

# Refugee Networks, Cooperation, and Resource Access

Evidence From a Network Experiment with Syrian Refugees in Lebanon and Jordan

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**Abstract**

How do refugees cooperate to mitigate community problems and why are some more effective than others? Scholars increasingly recognize the importance of refugees' networks for their well-being, facilitating mutual support and information flow about resources and services. A broad literature has studied how group structure affects collective action capacity, focusing almost exclusively on the role of dense networks in peer-sanctioning, but ignoring evidence from social network studies on the positive effects of diversity. I argue that in refugee crises, where resource mobilization is a binding constraint on cooperation, densely networked groups may have a disadvantage in mitigating community problems due to less resource diversity. To test this argument, I develop a methodology for separating network effects from selection, providing a novel test of the mechanisms linking group structure and cooperation. I implement the methodology in a social-network experiment with Syrian refugees in Lebanon and Jordan to study the effects of group structure on how individuals and groups confront community problems. Results show that networked groups have an advantage in overcoming the free-rider problem but possess less resource diversity that could support problem solving. The informational advantage of networked groups is driven by both network effects and selection. The resource disadvantage of networked groups is driven by selection.

## 1 Introduction

Today nearly one percent of the world's population has been displaced from their homes, living outside their country's borders as refugees or within them as internally displaced persons. More than 80% of refugees live in developing countries, where many face persecution and precarity. Yet little is known about how refugees, facing hardship and resource constraints, cooperate to mitigate community problems and why some refugee communities do so more effectively than others. Without conventional or formal means of claims-making or political participation, most refugees must find their own means of securing essential services from state and non-state providers, often mediated by brokers or as a product of institutional innovation. Cooperation often makes the difference in effectively facing an array of challenges, ranging from securing legal rights; to accessing humanitarian aid and other material resources; to promoting public order, safety, and security. Mitigating hardship within those communities requires identifying and mobilizing scarce resources while overcoming the free-rider problem inherent to public goods problems.

Despite the importance of understanding how to respond to refugee crises, limited evidence exists on the internal determinants of the well-being of those communities. Existing research on refugee well-being focuses almost exclusively on the effects of aid programs designed and run by outsiders and is fundamentally constrained by the lack of theory and empirics about the inner workings of refugee communities (but, see Parkinson , 2013, and Hajj , 2016). When designed by those lacking in understanding of the societies and communities they aim to assist, interventions are often suboptimal, ineffective, and at worst, harmful (Easterly, 2006).

In this paper I use the framework of social networks to study information, resource access, and cooperation in refugee communities. Networks are at the core

of the study of inter-group conflict, public goods provision, and problem solving in groups. Scholarship focusing on refugee crises has explored the importance of refugees' networks for survival and decision-making (Jacobsen and Landau, 2003; Harpviken, 2009; Steinberg, 2015), diaspora social movements (Wayland, 2004), and the spread of rebel organizations (Salehyan and Gleditsch, 2006). A central question that links these literatures is whether networked groups — those embedded in ethnic networks, kinship networks, or community-based networks — have a cooperative advantage; and if so, what drives the observed advantages of networked groups.

A great deal of literature in political science and economics proposes that networked groups have an informational advantage that mitigates the threat of free-riding (Fearon and Laitin, 1996; Putnam, 2000; Miguel and Gugerty, 2005; Habyarimana et al., 2009). Beyond political science research, however, a contrasting line of work argues that densely networked groups may have a disadvantage in finding effective solutions to collective problems if they possess redundant information and skills (Hoffman and Maier, 1961; Granovetter, 1973, 1983; Blau and Schwartz, 1984; Hong and Page, 2004; Page, 2007; Centola, 2015; Laitin and Jeon, 2015).

The latter body of research is essential for theorizing collective action capacity in refugee communities. Resource diversity is essential for cooperation when the free-rider problem is neither the sole nor the primary obstacle to cooperation. Looking broadly at responses to social dilemmas, whether people have access to resources and information necessary for effective action will shape their choice to act or not. The availability of and constraints on information and resources are critical determinants of cooperation, and some communities lack resources to solve public goods problems even in the presence of strong trust and reciprocity.

Studying the effects of group structure is complicated by two factors. Most network features are inherently endogenous, in the sense that naturalistic variation in

one dimension, even random variation, causes variation in other features as well. The endogeneity of group structure is further complicated by homophily, the empirical regularity that network ties are more likely between similar people (McPherson, Smith-lovin and Cook, 2001). As a consequence, an observed correlation between group structure and outcomes could be caused by similarities between group members rather than their interactions. In refugee communities, as in most networks, isolating the effects of group composition (or network structure) is particularly difficult because people typically choose where to live and with whom to form and maintain ties. For refugees these choices are critical for survival in the face of displacement and hardship.

This paper offers a novel experimental design to test whether the cooperative dynamics of networked groups are attributable to a causal effect of the network, or due to characteristics of individuals in the group that endogenously drive both cooperation and selection into the group. The experiment involves two levels of random assignment. First, I experimentally manipulate the network structure of groups by recruiting the members through referral recruitment or random selection, thereby identifying how variation in network features, with the consequent endogeneity, affects outcomes. Second, I experimentally place individuals into groups, identifying the effect of network structure on individual behavior, removing the confounding that comes from selection into groups and shedding light on the mechanisms linking network structure and cooperative behavior.

The experiment compares two distinct types of groups. First, referral recruited groups are meant to approximate densely connected refugee communities, largely composed of people who migrated together or self-selected into communities in order to live with friends and family. I refer to this type of group as ‘networked.’ Second, randomly sampled groups approximate people brought together by the turbulent

circumstances of forced migration into diverse communities, and do not arrive with dense networks of trust and reciprocity that characterize preexisting social groups. I refer to these groups as ‘unnetworked.’

To apply the experiment to the context of Syrian refugee community problems, I organized 56 group discussions with Syrians in Lebanon and Jordan, experimentally assigning groups to different recruitment methods, and randomly assigning individuals to groups. Outcome metrics include the level of engagement in attempts to respond to the community problem scenarios and the diversity of resources that groups drew on in their responses.

Results show that network effects — that is, the effect of interactions — increase the flow of information that might be useful for sanctioning free-riders, but not information that increases the group’s resource diversity. Second, we see that networked groups exhibit lower levels of resource diversity, constraining the likelihood of finding an effective approach to community problem solving. This suggests that although networked groups have a cooperative advantage in overcoming the free-rider problem, they suffer from a resource disadvantage.

This article’s first contribution is developing and testing a theory of the internal dynamics of refugee communities and the drivers of their collective action capacity. The second contribution is to existing political science research on cooperation, offering a corrective to the dominant focus on the importance of peer-sanctioning. Groups without resources to mitigate problems face a barrier to cooperation more fundamental than the threat of free riding. Drawing on work on social networks and diversity, I explain and test the complementary role of unique information and resource access.

