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Sentiments of Host Communities

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From hospitality to hostility:
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Abstract

In 2017, Bangladesh received a sudden influx of Muslim Rohingya refugees from neighboring Myanmar. While the predominantly Muslim host communities initially expressed sympathy for the refugees, the prolonged stay substantially affected their livelihoods, and public sentiment gradually deteriorated. Using an incentivized joy-of-destruction game, we found that as many as 58% of the hosts paid to reduce support for the refugees. Our regression analysis revealed that the more exposed hosts paid significantly more but were not more likely to express negative opinions toward the refugees. This contrast indicates that the incentivized experiment elicited real (not cosmetic) hostility toward the outgroup.

Keywords: Forcible displacement, refugee, intergroup contact, joy-of-destruction game, Bangladesh
JEL codes: F2, J1, O1, Z1

I. Introduction

The United Nations High Commissioner for Refugees (UNHCR) reported that in 2022, the count of forcibly displaced people exceeded 100 million for the first time in history. Given the significance of the issue, the forthcoming volume of the World Development Report (WDR), a World Bank flagship report, will be titled "Migrants, Refugees, and Societies." Refugees predominantly populate in the developing world, where international aid agencies and host countries strive to meet their basic humanitarian needs (Devictor et al., 2021; Hatton, 2020).

The influx of refugees substantially affects the livelihoods of hosts. For example, increased demand raises commodity prices and exacerbates natural resource extraction, and an augmented supply of unskilled labor lowers wages. When refugees are unlikely to be repatriated to their homeland or resettled in a third country, they are left with the sole option of staying in the host country. However, a prolonged stay may trigger social unrest and violence. To facilitate social cohesion, the emotional aspects of the hosts should be carefully considered. In reality, aid agencies and host governments are busy providing support to refugees; their support to hosts, especially with regard to their emotional wellbeing, is limited. Furthermore, scholarly investigations into such emotional wellbeing are lacking.

To empirically analyze the emotional effects of refugee inflows on host communities, this study focused on Rohingya refugees, one of the most populous and concentrated refugees in global history. The genocidal campaign in Myanmar in 2017 triggered a massive influx of the Rohingya, a Muslim minority group, into neighboring Bangladesh. The predominantly Muslim host communities initially sympathized with the refugees because of their shared religion and language. However, the prolonged stay and high fertility among refugees substantially affected their livelihood, and public sentiment gradually deteriorated (Ansar and Khaled, 2021). Ullah et al. (2021) surveyed over 2,000 host households and found that 72% of the respondents retrospectively indicated a positive view of refugees at the time of influx.

However, this percentage decreased to 18% by the time of their survey in 2020.

We conducted an incentivized lab-in-the-field experiment on 1,754 host households to rigorously measure the state of public sentiment. We adopted the joy-of-destruction (JOD) game to elicit their willingness to pay to reduce their support for refugees. To identify the causal impacts of refugee influx, we used the distance to the refugee camp as a proxy for refugee exposure. More than 700,000 refugees unexpectedly and suddenly flooded Bangladesh, and the existing camps were substantially expanded to accommodate them (Hussam et al., 2022). Camp expansion can be considered an exogenous event, and we used the distance to the camp as an identifying variation.

We found that 58% of the sample paid a non-zero amount in the incentivized JOD game to reduce (destroy) support for refugees. Furthermore, as many as 15% of the respondents paid the highest possible amount, which was close to their average daily per capita income. These results reveal the deteriorated hosts' sentiments and call for serious attention by policymakers to provide decent compensation for the hosts and facilitate social cohesion.

In our ordinary least squares (OLS) regressions, where we used distance to the refugee camp as an explanatory variable, households living closer to the camp proved significantly more likely to pay and to pay a larger amount. For every kilometer closer to the camp, the payment increased by 1.3%. In addition, our instrumental variable (IV) regression, where we used distance as an instrument for the damage caused to the hosts, indicated that households closer to the camp were more adversely affected, and the more affected households paid more. These findings suggest that increased exposure to refugees causes damage and worsens public sentiments. In contrast, we found that households closer to the camp or those that were more affected were no more likely to express negative opinions toward the refugees. This contrast indicates that the incentivized experiment revealed real (not cosmetic) hostility toward refugees.

This study contributes to two strands of the literature. First, we add to the emerging

literature on the refugee impact on host communities. Verme and Schuettler (2021) reported that the Syrian refugee crisis in 2011 and the European Union (EU) migration crisis in 2014–2015 evoked scholarly interest in the refugee impact on host communities. Existing studies mostly focus on the impact on commodity and labor markets (e.g., Akgündüz and Torun, 2020; Alix-Garcia et al., 2018; Taylor et al., 2016). According to Maystadt et al.'s (2019) survey, while investigations have also been conducted on health, security, and the environment, more research is warranted on social interactions and perceptions between refugees and hosts. We share this view and believe that a good understanding of hosts' emotional wellbeing will help policymakers mitigate intergroup tension and facilitate social cohesion.

To our knowledge, Hangartner et al. (2019) is the only study to investigate the causal impact of refugee influx on hosts' sentiments. They examined the case of Muslim refugees in Greek islands and demonstrated that exposure induced sizable and sustained hostility toward refugees and Muslim minorities. Our study differs by three important dimensions. First, we investigated the host community in a developing country in which the hosts were as equally poor as the refugees. Second, while they investigated the impact of transitory exposure, as most refugees left the islands within a short period (typically within 24 h), we explored the impact of the longer-term presence of refugees. In the case of the Rohingya, other solutions, including repatriation, resettlement, and third-country migration, have failed, and the only possible option is to keep the refugees in camps. Third, while the former study held interviews via telephone, we conducted face-to-face interviews to collect information and for an incentivized experiment.

Second, this study adds to the large and expanding literature on the impact of intergroup contact on attitudes and behaviors toward an outgroup: Bazzi et al. (2019) and Finseraas et al. (2019) on ethnicity; Boisjoly et al. (2006), Corno et al. (2022), and Enos (2014) on race; Bursztyn et al. (2022), Mousa (2020), and Scacco and Warren (2018) on religion; Lowe (2021) and Rao (2019) on caste and social class; and Broockman and Kalla (2016) and Dahl et al.

(2021) on gender. Our study is unique in that it focuses on the relationship between refugees and their hosts. While a few recent studies have focused on refugee-host contact by experimentally creating short-term interactions (Bezabih et al., 2021; Loiacono and Silva-Vargas, 2022), we analyzed real-world longer-term interactions using natural experimental variation. We established that proximity to the camp led to hostile behavior among the hosts, but did not translate into negative perceptions. Such contrasting results support the effective use of the JOD game to elicit real hostility toward an outgroup. In this regard, our work relates to Blouin and Mukand (2019), which conducted public and private variants of public goods games and considered the sending amount in public as a cosmetic attitude and that in private as a real attitude.

II. Setting

The Rohingya is an ethnic minority group in Myanmar, a predominantly Buddhist country. The Burmese government has had a history of persecuting the Rohingya since the late 1940s, and their citizenship was stripped in 1982 (Islam et al., 2022; Mahmood et al., 2017). In response to occasional fights between Rohingya militants and the Burmese government, which began in 2016, the government launched a massive Rohingya clearance operation in August 2017. The operation killed at least 6,700 Rohingya, and within a very short period, more than 700,000 Rohingya fled to neighboring Bangladesh as refugees (Albert and Maizland, 2020; Hussam et al., 2022). Although the Rohingya had intermittently become refugees over the past several decades, the 2017 refugee influx was unprecedented in terms of number and momentum.

Owing to the intermittent flow of Rohingya refugees, two registered refugee camps, Kutupalong and Nayapara, were established in the 1970s. In 2015, before the recent influx, 31,000 registered refugees lived in these camps, and an additional 230,000 Rohingya were

scattered throughout Bangladesh (Mahmood et al., 2017). They lived harmoniously with the host communities, even in cases of intermarriage. After the unexpected and sudden influx in 2017, the existing camps, particularly Kutupalong, were substantially expanded within weeks, primarily by clearing forest areas (Hussam et al., 2022). The expanded Kutupalong camp and newly established neighboring camps are commonly called the "mega camp." The mega camp was 5.5 kms north–south and 4.5 kms east–west, and accommodated most of the 2017 refugees.

Panels A and B in Figure 1 present land cover classification maps based on the random forest algorithm of Landsat 8 satellite imagery, thus illustrating the sudden and large expansion of the camp. Red indicates build-ups, and the largest red area in the upper center of the 2016 map (Panel A) denotes the Kutupalong refugee camp formed in the 1970s. The red dots appearing sporadically to the south of the Kutupalong camp indicate the residence of the host households and the Nayapara camp, which is smaller and not as concentrated as the Kutupalong camp. After the 2017 influx, the surrounding forest, which is shown in green, was erased, and the camp area (red) expanded substantially by 2018 (Panel B). Minor camp expansions have been ongoing since then; however, the red zone in the 2018 map suggests the boundary of the camp that continues to the present day.

