between members of distinct groups can reduce inter-group bias and discrimination and improve relations (Allport, 1954). Four conditions were originally specified for interaction to have this effect: that the groups have i) equal status and ii) common goals in the interaction, the interaction promotes iii) cooperation rather than competition, and there is iv) enforcement by authority, law, or custom. There is experimental evidence to support the inter-group contact hypothesis, as people randomized into interaction in heterogeneous army units or football teams that include ethnic minorities come to exhibit more favourable attitudes to migrants or minorities than people interacting in homogeneous units or teams (Finseraas and Kotsadam, 2017; Finseraas et al., 2019; Mousa, 2020). The extent to which, and precise conditions under which, interaction improves attitudes to an out-group are, however, debated (Pettigrew and Tropp, 2006; Pettigrew et al. 2011; Paluck et al. 2019). Three questions in particular merit attention.

Firstly, it seems vital to understand how easily the positively framed interactions envisioned by inter-group contact theory can deteriorate into interactions of a more negative nature. It is in general hard to insulate civic interaction across social groups from contamination of the content of the interaction. If subtle cues to competing interests or identity differences of the participants are introduced, how robust are the effects of interaction on attitudes to such cues? Secondly, considerable doubt on previous findings is cast by the class-room interaction experiment of Scacco and Warren (2018), which shows that differences in attitudes to an out-group between religiously mixed and homogeneous pairs of students are due to a deterioration of attitudes in the homogeneous pairs rather than an improvement among the mixed pairs. Quite apart from the challenge this presents for inter-group contact theory, it raises the question of whether the implication is to limit in-group interaction rather than increase inter-group interaction. And thirdly, inter-group interaction is a two-way street, but considerably more attention has been levelled at analyzing its effects on majority or host community group members than on minorities and migrants (Paluck and Clark, 2020). Does interaction improve migrant perceptions of how they are viewed by host community members? Do they feel more welcome in the local community as a result of inter-group contact?

In this article, we present results from a randomized field experiment designed to address these three questions. The experiment was conducted in the Tigray region of Ethiopia prior to the 2020 civil conflict and Covid-19 pandemic. We recruited 600 local residents from a community that hosts a refugee camp

housing migrants from Eritrea. We randomly assigned the host community respondents to four treatment groups and a control. In the first three treatments, host community members were paired with a randomly selected migrant from the camp to play an incentivized guessing game. The framing of the game was neutral in the first treatment. For example, respondents were asked to guess the weight of a pictured bag of local grain. In the second and third treatments, we subtly introduced an economic framing and an ethnic identity framing to the guessing game, respectively. For instance, the questions here were about the price of the pictured bag of grain, or the number of regions in Ethiopia that produce the grain, respectively.[1] The fourth treatment paired host community members with other host community members to play the neutral version of the game. Host community members in the control group did not interact with anyone, instead proceeding straight to the survey posed to all the other treatment groups post-interaction. A comparison of mean attitudes towards migrants in the first (neutral) treatment group with the control group allows us to capture the effect of a standard form of interaction envisioned in inter-group contact theory. Further comparisons with attitudes in the second (economic) and third (identity) treatments permit us to address the question of how robust inter-group interaction effects are to the introduction of economic or identity cues that can evoke thoughts of economic competition with or identity threats from migrants. Moreover, the inclusion of a fourth treatment group where host community members interact with each other rather than with a migrant (in addition to the pure control featuring no interaction) helps us distinguish the effects of in-group and out-group interaction on attitudes to migrants. Finally, since our experiment included 480 migrant respondents who were also randomized into the first three treatments where they interacted host community members, or into a control group of migrants that did not interact with anyone, we can test the effect of the interactions on migrant perceptions of host community attitudes as well.

Our results show that attitudes towards migrants were significantly more favourable among host community members assigned to the first (neutral) treatment than in the control group of host community members. This is consistent with the positive effects of interaction across groups posited by inter-group contact theory. As for the three questions posed above, we find the following. Firstly, attitudes towards migrants did not differ between the first (neutral) treatment and the second (economic) and third (identity) treatments, suggesting that the effect of inter-group interaction is robust to the introduction of economic or identity cues to the interaction. However, additional evidence suggests that these types of cues may subtly change the manner in which interaction affects attitudes. The economic and identity treatments in fact seem to have highlighted commonalities between host community members and migrants rather than differences, and alerted the former to the difficult situation of migrants. Secondly, we find that interacting with a fellow host community member (treatment four) has the same effect on attitudes to migrants as interacting with a migrant (treatment one). In other words, both affect attitudes positively, which contrasts with the findings of Scacco and Warren (2018) that in-group interaction may affect attitudes to out-group members negatively. Moreover, it suggests that the effect our results are picking up for the inter-group interaction treatments are more a function of the interaction part than of the inter-group part; human contact generally rather than inter-group contact specifically seems to be what improves attitudes to the out-group. Thirdly, and more disconcertingly for the implications of inter-group contact for mutual trust, the improvements in attitudes towards migrants as stated by host community members in the interaction treatments are not reflected in perceptions among migrants of how welcoming host community members are. Migrant beliefs about host community members' attitudes towards them do not significantly differ between the interaction treatments and the migrant control group.

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[1] Ethiopia is a federation subdivided into ethnically based regional states, which makes region a cue to identity in the third treatment.

The above results contribute substantially to the empirical literature on inter-group contact, broadly suggesting that the effect of interaction on attitudes towards the out-group is robust to both how one interacts and with whom. Additional results reinforce this point. Since we have paired host community members with random migrants, we can estimate the causal effect of migrant characteristics on attitudes expressed by hosts. Attitudes display little relation to the characteristics of the migrants with whom hosts interact, with the exception that host community members who interact with a more educated migrant end up with slightly more positive attitudes. In addition, the effects of our treatments are largely invariant over host characteristics, including over traits like age, gender, education, and wealth, with one interesting exception discussed further below.

The result that improved attitudes to migrants in our experiment is comparable across conditions where interaction is with a migrant and with a fellow host community member, poses a challenge not just to inter-group contact theory, but also social capital theory. Following Putnam (2000), a large literature has analyzed the effects of social capital on trust, collaboration, and economic outcomes. A number of studies suggest that bonding social capital, connections within a social group, tends to be detrimental to trust and collaboration between groups, whereas bridging social capital, connections across social groups, has favourable effects. Our findings reveal no such distinction; whether our treatments create interaction with an in-group host community member, or with an out-group member, we see the same, positive effects on attitudes to the out-group. Why our results differ from the social capital literature in this respect is an important question. One possible explanation could be that the interaction in our treatments is structured around a positive game activity, in contrast to more open-ended interaction in groups that arise in less controlled contexts. We note, however, that the interaction in our case also started with a 10-minute informal talk between paired respondents, an open-ended activity in which respondents discussed topics from the personal to the political, so this is unlikely to be the full explanation.

Our analysis also speaks more broadly to the literature on what shapes attitudes to migrants, and possible ways of improving these attitudes. Several experimental studies show that informing people about the true extent of immigration and the characteristics of immigrants can have a positive impact on attitudes towards them (Hainmueller and Hopkins, 2014; Grigorieff et al., 2016; Alesina et al., 2018). A few studies have also looked at narrative interventions emphasizing the productivity and/or difficult origins of migrants, with mixed results (Alesina et al., 2018; Kolstad et al., 2019). Our results clearly indicate that increased social interaction with migrants constitutes an additional means of influencing host community attitudes. Moreover, while previous studies find that ethnic cues moderate the effect of immigration information on attitudes towards migrants (Brader et al., 2008), our results reveal no such moderating effect on the impact of interacting with a migrant. In addition, while labour market competition theories have been challenged as an explanation of attitudes critical of migration in studies from developed countries (Hainmueller and Hopkins, 2015; Naumann et al., 2018), some of our results suggest that their dismissal may be premature. As hinted at above, we do find heterogeneous effects of our treatments along one dimension, which is whether host community respondents work in lower or higher skill occupations. Respondents in low skill occupations display more critical attitudes to migrants in our host community control group, but their attitudes also respond more positively to our interaction treatments. In other words, this suggests that labour marked position retains relevance in addressing both determinants of attitudes to migrants and the means to change them. In general, our study also contributes to an emerging literature of attitudes to migrants in developing countries, increasing coverage of a part of the world that will likely be absorbing substantial parts of future internal and international migration flows following conflict, disaster, climate change, and economic disparities (Lujala et al., 2020).