Methodologically, the article offers a new experimental approach for studying network effects. More generally, the article highlights that researchers studying the

structure of groups must be cautious in both observational and experimental studies where outcomes are defined at the group-level. In such cases, it will often be difficult or impossible for researchers to separately identify whether mechanisms operate at the individual or group level. Existing research does not clearly test whether these differences are driven by characteristics of the people in the groups (selection) or changes in behavior due to interactions between the people (network effects). Whether a researcher is comparing refugee camps, ethnic groups, or nations, the people who compose densely connected groups differ in many ways from the general population. This conclusion aligns with and adds to recent studies in highlighting the complexity and endogeneity of work on networks and cooperation (Larson and Lewis, 2016; Christia, Knox and Al-Rikabi, 2017; Kustov and Pardelli, 2018).

This article has a number of limitations. First, as with any lab-in-the-field study, the control that group discussions provide to structure the problems that people confront comes at the cost of external validity. In this paper, I present data from behavior in a group discussion, which may diverge from dynamics of how Syrians respond in practice when facing community problems. Second, the richness of using structured group discussions to study cooperation comes at the cost of measurement error due to the limitations of audio recordings, transcription and translation, and manual tagging of text for analysis. Third, group discussions are a time consuming and expensive endeavor, which limits sample size and power, as discussed more below.

## 2 Theoretical Framework: Networks and Community Cooperation

In order to develop testable hypotheses about how refugees' networks predict their ability to access services and mitigate public goods problems, I turn to two lines of literature about the relationship between networks and collective action capacity. First, I draw on literature in political science and economics proposing that networked groups have an informational advantage that mitigates the threat of free-riding. Second, I turn to research arguing that, first, densely networked groups possess less unique information, and second, diverse groups possess more unique information and skills, which facilitate effective solutions to collective problems.

### 2.1 The Advantages of Networked Groups: Information Flow and Punishment

The dominant explanation in political science and economics for the higher observed levels of cooperation in networked groups states that high-density networks facilitate information flow and effective in-group sanctioning (Fearon and Laitin, 1996; Putnam, 2000; Miguel and Gugerty, 2005; Habyarimana et al., 2009). Because social ties transmit information, these densely networked groups provide more opportunities for people to share and receive information. The flow of information increases the likelihood that free-riding is detected, that information spreads about the free-riding, and that the person in question can be located and sanctioned.

The first line of literature argues that information flow facilitates cooperation by reducing the free-rider problem.<sup>1</sup> Networked groups have fewer incentives for

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<sup>1</sup>I define the relevant group as people who regularly interact, implying relations such that mem-

free-riding, which manifests in higher collaboration around community problems. This leads to my first hypothesis that more density will lead to more engagement in community problems:

**H1: Group-level Network Effect on Engagement**

Networked groups will exhibit more collaboration and deliberation.

## **2.2 The Benefits of Diversity: Information Diversity and Resource Access**

Most work in political science and economics exploring the relationship between networks and cooperation fails to consider a wealth of theory and evidence showing that diversity can support cooperation (but, see Laitin and Jeon, 2015). Network theory offers tools for thinking about the possible negative relationship between group density and unique information. Granovetter (1973, 1983) argues that bridging ties between distant parts of a network tend to link diverse individuals, spreading information that recipients could not otherwise access. Blau and Schwartz (1984) writes that densely networked groups can be so clustered as to prevent meaningful contact outside the group, thereby stymying the flow of resources and information. Centola (2015) writes that as the similarity of groups increases, group members will be exposed to a narrower subset of the population.

Other work emphasizes the role of diversity in problem-solving. Diverse groups are likely to bring a wide range of skills, information, and knowledge that may make them more effective in solving problems, thereby increasing the expected benefits of cooperating (Hoffman and Maier, 1961; Hong and Page, 2004). Page (2007, 2010) 

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bers of the group are potential contributors and beneficiaries from each other's cooperation.

argues that diverse teams have an advantage in solving complex problems because they bring a wider range of information, skills, and heuristics to tackling challenges. Social psychology experiments find that new viewpoints improve problem solving (Nemeth, 1986) and ethnic diversity leads to higher creativity (McLeod, Lobel and Cox Jr, 1996). Economic models that account for skills and knowledge differentiation suggest conditions under which diversity will increase productivity (Lazear, 1999; Alesina and La Ferrara, 2005).

Related predictions flow from resource mobilization theory, which asserts that groups striving for social change need to marshal external resources and aggregate them for collective purposes subject to the structural constraints groups face (Morris, 1986; McCarthy and Wolfson, 1996). Groups with serious objective deprivations will need to rely more heavily on external resources to realize their preferences for social change (McCarthy and Zald, 1977, p.1225-6). In refugee communities, which generally face major objective deprivations, resources valuable for mitigating community problems can include information, human capital, material goods, and political connections. Although scholarship on resource availability and collective action has a long tradition in sociology and political science (McCarthy and Zald, 1977; Morris, 1986; McCarthy and Wolfson, 1996; Weinstein, 2006; Staniland, 2012), it remains missing from literature on group structure and cooperation.

These three literatures all lead to the conclusion that information diversity facilitates cooperation by increasing the effectiveness of group responses, and therefore the expectation that contributing to a public good will lead to a productive outcome. In a context where a group doesn't have the internal resources to mitigate its own problems, access to a broader range of information and external resources could be critical for problem solving. This leads to the second that networked groups will exhibit less information diversity in response to community problems.

**H2: Group-level Network Effect on Unique Resources**

Networked groups will bring fewer unique resources to responses to community problems.

**2.3 Network Effects or Selection**

A key challenge in studying groups and networks is distinguishing network effects, in which interactions between group members drive outcomes, from selection, where characteristics of group members drive outcomes, regardless of what group they are in, which might lead us to mistake spurious correlations for network effects. Although hypotheses H1 and H2 test for group-level differences, they do not speak to whether the differences are driven by features of the groups (i.e., network effects) or features of the individuals in the groups (i.e., selection). If network effects drive differences between groups, then we would observe the same person engaging differently based on what group they are in.

Network effects imply that people in networked groups interact more and share more information in ways that they would not in a group with people they are not connected to. In the context of ethnic networks, network effects would imply that if we could hold all other characteristics constant and observe communities of the same individuals that are either ethnically homogeneous or ethnically diverse, the ethnic homogeneity of the former counterfactual group would drive an informational advantage for identifying and sanctioning free riders.

If selection drives differences, then we would expect to see the *same* person behave similarly in different group settings, although *different* people would tend to sort into one group or another based on their characteristics. Selection would imply that a person we observe in a networked group shares more information or is more

observable or locatable due to their characteristics rather than the structure of the network. If cross-group differences were driven by selection, we would observe differences in information flow and cooperation across groups, but we would not see differences between people randomly assigned to one group type or another. In the context of ethnic networks, selection implies that if we could hold all characteristics of a group constant but for the density of ethnic ties, and we could observe counterfactual communities of the same individuals that are either ethnically homogeneous or ethnically diverse, then the two counterfactual groups would possess the same informational advantage in identifying and sanctioning free riders. In this case, we would observe differences in information flow and cooperation across groups, but we would not see an effect on individuals randomly assigned to one group type or another.

### **H3: Individual-level Network Effect on Engagement**

Random assignment of an individual to a networked group will increase their collaboration and deliberation.

### **H4: Individual-level Network Effect on Unique Resources**

Random assignment of an individual to a networked group will decrease the volume of unique resources that they draw on in community problems.