In the past, while the Rohingya occasionally entered Bangladesh as refugees, most returned to Myanmar. However, the repatriation of recent refugees has been severely limited; even five years after the influx, only 1% of refugees have been resettled or moved to a third country (Ullah et al., 2021). A reason for the failure of the repatriation process is that a large number of refugees made diplomatic negotiations difficult. Further difficulties were also added by the political instability in Myanmar since 2021. Moreover, the refugees had a higher fertility rate, and over 30,000 infants were born every year in the camp (Tayeb, 2021).

Initially, the host Muslim Bangladeshi were sympathetic to the Rohingya refugees. However, as their stay was prolonged, the socio-economic and environmental impacts thereof

became apparent. In addition, the population explosion in the camp triggered social anxiety, and the sentiment toward the Rohingya deteriorated. Ansar and Khaled (2021) conducted in-depth interviews with hosts and found that economic instability, political uncertainty, and unequal access to humanitarian aid shifted the host's sentiment from solidarity to resistance.

Massive humanitarian aid has been provided to Bangladesh by the international communities. The refugee crisis evoked wide international attention during its outbreak, and in the six months since August 2017, 344 million USD had been provided for their aid. The amount increased to 656 million USD in 2018, but aid started to decrease as international attention waned (Tayeb, 2021). While most aid was used for refugees at the beginning of the crisis, a part of the aid was spent for the host communities as the emergency phase ended. However, the support given was limited, and most host communities expressed dissatisfaction with it, and thus, compensation for the host population and reconciliation between hosts and refugees have become emerging issues for the Bangladeshi government and international aid agencies.

III. Data

We mainly used data collected from our original survey, which included an incentivized lab-in-the-field experiment to measure hostility toward Rohingya refugees. We supplemented such data using the Household Income and Expenditure Survey (HIES) 2016 data collected by the Bangladesh Bureau of Statistics to check for preexisting differences before the refugee influx.

Survey

Of the 64 districts in Bangladesh, we selected Cox's Bazar, where the camp is located, and Bandarban, which is next to Cox's Bazar, as our study area. The population of Cox's Bazar

district was 2.3 million before the refugee influx, after which 700,000 refugees arrived; the numbers illustrate the scale of refugee influx. We performed stratified random sampling in these two districts to choose 120 villages. These included 64 villages in the 4 most exposed sub-districts in Cox's Bazar, 32 villages in the remaining 4 sub-districts in Cox's Bazar, and 24 villages in 3 sub-districts in Bandarban. In each village, we randomly selected 15 households, and the expected sample size was 1,800 households. Appendix A provides more details on the sampling design and survey implementation.

Trained enumerators, mostly graduate students, visited each household to conduct an interview survey from January 2021 to January 2022. Each interview took 45 minutes at the median to complete the structured questionnaire and joy-of-destruction game, which were pre-programmed in a tablet computer-assisted personal interview (CAPI) application. We interviewed the household heads. When a head was unavailable, the enumerator made an appointment to revisit the household. When a head temporarily lived outside the village and was unavailable for interview, we interviewed a spouse or any household member with decision-making power when the head was absent. The response rate was high, and we obtained reliable answers from 1,754 households; in 95.8% of cases, a household head responded to our survey. Panel C in Figure 1 shows the locations of our sample households based on Global Positioning System (GPS) coordinates.

Joy-of-destruction (JOD) game

As an honorarium for participating in our survey, we offered 400 Bangladeshi Taka (BDT), which is equivalent to 4.7 USD, to the respondents.[1] Using this honorarium, we conducted an incentivized JOD game to measure respondents' willingness to harm others at a personal cost (Abbink and Herrmann, 2011; Abbink and Sadrieh, 2009). Prediger et al. (2014)

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[1] This conversion uses the exchange rate in January 2021. The rate had been stable until September 2021, and it increased by about 3% by January 2022.

is the first study, according to our knowledge, to adopt this game in the field by targeting a non-student sample, and Bauer et al. (2018) is a novel study that used this game to measure hostility toward an ethnic minority.

We gave the respondents the option to pay to reduce the donation we were making to an international non-governmental organization (NGO) working in the refugee camp. We anonymized the names of the NGO so that a particular name would not influence their decisions. The donation amount was 400 BDT and five times the amount paid was deducted from the donation. Each respondent had the option to pay 0, 20, 40, 60, or 80 BDT. We prepared discrete choice sets instead of continuous values to simplify the decision-making process. The economically rational strategy is to pay 0 BDT as the amount is deducted from earnings. In this case, both the respondent and the NGO received 400 BDT. If the respondent chose to pay 80 BDT, their remaining honorarium was 320 BDT, and the donation amount was 0 BDT. The maximum payable amount of 80 BDT is close to the daily per capita income. Since our sample households were poorly educated, and we carefully explained the amount of their earnings and donations in each scenario.

We believe that the JOD game is the most suitable for measuring hosts' hostility in an incentivized manner. No material gain was achieved by making a payment and no wrongdoing was punished (as in the punishment against free riders in the public goods game). Furthermore, as the initial endowment for the respondent and the refugee (i.e., through an NGO) was an equal amount of 400 BDT, the payment would reduce no inequality. However, the hosts may feel that they were deprived of their real lives because of the massive support received by refugees from the international community. They may have burned their money to damage such gains among refugees and reduce relative inequality. Hence, we collected information on a hypothetical inequality aversion measure and explicitly controlled for it in our regression

analysis.[2] In addition, the payment may be motivated by general antipathy to an outsider, and thus, we controlled self-reported distrust toward a foreigner in the regression analysis. Therefore, the payment in our JOD game, conditional on the inequality aversion and foreigner distrust measures, indicates the host's hostility toward refugees.

Other key variables

To measure self-reported perceptions of refugees, we collected four sets of information. The first was self-reported trust, which was based on the Social Value Orientation module. We asked how much the respondents trusted the Rohingya refugees, with the answer options ranging on a 4-point Likert scale. Second, we asked how much they thought Rohingya refugees would pay if they played a hypothetical JOD game to reduce support for the host communities. The third question was, "Do you think the Rohingya integrate well into the local Bangladeshi community?" The fourth was, "How well do you think you get on (communicate in general) with the Rohingya?" Both questions were borrowed from a household survey conducted by an international NGO called Xchange in 2018, and the answer options ranged on a 5-point Likert scale. Xchange surveyed 1,697 households in two sub-districts closest to the camp.

The influx of refugees has substantially affected the host communities' livelihoods. Although the movement of refugees is restricted outside the camp and they are not allowed to work in the host community, the restriction is not strictly imposed. Refugees visit the local market to purchase food and non-food items not included in the food aid package, which increases prices. They also engage in unskilled labor activities, mainly agricultural work or fishing, which puts downward pressure on wages. In addition, Rohingya refugees went outside the camp to collect non-timber forest products, particularly in the immediate aftermath of the

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[2] To measure inequality aversion, we followed Engelmann and Strobel (2004) and asked respondents to choose from the three allocations they would prefer. This choice enables us to disentangle inequality aversion from selfishness, efficiency concern, and maximin preferences.

influx. Resource extraction caused massive deforestation, and the refugees traveled tens of kilometers to collect forest resources once the surrounding forest was cleared. Following severe deforestation even in the Bandarban district, aid organizations started to distribute cooking gas cylinders about a year after the influx, which substantially reduced refugees' collection of forest resources. Several environmental assessments have been conducted using satellite imagery, and environmental damage has been reported (e.g., Ahmed et al., 2019; Hassan et al., 2018; Sakamoto et al., 2021). The influx also deteriorated hosts' sense of public security. Some refugees engage in criminal activities related to drugs and human trafficking, but these facts are exaggerated in the media and trigger anxiety among hosts.

To quantify the damage caused by the refugee influx, we collected information on the following aspects: commodity price, income, perceived level of crime, and forest degradation. For the first three, we asked the respondents to report changes therein in the past five years on a 5-point Likert scale, and we coded them as 1 if they responded "very much" to each question. For the environment, we asked if the respondents were aware of the forest degradation caused by the Rohingya.

IV. Results

This section describes the collected data, explains our empirical model, then presents the estimated results.

Descriptive results

Table 1 presents the characteristics of our sample households according to the three categories of their residential sub-districts. In the Muslim-majority district, Bengali Muslims were the majority. In the tribal-majority district, half were Bengali, and half were Muslim. The average household head was male, in their mid-40s, and had completed only three years of

education. According to the 2015 Barro-Lee data, the average completed years of education for cohorts 35–55 was approximately four years. This comparison indicates that our study area, particularly the tribal majority district, was underdeveloped. The average monthly household income was about 16,000 BDT in the Muslim-majority district, which was close to the national average. The average distance to the camp was 22 km in the exposed areas, whereas it was more than double in the other areas.