The article is structured as follows. Section 2 presents the details of our randomized field experiment and empirical approach. Section 3 gives a descriptive overview of our data. Our main results are presented in Section 4, with two subsections devoted to treatment effects on host community respondent attitudes, and migrant perceptions, respectively. Section 5 concludes.

2. Research design

2.1 Context, sampling and experimental design
The experiment was conducted in the Tigray region of Ethiopia in the period 25 January to 4 February 2020. Ethiopia is a major international host of refugees, reflecting the fragility of countries in the region, hosting about 735,000 refugees at the start of 2020, predominantly from South Sudan, Somalia, and Eritrea (UNHCR, 2020). The Tigray region is one of the nine regional states of Ethiopia, bordered by Eritrea in the north, Sudan to the west, and regional states Amhara to the southwest and Afar in the east. At the time of our survey, close to 95,000 Eritrean migrants lived in refugee camps in Tigray, two-thirds of the total number of refugees from Eritrea in the country, having fled political persecution, poverty, and potentially indefinite military conscription. Immigration has been ongoing since the end of the war between the two countries in 2000, with a spike following the 2018 peace agreement that led to a short-lived border opening.

A history of conflict notwithstanding, a study by Betts et al. (2019) concludes that Eritrean migrants are fairly well-regarded among Ethiopian citizens. Though it is unclear to what extent their survey results underpin this conclusion, statistics from our control group present a similar picture of attitudes towards migrants being on the positive side. On the other hand, ethnographic work by Massa (2020) suggests that migrants from Eritrea living outside of camps strategically conceal their identity in anticipation of social discrimination, and recounts a feeling among some of being stranded in an enemy country. While Eritrean migrants are culturally similar to and speak the same language as locals in Tigray, this and their similar levels of schooling should make them closer competitors in the labour market. Moreover, identity distinctions based on nationality remain potent, as emphasized in media reports of anger and violence directed at Eritrean migrants following the alleged involvement of Eritrean forces on the side of the Ethiopian central government in the November 2020 conflict with the Tigray People's Liberation Front.[2] Since our experiment was conducted earlier in the year, results are not affected by the recent conflict.

Host community participants for our experiment were recruited from the town of Mai-Tsebri in the Tigray region, located about 5 km from the Mai-Ayni refugee camp, from which we recruited the migrant participants. In the town, enumerators started from the main intersection of the town, fanned out in pre-specified directions, and invited an adult (which in this context we consider 15+) from every fifth household to participate in the experiment. Of about 1500 potential participants identified in this way, we randomly selected a final sample of 600 host community participants to take parts in the experiment (with 150 replacement participants in case some of those selected did not turn up on their assigned day). In the refugee camp, a facilitator registered 1000 willing participants, of whom 480 were randomly selected to participate in the experiment. Participants were randomly assigned their day and session of participation in the experiment ahead of time. At their assigned day of participation, host community and migrant participants were bussed to an experiment site in Mai-Tsebri where the experiment was
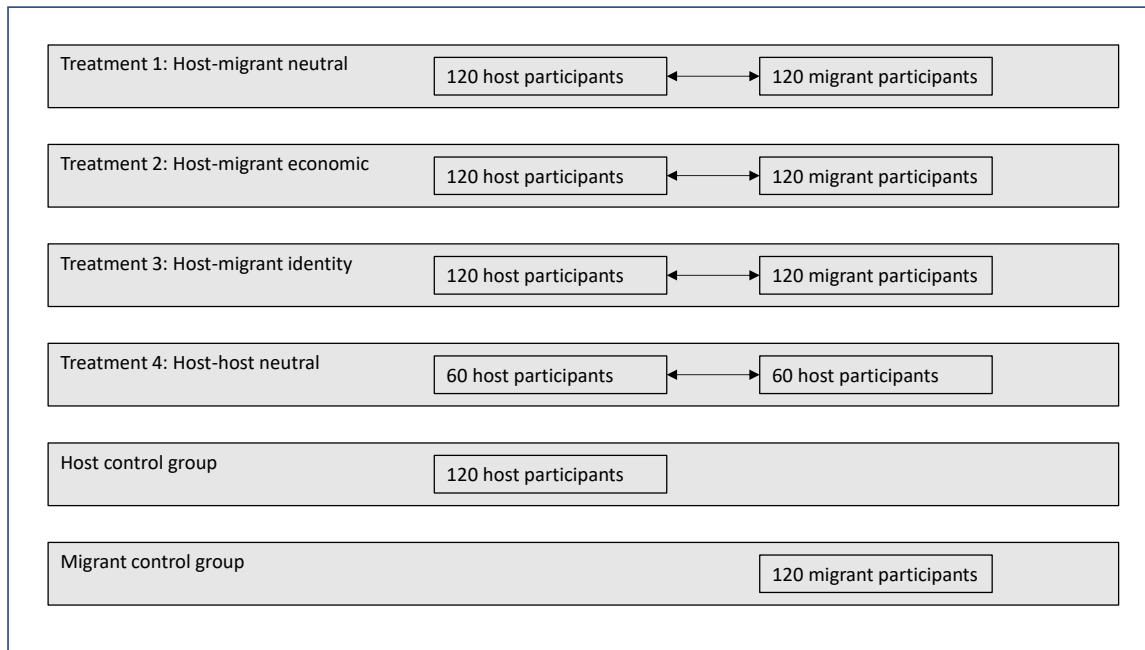
[2] https://www.bbc.com/news/world-africa-55277843#:~:text=Nearly%20100%2C000%20Eritrean%20refugees%20have,%2C%22%20a%20government%20statement%20said.

conducted. The treatments and instrument were thoroughly piloted, in a different host community using migrants not living in a refugee camp, to avoid contamination.[3]

Upon arrival at the site of the experiment, participants were randomly assigned to one of the treatment groups or a control. In practice, this was done by having respondents pick one of a set of laminated cards which assigned them to one of six rooms (one for each treatment/control group, see below), and also to a partner in treatments that involved one. Each session of the day was hence designed to include concurrent activity in all treatment and control groups in six separate rooms, with an equal number of hosts (respectively migrants) taking part in each group. In total, each treatment group contained 120 respondents from the host and/or migrant sample, and the structure of interaction in the treatment groups was as illustrated by Figure 1. In treatments 1 through 3 host community participants were randomly paired with a migrant participant. In treatment 4 host community participants were randomly paired with another host community participant. In other words, the first three treatments entailed host-refugee interaction of different forms, the fourth treatment entailed host-host interaction. In addition, we have a control group of host community members and a control group of migrants, neither of whom interacted with other participants. Participants in the treatment groups had a total of 15 minutes of paired interaction (detailed in the treatments section below), before responding individually and separately to a survey (one for host community members and another for migrants). Participants in the control groups moved straight to their respective surveys.

Figure 1. Structure of treatments

Treatment 1: Host-migrant neutral	120 host participants ←→ 120 migrant participants	
Treatment 2: Host-migrant economic	120 host participants ←→ 120 migrant participants	
Treatment 3: Host-migrant identity	120 host participants ←→ 120 migrant participants	
Treatment 4: Host-host neutral	60 host participants ←→ 60 host participants	
Host control group	120 host participants	
Migrant control group	120 migrant participants	

2.2 Treatments
The 15-minute interaction of the four treatments all began with 10 minutes of informal interaction in the randomly formed pairs, where they could get to know one another free of any imposed conversational

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[3] The pilot location was the city of Shire, the zonal capital, located about 250 km away from the main experimental location Mai-Tsebri.

structure. After the informal interaction, the pairs in the four treatment groups engaged in variations on an incentivized guessing game, specified as follows:

- Treatment 1 (**host-migrant interaction, neutral game**):
  Participants were shown a sequence of five pictures of various items, and asked to guess physical properties of the items (such as the weight of a bag of teff, a staple grain in Ethiopia and Eritrea, or the age of a pictured waiter).