## **3 Study Context: The Syrian Refugee Crisis**

The Syrian conflict sparked an enormous refugee crisis, with millions of people fleeing to Lebanon, Jordan, Turkey, Iraq, Egypt and beyond. Using UN registration numbers, which will provide a conservative estimate of displacement, four million

Syrians have fled to neighboring countries and eight million are displaced inside Syria. As of mid-2016, when the data for this paper was collected, approximately one million Syrians lived in Lebanon, along with 4.5 million native residents, in this small nation with a land area three-quarters the size of the US state of Connecticut. Approximately 630,000 Syrians lived in Jordan, alongside a 2015 Jordanian population of approximately 6.6 million. Jordan is larger, and is comparable in size to the medium-sized U.S. states of Indiana and Maine.<sup>2</sup>

In Jordan and Lebanon, most Syrians live in urban and peri-urban settings, with 20% of those in Jordan living in camps and 15% in Lebanon in camps. In Jordan, UNHCR formally runs a handful of medium and large camps, whereas no central authority manages Lebanon's many small camps, since the UN did not establish official refugee camps in the country.<sup>3</sup> Worldwide, refugees living outside camps is the norm; less than one third of the world's 22.5 million refugees live in camps.

In the early years of the refugee crisis it was fairly simple for Syrians to enter and reside in Lebanon or Jordan. However, legal restrictions on entry, residency, and work increased as the conflict continued, severely limiting Syrians' ability to enter the countries, and forcing the majority of those already residing there into

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<sup>2</sup>Source for Syrian populations: <https://data2.unhcr.org/en/situations/syria>. Accessed February 16, 2019. Source for 2015 Jordanian population: [http://www.dos.gov.jo/dos\\_home\\_e/main/population/census2015/Main\\_Result.pdf](http://www.dos.gov.jo/dos_home_e/main/population/census2015/Main_Result.pdf). NB: In addition to 6,613,587 Jordanian nationals, the 2015 Jordanian census reports 634,182 Palestinians without Jordanian citizenship, 636,270 Egyptians, and more than 380,000 non-Syrian non-Jordanian residents of other nationalities.

<sup>3</sup> People conversant in NGO/UN legalese may be familiar with the term '*informal settlement*' (*IS*) used to describe refugee camps in Lebanon. The term is meant to emphasize the fact that the camps are not run by the UN Refugee Agency. I maintain that the difference is more bureaucratic than useful, and I deliberately use the term 'camp' rather than IS

legal and financial precarity. Lebanon and Jordan deny Syrians a general right to work and constrain their movement. For most refugees, any interaction with state authorities, such as police or government bureaucracy, can carry significant risk. In Lebanon and Jordan, Syrians fear passing through checkpoints due to the risk of abuse, arrest, and deportation. Traveling even short distances might involve passing through checkpoints, which means that Syrians cannot move freely; and those who cannot legally move cannot safely work, visit family, go to hospitals to receive healthcare, or travel to urban centers to renew documents.

During more than a year of qualitative fieldwork in Syrian communities in Lebanon, I observed community cooperation and resource access to be central determinants of Syrians' well-being. Although Syrians cannot change the fundamental causes of their problems, they leverage connections and resources in response strategies to meet daily needs and ease their difficulties (what many Syrians referred to as 'making do,' *zabat al-hal*). The inchoate dynamic nature of refugee communities magnifies the importance of information about social, economic, and bureaucratic processes that many stable communities can take for granted. People continually search for information about safe travel routes, reliable employers, the current state of work-permit laws, and services available from NGOs and international organizations.

## 4 Research Design: Social-Network Experiment

To study how groups of Syrians cooperate to confront community problems and to test whether network effects or selection or drive group differences, I conducted a randomized controlled network experiment in 56 group discussions with Syrian refugees, across 14 cities, towns, and refugee camps in Lebanon and Jordan. The experiment involves two levels of random assignment. First, for each group discussion,

I randomly assigned whether it was recruited through referral recruiting or a random sample. This allows me to identify how variation in network features, with the consequent endogeneity, affects cooperation. Second, I experimentally place individuals in groups, identifying the effect of network structure on individual behavior, thereby avoiding the confounding that comes from selection into groups.

I began by randomly sampling 56 individuals from the UN Refugee Agency census. Experimental variation constituted assigning these 56 people to either serve as a seed for recruiting 9 other group participants through referral recruiting or to sit with 9 other randomly sampled people from the same locality. This variation created either networked groups through referral sampling or unnetworked groups through random sampling from a large census (census populations in each research site ranged from a few hundred eligible participants per gender, to tens of thousands of eligible participants per gender in the cities). By recruiting through referral recruitment, I create groups that are likely to have dense network of trust, reciprocity, and monitoring. By recruiting through random sampling, I create groups with the potential for bridging ties (Granovetter, 1973) and diverse connections and information (Page, 2007).

First, the design allows us to compare networked groups to randomly sampled groups, estimating the counterfactual comparison of groups being formed through one decision rule or another. Second, the experiment allows us to estimate the effect of an individual being placed in a networked group, thereby identifying network effects.

We can interpret the differences between networked groups and randomly sampled groups in two non-mutually exclusive ways. Randomly sampled individuals are representative of the population of Syrians who were eligible for participation

in the study.<sup>4</sup> Because referrers were representative of the Syrian population, given the inclusion criteria, the people they referred are representative of the people who would be referred in the population. Therefore I am comparing typical people to typical connected people. Second, random selection and assignment imply that the characteristics of observed network neighborhoods are representative in expectation of the population’s network neighborhoods. Therefore, the experiment allows us to compare representative people to representative groups.

The results from the individual-level experiment identify network effects, that is the effect of individuals interacting with other people in one group type or another, therefore being exposed to the characteristics and behavior of other people. This contrasts with spurious correlations between peoples’ behavior and group features where individuals would have behaved similarly even if the people had not interacted with each other.<sup>5</sup>

## 4.1 Public Goods Vignettes

To study how Syrians engage in community problem solving, I presented participants with audio vignettes describing problems that are common in refugee communities. The scenarios capture common collective problems that Syrian refugees face in Lebanon and Jordan pertaining to issues of law and order, freedom of movement,

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<sup>4</sup>Inclusion criteria were: live in the research site, be registered with UNHCR, not be a member of the nuclear family of other group participants, and be between the ages of 20 and 50.

<sup>5</sup>As (Manski, 1993) clarifies, observed group differences comprise effects of peer characteristics and peer outcomes (meaningful network effects) and also correlations between structure and outcomes. Group-level random assignment bundles together these three different mechanisms. The individual-level experiment identifies a network effect, by which I mean the sum of what Manski refers to as ‘exogenous effects’ and ‘endogenous effects.’ By spurious effects, I mean Manski’s concept of ‘correlated effects.’

resource redistribution, and the ability to earn a basic livelihood.

I developed the content of the vignettes based on more than a year of qualitative fieldwork in Syrian communities in Lebanon, and in conjunction with Syrian, Lebanese, and Jordanian NGO staffers who work with Syrian refugees. I wrote the scripts in Arabic and hired Syrian voice actors to record them. The full text of the vignettes is available in the appendix and on my website, where the reader will find a link to a video that includes the Arabic-language audio of the vignettes with English-language subtitles.<sup>6</sup>

The moderator played the audio vignettes about 90 minutes into focus groups that lasted two hours on average, and the presentation and discussion of all four vignettes lasted about 15 minutes on average. The four public goods vignettes were played in random order to eliminate order effects and facilitate consistency of measurement across groups.