Panel A in Table 2 presents the descriptive results for the JOD game. In total, 58% of the sample paid part of their earned compensation to reduce support for refugees. Although we need to be cautious with comparisons across studies because of the differences in context, framing, or stake size, the proportion was higher than that observed in the existing studies. In the survey of the JOD game by Sanjaya (2021), 10 studies conducted the game with a costly destruction option and targeting a non-student sample; the average proportion was 36%. Furthermore, 15% of our respondents paid the maximum payable amount of 80 BDT (0.9 USD) to reduce support altogether. According to Table 1, the average monthly per capita income was approximately 3,000 BDT (dividing household income by household size), and the average daily per capita income was 100 BDT. Therefore, 80 BDT was close to our sample's average daily per capita income. Our finding that the majority of our sample reduced support for refugees in the game with a relatively high stake indicates an alarming tension between the hosts and the Rohingya refugees. The breakdown reveals that the respondents in the exposed areas paid more. Approximately two-thirds paid a non-zero amount, and 17% paid the maximum. Panel A in Appendix Figure B1 visualizes the results.

Panel B in Table 2 presents the descriptive statistics for the four perception variables. For the self-reported distrust, most respondents did not trust the Rohingya at all. However, unlike in the JOD game, there seems to be no systematic pattern between location and self-reported opinion measures. In the original survey conducted by Xchange in 2018, hosts'

opinions were much better. When asked the integration question, 81% answered yes. In our data, only 19% answered "very well" or "somewhat well" (and 26% responded neutrally). This comparison indicates the deterioration of sentiments over time.

As the scale of each question was different, we standardized each question (with a mean of 0 and a standard deviation of 1). We created an aggregated index by adding standardized scores. Aggregation was used to mitigate the problem of multiple hypothesis testing. The aggregated index reported toward the bottom shows that households living in the remote part of Cox's Bazar expressed more negative opinions than those living closer to the camp or Bandarban. Appendix Table B1 presents the correlation matrix of the JOD game, the aggregated index, and its components. It shows a positive correlation between the JOD payment and opinion index, but the correlation is weak, with a correlation coefficient of 0.213.

Finally, Panel C presents the descriptive statistics of the damage caused by the refugee influx. In all four categories, more households living closer to refugee camps experienced damage. A smaller share of households in other areas also reported damage, particularly with respect to environmental degradation. Others reported damage not necessarily caused by the refugee influx, as we asked about the changes in the past five years. We created a damage index by summing these four dummies, with the index ranging from 0 to 4. The index reported toward the bottom shows that households closer to the camp experienced more damage.

Regression specification

We performed regression analyses to examine the relationship between distance to the camp, damage caused by the refugee influx, and sentiment toward the refugees. First, we formulated our OLS model as follows:

$$y_i = \beta_0 + \beta_1 \times Dist_i + \boldsymbol{X_i\gamma} + \theta_j + \theta_k + \theta_t + \epsilon_i \qquad (1)$$

y_i indicates the outcome variable of household i, which can be the payment in the JOD game and the reported opinion of the refugees. $Dist_i$ is the distance from the location of each household to the nearest border of the camp. The rationale behind this specification is that the camp expansion was sudden and unexpected; thus, the distance captured exogenously induced exposure to refugees. X_i is a vector of household characteristics that may affect the outcome variables. It has all the variables presented in Table 1 except for household income. As household income at the time of the survey may have been affected by the refugee influx, we controlled for household income from five years ago, which was collected retrospectively. We also controlled for the dummy variable taking the value of 1 if a non-household head responded to the survey.

We likewise controlled for various fixed effects. θ_j indicates the sub-district fixed effects. As households in the same village share similar values of $Dist_i$, and our primary interest was not the within-village difference in exposures but the between-village difference, we did not control for village fixed effects. Panel C in Figure 1 illustrates that the sample villages are scattered around the sample districts. To control for the unobserved autocorrelation of outcomes among villagers, we clustered the standard error, ε_i, at the village level. We also controlled for the enumerator fixed effect, θ_k. Since our outcome includes sensitive information, how the enumerator asked the question or how they behaved may have influenced the response. We controlled for the survey phase fixed effects, θ_t, to control for overall changes in the political or other environmental aspects surrounding the Rohingya issue.

β_1 in our OLS model indicates the effect of living close to the camp. To examine the impact of damage on sentiment, we conducted an analysis using the distance to the camp as an instrument for the damage index. Our two-stage IV model is postulated as follows:

$$Damage_i = \beta_0 + \beta_1 \times Dist_i + X_i\gamma + \theta_j + \theta_k + \theta_t + \epsilon_i \tag{2}$$

$$y_i = \beta_0 + \beta_1 \times \widehat{Damage}_1 + X_i\gamma + \theta_j + \theta_k + \theta_t + \epsilon_i \tag{3}$$

In the first stage, the damage index was regressed on $Dist_i$, controlling for the same variables as in Equation (1). The two-stage model examined how exposure to refugees, measured by distance, caused damage to host households. The outcome variable was then regressed on the predicted damage index in the second stage. β_1 in the second stage indicates how the damage caused by the refugee influx was translated into hostility.

Validity of empirical strategy

Before presenting the estimated results, we discuss the exogeneity of our distance variable by examining the relationship between distance and pre-existing socioeconomic conditions. To do so, we employed the HIES data, which are based on a nationally representative survey. We used the data from the 2016 round, which collected data from 46,076 households.[3] The HIES adopted stratified sampling, and the 2016 data covered 57 villages located in our study sub-district. Appendix Figure C1 presents the locations of the sample villages. Twenty households were randomly sampled from each sample village, and we had 1,140 observations in our study area. We regressed various characteristics of these 1,140 households on the distance to the camp so that we could examine whether the pre-existing differences were correlated with distance.

Appendix Figure C2 illustrates the regression coefficients and confidence intervals for the distance variables. The outcome variables were standardized, sub-district fixed effects were controlled for, and standard errors were clustered at the village level. The coefficient of distance

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[3] We initially planned to also use the 2010 round to construct repeated cross-section data to check pre-trends, but the 2010 survey was much smaller in sample size and contained only 10 villages (200 households) in our study area. Hence, we decided to use only the 2016 data.

was not significant for all individual characteristics. It is significant for the log of non-food expenditure, but the point estimate is not large. Furthermore, the coefficient is insignificant for food and total expenditure. These results indicate that the distance to the camp, conditional on the sub-district fixed effect, was not correlated with various pre-existing measures, including human capital stock, health status, living standards, the experience of shocks, and migration. Therefore, we can interpret the distance to the camp as a measure of exposure to Rohingya refugees.

Regression results

Panel A in Table 3 presents our main results, in which the outcome is the amount paid in the BDT. The odd-numbered columns show a parsimonious model controlling only the sub-district, enumerator, and survey phase-fixed effects. In the even-numbered columns, we included the full set of household characteristics. While the distance to the camp was not correlated with pre-existing observable characteristics, there might be some differences between households closer to and farther away from the camp. The inclusion of household-level control variables may have improved the precision of our regression analysis.

Columns (1) and (2) present the OLS results. The distance to the camp is negative and significant, and the coefficient does not differ significantly with the inclusion of control variables. These results indicate that households exposed to refugees paid significantly more to reduce their support. According to Table 1, the median distance to the camp was 23.2 km in the adjunct areas and 68.2 km in the remote areas. The point estimate of -0.33 in column (1) means that the paid amount differed by 14.9 BDT between a household with median remoteness to the camp in the adjunct areas and that with median remoteness to the camp in the remote areas. Panel B in Appendix Figure B1 graphically illustrates the non-parametric relationship between distance and paid amount (without controlling for any fixed effect). It demonstrates

that the negative relationship consistently holds for all the distance ranges.

There are three points to note regarding the control variables, whose point estimates are presented in Appendix Table B2. First, the coefficient of completed years of schooling is negative and significant, thus indicating that educated households pay less. It may be because they understood that payment would not increase their payoff. This result may be consistent with the general pattern obtained from the cross-country analysis by Mayda (2006) that the educated population has a positive view of immigrants. Second, the Muslim dummy variable was negative and significant. As the vast majority of Rohingyas believe in Muslim, Muslim hosts were more sympathetic toward them and did not dare reduce the support for them. This finding reiterates the fact that the JOD game successfully measured the real sentiment. Third, the distrust in a foreigner is negative and significant. This suggests that, even after controlling for general antipathy to an outsider, the exposed households paid more, which indicates their hostility directed toward the refugees.

Columns (3) and (4) present the first-stage IV results. The distance was negative and significant, thus suggesting that households living closer to the camp were adversely affected. The F-statistics reported toward the bottom are greater than the conventional level of 20, thus validating our IV strategy. Columns (5) and (6) present the second-stage results. The coefficient is positive and significant, thereby indicating that households that experienced damage by refugees paid more. The point estimate reported in column (1) was 19.9, and the damage index ranges from 0 to 4. Hence, the households that experienced all the damages paid almost 80 BDT more than households that did not experience any damage. For the control variables, the education and Muslim variables are negative and significant while the distruct variable is positive and significant, as in Columns (1) and (2). Overall, Panel A shows that the households more exposed to the refugees, particularly those adversely affected by them, exhibited hostile attitudes toward the refugees.