- Treatment 2 (**host-migrant interaction, economic game**):
  Participants were shown the sequence of the same five pictures as in Treatment 1, and asked to guess their price (such as the price of a bag of teff, or the wages of a pictured waiter).

- Treatment 3 (**host-migrant interaction, identity game**):
  Participants were shown a sequence of five pictures as in Treatment 1, and asked to guess their regional origin (such as how many regions of Ethiopia produce teff, or the regional origin of a pictured waiter).[4]

- Treatment 4 (**host-host interaction, neutral game**):
  Same game as treatment 1, but played by pairs of host community members.

The full set of pictures, questions and correct answers used for the variations of the guessing game are presented in Appendix B. Answers to the questions in the guessing game were discussed in the pairs, but their final answers were collected individually and separately in the first section of the subsequent survey. Participant compensation depended on the number of correct answers (within some pre-defined margins of error). Their number of correct guesses was revealed to respondents at the end of the survey, which means that we cannot test the effect of success in the game on attitudes as in Mousa (2020).[5] We note, however, that interaction through the game appears meaningful in the sense that there is a high correlation (0.64, p=0.0000) in the number of correct guesses among paired players. Two control groups consisting of host and migrant respondents, respectively, did not interact with anyone (either informally or through a game), and received a fixed participation fee. In all cases, compensation was made after completion of the survey.

2.3 Empirical strategy
Our main analysis focuses on how interaction with migrants affect attitudes towards migrants among host community respondents. A pre-analysis plan covering the estimation of treatment effects on host community attitudes was registered on the American Economic Association's RCT registry on 10 January 2020.[6] The pre-analysis plan did not include analyses of mechanisms of heterogeneous effects, or of the migrant data, which are to be considered exploratory.

Our outcome variable is based on the following three survey questions:

1. "To what extent do you agree with the following statement: 'Refugees who are currently living in refugee camps in Ethiopia should be allowed to freely work and live outside of the camp.'"

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[4] As noted above, regional origin is related to ethnicity in the Ethiopian case.
[5] Consistent with this, there is no significant correlation between the number of correct guesses and attitudes (additional results available on request).
[6] https://www.socialscienceregistry.org/trials/5228.

2. "To what extent do you agree with the following statement: 'Refugees who are currently admitted to Ethiopia should be allowed to settle in my home community permanently if they are not able to return to their home country.'"
3. "To what extent do you agree with the following statement: 'If given a chance to settle, a refugee can be as good a citizen as someone who is born locally.'"

All three questions were answered on the following scale: 5 – Agree very strongly, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Disagree very strongly, 0 – Don't know. For our dependent variable, Attitude to migrants, we create an index from responses to these questions by summing the responses (treating Don't know as missing), and rescaling the sum to a number between zero and one.

Treatment effects are estimated through OLS estimation (with robust standard errors) of the following equation:

$$y_i = \alpha + \beta_{T1}T1_i + \beta_{T2}T2_i + \beta_{T3}T3_i + \beta_{T4}T4_i + \varepsilon_i \tag{1}$$

where y_i is the outcome variable for individual i, and Tt_i are indicator variables taking the value one if individual i is in treatment group t, and zero otherwise. The estimated coefficients thus capture the mean attitudes in the treatment groups compared to the host control group.

We also estimate an equation which includes the covariates captured by the vector X_i:

$$y_i = \alpha + \beta_{T1}T1_i + \beta_{T2}T2_i + \beta_{T3}T3_i + \beta_{T4}T4_i + X_i\gamma + \varepsilon_i \tag{2}$$

The covariates include age, gender, household headship status, years of education, occupation, wealth measured through an asset index, migration history of the respondent, and village fixed effects. All host respondent variables are detailed in Table A1 in Appendix A.

Formally, we pre-specified the following three hypotheses to be tested through the above estimations:

Hypothesis 1: Active interaction with a migrant through a neutral game has no effect on attitudes to migrants among host community members ($\beta_{T1} = 0$).

Hypothesis 2: There is no difference in the effect of active interaction with a migrant through a neutral game and through an economically framed game ($\beta_{T1} = \beta_{T2}$).

Hypothesis 3: There is no difference in the effect of active interaction with a migrant through a neutral game and through an identity framed game ($\beta_{T1} = \beta_{T3}$).

A priori, we expected the neutral interaction with a migrant to improve host community respondent attitudes ($\beta_{T1} > 0$), i.e. for hypothesis 1 to be rejected. We also expected this effect to be due to the interaction with a migrant, rather than human interaction in general, which we test by comparing the effect of the host-migrant neutral treatment to that of the host-host neutral treatment (i.e. $\beta_{T1} = \beta_{T4}$). For the other two hypotheses, we did not express a clear a priori expectation, but a clear aim is to assess the extent to which introducing economic or identity clues to the interaction with a migrant attenuates the effects of interaction, consistent with economic competition or social identity based theories of attitudes to migrants, respectively.

The rest of our analysis is not pre-specified, but generally in line with the above specifications. Our design not only randomizes respondents into treatments, but also randomizes which migrants the host respondents interact with (in the treatments that involve interaction with migrants). This permits us to also analyze the causal effect of migrant attributes encountered in the interaction on host respondent attitudes. We do this through the following specification:

$$y_{i,j} = \alpha + \beta_{T2}T2_i + \beta_{T3}T3_i + \boldsymbol{X_i}\gamma + \boldsymbol{M_j}\mu + \varepsilon_{i,j} \tag{3}$$

where $y_{i,j}$ is the outcome variable for host respondent i paired with migrant respondent j, $\boldsymbol{M_j}$ is a vector of migrant characteristics which include age, gender, education, occupation, and wealth. The other variables are as specified above. The definitions of the migrant co-variates included in $\boldsymbol{M_j}$ are given in Table A2 in Appendix A. Estimation of equation (3) includes only observations from treatments that pair a host and a migrant, and the host-migrant neutral treatment group is the excluded category.

In addition, we examine heterogeneities in treatment effects across host covariates, to see whether it matters who interacts, in addition to with whom they interact. We also explore the mechanisms behind our results by replacing the dependent variable in equations (1) and (2) with a set of mechanism variables. In particular, we test whether interaction leads i) to reduced perceived social distance to migrants, ii) to a greater appreciation of the plight of migrants, or iii) to a more favourable assessment of their productivity or local contribution to the host community. The first and last of these mechanisms map into social identity and economic competition based theories of attitudes to outgroups. The second captures the possibility of an effect on altruism or a reduction in responsibility attributed to migrants for their own situation as explored in Kolstad et al. (2019), and consistent with the accountability principle suggested by Konow (2000). The mechanism variables are explained in detail in Table A1 in Appendix A.

As noted, our data also gives us the unique opportunity to analyze the effects of interaction as seen from the migrant side. The dependent variable in this case captures perceptions among migrants of host community attitudes towards migrants, i.e. how welcoming migrants perceive them to be. It is constructed from answers to the following three questions:

1. "To what extent do you agree with the following statement: 'I believe people in Tigray are generally positive to migrants who arrive here.'"
2. "To what extent do you agree with the following statement: 'I think people in this host community fear that migrants will take their jobs.'"
3. "To what extent do you agree with the following statement: 'If I was hit by a car, I think a passing host community member would help me.'"

As in the case for our dependent variable in the host analysis, we create an index by summing responses to the three questions (with responses to the second question inverted), and rescale to values between zero and one. The effects of treatments on migrant perceptions, the correlation of perceptions with migrant characteristics, and the effects of being paired with hosts of certain characteristics on migrant perceptions, are analyzed analogously to equations (1), (2), and (3), with the migrant co-variates $\boldsymbol{M_j}$ and host co-variates $\boldsymbol{X_i}$ interchanged in the specifications and treatment effects estimated relative to the migrant control group (and with the host-host interaction treatment not included). All migrant variables used in these analyses are presented in detail in Table A2 in Appendix A.