To attain evidentiary validity, vignettes should resonate with participants, which may not happen if the vignettes are designed based on misguided *a priori* conceptions of what community problems Syrians face. Therefore, I sought to achieve three goals in designing the audio vignettes' content. First, I aimed to maximize the realism and salience of scenarios. Second, I designed the audio vignettes to describe problems that were sufficiently general they would resonate with Syrians living in urban, peri-urban, and camp settings in both Lebanon and Jordan. Third, I made the content sufficiently specific to prompt meaningful discussion.

The transcripts demonstrate that the issues raised in the vignettes resonated in a vast majority of groups. I coded whether people made statements about the relevance and irrelevance of the vignettes during the group discussions. In the majority

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<sup>6</sup>Website: [danieltrmastery.com](http://danieltrmastery.com)

of vignette discussions (79%) there was at least one explicit comment about the vignette’s relevance (e.g., “This type of thing happens in our community”), and in only a small share of the vignette discussions (10%) did anyone say anything about its irrelevance (e.g., “This type of thing does *not* happen in our community”).

After playing each vignette, the moderator opened the discussion to the participants. Moderators did little to shape participants’ responses to the audio vignettes. To help preserve excludability, moderators were not told about the intention of the construction of networked and randomly sampled groups, and were not told about the hypotheses under investigation.<sup>7</sup> The presentation of the vignettes was not heavily structured and participants were not prompted to respond in any particular way, or even respond at all. I trained moderators to do very little to guide discussion after the vignette audio files were played. At most, if participants asked what they were supposed to do, the moderators were trained to say something minimal like, “What would you do?” or “Can you do anything in this situation?” but explain no more and never express expectations that people work together.

## 4.2 Estimation

I present difference-in-means estimates for metrics of group deliberation in response to the public goods vignettes. Across 56 group discussions, a total of 223 community problem vignettes were presented.<sup>8</sup> The groups comprised a total of 489 individuals, 243 of whom were randomly sampled and assigned individuals, for whom treatment assignment is therefore exchangeable.

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<sup>7</sup> Moderators knew that the groups were either people who mostly knew each other, or mostly did not know each other, which was necessary for practical reasons of getting participants into the right room.

<sup>8</sup>Rather than 224, due to a moderator error in presenting the vignettes.

Randomly sampled and assigned individuals are indexed in  $i$  (for individual-level analyses), and community problem vignettes group discussion vignettes are indexed in  $j$  (for group-level analyses). I denote an outcome of interest as  $Y_i$  at the individual level, and as  $Y_j$  at the group discussion vignette level. The outcomes include the total number of comments on a subject and a binary indicator for whether a certain topic was discussed, both at the individual ( $Y_i$ ) and groups levels ( $Y_j$ ).  $Z_i$  denotes whether an individual was assigned to in a referral recruited networked group ( $Z_i = 1$ ) or a randomly sampled group ( $Z_i = 0$ ).  $Z_j$  denotes whether a group was recruited through referral sampling ( $Z_j = 1$ ) or random sampling ( $Z_j = 0$ ).

First, I estimate the causal effect of a group being recruited through referral sampling or through random sampling, which I call the *group-level network effect*. I present differences at the group-vignette level between networked groups and randomly sampled groups, calculated as:

$$E[Y_j|Z_j = 1] - E[Y_j|Z_j = 0] \quad (1)$$

Second, I estimate the causal effect of an individual being placed in a networked group or a randomly sampled group, which I call the *individual-level network effect*. I present differences at the individual level between seeds assigned to networked groups and those assigned to randomly sampled groups, calculated as:

$$E[Y_i|Z_i = 1] - E[Y_i|Z_i = 0] \quad (2)$$

In both individual-level and group-level analysis, I present robust standard errors clustered at the group level and randomization-inference  $p$  values calculated based

on treatment assignment permutation at the group level blocked by country, site, and gender.<sup>9</sup>

### 4.3 Randomization Check

I check randomization by testing for the observable similarity of randomly sampled participants across the two group conditions, comparing people randomly assigned to networked groups and those assigned to randomly sampled groups. This excludes people in the networked group who were recruited through referrals. All participants in the unnetworked groups were randomly sampled from the census, meaning they are interchangeable with seeds, thereby increasing the power of the randomization check. As expected under random assignment, participant questionnaire data shows that participants' measured pre-treatment covariates are balanced across the two experimental conditions. I discuss the randomization check in detail in the appendix.

### 4.4 Manipulation Check

I present the formalization of the manipulation checks and the detailed results in the appendix. First, as a basic test of design, I test whether networked groups had higher group density, defined as the share of realized ties to possible ties in a group. For example, if everyone knows everyone else in a group, the density is 1. If half of the possible dyadic relationships in a group are realized, the density of the group is 0.5. As shown in the appendix, across multiple metrics of participant connections the density of networked groups was much higher than that of randomly sampled groups. The data clearly demonstrates that the groups assigned to the 'networked'

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<sup>9</sup> Although errors are likely correlated within regions as well as within group discussions, standard errors are clustered by group discussion because it was the level of random assignment.

condition are in fact more densely networked. Other measured covariates do not appear to vary.

I also present manipulation checks for diversity in the appendix. Compared to referral sampled networked groups, randomly sampled groups exhibit higher variance in terms of a number of ascriptive and descriptive characteristics including age range, marital status, household size, and number of days worked in the past month. These differences are not statistically significant, possibly due to the small sample size (that is, 56 group discussions). As discussed in the appendix, empirical measurement of diversity is more nuanced than that of density because direct measurement of information diversity is difficult.

## 5 Data: Community Problem Vignettes

Data includes metrics of deliberation and cooperation in the group discussions capturing how participants responded to community-problem vignettes. Two experienced moderators conducted 56 group discussions, comprising 489 individuals and 223 vignettes (rather than 224, due to a moderator error in presenting the vignettes). The average group had 8.7 participants, ranging in size from 6 to 10 people. Attendance rates were balanced across treatment and control arms. Group discussions were either all-male or all-female, with no mixed-gender groups. All data collection was conducted in Levantine Arabic and all documents read to or distributed to participants were in formal Arabic. I speak the dialect fluently and all recruiters and moderators were native speakers. I explained the content of the documents to participants in Levantine Arabic to ensure comprehension. I monitored all aspects of the study including recruitment, data collection, and transcription. Recruiters read all people contacted a consent script approved by the Yale Human Subjects Committee

under protocol HSC #1603017430. Moderators read another consent script to participants before groups began. I discuss more details of study conduct and quality checks in the appendix.

I ran the group discussions in Lebanon in May and June 2016, and in Jordan in June and July 2016. Due to delays with obtaining permits for research in Za‘atari camp, I ran the group discussions there in September 2016. I conducted pilot group discussions in Lebanon in May 2016 to improve the public goods vignettes, discussion guide, and framing of the study. I present additional information in the appendix about site selection, blocking, assignment of moderators to group discussions, recruitment procedures, and participant descriptives.