Table 2 shows that the results of the JOD game had twin peaks at 0 BDT and 80 BDT, and thus, there may be a distinction between the households that did not pay at all and those who paid at least the smallest possible amount of 20 BDT. Hence, we estimated the Linear Probability Model, where the outcome is a dummy variable taking the value of 1 if a household paid at least 20 BDT, and 0 otherwise. This model examines if exposure to the refugees influences the extensive margin of the decision to pay in the JOD game. Appendix Table B3 presents the results. The first-stage regression is exactly the same as that reported in Table 3, and its results are not presented. The results present qualitatively the same pattern. The distance is negatively correlated with the payment in the OLS model, and the damage index is positively correlated with the payment in the IV model.

Subsequently, we analyzed how opinions were related to exposure. We used the aggregated standardized score as an outcome variable and estimated the same OLS and IV models. Panel B of Table 3 presents the results. In the OLS model, the coefficient of distance is small and insignificant (see Columns 1 and 2). Similarly, the coefficient of distance is insignificant in the IV model (see Columns 3 and 4). The results indicate that households more exposed to refugees or those more affected by their inflow were no more likely to express negative opinions toward refugees. In other words, the households less exposed and less affected were equally likely to express negative opinions. Although the estimated coefficients of control variables are only reported in Appendix Table B4, the Muslim dummy was negative and significant, thereby indicating that Muslims expressed more favorable opinions toward refugees of the same religion. Upon investigating each of the four components of the opinion measures, there was no relationship. The results are reported in Appendix Table B5, and none of the distances or damage coefficients is significant.

Panels A and B in Table 3 present a clear contrast. The exposed and affected households paid significantly more, but were no more likely to express negative opinions toward the

refugees. This result indicates that the expression of negative opinion was cheap talk, and the majority of Bangladeshi hosts expressed negative opinions toward the refugees. However, only those exposed and directly affected were willing to pay real money. This contrasting pattern suggests that the incentivized game revealed real (and not cosmetic) hostility toward refugees.

Heterogeneity

Lastly, we turn to heterogeneous effects of exposure to the refugees. For readability, Table 4 only presents results on the OLS estimation that included the control variable (i.e., the results comparable to those reported in column 2 in Table 3). There are three points to note. First, the coefficient of the distance variable is stable both for the JOD payment and the opinion index, even when the interaction term with each control variable was added. This indicates that no particular sub-group drives our results and reinforces our conclusion. Second, the interaction with the religious identity variable is positive and significant. We interpret that the host households who strongly believe in Muslim innately felt sympathy for Rohingya, and their sentiment was not much affected by negative exposure to them. Third, the interaction with the inequality aversion is negative and significant. Together with the coefficient of inequality aversion itself, the inequality-averse households paid more than non-averse households only in a remote area. This may be because households in remote mountainous areas are poor, and they particularly envied the massive humanitarian support enjoyed by the refugees.

V. Conclusions

While it is important to consider the sentiments of the host population to implement policies for their compensation and reconciliation with the refugees, the literature has not analyzed the impact of refugee influx on the emotional aspects of hosts. To fill this important research gap, this study collected unique data on hosts' sentiments in an incentivized manner.

The deterioration of the hosts' feelings became evident, and policymakers and aid workers need to be aware of these results when formulating policies for refugees and host communities.

An important next step is to find an effective program to reduce the tension between hosts and refugees. A joint sports event is a typical attempt by aid organizations for such purposes. Lowe (2021) and Mousa (2020) conducted a field experiment and found the effectiveness as well as the limitations of such interventions. Despite its effectiveness, organizing a sports event or other social events involving different groups is usually costly and not scalable. An alternative option is the provision of information. Blouin and Mukand (2019) found that a radio campaign significantly improved attitudes and behavior toward a previously fighting ethnic group in Rwanda. There is room for investigating what types of information and media (including traditional media, online media, or social networking services) are most effective in facilitating social cohesion.

A broader implication of our study is the efficacy of an incentivized experiment to elicit real sentiments. The usual opinion survey is hypothetical and the responses may be cheap talk. We found that less affected households also expressed negative opinions while paying significantly less in the JOD game. Although the full-scale implementation of an incentivized game is costly, it can be implemented among a subset of survey respondents to better understand their real preferences toward an outgroup such as immigrants, political parties, or religious or ethnic groups.

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Table 1: Characteristics of sample household

	Muslim majority sub-district (near the camp)		Muslim majority sub-district (far from the camp)		Tribal majority sub-district	
	Mean	SD	Mean	SD	Mean	SD
Household Survey	N = 955		N = 471		N = 328	
Characteristics of HH head						
=1 if male	0.79	0.40	0.84	0.36	0.84	0.37
=1 if Bengali	0.97	0.17	1.00	0.05	0.50	0.50
Completed years of schooling	3.4	4.3	3.4	4.2	2.1	3.3
Age (at the time of the survey)	47.3	14.8	47.7	14.0	45.6	13.7
= 1 if feel belonged more to a religious group	0.52	0.50	0.65	0.48	0.39	0.49
=1 if averse to inequality	0.64	0.48	0.69	0.46	0.78	0.41
Distrust in a foreigner (4 scale)	3.0	1.02	3.3	0.93	3.3	0.91
=1 if interacting with Rohingya	0.33	0.47	0.04	0.20	0.08	0.28
Characteristics of HH						
=1 if migrated in the past 5 years	0.04	0.20	0.07	0.26	0.03	0.16
Number of HH members	5.7	2.2	5.6	2.2	5.4	2.1
Monthly HH income (BDT)	16,667	18,900	16,048	17,497	10,090	9,981
Distance to the city (minutes)	67.6	88.7	93.5	116.0	133.1	130.5
Remote Sensing Data [a]	N = 934		N = 464		N = 289	
Distance to the camp (km)	21.8	12.6	63.6	12.3	48.5	15.2
Min	0		38.3		15.3	
Median	23.2		68.2		51.6	
Max	62.9		82.1		68.0	

Note: (a) GPS location of some sample households was not recorded in CAPI either because the interview was conducted outside the household (0.9%) or because the GPS signal was not captured by the tablet (2.9%).

Table 2: Descriptive statistics of main variables

	Muslim majority (near the camp) N = 955	Muslim majority (far from camp) N = 471	Tribal majority N = 328	Total N=1754
Panel A: JOD game	26.3	22.5	19.2	24.0
	(29.0)	(27.4)	(25.2)	(28.0)
0 BDT	[38.9]	[44.4]	[49.1]	[42.2]
20 BDT	[28.6]	[29.1]	[28.9]	[28.8]
40 BDT	[11.7]	[9.3]	[7.2]	[10.3]
60 BDT	[3.6]	[4.0]	[6.3]	[4.2]
80 BDT	[17.2]	[13.2]	[8.5]	[14.5]
Panel B: Opinion				
Self-reported distrust	3.7	3.8	3.7	3.7
(4 Likert scale)	(0.66)	(0.63)	(0.65)	(0.65)
JOD by Rohingya	26.1	27.6	16.5	24.8
(0, 20, 40, 60, 80 BDT)	(33.6)	(34.3)	(26.2)	(32.8)
Opinion integration (reverse)	3.6	3.8	3.4	3.6
(5 Likert scale)	(1.23)	(1.06)	(1.08)	(1.17)
Opinion getting on (reverse)	3.2	3.5	3.0	3.3
(5 Likert scale)	(1.23)	(1.10)	(0.81)	(1.14)
Standardized Index	-0.07	0.53	-0.64	0.00
(Aggregated)	(2.51)	(2.46)	(1.97)	(2.44)
Panel C: Damage				
HH income declined	0.37	0.30	0.30	0.34
(=1 if yes)	(0.48)	(0.46)	(0.46)	(0.47)
Commodity price increased	0.19	0.17	0.10	0.17
(=1 if yes)	(0.39)	(0.37)	(0.30)	(0.37)
Forest degraded	0.59	0.35	0.30	0.47
(=1 if yes)	(0.49)	(0.48)	(0.46)	(0.50)
Level of crime increased	0.20	0.04	0.04	0.13
(=1 if yes)	(0.40)	(0.20)	(0.21)	(0.33)
Damage index	1.34	0.86	0.75	1.10
(0 – 4)	(1.07)	(0.93)	(0.85)	(1.03)

Note: Numbers are the means, numbers in parentheses are standard deviations, and numbers in brackets are proportions.