3. Data

Descriptive statistics for our host community member sample is presented in Table A3 in Appendix A. The host respondents are on average 26 years old,[7] almost 60 per cent are male and almost 39 per cent the head of their household. Years of education completed varies from zero to 17, with a mean of 8 years. Among those employed, small-scale self-employment and day labourer are the most common categories, each representing about 20 per cent of the total sample. Our asset index is based on factor analysis of the following variables; ownership of farm land, house, refrigerator, TV, bicycle, motorcycle, car/bajaj, mobile phone, computer, and the number of rooms the respondent's household occupies. About a quarter of respondents own land, a little more than half own their own house, a quarter own a fridge, and a little over 40 per cent a TV. About 15 per cent of respondents own a bicycle, less than two per cent own a motorcycle, and less than four per cent a car/bajaj. Over 90 per cent own a mobile phone, but only four per cent a computer. The median respondent occupies a one-room home. About a third of host respondents have a history of migration in the sense of having lived outside the Tigray region.

Balance on host co-variates across treatment arms is demonstrated in Table A4 of Appendix A. The final column of the table contains the p-value of an F-test of the null hypothesis that the treatment arms do not predict the means on each balancing variable. Pairwise comparisons of group means are not included in the table since they are too numerous, but do not add much to the F-test. The imbalance in respondents that are self-employed in firms with employees is due to the small overall number of respondents in this category. Beyond this, there are few significant differences between groups. There is balance on all variables except village origin, which is no more than one would expect by chance. Randomization looks to have worked well in taking out differences between treatment groups. To address any remaining imbalance, we present estimations of treatment effects where co-variates are controlled for, including village fixed effects.

For our migrant sample, descriptive statistics are given in Table A5 in Appendix A. The age distribution is not that different from our host sample, with a mean age of 28, but males are more heavily represented in this sample, and the average education is half a year lower. The occupational categories capture reported respondent occupations before migrating. The proportion of skilled labourers is much higher, and the proportions of day labourers and small-scale self-employed much lower than in the host sample. More than half the migrant sample also fall in the excluded occupation category (which includes housewives, students, the unemployed, and other categories), compared to less than 40 per cent in the host sample, the main difference here is in the number of students, which is much higher in the migrant sample. For obvious reasons, the wealth index reported for migrants is based on fewer variables than for host community residents, it is based on factor analysis of bicycle and mobile phone ownership, and on estimated average monthly income. Less than two per cent of migrants own a bicycle, 85 per cent own a mobile phone, and the reported average monthly income is about 1300 Birr (35 USD).

Table A6 in Appendix A tests for balance in migrant co-variates across treatments. Again, the last column contains the p-value of an F-test of the null hypothesis that the treatment arms do not predict the means on each balancing variable. There are no significant differences, and pairwise comparisons of groups

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[7] The descriptive data states a minimum age of 10 among our respondents, this is a data entry error which does not affect results, the actual minimum age among respondents is 15.

(subsumed due to space constraints) do not suggest otherwise. The only exception is again the self-employed with employees occupation category in which there are few respondents overall; we ignore results for this variable in subsequent discussions. As for the analysis of hosts, we present estimates of treatments effects on migrant perceptions that also include the listed migrant co-variates. Balance across treatments on both host and migrant characteristics also means that any differences in host attitudes across treatments that involve interaction with a migrant are not driven by imbalances in migrant characteristics, and vice versa for migrant perception differences across these three treatment groups.

4. Main results

4.1 Effects on attitudes of host community members
The effects of our treatments on host community member attitudes to migrants are presented in the first column of Table 1. The mean level of our attitude variable in the control group is .689, and attitudes in all four treatment groups are significantly more favourable than in the control, by between 5.6 and 7.6 percentage points. Moreover, the effects of the four treatments are not significantly different from each other. The positive effects in our three host-migrant interaction groups would be consistent with an inter-group contact effect. However, since the effect of host-host interaction on attitudes to migrants is almost the same as the effects of interaction with migrants, this suggests that most of the effects we are seeing are due to human contact or contact with a general other, rather than inter-group contact. A possible interpretation of this finding is that human contact makes host community members more favourably disposed towards people in general, rather than specifically towards the people they interact with. This contrasts with previous empirical studies of effects of inter-group contact.

Moreover, comparing results for our three host-migrant interaction treatments does not confirm concerns that introducing economic or identity-related topics in the interaction attenuates the effects of interaction; the effects of all three treatments are very similar. In other words, we cannot reject hypotheses 2 and 3. Adding host covariates in the second column of Table 1 does not change results; and from the covariates we see that attitudes to migrants are positively related to age, and negatively related to being male and to small-scale self-employment. Conditional on the other variables, we see no significant association between for instance education or wealth and attitudes to migrants. This contrasts with findings from developed countries of more favourable attitudes to migrants among the well-off and educated (Hainmueller and Hopkins, 2014), but is consistent with patterns from other developing country contexts (Lujala et al., 2020).

The main results hence suggest that effects of interaction are robust to the framing of interaction (neutral versus economic and identity cues), and with whom one interacts (host in-group versus migrant out-group). In column three of Table 1, we add the characteristics of the migrants with whom hosts have interacted to the specification. Note that this reduces the sample to the 360 respondents assigned to the host-migrant treatments, and that the host-migrant neutral group is the excluded group in this specification, which means that the estimated treatment effects are relative to this group. As noted above, pairing of hosts with migrants is random, which means that results for these variables can be interpreted as causal effects of being paired with migrants with these characteristics on host attitudes. In general, the results suggest that it does not matter all that much who hosts are paired with. There is a small positive effect on host attitudes of being paired with an educated migrant, and a negative effect of being paired with a skilled employee (compared to the excluded group which contains respondents

outside the labour market).[8] With these possible exceptions, however, the effects of interaction seem quite robust to characteristics of the assigned migrant partner, including their age, gender, or wealth.

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[8] The group of migrants who are self-employed with employees contains only three respondents and is hence too small to make interpretation of its coefficient meaningful.

Table 1. Main results, host attitudes to migrants

Dependent variable	(1) Attitude to migrants	(2) Attitude to migrants	(3) Attitude to migrants
Treatment host-migrant neutral	0.069**	0.065**	
	(0.030)	(0.031)	
Treatment host-migrant economic	0.076***	0.076***	0.009
	(0.029)	(0.029)	(0.028)
Treatment host-migrant identity	0.072**	0.063**	-0.008
	(0.028)	(0.028)	(0.025)
Treatment host-host neutral	0.056*	0.056*	
	(0.029)	(0.030)	
Age		0.003**	0.004**
		(0.001)	(0.002)
Male		-0.035*	-0.021
		(0.021)	(0.025)
Head of household		0.007	0.001
		(0.021)	(0.028)
Education		0.004	0.004
		(0.003)	(0.004)
Occupation skilled employee		0.001	-0.015
		(0.028)	(0.034)
Occupation unskilled employee		0.011	0.063
		(0.037)	(0.040)
Occupation day labourer		-0.003	0.035
		(0.027)	(0.030)
Occupation farmer		-0.003	-0.026
		(0.038)	(0.060)
Occupation self-employed without employees		-0.043*	-0.041
		(0.025)	(0.033)
Occupation self-employed with employees		-0.074	-0.038
		(0.046)	(0.064)
Asset index		0.005	0.002
		(0.011)	(0.016)
Migration history		0.019	0.027
		(0.020)	(0.026)
Migrant: Age			0.001
			(0.001)
Migrant: Male			-0.019
			(0.026)
Migrant: Education			0.007*
			(0.004)
Migrant: Occupation skilled employee			-0.051*
			(0.029)
Migrant: Occupation unskilled employee			-0.004
			(0.062)
Migrant: Occupation day labourer			-0.032
			(0.079)
Migrant: Occupation farmer			-0.028
			(0.038)
Migrant: Occupation self-employed without employees			0.067
			(0.054)
Migrant: Occupation self-employed with employees			0.124***
			(0.034)
Migrant: Asset index			0.014
			(0.010)
Constant	0.689***	0.550***	0.534***
	(0.023)	(0.057)	(0.083)
Village fixed effects	No	Yes	Yes
r2	0.018	0.062	0.109
N	600	600	360

Note: Results from OLS regressions. Robust standard errors in parentheses. Variables as defined in Tables A1 and A2 in Appendix A. *** indicates significance at the 1% level, ** at 5%, * at 10%.