Although there are only 56 groups I defined outcomes such that there are multiple observations within each cluster. In the case of this study, I had 4 community problems that participants discussed in each group. So I had 56 clusters, and  $n = 223$ . So the ‘effective  $n$ ’ is certainly less than 223 but probably more than 56. By including multiple vignettes (analogous to ‘games’), I can run analysis both at the vignette level, and run a separate analysis at the individual participant level, both clustered at the group level.

## 5.1 Participant Protection in Humanitarian Crises

Recruiting and conducting research with participants from a vulnerable population requires great care to minimize potential for harm. To decrease the transparency of recruitment identifiers I utilized the fact that a majority of Syrian adults have a nickname. During recruitment and discussion conduct the research team referred to participants by their nickname whenever possible. The widespread nickname system is based on the name of someone’s eldest son or eldest daughter (if they have no son).

For example, Um Ali (meaning Ali's mom) is the nickname for a woman whose eldest son is named Ali. Abu Muhammed (meaning Muhammed's dad) is the nickname for a man whose eldest son is named Muhammed. Sometimes a man without children uses a similar nickname, but replaces the name of a child with the name of his father, implying that when he has a son, he will name the son after his father, although it is also widespread for young and adult men to use their father's name even if they do not plan to name their child after the father. Women who do not have children less frequently adopt such nicknames, although some adopted them during the early days of the uprising to protect their identities.

Files including recruitment information and transcripts are password-protected and encrypted. People's responses are further protected by the fact that their statements and real names never appear in the same document. In the audio files of the group discussions, moderators referred to people by their nickname (which was written on a placard in front of each person at the beginning of the discussion to help the moderator with the nicknames), and the transcripts identify participants by their nickname.

In order to effectively anonymize transcript data while maintaining the ability to link respondent comments to respondent characteristics, moderators consistently referred to participants by their nickname, and were trained to never refer to people in the groups by their real name. A post-discussion questionnaire recorded each participant's nickname and not their real name. With participants' nicknames indicated in the audio recordings, transcripts, and post-discussion questionnaires, I can link transcript data to questionnaire data while maintaining participant anonymity.

## 5.2 Coding and Tagging

I tagged the transcripts according to a coding guide that I developed in partnership with three researchers who were not otherwise involved in the project. We each read a random sample of vignettes to define codes that capture salient dynamics in the discussions. The process was iterative. In the first stage, one outside researcher and I each read a random sample of transcripts, and documented the salient themes that we each found in the discussions. We met to consolidate our respective themes and collaboratively define coding rules for each thematic tag. Next, a second outside researcher read a random sample of transcripts, and then read the draft of the coding guide, offering comments on existing themes and coding rules, and suggesting revisions and additions. Then a third outside researcher conducted the same procedure as the second. After this feedback, I finalized the coding guide.<sup>10</sup> The researchers who developed the coding guide and I were blind to treatment status while developing the guide and I was blind to treatment status while coding the transcripts.

I coded responses to the vignettes based on the transcripts. I randomized the order in which I read the groups and the vignettes within each group. I coded the transcripts according to the guide and made no modifications to the guide after I began coding. Coding was not automated or predictive; I read and hand-coded all transcripts using the qualitative data analysis software Dedoose, which then output the results in a spreadsheet for statistical analysis. Details of the coding guide and coding process are available in the appendix. I was blind to treatment status while developing the vignette coding guide and while coding transcripts. There is little information in the transcripts that would reliably reveal the treatment status of a group to a reader. I only merged treatment status with other covariates after I

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<sup>10</sup>The coding guide is available on my website, [danielrmasterson.com](http://danielrmasterson.com).

completed the coding.

### 5.3 Outcomes

To test hypotheses about the group-level network effect on collaboration (H1) and the individual-level network effect on collaboration (H3), I examine the number of comments where participants actively discussed responses to the public goods on the table with other participants. Dialogue is coded as comments about the problem that either responded to a previous comment or prompted a direct response from another participant.

To test hypotheses about the volume of unique information discussed in groups (H2) and by individuals (H4), I tagged comments where a speaker said that, in response to the public goods problem on the table, Syrians (a specific Syrian including the speaker, or Syrians in general) could turn to some resource outside the discussion group. I test for results across all resources that were discussed in any group. The resources discussed included Syrian leaders, brokers between the Syrian and the host community, traditional dispute resolution involving sheikhs (*sulha*), the host community, NGOs, the national government, and the police. A comment was tagged as a ‘resource’ if a participant stated that Syrians (a specific Syrian including the speaker, or Syrians in general) could turn to the resource to mitigate the public goods problem in the current vignette.

I measure the volume of *unique information* about resources that groups discuss in responses to community problems, as defined in equation 3.

$$v_j = \sum_{k=1}^{\ell} \mathbb{1}(r_{jk} \geq 1) \quad (3)$$

The volume of unique information that group  $j$  discussed in response to community problems,  $v_j$ , is a function of the resources discussed  $r$ , indexed in  $k \in \{1 \dots \ell\}$  for each group discussion vignette  $j$ , and  $\mathbb{1}$  is the indicator function.

At the individual level, unique information is defined with respect to each participant  $i$  as defined in equation 4.

$$v_i = \sum_{k=1}^{\ell} \mathbb{1}(r_{ik} \geq 1) \quad (4)$$

## 6 Results

First, to test for group-level network effects (Hypotheses 1, 2, and 3), I compare group discussions that were randomly assigned to be recruited as networked groups to those recruited through a random sample. Second, to test for individual-level network effects (Hypotheses 4, 5, and 6), I compare individuals randomly assigned to sit in a discussion group with their networked group to those assigned to sit with a randomly sampled group. Outcomes include metrics of cooperation, information redundancy, and resource diversity. HC2 robust standard errors are clustered at the group level. Also, I present the randomization inference  $p$  value, which I calculate by randomly permuting the treatment assignment labels following the blocking structure that was used for actual randomization.

### 6.1 Group-level Network Effects: Group Structure and Cooperation

Table 1: Group-level Effects

	Dialogue	Leaders	Brokers	Sulha	Host	NGOs	Gov	Police
Control mean	2.46	0.1	0.17	0.14	0.2	0.05	0.39	0.07
$\hat{\beta}$	1.33	-0.06	-0.09	-0.08	-0.08	-0.04	-0.04	0.04
	(0.62)	(0.03)	(0.04)	(0.03)	(0.04)	(0.02)	(0.06)	(0.04)
RI $p$ -value	<0.01	0.03	0.02	0.02	0.06	0.01	0.49	0.35

Notes:  $n = 223$ .  $\hat{\beta}$  denotes difference-in-means estimate. HC2 robust standard errors, clustered at the group level, are reported in parentheses. Randomization inference performed with 100,000 simulated randomized treatment assignment vectors, clustered at the group level and blocked by country, site, and gender. Results are robust to adjustment.