Table 3: Main estimation results

Panel A: JOD

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	OLS		First stage		IV	
	JOD payment (BDT)		Damage index		JOD payment (BDT)	
Distance to the camp (km)	-0.33***	-0.33***	-0.017***	-0.013***		
	(0.13)	(0.12)	(0.0041)	(0.0041)		
Damage index					19.9***	25.5***
					(6.35)	(8.74)
Control variables	N	Y	N	Y	N	Y
N	1687	1687	1687	1687	1687	1687
First-stage F-statistics			32.9	29.3		

Panel B: Opinion index

Dependent variable	(1)	(2)	(3)	(4)
	OLS		IV	
	Negative opinion index			
Distance to the camp (km)	0.0011	-0.0013		
	(0.0078)	(0.0076)		
Damage index			-0.067	0.10
			(0.47)	(0.56)
Control variables	N	Y	N	Y
N	1687	1687	1687	1687

Note: Estimated coefficients are reported. ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Numbers in parentheses are standard errors clustered at the village level. Sub-district fixed effects, enumerator fixed effects, and survey phase fixed effects were controlled.

Table 4: Heterogeneity (OLS)

Dependent variable	JOD payment (BDT)		Negative opinion index	
	(1)	(2)	(3)	(4)
X	Distance	Distance interacted with X	Distance	Distance interacted with X
=1 if male	-0.31**	-0.029	-0.0017	0.00042
	(0.13)	(0.078)	(0.0093)	(0.0055)
N	313	1374	313	1374
=1 if Bengali	-0.35	0.019	-0.0067	0.0056
	(0.22)	(0.19)	(0.013)	(0.010)
N	179	1508	179	1508
=1 if Muslim	-0.40**	0.072	-0.0044	0.0032
	(0.17)	(0.12)	(0.011)	(0.0073)
N	280	1407	280	1407
Competed years of schooling	-0.33***	-0.0084	-0.000044	-0.0025
(=1 if above median)	(0.12)	(0.036)	(0.0082)	(0.0034)
N	856	831	856	831
Age	-0.36***	0.053	-0.0047	0.0062*
(=1 if above median)	(0.12)	(0.041)	(0.0078)	(0.0032)
N	876	811	876	811
= 1 if feel belonged to a religion	-0.41***	0.13*	-0.0081	0.011**
	(0.14)	(0.064)	(0.0086)	(0.0048)
N	772	915	772	915
=1 if averse to inequality	-0.43***	0.16**	0.0043	0.064
	(0.12)	(0.066)	(0.0086)	(0.11)
N	554	1133	554	1133
Distrust in a foreigner	-0.30**	-0.055	-0.0035	0.0037
(=1 if above median)	(0.12)	(0.051)	(0.0084)	(0.0043)
	784	903	784	903
=1 if interacting with Rohingya	-0.35***	0.064	0.0060	-0.024**
	(0.13)	(0.11)	(0.0080)	(0.011)
N	1348	339	1348	339
=1 if migrated	-0.34***	0.077	-0.0019	0.0076
	(0.11)	(0.27)	(0.0074)	(0.015)
N	71	1616	71	1616
Number of HH members	-0.32**	-0.033	0.00064	-0.0052
(=1 if above median)	(0.13)	(0.037)	(0.0077)	(0.0032)
N	921	766	921	766
Log (past per capita income)	-0.36***	0.049	-0.0034	0.0034
(=1 if above median)	(0.12)	(0.031)	(0.0078)	(0.0022)
N	841	846	841	846
Log (distance to the city)	-0.40***	0.14**	-0.0055	0.0088**
(=1 if above median)	(0.13)	(0.061)	(0.0074)	(0.0040)
N	1107	580	1107	580
=1 if non-HH head responded	-0.33***	0.095	-0.0018	0.018
	(0.12)	(0.14)	(0.0075)	(0.013)
N	1620	67	1620	67

Note: N in columns 1 and 3 presents the sample size of those whose control variable takes the value of 0 while N in columns 2 and 4 presets that takes 1. Estimated coefficients are reported. ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Numbers in parentheses are standard errors clustered at the village level. The control variables, sub-district fixed effects, enumerator fixed effects, and survey phase fixed effects were controlled.

Figure 1: Expansion of the refugee camp and location of sample household
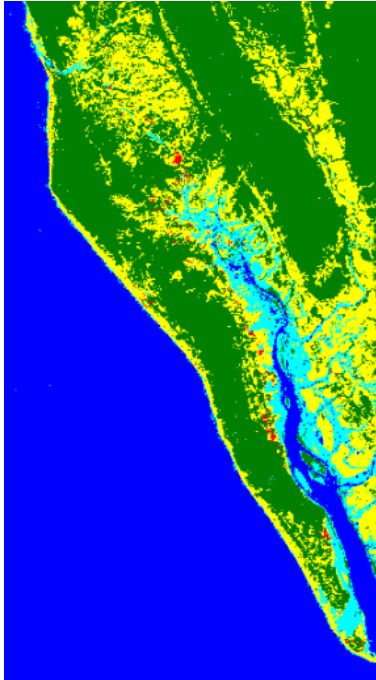
Panel A: 2016   Panel B: 2018   Panel C: Sample household
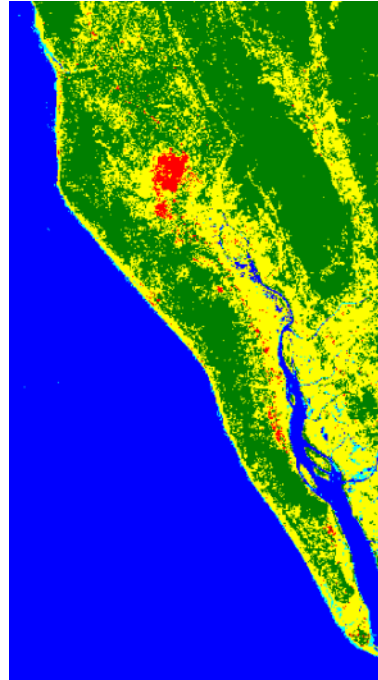
	permanet water
	temporal water
	vegetation
	barren
	built-up
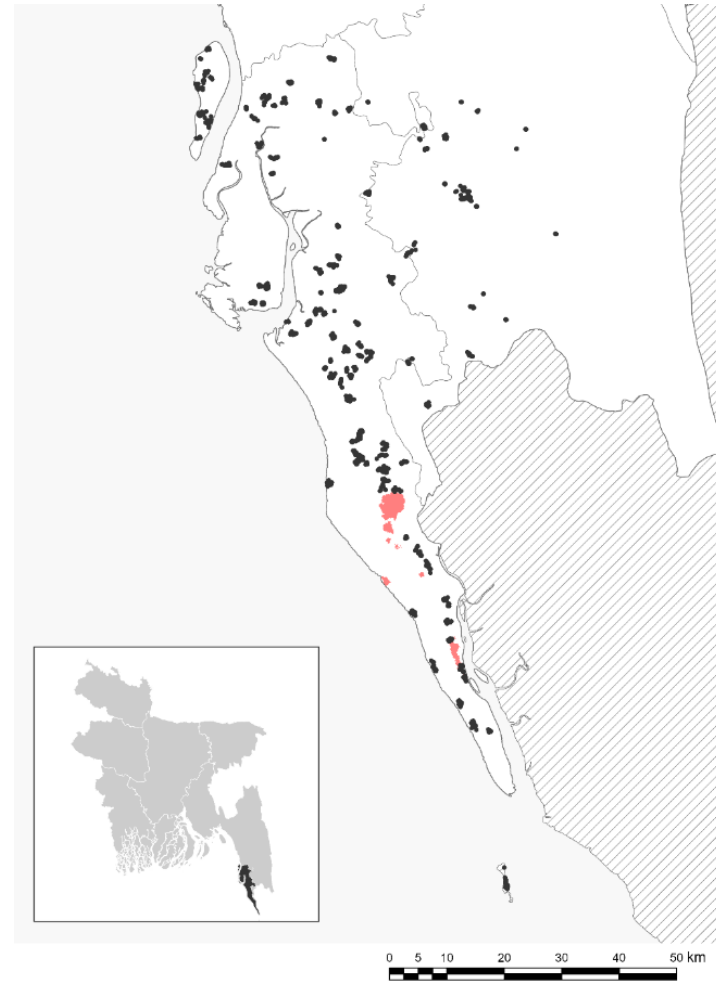
Note: Panels A and B show land cover maps in 2016 and 2018, respectively. The maps encompass an area of 39 km from east to west and 65 km from north to south. The maps were created based on Landsat 8 images. Data on Landsat 8, vegetation index, water index, and built-up index were extracted from Google Colab. The pixel resolution was about 120 meters. The random forest algorithm was used to classify each pixel into five types; permanent water, temporal water, vegetation, barrens, and built-up. In the classification process, supervised data were manually obtained from Landsat images to train the algorithm. We adjusted the consistency of the time series for pixels classified as built-up using data from 2014 to 2021 by assuming that the built-up will not change to vegetation or barrens in a relatively short period of time. Panel C shows the location of Cox's Bazar district is shown in dark gray on the lower left map, which depicts entire Bangladesh. The areas in red on the main map are refugee camps, while the shaded areas are Myanmar. The black dots show the locations of surveyed households.