The above results strongly suggest that improvements in attitudes towards an out-group is due to interaction in itself, rather than interaction specifically with the out-group. Our data contains additional variables which can be used to further examine this conclusion. In addition to the effect of interaction in itself, we consider three ways in which interaction with migrants specifically can improve attitudes towards them. The first is through increasing identification with migrants by building down perceived distinctions between "us" and "them", reducing perceptions of migrants as having a different social identity or belonging to a distinct social group from hosts. The second is through an improved understanding of the difficult situation or plight of migrants; the lack of a choice in leaving their home country, or their level of poverty or economic hardship. And the third is through a greater appreciation of the productivity and local contributions of migrants; a sense that migrants are hard-working rather than opportunistic, and their presence beneficial rather than detrimental to the local community.

In Table 2, we present results where we regress indices capturing each of these three mechanisms on the treatment dummies.[9] The results confirm our previous conclusion that human contact, rather than inter-group contact, is behind the observed effects on attitudes, but also add further nuance. Looking at the neutral host-migrant interaction treatment, it is noteworthy that it does not affect any of the three mechanism variables, consistent with the idea that human contact rather than interaction with migrants specifically is what drives the effect on our main attitude variable. For the other two host-migrant treatments, results are a bit different, however. The treatment that includes economic cues appears to have increased the appreciation of host community members for the plight of migrants. Similarly, the treatment that includes identity cues has led to an improvement in both identification with migrants, and in appreciating their difficult situation. These effects are broadly consistent with the cues introduced in the two treatments (since the identity treatment affects views relating to identity and the economic treatment views relating to the economic situation of migrants) and also address concerns that the cues were too subtle for respondents to notice. Furthermore, they suggest that introducing these types of clues may make the effects we observe on attitudes more about specific interaction with the out-group than is the case for the neutral interaction. The mechanism results for these two treatments are also important in documenting potential ways in which economic and identity topics can have positive effects which counteract any concerns these topics elicit in host population respondents.

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[9] The estimations include host co-variates, results without covariates are very similar (results available on request).

Table 2. Results, mechanism variables.

Dependent variable	(1) Identification with migrants	(2) Plight of migrants	(3) Contribution of migrants
Treatment host-migrant neutral	0.009	-0.012	0.013
	(0.024)	(0.025)	(0.023)
Treatment host-migrant economic	0.006	0.050**	0.005
	(0.025)	(0.024)	(0.024)
Treatment host-migrant identity	0.045*	0.051**	0.004
	(0.023)	(0.022)	(0.024)
Treatment host-host neutral	-0.017	0.021	-0.035
	(0.022)	(0.024)	(0.025)
Constant	0.493***	0.482***	0.650***
	(0.050)	(0.045)	(0.049)
Host controls	Yes	Yes	Yes
r2	0.043	0.055	0.048
N	600	595	600

Note: Results from OLS regressions. Robust standard errors in parentheses. Variables as defined in Table A1 in Appendix A. *** indicates significance at the 1% level, ** at 5%, * at 10%.

Finally, we have conducted additional explorative analyses of heterogeneities of treatment effects across host co-variates. In general, the results suggests that the treatment effects are robust to a range of host characteristics. There are no major differences in treatment effects across levels of age, education or wealth, or between genders.[10] There is one interesting exception though, relating to host occupational background. Of the occupational groups that contain a non-trivial number of respondents, treatment effects seem to be stronger for unskilled employees and day labourers. This indicates a possibility that attitudes of host respondents in low skill occupations may be particularly responsive to interaction with migrants. In Table 3, we present further analysis of heterogeneous effects along these lines. For ease of exposition, we create a Low skill occupation categorical variable consisting of respondents whose occupational categories are unskilled employee (in contrast to skilled employee), day labourer (in contrast to farmer), and self-employed without employees (in contrast to self-employed with employees). We interact this Low skilled variable with each of the four treatment variables (controlling for the direct effect of a Low skill occupation through including the underlying occupational categories in the covariates). The results show that the effects of the interaction treatments appear to be significantly larger for respondents in low skill occupations compared to other occupations. In fact, our results appear to be driven by responses in the low skill occupational categories.

The coefficients of the underlying occupational categories included in the covariates also brings out an additional insight that previous results not controlling for this form of heterogeneity did not. The occupational categories where we see a larger effect of the treatments are the ones generally more critical to migrants. In other words, where our interaction treatments seem to bring improvements in attitudes to migrants is among respondents in occupations otherwise more critical of them. This finding is of course explorative, but it is interesting to note that other studies have uncovered similar patterns. In the study of host community attitudes to climate migrants in Bangladesh conducted by Kolstad et al. (2019), results indicate a more favourable effect of information interventions among day labourers than in other occupational categories, a category that is initially among the most critical to migrants. These patterns should be examined in further studies. But they do indicate that it may be premature to dismiss theories of labour market position or competition as irrelevant in studying attitudes to migrants as suggested by

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[10] Results available on request.

Hainmueller and Hopkins (2014); instead, their content and implications may require greater attention and nuance than they have so far received.

Table 3. Heterogeneous effect, low skill occupations.

Dependent variable	(1) Attitude to migrants
Treatment host-migrant neutral	0.014
	(0.037)
Treatment host-migrant economic	0.023
	(0.034)
Treatment host-migrant identity	0.026
	(0.033)
Treatment host-host neutral	0.003
	(0.037)
Interaction Treatment host-migrant neutral * Low skill occupation	0.112*
	(0.063)
Interaction Treatment host-migrant economic * Low skill occupation	0.124**
	(0.061)
Interaction Treatment host-migrant identity * Low skill occupation	0.083
	(0.058)
Interaction Treatment host-host neutral * Low skill occupation	0.115*
	(0.061)
Age	0.003**
	(0.001)
Male	-0.034
	(0.021)
Head of household	0.005
	(0.021)
Education	0.004
	(0.003)
Occupation skilled employee	0.002
	(0.028)
Occupation unskilled employee	-0.074
	(0.060)
Occupation day labourer	-0.089
	(0.055)
Occupation farmer	-0.014
	(0.036)
Occupation self-employed without employees	-0.129***
	(0.050)
Occupation self-employed with employees	-0.059
	(0.047)
Asset index	0.002
	(0.012)
Migration history	0.019
	(0.020)
Constant	0.588***
	(0.058)
Village fixed effects	Yes
r2	0.074
N	600

Note: Results from OLS regressions. Robust standard errors in parentheses. Variables as defined in Table A1 in Appendix A. The Low skill occupation category used in the interaction terms comprises respondents in the categories Occupation unskilled employee, Occupation day labourer, and Occupation self-employed without employees. *** indicates significance at the 1% level, ** at 5%, * at 10%.

4.2 Effects on migrant perceptions of host attitudes
Interaction does seem to improve host community attitudes towards migrants, even if our results suggest that it is human rather than inter-group contact that matters. An important question for the relation between host and migrants, however, is whether migrants perceive a similar change in host attitudes from interactions of this kind. In other words, do we see any effects on the migrant side, do interventions that bring hosts and migrants into contact make migrants feel more welcome in the local community? Table 4 presents results for our dependent variable which measures the perceptions of migrant of host community member attitudes towards them. Results in the first column show that perceptions among migrants in our treatment group do not differ from those of the control group of migrants who did not interact with a host community member. In other words, contact with host community members has done little to make migrants feel more welcome. This should serve to temper findings from previous studies of host migrant interaction, which have tended to ignore the migrant side. It also raises the question of whether interactions need to be conducted in different ways for an out-group to be convinced of favourable effects on attitudes on an in-group. Our intervention meets the conditions set out in Allport (1954) for interaction to result in improved attitudes, but still this does not seem sufficient to improve out-group perceptions in our case. On the plus side, however, our results at least indicate that the interactions have not worsened migrant perceptions of how welcome they are in the host community.