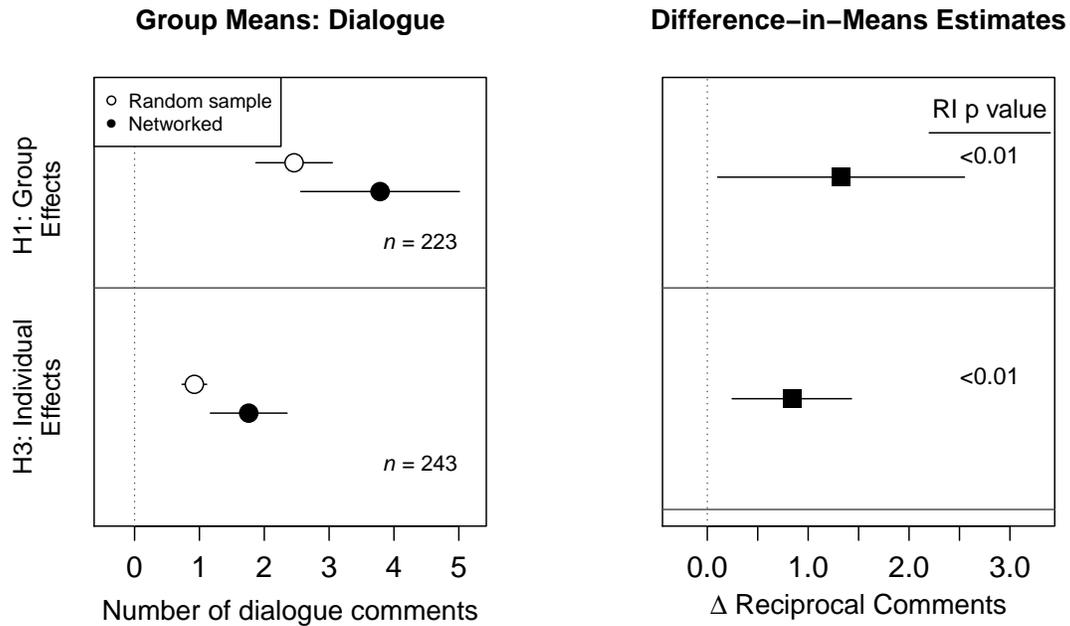


Figure 1: Dialogue Results

### 6.1.1 H1 – Group-level Network Effect on Engagement

In Table 1 the unit of analysis is the group-vignette. The outcome for the Dialogue column is a continuous measure of the number of reciprocal comments between two participants discussing the community problem. The mean number of comments per group-vignette (including moderator comments) was 14.01 (max: 63, min: 1).

The first hypothesis states that when a group is recruited through referral sampling the group will engage more in responses to community problems. Table 1 shows that networked group participants engaged with each other in response to the community problems at higher rates than the randomly sampled groups. The mean for the randomly sampled groups shows that 2.46 comments were dialogue per vignette discussion, whereas the networked groups made 3.79 dialogue comments on aver-

age. This constitutes a 54 percent increase from baseline in the number of dialogue statements, and a 12 percentage point increase in the share of comments that were dialogue, from roughly 22% of comments being dialogue in control to roughly 34% of comments in treatment. Given the 14.01 comments per vignette-group pair, the magnitude of the effect is a 10 percentage point increase in the share of comments that are dialogue, rather than stand-alone comments. As shown in the appendix, results are robust to covariate adjustment.

### 6.1.2 H2 – Group-level Network Effect on Nonredundant Resources

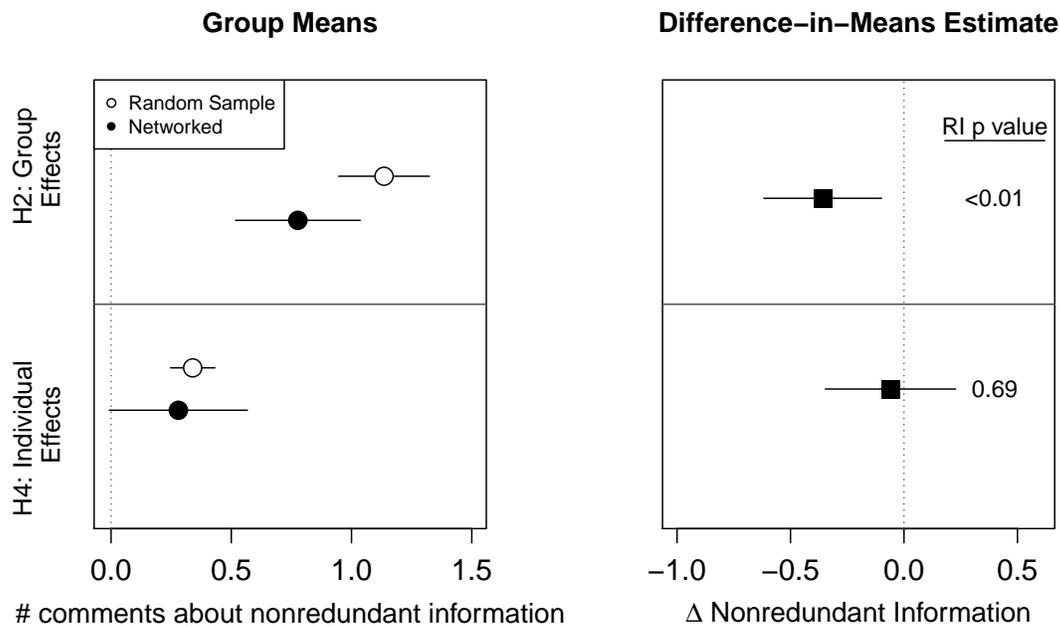


Figure 2: Nonredundant Information Results

The second hypothesis states that groups recruited through referral sampling would bring fewer unique resources to their responses to community problems. Figure 2

shows that the average number of unique resources that were discussed in a given group-vignette was 1.14 in randomly sampled groups and 0.78 in networked groups. This constitutes a 32 percent decrease in the number of unique resources discussed. As shown in the appendix, results are robust to covariate adjustment.

### 6.1.3 Disaggregated Analysis of Resource Diversity

In order to examine what types of resources are driving the increase in unique resources, I test for network effects for each type of resource. The resources in Table 1 are binary variables, and each indicates whether at least one respondent stated that Syrians can turn to each actor in response to the community problem. I find that across a range of actors, networked groups are consistently *less* likely to say that they could draw on these resources. Almost all results align with theoretical predictions: point estimates are negative and the difference in means is statistically significant for all variables except the national government and police.

Across the different resources, the randomly sampled groups more often made statements that Syrians could turn to the resources to help mitigate the problem under discussion. That is, the networked groups had a lower rate of saying that Syrians could turn to resources, like leaders, to help mitigate the collective problem under discussion. This means the speakers both know about the existence of the resource and its usefulness, and believe there is some chance of accessing and mobilizing the resource.