Appendix A: Sampling Design and Survey Implementation

Bangladesh has 64 districts, and we performed stratified random sampling for two of them in this study: Cox's Bazar and Bandarban. The refugee camp is located in Cox's Bazar District. The population of Cox's Bazar district was 2.3 million before the refugee influx, after which 700,000 refugees arrived; the numbers illustrate the scale of refugee influx. Most residents in this district are Bengali Muslim. The Bengali dialect in the district is also similar to the Rohingya language and can be used to communicate with each other.

Bandarban district is next to Cox's Bazar and is one of the three provinces of the Chittagong Hill Tract, where the minority non-Muslim group is exceptionally dominant in Bangladesh. While there are restrictions on the movement of refugees outside the camp, Bandarban District is accessible by land, and environmental damage was reportedly caused by refugees' collection of non-timber forest products. Furthermore, as houses in the camp are mainly constructed of bamboo, the surge in demand has resulted in the illegal cutting down of bamboo groves. In our survey, we included Bandarban to analyze how the deforestation affected people in this district, and how the sentiment of the non-Muslim population differed from that of the Muslim majority camp-adjoining community.

We targeted all eight sub-districts (called Upazilas in Bangladesh) in Cox's Bazar and three (out of seven) sub-districts located in Southern Bandarban, which were closer to the camp. Refugee-induced damage was mostly concentrated in these sub-districts. The 11 sub-districts consisted of (i) the 4 most exposed sub-districts in Cox's Bazar, (ii) the remaining 4 sub-districts in Cox's Bazar, and (iii) 3 sub-districts in Bandarban. Given budgetary and human resource constraints, we randomly sampled 16 villages from each of the four exposed sub-districts and eight villages each from the other two categories. Based on the list of all villages in each sub-district, we randomly sampled a fixed number of villages from each sub-district. The total sample villages are 16 villages × 4 sub-districts + 8 villages × (4+3) sub-districts =

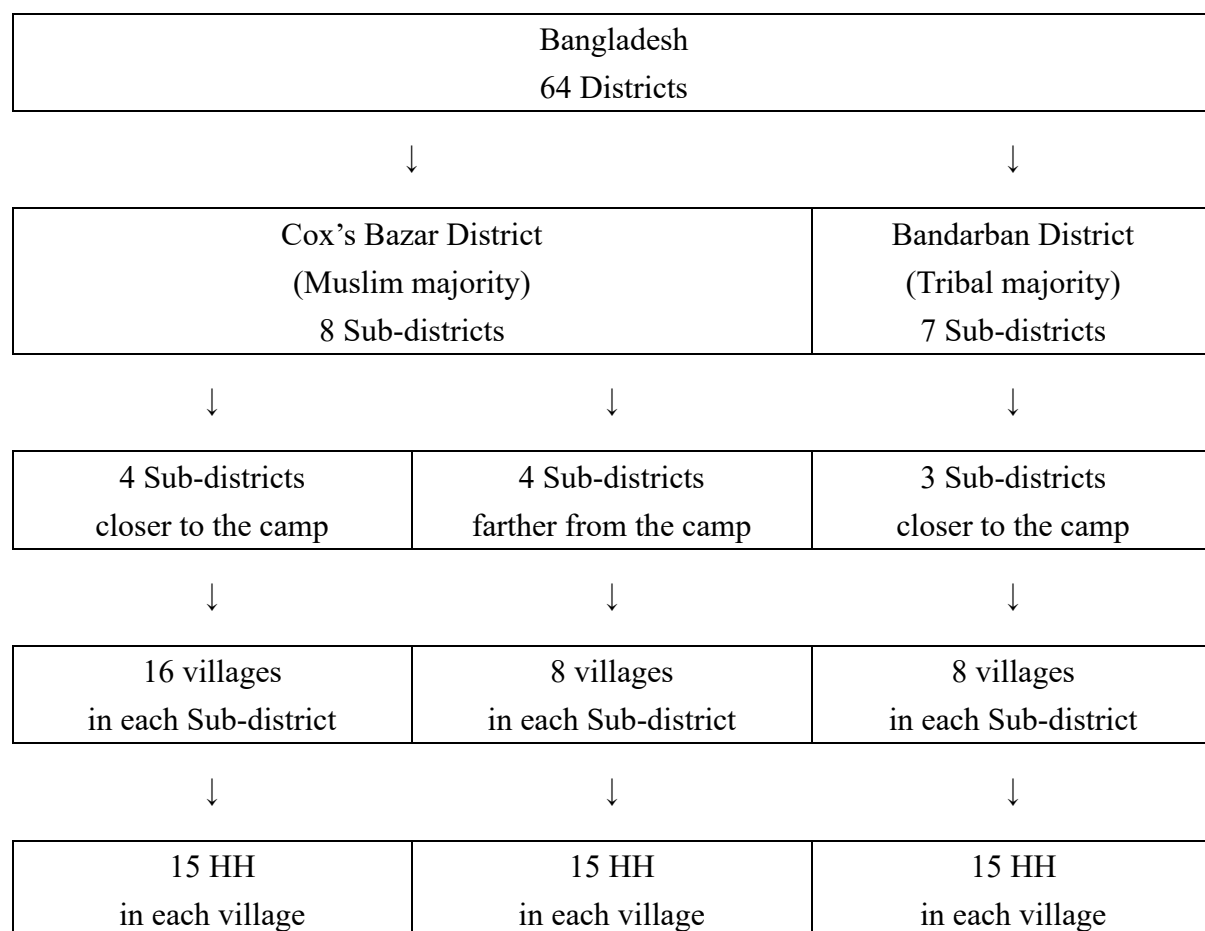120 villages. Appendix Table A1 presents the sampling design.

We randomly selected 15 households from each of the 120 sampled villages. In some villages without an updated list of households, we created a list before sampling. The expected sample size was 15 households × 120 villages = 1,800 households. Some sampled villages in Bandarban, which were located in a remote area, had fewer than 15 households; we interviewed all households in these villages. Furthermore, some data collection interviews were not conducted when the respondent was unfound or unavailable. We ultimately collected data from 1,754 households.

Trained enumerators, mostly graduate students, visited each household to conduct an interview survey. Each interview took 45 minutes at the median to complete the structured questionnaire and the joy-of-destruction game. The questionnaire and game were pre-programmed in a tablet computer-assisted personal interview (CAPI) application. We interviewed the household heads. When a head was unavailable, the enumerator made an appointment to revisit the household. When a head temporarily lived outside the village and was unavailable for interview, we interviewed a spouse or any household member with decision-making power when the head was absent. The response rate was high, and we obtained reliable answers from 1,754 households; in 95.8% of cases, a household head responded to our survey.

The survey was conducted in three phases from January 2021 to January 2022. The first phase was a pilot survey conducted in January 2021 in 5 villages randomly selected from 120 villages. We did not find any major problems. We then added minor edits to the questionnaire and started a full-scale survey soon after the pilot. The majority of sampled households were interviewed between January and March 2021. Although we planned to finish all of the interviews in early 2021, we took a pause in March 2021—at which point we had completed interviews with 1,701 households—because of coronavirus disease (COVID-19)-related

restrictions and problems with the CAPI server. We were able to resume the survey in December 2021, interview the remaining households, and collect data from 53 households by January 2022.

Appendix Table A1: Sampling scheme

Bangladesh 64 Districts		

↓		↓

Cox's Bazar District (Muslim majority) 8 Sub-districts		Bandarban District (Tribal majority) 7 Sub-districts

↓	↓	↓

4 Sub-districts closer to the camp	4 Sub-districts farther from the camp	3 Sub-districts closer to the camp

↓	↓	↓

16 villages in each Sub-district	8 villages in each Sub-district	8 villages in each Sub-district

↓	↓	↓

15 HH in each village	15 HH in each village	15 HH in each village

Appendix B: Additional Tables and Figures

Appendix Table B1: Correlation matrix of the outcome variables

	JOD	(A)	(B)	(C)	(D)
Paid amount in the JOD game					
Self-reported trust (A)	0.123				
JOD by Rohingya (B)	0.197	0.062			
Opinion on integration (C)	0.109	0.212	0.078		
Opinion on getting on (D)	0.092	0.215	0.022	0.391	
Standardized index (E)	0.213	0.610	0.476	0.689	0.667

Appendix Table B2: Estimation results on JOD (full model)