Column two adds migrant covariates. Older migrants report more positive perceptions of host community attitudes, but beyond this there seems to be little systematic variation in how welcome migrant feel. Similarly, these perceptions do not appear to vary much with the characteristics of the host community member a migrant has been paired with, as the addition of host co-variates in column three shows. It is a bit of a paradox that while older and female hosts report having more favourable attitudes towards migrants, migrants who interact with these types of hosts do not end up with perceptions that hosts have more favourable attitudes. However, as the outcome variable here is about perceptions of host attitudes in general (not just in the person you interact with), this should not be overstated. As a further paradox, hosts whose occupational category is skilled employee do not report better attitudes to migrants, however, migrants who interact with such hosts perceive hosts to be more welcoming.

Table 4. Results, migrant perceptions of host attitudes.

Dependent variable	(1) Migrant: Perception of host attitudes	(2) Migrant: Perception of host attitudes	(3) Migrant: Perception of host attitudes
Treatment host-migrant neutral	0.006	0.008	
	(0.019)	(0.020)	
Treatment host-migrant economic	0.016	0.016	0.006
	(0.020)	(0.021)	(0.021)
Treatment host-migrant identity	0.028	0.027	0.016
	(0.019)	(0.020)	(0.020)
Migrant: Age		0.001*	0.001
		(0.001)	(0.001)
Migrant: Male		-0.015	-0.019
		(0.017)	(0.019)
Migrant: Education		0.002	0.002
		(0.003)	(0.003)
Migrant: Occupation skilled employee		-0.024	-0.031
		(0.020)	(0.024)
Migrant: Occupation unskilled employee		-0.003	-0.003
		(0.037)	(0.038)
Migrant: Occupation day labourer		-0.018	-0.023
		(0.029)	(0.037)
Migrant: Occupation farmer		0.005	0.009
		(0.026)	(0.027)
Migrant: Occupation self-employed without employees		-0.017	-0.029
		(0.038)	(0.054)
Migrant: Occupation self-employed with employees		-0.033	-0.067
		(0.108)	(0.146)
Migrant: Asset index		0.008	0.006
		(0.006)	(0.007)
Age			-0.001
			(0.001)
Male			0.016
			(0.020)
Head of household			0.020
			(0.021)
Education			0.003
			(0.004)
Occupation skilled employee			0.064**
			(0.029)
Occupation unskilled employee			-0.012
			(0.031)
Occupation day labourer			0.020
			(0.026)
Occupation farmer			-0.024
			(0.036)
Occupation self-employed without employees			0.011
			(0.027)
Occupation self-employed with employees			0.038
			(0.067)
Asset index			-0.006
			(0.010)
Migration history			-0.029
			(0.020)
Constant	0.770***	0.730***	0.711***
	(0.013)	(0.035)	(0.076)
Village fixed effects	No	No	Yes
r2	0.005	0.019	0.055
N	476	476	357

Note: Results from OLS regressions. Robust standard errors in parentheses. Variables as defined in Tables A1 and A2 in Appendix A. *** indicates significance at the 1% level, ** at 5%, * at 10%.

5. Concluding remarks

The general implication of our experimental results is that contact across social groups is good, but perhaps not for the reasons previously suggested. Contact of the positively framed kind envisioned in inter-group contact theory potentially contains two separate elements; a contact part, and an inter-group part. Our experiment improves on our understanding of what drives the results in the empirical literature on inter-group contact by including a pure non-interactional control group, and an in-group interaction treatment, which allows us to separate these effects. Our results suggest that effects of interaction is driven by the human contact part, rather than being specifically related to inter-group contact. A positively framed interaction may simply put respondents in a positive frame of mind which improves attitudes towards out-group members, rather than this being specifically related to interaction with a member of the out-group. The positive effect of contact in the inter-group case is, however, also quite robust. Our results suggest that we do not have to worry too much about the form this interaction takes (within certain bounds), or how host population and migrant populations are matched in interactions.

Our results do, however, present one important paradox here. While host community members report more favourable attitudes to migrants as a result of the interaction treatments, migrants do not perceive any change in host attitudes. This means that while interaction of the kind studied here may not affect migrant perceptions negatively, we also do not see the attitude change in hosts reflected in migrant perceptions. If effects on self-perceptions of hosts deviate from the assessment made by an outside party, this raises the question of how real the changes in attitudes among hosts are. One possible interpretation of our results is hence that the effects on host attitudes may be less substantial when more objectively evaluated. There are also other possible explanations for this apparent discrepancy. Migrant perceptions of hosts may be harder to shift; however balanced you make the interaction between hosts and migrants, there remains an asymmetry of vulnerability between the two groups, and it may take more to make migrants feel accepted than to make hosts more accepting of migrants. Migrants simply have more at stake, in particular given their uncertain situation in a refugee camp. Another possible explanation is that migrants respondents in our case may have been reluctant to criticize the attitudes of host community members. While the mean of our migrant perceptions variable is quite high, we note that there is also considerable variation, so some migrant are at least highly sceptical of host attitudes. The extent to which effects of interaction tend to be one-sided, the reasons for this type of deviation, as well as possible ways of increasing mutually favourable perceptions and trust, are important matters for further research.

Randomization into treatments of both host community members and migrants in our experiment means that our results reflect causal effects, not driven by other differences between treatment groups. Our results show that even brief interaction of 15 minutes can be enough to shift attitudes. We have studied the short-term effects of these interactions on stated attitudes, our results do not speak to possible long-term and behavioural changes resulting from interaction, which is a matter for further research. The cues we introduced to economic competition and identity threats were also quite indirect, and while they do seem to have been noticed by respondents, stronger cues or interactions that contain more conflicting interests may have different effects. Finally, our experiment was conducted in a setting where hosts and migrants speak the same language, many host community members have extensive migration histories, and the possibility of onward migration of the migrants from Ethiopia, may mean that the context is a favourable one for interaction to improve attitudes. On the other hand, and as recent event underscore, this is also a region marked by internal conflict within Ethiopia, and international conflict and tensions with Eritrea, which could point in the opposite direction. The extent to which our results generalize to other contexts is a matter for further research.

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Appendix A. Descriptive information

Table A 1. Variable definitions for host respondent variables.

Host variables	Explanation
Dependent variable	
Attitude to migrants	Host respondent attitude to migrants.
	Index created by summing responses to the following three questions, and rescaled to values from 0 to 1:
	1. "To what extent do you agree with the following statement: 'Refugees who are currently living in refugee camps in Ethiopia should be allowed to freely work and live outside of the camp.'"
	2. "To what extent do you agree with the following statement: 'Refugees who are currently admitted to Ethiopia should be allowed to settle in my home community permanently if they are not able to return to their home country.'"
	3. "To what extent do you agree with the following statement: 'If given a chance to settle, a refugee can be as good a citizen as someone who is born locally'".
	All three questions are answered on the following scale: 5 – Agree very strongly, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Disagree very strongly, 0 – Don't know (treated as missing).
Treatment variables	
Treatment host-migrant neutral	Dummy variable of whether host respondent was assigned to the host-migrant neutral treatment (1 – Yes, 0 – No)
Treatment host-migrant economic	Dummy variable of whether host respondent was assigned to the host-migrant economic treatment (1 – Yes, 0 – No)
Treatment host-migrant identity	Dummy variable of whether host respondent was assigned to the host-migrant identity treatment (1 – Yes, 0 – No)
Treatment host-host neutral	Dummy variable of whether host respondent was assigned to the host-host treatment (1 – Yes, 0 – No)
Mechanism variables	
Identification with migrants	Host respondent identification with migrants.
	Index created by summing the inverted responses to the following two questions, and rescaled to values from 0 to 1:
	1. To what extent do you agree with the following statement "I have more in common with the members of my community than with refugees that arrive here"
	2. To what extent do you agree with the following statement- "There are more differences between me and a typical refuge than there are similarities"
	Both questions are answered on the following scale: 5 – Agree very strongly, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Disagree very strongly, 0 – Don't know (treated as missing).
Plight of migrants	Host respondent appreciation of plight of migrants.
	Index created by summing the responses to the following two questions (with responses to the second question inverted), and rescaled to values from 0 to 1:
	1. To what extent do you agree with the following statement - "I believe that refugees migrate because they see no other alternative" (5 – Agree very strongly, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Disagree very strongly, 0 – Don't know (treated as missing)).
	2. The typical refuge who wants to settle in my community is likely to be _____ (1 - Very poor, 2 - Poor, 3 - Neither rich nor poor, 4 - Rich, 5 - Very rich, 0 - Don't know (treated as missing)).
Contribution of migrants	Host respondent appreciation of local contribution/productivity of migrants.
	Index created by summing responses to the following two questions, and rescaled to values from 0 to 1:
	1. To what extent do you agree with the following statement - "I believe that refugees contribute positively to our local economy"
	2. To what extent do you agree with the following statement - "In general, I believe that refugees are hard-working and productive if given a chance to work"
	Both questions are answered on the following scale: 5 – Agree very strongly, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Disagree very strongly, 0 – Don't know (treated as missing).
Covariates	
Age	Age of host respondent (number of years)
Male	Gender of host respondent (dummy variable, 1 – male, 0 – female)
Head of household	Host respondent is head of household (dummy variable, 1 – Yes, 0 – No)
Education	Number of years of education completed by host respondent
Occupation skilled employee	Primary occupation of host respondent is skilled employee (dummy variable, 1 – Yes, 0 – No)
Occupation unskilled employee	Primary occupation of host respondent is unskilled employee (dummy variable, 1 – Yes, 0 – No)
Occupation day labourer	Primary occupation of host respondent is day labourer (dummy variable, 1 – Yes, 0 – No)
Occupation farmer	Primary occupation of host respondent is farmer (dummy variable, 1 – Yes, 0 – No)
Occupation self-employed without employees	Primary occupation of host respondent is self-employed without employees (dummy variable, 1 – Yes, 0 – No)
Occupation self-employed with employees	Primary occupation of host respondent is self-employed with employees (dummy variable, 1 – Yes, 0 – No)
Asset index	Wealth index for host respondent based on factor analysis of the following asset variables: ownership of farm land, house, refrigerator, TV, bicycle, motorcycle, car/bajaj, mobile phone, computer, number of rooms the household occupies
Migration history	Migration history of host respondent (dummy variable, 1 - respondent has lived outside of Tigray, 0 - otherwise)
Village fixed effects	Dummy variables for each of the 3 villages host respondents are recruited from