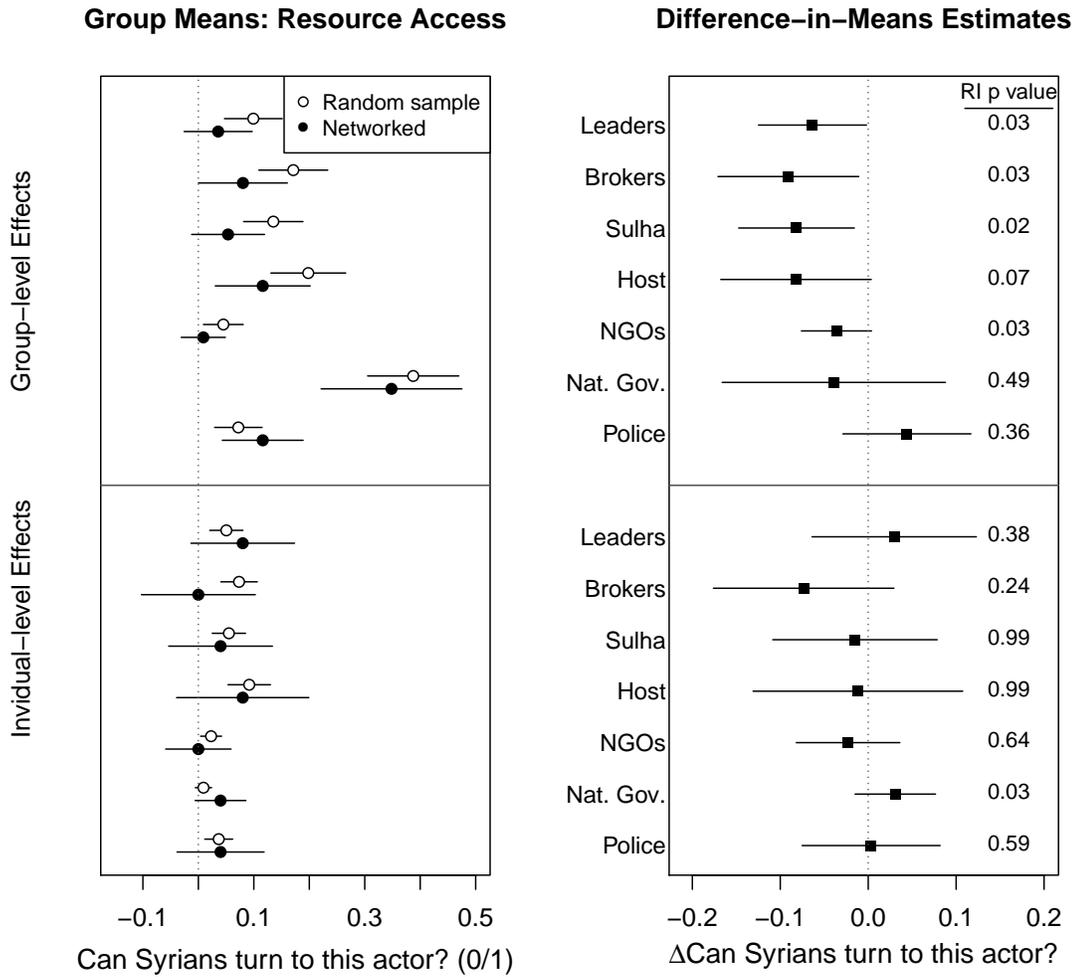


Figure 3: Resources Results

A striking descriptive finding is how rarely Syrians state that they would turn to NGOs to confront these problems. This aligns with findings from der Windt and Cornelis (2016) that local institutions, not NGOs, are key in sustaining high levels of intra-community cooperation. The frequency of comments about host community and government suggests the importance of understanding determinants of local

policymaking in refugee crises (Mourad, 2017). And emphasis on internal refugee community resources further motivates recent work in political science seeking to understand the internal politics of refugee communities, including how refugees access housing, jobs, and services (Parkinson, 2013), and develop informal institutions for law and order and property rights (Hajj, 2016).

Turning to results for the national government and the police, the findings are not what I expected from my theory. Confidence intervals are wide, and although the point estimate for the outcome of relying on the national government is negative, which aligns with theory, the sign of the point estimate for relying on the police is positive. Very few groups discussed turning to the police as useful for mitigating their community problems, and the observational null result suggests that network structure does not correlate with their accessibility. In contrast, the baseline rate of turning to the national government is quite high, but there is no strong evidence that social connections correlate with accessibility.

Although I am hesitant to engage in post hoc theorizing (and another study would be necessary to test any refined hypotheses), I see the null results as suggestive evidence that there are bounds on what network ties can facilitate in collective problem solving. Social ties may not be a panacea for resource access. In this case, bureaucratic or threatening organizations may require more than just information about their existence for groups to benefit from them.

## 6.2 Individual-level Network Effects

Both network effects and selection are typified by correlations between observed group structure and outcomes. If ties are more likely between similar people, their outcomes could be correlated because of similarities in their characteristics rather

than as a consequence of their interactions. To disentangle this endogeneity, I present experimental estimates of the effect of a person sitting with a group of people drawn from a referral sample (forming a networked group) compared to a baseline group of randomly sampled individuals. The interpretation of these effect estimates contrasts with that of the group-level estimates above, which represented the expected difference between the behavior of networked groups and that of randomly sampled groups. These estimates represent the expected change in individual behavior when assigned to sit in a networked group rather than a randomly sampled group.

### 6.2.1 H3 – Individual-level Network Effect on Engagement

First, I test whether the above results for dialogue and resources are attributable to network effects – that is, the effect of interactions. I examine how individuals who were randomly assigned to networked groups engaged in the community problem scenarios. The second panel of Figure 1 presents group means on the left and difference-in-means estimates on the right. I find that people placed in networked groups engage more with others when facing collective problems. This evidence supports Hypothesis 3.

The third hypothesis states that individuals assigned to sit with a networked group will engage more in response to community problems. Table 1 shows that individuals assigned to a networked group engaged with each other in response to the community problems at higher rates than the randomly sampled groups. Individuals in randomly sampled groups made 0.92 dialogue comments on average, whereas individuals in networked groups made 1.76. This constitutes nearly a doubling of the number of dialogue statements, and a 12.6 percentage point increase in the share of comments that were dialogue, from 29.6% of comments being dialogue in randomly

sampled groups to 42.3% of comments in networked groups. The average number of comments per individual was 3.2. As shown in the appendix, results are robust to covariate adjustment.

### 6.2.2 H4 – Individual-level Network Effect on Diversity of Resources

The fourth hypothesis states that individuals assigned to sit with a networked group will discuss fewer unique resources. Looking at the results in Figures 2 and 3 I do not find clear evidence of individual-level network effects on resource diversity. In Figure 3 the national government is the only resource where I detect a statistically significant treatment effect, but in the absence of a more systematic result for this outcome, it is difficult to interpret. Overall, I do not find clear evidence in support of Hypotheses 4. The estimate in Figure 2, is more well-identified than those in Figure Figures 3. For the estimates of individual-level network effects on disaggregated resources, we cannot rule out large effects since the 95% confidence intervals for our estimates of network effects on resource diversity are wide.

The statistical significance of the effect estimates differs between the 95% confidence intervals based on t-test standard errors clustered by group and the  $p$  values calculated with randomization inference. Randomization inference may give different  $p$  values from conventional tests when the number of observations (or clusters) is small and when the distribution of outcomes is non-normal (Gerber and Green, 2012, p. 65). The t-test gives inaccurate  $p$  values in this case because the outcomes are not normally distributed and the number of observations (and clusters) is small.

### 6.3 Alternative Explanations

The findings above could be driven by trivial discussion dynamics (e.g., some groups talk more) rather than cooperative dynamics. If networked groups simply talk more, both about trivial matters and in response to community problems, we would see the amount of engagement increasing. Contradicting this possibility, however, is the fact discussed above that not only did the number of comments engaging with the problem increase, but also the share of comments doing so.