Dependent variable	OLS		First stage		IV	
	(1)	(2)	(3)	(4)	(5)	(6)
	JOD payment (BDT)		Damage index		JOD payment (BDT)	
Distance to the camp (km)	-0.33***	-0.33***	-0.017***	-0.013***		
	(0.13)	(0.12)	(0.0041)	(0.0041)		
Damage index					19.9***	25.5***
					(6.35)	(8.74)
=1 if male		1.71		0.064		0.075
		(1.87)		(0.058)		(2.18)
=1 if Bengali		7.32		0.22*		1.67
		(5.53)		(0.13)		(5.76)
=1 if Muslim		-9.68**		-0.011		-9.41**
		(4.77)		(0.10)		(4.34)
Competed years of schooling		-0.38**		0.013**		-0.70***
		(0.18)		(0.0055)		(0.24)
Age		-0.047		0.00041		-0.057
		(0.055)		(0.0016)		(0.059)
= 1 if feel belonged to a religion		-1.34		-0.033		-0.49
		(1.61)		(0.049)		(1.99)
=1 if averse to inequality		-1.57		-0.095*		0.85
		(1.61)		(0.051)		(2.15)
Distrust in a foreigner		1.65*		-0.031		2.45**
		(0.85)		(0.026)		(1.01)
=1 if interacting with Rohingya		3.87*		0.26***		-2.68
		(2.13)		(0.067)		(3.40)
=1 if migrated		-2.80		0.21		-8.19*
		(3.89)		(0.15)		(4.46)
Number of HH members		-0.26		0.014*		-0.61*
		(0.29)		(0.0078)		(0.32)
Log (past per capita income)		0.36		-0.0056		0.51
		(0.28)		(0.0086)		(0.33)
Log (distance to the city)		-0.49		-0.050		0.79
		(0.97)		(0.034)		(1.40)
=1 if non-HH head responded		1.21		0.031		0.43
		(3.48)		(0.092)		(3.87)
N	1687	1687	1687	1687	1687	1687
First-stage F-statistics			32.9	29.3		

Note: Estimated coefficients are reported. ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Numbers in parentheses are standard errors clustered at the village level. Sub-district fixed effects, enumerator fixed effects, and survey phase fixed effects were controlled.

Appendix Table B3: Estimation results on JOD (extensive margin, full model)

Dependent variable	OLS		IV	
	(1)	(2)	(3)	(4)
	=1 if paid a non-zero amount in JOD			
Distance to the camp (km)	-0.0051***	-0.0050***		
	(0.0018)	(0.0017)		
Damage index			0.31***	0.39***
			(0.087)	(0.12)
=1 if male		0.028		0.0026
		(0.035)		(0.040)
=1 if Bengali		0.019		-0.067
		(0.072)		(0.093)
=1 if Muslim		-0.14***		-0.14***
		(0.047)		(0.052)
Competed years of schooling		-0.0039		-0.0087**
		(0.0031)		(0.0041)
Age		-0.00047		-0.00063
		(0.00090)		(0.00092)
= 1 if feel belonged to a religion		-0.038		-0.025
		(0.030)		(0.035)
=1 if averse to inequality		-0.017		0.020
		(0.026)		(0.032)
Distrust in a foreigner		0.035**		0.047***
		(0.013)		(0.015)
=1 if interacting with Rohingya		0.068*		-0.032
		(0.035)		(0.054)
=1 if migrated		-0.048		-0.13
		(0.080)		(0.090)
Number of HH members		-0.0031		-0.0084
		(0.0057)		(0.0061)
Log (past per capita income)		0.0013		0.0035
		(0.0046)		(0.0057)
Log (distance to the city)		-0.024*		-0.0049
		(0.015)		(0.019)
=1 if non-HH head responded		-0.012		-0.024
		(0.054)		(0.062)
N	1687	1687	1687	1687

Note: Estimated coefficients are reported. ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Numbers in parentheses are standard errors clustered at the village level. Sub-district fixed effects, enumerator fixed effects, and survey phase fixed effects were controlled.

Appendix Table B4: Estimation results on opinion (full model)

Dependent variable	OLS		IV	
	(1)	(2)	(3)	(4)
	Negative opinion index			
Distance to the camp (km)	0.0011	-0.0013		
	(0.0078)	(0.0076)		
Damage index			-0.067	0.10
			(0.47)	(0.56)
=1 if male		0.15		0.14
		(0.12)		(0.13)
=1 if Bengali		0.62*		0.60*
		(0.32)		(0.34)
=1 if Muslim		-0.57**		-0.57**
		(0.25)		(0.24)
Competed years of schooling		-0.016		-0.017
		(0.014)		(0.015)
Age		-0.00036		-0.00040
		(0.0042)		(0.0042)
= 1 if feel belonged to a religion		0.099		0.10
		(0.11)		(0.11)
=1 if averse to inequality		-0.14		-0.13
		(0.12)		(0.14)
Distrust in a foreigner		0.38***		0.38***
		(0.073)		(0.072)
=1 if interacting with Rohingya		-0.0047		-0.031
		(0.22)		(0.25)
=1 if migrated		0.16		0.14
		(0.39)		(0.41)
Number of HH members		-0.00071		-0.0021
		(0.025)		(0.024)
Log (past per capita income)		0.014		0.015
		(0.019)		(0.019)
Log (distance to the city)		0.010		0.015
		(0.074)		(0.085)
=1 if non-HH head responded		-0.14		-0.14
		(0.27)		(0.27)
N	1687	1687	1687	1687

Note: Estimated coefficients are reported. ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Numbers in parentheses are standard errors clustered at the village level. Sub-district fixed effects, enumerator fixed effects, and survey phase fixed effects were controlled.

Appendix Table B5: Estimation results on opinion (OLS, each component, full model)

| Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Self-reported trust		JOD by Rohingya		Integration		Getting-on	
Distance to the camp	0.0027	0.0013	-0.11	-0.067	-0.0038	-0.0036	0.0042	0.0021
(km)	(0.0022)	(0.0020)	(0.14)	(0.14)	(0.0043)	(0.0042)	(0.0035)	(0.0035)
=1 if male		0.025		0.41		0.050		0.065
		(0.040)		(1.82)		(0.059)		(0.061)
=1 if Bengali		0.046		0.58		0.38**		0.24
		(0.10)		(5.66)		(0.15)		(0.15)
=1 if Muslim		-0.065		1.38		-0.33***		-0.26**
		(0.063)		(4.61)		(0.12)		(0.12)
Competed years of		0.0034		-0.35*		-0.0053		-0.0063
Schooling		(0.0036)		(0.21)		(0.0061)		(0.0058)
Age		-0.00011		-0.022		-0.00087		0.0014
		(0.0011)		(0.055)		(0.0021)		(0.0018)
= 1 if feel belonged to a		-0.0075		0.41		0.018		0.095*
religion		(0.037)		(1.49)		(0.051)		(0.057)
=1 if averse to inequality		-0.047		-0.43		-0.061		0.00081
		(0.037)		(1.81)		(0.066)		(0.052)
Distrust in a foreigner		0.19***		0.53		0.025		0.056*
		(0.025)		(0.90)		(0.030)		(0.030)
=1 if interacting with		-0.044		6.03**		-0.013		-0.13*
Rohingya		(0.061)		(2.34)		(0.084)		(0.074)
=1 if migrated		0.15**		-0.074		-0.083		0.010
		(0.073)		(5.88)		(0.20)		(0.17)
Number of HH members		0.0062		-0.060		0.0029		-0.013
		(0.0079)		(0.40)		(0.011)		(0.010)
Log (past per capita		0.010*		-0.055		0.0091		-0.0084
income)		(0.0057)		(0.28)		(0.0089)		(0.0082)
Log (distance to the city)		-0.0042		-0.76		-0.010		0.056
		(0.019)		(1.15)		(0.034)		(0.035)
=1 if non-HH head		0.068		-4.34		-0.12		-0.0089
responded		(0.063)		(3.45)		(0.12)		(0.10)
N	1687	1687	1687	1687	1687	1687	1687	1687

Note: Estimated coefficients are reported. ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Numbers in parentheses are standard errors clustered at the village level. Sub-district fixed effects, enumerator fixed effects, and survey phase fixed effects were controlled.