Table A 2. Variable definitions for migrant respondent variables.

Migrant variables	Explanation
Dependent variable	
Migrant: Perception of host attitudes	Migrant respondent perception of host community attitudes towards migrants:
	Index created by summing responses to the following three questions (with responses to the second question inverted), and rescaled to values from 0 to 1:
	1. To what extent do you agree with the following statement: "I believe people in Tigray are generally positive to migrants who arrive here"
	2. To what extent do you agree with the following statement: "I think people in this host community fear that migrants will take their jobs"
	3. To what extent do you agree with the following statement: "If I was hit by a car, I think a passing host community member would help me"
	All three questions are answered on the following scale: 5 – Agree very strongly, 4 – Agree, 3 – Neither agree nor disagree, 2 – Disagree, 1 – Disagree very strongly, 0 – Don't know (treated as missing).
Covariates	
Migrant: Age	Age of migrant respondent (number of years)
Migrant: Male	Gender of migrant respondent (dummy variable, 1 – male, 0 – female)
Migrant: Education	Number of years of education completed by migrant respondent
Migrant: Occupation skilled employee	Occupation of migrant respondent before migration was skilled employee (dummy variable, 1 – Yes, 0 – No)
Migrant: Occupation unskilled employee	Occupation of migrant respondent before migration was unskilled employee (dummy variable, 1 – Yes, 0 – No)
Migrant: Occupation day labourer	Occupation of migrant respondent before migration was day labourer (dummy variable, 1 – Yes, 0 – No)
Migrant: Occupation farmer	Occupation of migrant respondent before migration was farmer (dummy variable, 1 – Yes, 0 – No)
Migrant: Occupation self-employed without employees	Occupation of migrant respondent before migration was self-employed without employees (dummy variable, 1 – Yes, 0 – No)
Migrant: Occupation self-employed with employees	Occupation of migrant respondent before migration was self-employed with employees (dummy variable, 1 – Yes, 0 – No)
Migrant: Asset index	Wealth index for migrant respondent based on factor analysis of the following asset variables: ownership of bicycle, mobile phone, estimated average monthly income

Table A 3. Summary statistics, host sample.

	Obs	Mean	Std. Dev.	Min	Max
Attitude to migrants	600	0.743	0.212	0	1
Age	600	26.083	8.179	10	65
Male	600	0.590	0.492	0	1
Head of household	600	0.390	0.488	0	1
Education	600	8.368	3.608	0	17
Occupation skilled employee	600	0.108	0.311	0	1
Occupation unskilled employee	600	0.058	0.235	0	1
Occupation day labourer	600	0.190	0.393	0	1
Occupation farmer	600	0.023	0.151	0	1
Occupation self-employed without employees	600	.215	0.411	0	1
Occupation self-employed with employees	600	0.017	0.128	0	1
Asset index	600	0.000	1.000	-1.331	4.670
Migration history	600	0.310	0.463	0	1
Village 1 (Hadnet)	600	0.485	0.500	0	1
Village 2 (Hayelom)	600	0.277	0.448	0	1
Village 3 (M/shila)	600	0.238	0.426	0	1

Table A 4. Balance on covariates across treatments, host sample.

	Treatment host-migrant neutral	Treatment host-migrant economic	Treatment host-migrant identity	Treatment host-host neutral	Control	Orthogonality test
Age	25.842	26.050	27.317	26.150	25.058	0.289
	(0.823)	(0.782)	(0.796)	(0.673)	(0.639)	
Male	0.550	0.625	0.567	0.625	0.583	0.681
	(0.046)	(0.044)	(0.045)	(0.044)	(0.045)	
Head of household	0.350	0.433	0.442	0.367	0.358	0.431
	(0.044)	(0.045)	(0.046)	(0.044)	(0.044)	
Education	8.967	8.575	7.992	7.958	8.350	0.137
	(0.297)	(0.312)	(0.364)	(0.33)	(0.336)	
Occupation skilled employee	0.092	0.142	0.100	0.100	0.108	0.801
	(0.026)	(0.032)	(0.028)	(0.028)	(0.028)	
Occupation unskilled employee	0.058	0.025	0.075	0.075	0.058	0.241
	(0.021)	(0.014)	(0.024)	(0.024)	(0.021)	
Occupation day labourer	0.200	0.158	0.208	0.192	0.192	0.876
	(0.037)	(0.033)	(0.037)	(0.036)	(0.036)	
Occupation farmer	0.008	0.008	0.017	0.033	0.050	0.233
	(0.008)	(0.008)	(0.012)	(0.016)	(0.02)	
Occupation self-employed without employees	0.200	0.208	0.242	0.225	0.200	0.925
	(0.037)	(0.037)	(0.039)	(0.038)	(0.037)	
Occupation self-employed with employees	0.025	0.025	0.008	0.025	0.000	0.039
	(0.014)	(0.014)	(0.008)	(0.014)	(0)	
Asset index	0.068	0.053	-0.081	0.017	-0.057	0.723
	(0.09)	(0.091)	(0.092)	(0.089)	(0.095)	
Migration history	0.317	0.358	0.283	0.325	0.267	0.574
	(0.043)	(0.044)	(0.041)	(0.043)	(0.041)	
Village 1 (Hadnet)	0.475	0.442	0.533	0.500	0.475	0.694
	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	
Village 2 (Hayelom)	0.242	0.258	0.292	0.250	0.342	0.435
	(0.039)	(0.04)	(0.042)	(0.04)	(0.043)	
Village 3 (M/shila)	0.283	0.300	0.175	0.250	0.183	0.064
	(0.041)	(0.042)	(0.035)	(0.04)	(0.035)	
N	120	120	120	120	120	

Table A 5. Summary statistics, migrant sample

	Obs	Mean	Std. Dev.	Min	Max
Migrant: Perception of host attitudes	476	0.783	0.151	0.083	1
Migrant: Age	476	28.584	9.555	15	70
Migrant: Male	476	0.737	0.441	0	1
Migrant: Education	476	7.771	3.393	0	22
Migrant: Occupation skilled employee	476	0.275	0.447	0	1
Migrant: Occupation unskilled employee	476	0.044	0.206	0	1
Migrant: Occupation day labourer	476	0.013	0.112	0	1
Migrant: Occupation farmer	476	0.084	0.278	0	1
Migrant: Occupation self-employed without employees	476	0.042	0.201	0	1
Migrant: Occupation self-employed with employees	476	0.006	0.079	0	1
Migrant: Asset index	476	0.000	1.004	-1.776	9.809

Table A 6. Balance on covariates across treatments, migrant sample.