A second trivial discussion dynamic would be if randomly sampled groups simply discuss resources more, but do not have more access to resources. In this case we would expect them to make both more positive and more negative comments about resources. This would suggest that randomly sampled groups discuss resources more, and possibly are more aware of their existence, but it would undermine the conclusion that randomly sampled groups are better able to access resources. However, if randomly sampled groups in fact bring more unique information about how to access resources, I would expect them to make more positive statements about resources, as shown above in Table 1, and I would expect them to make the same number negative comments as networked group (or possibly fewer negative comments).

To refine the interpretation of the group differences I test for a relationship with explicit statements about *not* being able to turn to resources. The results presented in Table 1 in the previous section are based on statements like “We can turn to brokers in response to the problem.” The group differences on negative statements, like “We *cannot* turn to the police in response to the problem,” is a separate empirical question. I coded transcripts for both positive and negative comments about whether each type of outside resource would or would not be helpful.

The regression results are presented in Tables 2. I do not find strong evidence of a

Table 2: Group-level Network Effect: Not Able to Rely on Resources

	Not Leaders	Not Brokers	Not Sulha	Not Host	Not NGOs	Not Gov	Not Police
Control mean	0	0	0	0.23	0.03	0	0.25
$\hat{\beta}$	0	0	0	-0.04	0.02	0.04	-0.02
	(0)	(0)	(0)	(0.05)	(0.02)	(0.02)	(0.07)
RI $p$ -value	–	–	–	0.41	0.5	0.03	0.75

Notes:  $n = 223$ .  $\hat{\beta}$  denotes difference-in-means estimate. HC2 robust standard errors, clustered at the group level, are reported in parentheses. Randomization inference performed with 100,000 simulated randomized treatment assignment vectors, clustered at the group level and blocked by country, site, and gender. Results are robust to adjustment for observed covariates.

relationship between group structure and negative statements about resources. First, no one made statements that Syrian leaders, brokers, traditional dispute resolution, or the police would *not* be helpful. Columns 1-3 show that the control-group mean and the difference-in-means estimate are both 0. The one metric where I find a statistically significant difference-in-means estimate in Table 2 is an increase in the number of vignette discussions where someone discussed not being able to turn to the national government, from 0 of 111 control-group discussions to 5 of 112 treatment-group discussions. It is worth noting that if even one control-group discussion had mentioned not being able to turn to the national government, this result would go away. Nonetheless, the lack of a relationship between group structure and negative statements obtains across all other resources.

Although I did not find clear evidence of an individual-level network effect on

positive statements about resources, I nonetheless also test for an individual-level network effect on negative statements to rule out the possibility of an effect through that alternative pathway. As in the group-level analysis above, I find no difference between the comparison groups in terms of negative statements about resource access. The results are presented in the Appendix.

## 7 Discussion

I find evidence of group-level effects on both engagement and resources. The finding that networked groups exhibit higher engagement in response to collective problems supports Hypothesis 1 and aligns with much existing evidence that networked groups have an informational advantage in monitoring and punishing free-riders. Second, I find supportive evidence for Hypothesis 2 that networked groups exhibit fewer unique resources in their responses. This aligns with a great deal of work on the benefits of diversity in problem solving.

The paper's novel experimental finding comes from random assignment of individuals to networked or unnetworked groups. The results from this level of random assignment support Hypothesis 3; interaction with one's networked group increase their engagement in community problem. In contrast, I do not find support for Hypothesis 4. Interaction with one's networked group does not appear to increase the diversity of resources they utilize to confront community problems. This implies that the group-level effect related to Hypothesis 2, is driven by selection. To be clear, saying that the resource advantage is driven by selection does not mean that the effect is not meaningful. When recruiting groups, the group-level effect of using one recruitment mechanism rather than another represents a meaningful causal effect between two counterfactual groups.

The results from the group-level experiment show what forms of cooperation we can predict if groups were deliberately recruited to form tightly-knit groups or not. In refugee communities we can imagine this intervention corresponding to a decision rule that an NGO might use to form social committees for community-driven programming or a state might use to determine entrance into a refugee camp. More generally, this sort of group-level assignment corresponds to interventions where

a policy maker or program designer needs to form groups through some exogenous process, as opposed to people self-selecting into groups.

## 8 Conclusion

The dominant explanation in political science for the higher levels of cooperation in networked groups states that high-density networks facilitate information flow and effective in-group sanctioning. In contrast, other work predicts that unnetworked and diverse groups bring a wider range of skills, information, and knowledge that may make them more effective in solving problems, thereby increasing collective action capacity.

This paper presents evidence that while networked groups may have a cooperative advantage in overcoming the free-rider problem, they may suffer a resource disadvantage. This matters because the free-rider problem is neither the sole nor the primary obstacle to cooperation. Looking broadly at responses to social dilemmas, whether people have access to resources and information necessary for effective action will shape their choice to act or not. The availability of and constraints on information and resources are critical determinants of cooperation, and some communities lack resources to solve public goods problems even in the presence of strong trust and reciprocity.

Understanding refugee community dynamics is important not just for policy design, but for understanding long-term trajectories of refugees and hosting countries. Despite the frequent use of the term ‘crisis’ to describe large-scale refugee migration, the reality is that such displacement is often prolonged and stable. Among refugee crises that last more than 5 years, the expected length of displacement is 26 years (UNHCR, 2015). Furthermore, even after a refugee crisis is classified as

having ended, many refugees continue living outside their home country for years (Arababa'h et al., 2019).

Refugee communities possess unique features that require new theory to predict how people will access housing, jobs, and other services. Refugees arrive as outsiders, displaced by war and persecution, most often in neighboring states where the political, ethnic, or religious divisions that precipitated their flight are still salient and contentious. Refugees are not citizens, let alone voters, in places where they live, and the determinants of their access to services and public goods are therefore distinct. Refugees are regularly denied services, legal residency, the right to work, and a host of other rights and privileges that would sustain their basic well-being. The scale of refugee migration often dramatically changes the demographics of receiving countries in a short time frame. Refugee migration often sets in motion a large humanitarian crisis response, infusing refugee communities with resources and defining power structures around access to them. The humanitarian system also infuses hosting communities with new jobs and investment (Lehmann and Masterson, 2018).

What does this project suggest for policy design in humanitarian interventions? How can external actors promote the internal capacities of refugee communities, or leverage a better understanding of communities' internal capacities in program design? The experimental results in this article speak directly to policy makers' choices about who to bring into refugee community-driven and community-capacity-building programs. The underlying assumption of community programming is that beneficiary communities often have internal collaborative capacities to help themselves that aid agencies fail to recognize. My findings show that this approach will often not be the right answer. If refugee groups do not have the internal resources necessary to mitigate their problems, NGO community-driven programming that attempts to

leverage a group's ability to solve problems internally may be promoting precisely the wrong capacities. Rather than a group solving its own problems internally, it may be optimal for a group to go to outsiders for help. In refugee communities, program design may be more effective if NGOs support refugees in asking who they can go to for help, rather than asking how they can solve a problem themselves. In communities where trust or reciprocity is the binding constraint for effective cooperation, building social ties and systems of accountability within the community can help. In communities where resource access is the problem, linking refugees to local authorities, service providers and surrounding neighborhoods, in ways that are sensitive to the dynamic vulnerabilities that refugees face vis-a-vis these actors, may be an effective way to facilitate access to resources necessary to meaningfully mitigate problems.

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