Appendix Figure B1: Visualization of main results
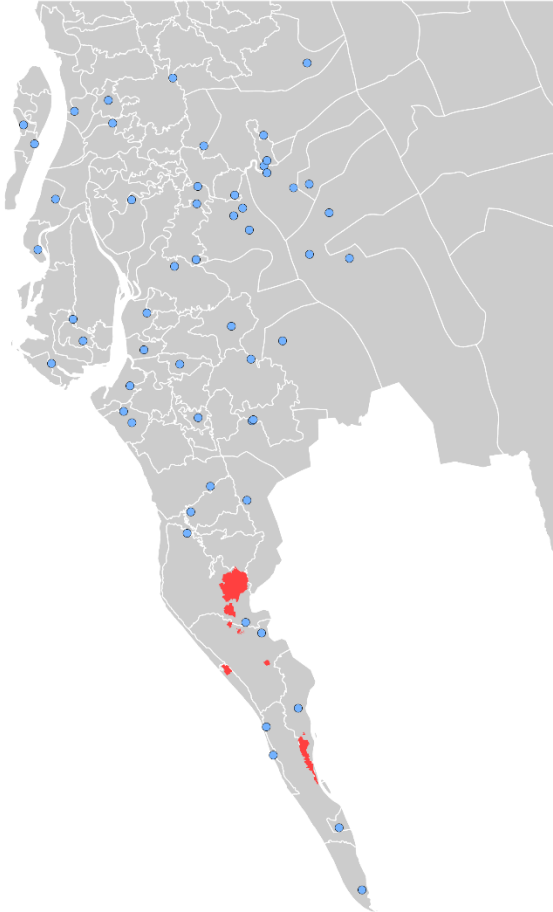
Panel A: Results of the JOD game

Paid amount in JOD
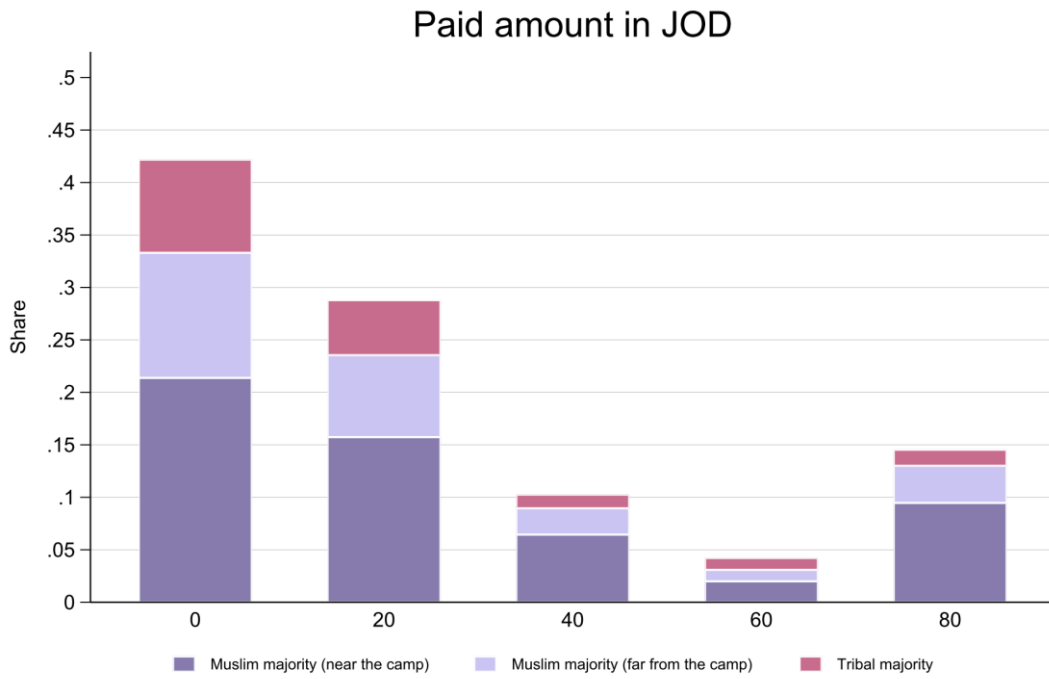
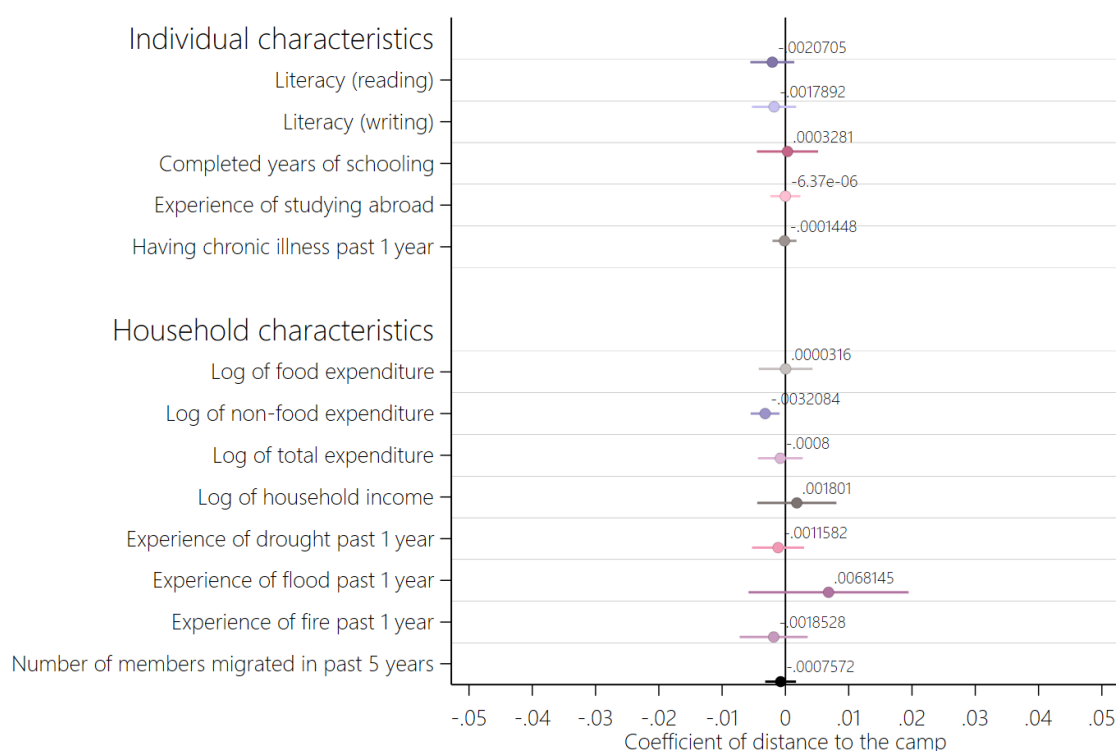Panel B: Relationship between the JOD game and distance to the camp
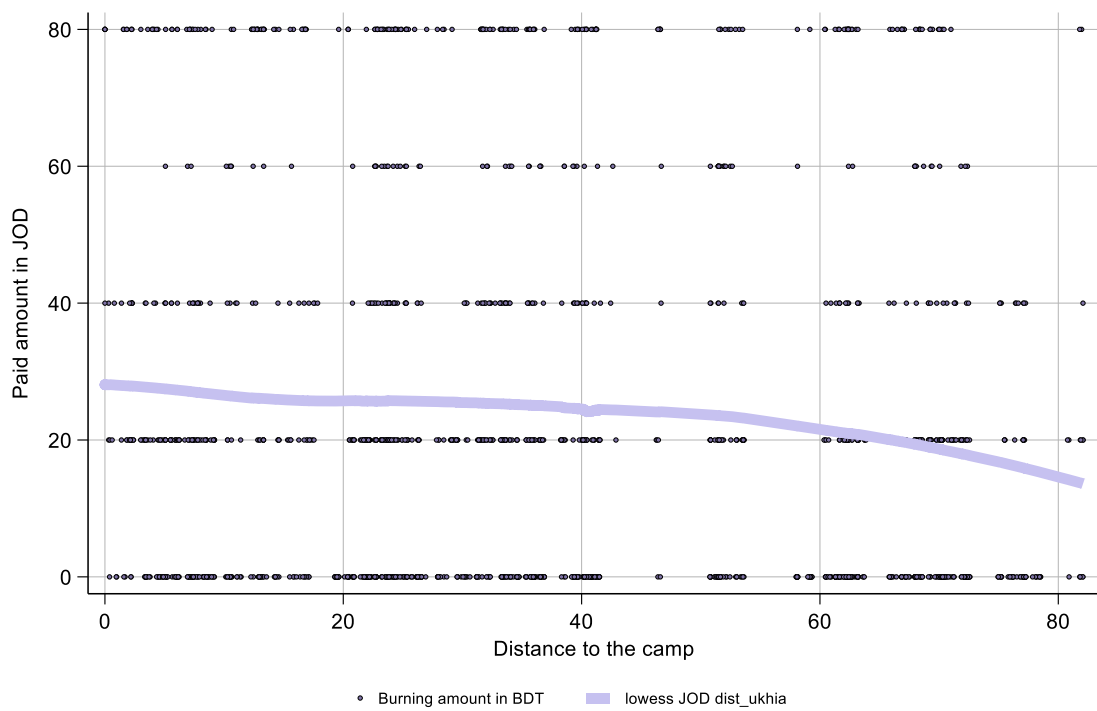
Appendix C: HIES 2016 data

Appendix Figure C1: Location of sample villages

Note: The blue dots represent sample village and the areas in red are refugee camps.

Appendix Figure C2: Relationship between the distance and pre-existing conditions

Note: Data source is HIES 2016. The sample size ranges from 2876 to 5360 for the individual characteristics and 1139 for the household characteristics. Each dot represents the regression coefficient of each variable outcome on the distance to the camps, and each bar represents a 95% confidence interval. The regressions controlled sub-district fixed effects, and standard errors were clustered at the village level. All the outcome variables were standardized with a mean of zero and a standard error of one.