	Treatment host-migrant neutral	Treatment host-migrant economic	Treatment host-migrant identity	Control	Orthogonality test
Migrant: Age	29.176	28.068	28.067	29.025	0.702
	(0.924)	(0.847)	(0.766)	(0.961)	
Migrant: Male	0.765	0.695	0.717	0.773	0.462
	(0.039)	(0.043)	(0.041)	(0.039)	
Migrant: Education	7.613	7.729	8.092	7.647	0.695
	(0.328)	(0.299)	(0.317)	(0.302)	
Migrant: Occupation skilled employee	0.319	0.280	0.233	0.269	0.523
	(0.043)	(0.041)	(0.039)	(0.041)	
Migrant: Occupation unskilled employee	0.050	0.076	0.025	0.025	0.227
	(0.020)	(0.025)	(0.014)	(0.014)	
Migrant: Occupation day labourer	0.025	0.000	0.017	0.008	0.110
	(0.014)	(0.000)	(0.012)	(0.008)	
Migrant: Occupation farmer	0.059	0.076	0.108	0.092	0.535
	(0.022)	(0.025)	(0.028)	(0.027)	
Migrant: Occupation self-employed without employees	0.042	0.034	0.017	0.076	0.157
	(0.018)	(0.017)	(0.012)	(0.024)	
Migrant: Occupation self-employed with employees	0.000	0.017	0.000	0.008	0.222
	(0.000)	(0.012)	(0.000)	(0.008)	
Migrant: Asset index	-0.019	0.016	-0.097	0.102	0.418
	(0.071)	(0.120)	(0.070)	(0.099)	
N	119.000	118.000	120.000	119.000	

Appendix B. Guessing game materials.

The guessing game used in the treatments consisted of a sequence of five pictures and associated questions that vary between treatments. In the two neutral treatments (host-migrant neutral and host-host neutral), questions were asked about physical properties of objects in the pictures. In the economic treatment (host-migrant economic), the question were about prices related to the pictured objects. And in the identity treatment (host-migrant identity), the questions were about the regional origin of objects of the pictured objects. The pictures used for each of the five parts of the guessing game, the precise formulation of the questions in each treatment, and correct answers for the questions can be found below. Answers were accepted as correct if they were within a certain range around the correct value, these ranges are also found below.

The choice of pictures and questions to include in the guessing game was made on the basis of a preliminary set of pictures and questions included in the pilot. It was decided that the pictures for the experiment should include: i) a bag of teff, ii) a public transport bus, iii) a house, iv) a waiter, and v) a woman with a 'shuruba' (a braid-type traditional hairstyle). Pictures of these objects were taken by the field coordinator, and information at the same time collected on the physical properties, local prices, and (where appropriate) the regional origin, of the objects. The properties asked for in the guessing game are hence actual properties of the pictured objects, for instance the actual weight of the pictured bag of teff, the local price of teff, the actual number of seats in the pictured bus, the actual age, wages and regional origin of the pictured waiter, and so on.

The pictures were also taken to include sufficient context to serve as a reasonable reference for the questions, where appropriate. For instance, the picture of the bag of teff was taken at a mill with a door for a background in order to enable respondents to have a reasonable guess of the size of the sack. The top of sack of the teff was made to be visible enough for respondents to identify the colour of the teff grains.[11] The bus picture was taken in a neutral setting featuring a person apparently fixing its motors, presenting a reference to the size of the bus relative to that of the person. The house picture for the neutral and economic treatment was made to represent an average or typical house rented in Mai-Tsebri, this entailed using a different picture for the identity treatment, which while not ideal from an experimental perspective is unlikely to matter for results. The pictures of the waiter and the shuruba were both made to ensure that the person and hair style represented had recognizable regional characteristics.

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[11] The colour of teff grains is typically white, 'sergena'/mixed, or red, the prices of which differ.

Question 1

Neutral treatments:
"Look at the bag of teff shown in the picture. Estimate the weight of the teff shown in the bag."
Correct answer: 63 kg. Accepted range: 48-78 kg.

Economic treatment:
"Look at the teff in the picture. Estimate how much a 100 kg of teff (similar to the one in the picture) is sold for in Mai-Tsebri grain market."
Correct answer: 3300 birr. Accepted range: 2800-3800 birr.

Identity treatment:
"There are 9 regions in Ethiopia. How many of these regions produce teff?"
Correct answer: 5 regions. Accepted range: 4-6 regions.

Question 2

Neutral treatments:
"Look at the bus shown in the picture. Estimate how many seats the bus has."
Correct answer: 25 seats. Accepted range: 20-30 seats.

Economic treatment:
"Look at the bus shown in the picture. Estimate the bus fare from Mai-Tsebri to Mekelle in a bus like this."
Correct answer: 145 birr. Accepted range: 125-165 birr.

Identity treatment:
"How long (in days or hours) does it take to travel from Mai-Tsebri to Jijga (in Somalia region) by bus?"
Correct answer: 3 days. Accepted range: 2-4 days.

Question 3

Neutral treatments:
"Look at the house shown in the picture. How many people do you think live in this house?"
Correct answer: 4 persons. Accepted range: 2-6 persons.

Economic treatment:
"Look at the house shown in the picture. Estimate the monthly rent of the house shown in the picture."
Correct answer: 750 birr. Accepted range: 650-850 birr.

Identity treatment:
"This picture of the house is taken in a rural location in Ethiopia outside of Tigray. Guess which region this house is located in."
Correct answer: Debub. Accepted range: Oromiya/Debub.

Question 4

Neutral treatments:
"Look at the man in the picture. Guess his age."
Correct answer: 25 years. Accepted range: 20-30 years.

Economic treatment:
"Look at the waiter in the picture. Guess his monthly wage rate."
Correct answer: 700 birr. Accepted range: 500-900 birr.

Identity treatment:
"Look at the man in the picture. Guess where he is from."
Correct answer: Kunama. Accepted range: Kunama, Gambela, Benshagul-Gumuz.

Question 5:

Neutral treatments:
"Look at the hair style/'shuruba' of the women in the picture. How long does it take to make such a shuruba (in hours)?"
Correct answer: 2 hours. Accepted range: 1-3 hours.

Economic treatment:
"Look at the hair style on the picture. How much do you think the maker charges to make this 'shuruba'/hair style?"
Correct answer: 70 birr. Accepted range: 50-90 birr.

Identity treatment:
"Look at the 'shuruba' on the women in the picture. Where in Ethiopia is this shuruba from?"
Correct answer: Raya. Accepted range: Raya, Tigray, South Tigray.

We report results from a randomized field experiment conducted in the Tigray region of Ethiopia, which tests the impact of interaction with migrants on host community members' attitudes towards migrants. In three treatment groups, host community members were randomly paired with a migrant from a nearby refugee camp to play an incentivized guessing game. In the first of these treatments, the game was neutral in content, in the second it introduced subtle cues to economic matters, and in the third subtle cues to ethnic identity. In a fourth treatment, host community members were paired with other host community members to play the neutral game, and in the control condition host community members did not interact with anyone. The results show that, compared to the control group, interaction with a migrant significantly improved attitudes towards them. Subtle cues to economic matters or identity did not diminish this effect. However, we see similar effects on attitudes to migrants in the treatment group where hosts interacted with other hosts, which suggests that the effects are driven by human interaction in general, rather than by interacting specifically with a migrant. The effects of interaction are not much affected by the characteristics of the paired hosts and migrants, though host respondents in low skill occupations appear to respond more favourably to the treatments. Interestingly, however, we find no effects of the treatments on how migrants believe they are perceived by host community members.

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