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How migration shapes local networks: Evidence from 145 Senegalese villages

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Abstract

Abstract: Out-migration is a common feature of rural life in the Global South, yet its effects on social networks in origin communities remain underexplored. Drawing on original data from nearly 10,000 households in 145 villages in Senegal, this paper presents observational evidence linking household migration status to social ties in sending areas. Migrant households maintain significantly more local social connections than non-migrant households, driven by stronger ties among migrants and by inward links to migrant households. This heightened connectivity cannot be explained solely by economic resources; instead, it appears to be shaped by non-material factors such as access to information. These findings do not support the hypothesis of disintegration of rural communities due to migration. However, social networks are a central feature of rural life and by shifting attention from destination- to origin-area networks, the paper broadens the understanding of migration's social impacts.

Keywords: Migration, Network Analysis, Household Networks, Senegal

1 Introduction

Migration – including rural-urban internal mobility, which is the dominant mode of migration in much of the Global South and beyond – often leads to large economic returns for migrants and their households (Cenci, Kleemans and Tjernström 2024; Selod and Shilpi 2021). However, there are countervailing concerns that out-migration can tear at the social fabric of origin communities. Some policy and media reports have lamented how migration can drain rural villages of their vibrancy and fray social cohesion, for example in Nepal (Government of Nepal 2021), Haiti (Hussein 2017), and Ghana (Ghana Statistical Service 2023).[1] Social scientists have observed that "a social consequence of migration may be community disintegration" (Lu 2019) and that "migration disrupts the 'glue that holds societies together"' (Pardelli and Kustov 2025). Yet the evidence base for migration-induced disengagement that hollows out community cohesion is sparse.

In this paper, we bring new and unique data from Senegal to bear on this question. Rural Senegal is a particularly relevant context as it has a strong tradition of internal and external migration (Ba, Bourgoin and Diop 2018) that is predicted to increase as a consequence of slow-onset climate factors (Rigaud et al. 2021). We investigate how migration in this context affects household embeddedness in intra-village networks, using comprehensive data on migration histories and network links that we collected from all available households in 145 rural villages. We map entire village networks with data from 9,340 households for four different network types, which helps us to understand social interactions as well as certain modes of resource sharing: social networks, general personal advice networks, migration information and information networks, and whom to talk to for organizing village events. In addition, we collected data on financial risk sharing for about half of our sample.

With these data, we provide observational evidence that households with and without migrating members systemically differ in their sending area social ties. We define

[1] This concern is not limited to developing country contexts; see e.g. Breitinger et al. (2025) on East Germany.

migrant households as those that had a former member who moved away in the past 10 years. We also distinguish between internal and external migration, the gender of the migrant, and the time since migration.

We estimate the relationship of a household's migration status with its network ties in an undirected and a directed dyadic analysis. The undirected analysis follows Fafchamps and Gubert (2007) and regresses network ties on within-dyad sums and absolute differences in migration and background characteristics to fulfill symmetry that is required when ties have no direction. In the directed analysis, we regress social ties on a dummy indicator for the migration status of the source household i, an indicator for the target household j and an interaction of the migration indicators of the two households, while controlling for background characteristics. The coefficient on i then presents the relationship of the outward social ties with migration, the coefficient on j the relationship of the inward social ties with migration, and the interaction coefficient the homophily in social ties among migrants.

The temporal structure of our data is such that past migration is linked to subsequent network characteristics and our analysis controls for a variety of potential confounding factors. However, we do not claim causality. Hypotheses that result from the correlational analysis and the conceptual considerations offer avenues for future causal research. Moreover, correlational findings can still inform policy in some respects. For example, targeting migrant households for information dissemination because they are likely to be well-connected does not require the former attribute to be a well-identified cause of the latter.

Our main analysis focuses on social ties, the broadest network in our data and one that encompasses most links observed in the personal advice and migration information networks. We then examine whether migrant households perform functions that incentivize others to seek ties with them, concentrating on the material and immaterial resources they may provide as a result of their migration status. Specifically, we consider three potential functions of social networks: information, access to financial resources, and social status.

Our results show that migrant households are overall more socially connected, and that this is mostly due to inward ties from non-migrant households and ties among migrant households. It suggests that other households seek social connections with migrant households, while migrant households do not seek more connections with non-migrant households. Coefficient sizes are small in absolute terms, but sizable relative to the baseline probability of a tie in a pair. The probability of a tie is 5.7% which is increased by 0.7 percentage points (12.3%) for migrant households by the inward link from non-migrant households, and by 0.9 percentage points (15.8%) from migrants' homophily in social ties. These patterns are similar by gender of the migrant and time since the migrant left. Results by internal or international destinations show that homophily is driven by international migration whereas the in-degree result is strong for all destinations.

Given the result on in-degree ties, we then examine the incentives of other households to connect with migrant households. First, we assess access to migration information – and information more broadly – as a key function that connections with migrant households plausibly serve. We use the same analysis as before but replace the outcome with personal advice network ties, migration information network ties and diffusion ties of the event organizing network. The result patterns for personal advice and organizing an event are similar to the main social network results but the coefficient sizes are smaller by one-third to one-half of the social network coefficients. Notably, for migration advice only the migration homophily coefficient is significant. Based on data on financial transfers from and to other households in the village, we do not find any evidence that migration net increases risk-sharing. If anything contributions of migrant households, conditional on giving, are lower by about 12%. In addition, we test whether migrant households enjoy higher social prestige by examining their social ties with village chiefs as a high status group in the village, but find only weak evidence for an increase in their social connections.

Lastly, we analyze how the relationship of social ties with migration status varies by village characteristics. For example, if migration *causes* social connectivity, then we

would expect the benefits of connecting to migrant households to cease as migration gets more common. Subsample analysis with samples split at the median village level migration rate confirm stronger associations at low migration rates, and weaker associations at high migration rates. In low-migration villages, migrant households even have significantly lower outward ties, suggesting that they partially withdraw from the network. Their overall connectivity is still higher though due to the heightened inward links and homophily.

In addition, villages that are more remote, smaller, denser, less ethnically fractionalized and have fewer pastoral households exhibit stronger associations between migration status and social ties. This pattern suggests that incentives to connect with migrant households are greater in more cohesive and integrated networks. Also in some of these subsamples migrant households appear to withdraw from some social connections.

This paper makes several contributions. First, we speak to a literature that has linked out-migration to diminished social capital in origin communities. Some evidence suggests that high out-migration rates undermine intracommunal trust (Jo 2019), collective action (Sellars 2019), the governance of common-pool resources (Wang, Chen and Araral 2016), and even voter turnout (Pardelli and Kustov 2025).[2] As households reorient their lives around various opportunities that beckon elsewhere, a sense of joint belonging and local solidarity is lost, intracommunal social linkages weaken, and cohesion erodes, so a common argument goes. However, most studies base their findings on community-level aggregated data, leaving it unclear to what extent migrant-sending households actually conform to a narrative of disengagement. This is a gap that this paper's household-level analysis addresses. Further, social capital is commonly understood as the network of relationships that help communities function effectively, but to our knowledge none of the literature in this area has drawn on network data, as we do here.

[2]For voter participation in national elections, (Lu 2019) describe competing effects, where migration-fuelled disengagement from local communities can be offset by the "political remittances" of migrants that connect their social ties at origin to the national discourse (Gori Maia and Lu 2021).

Second, we present new data on fully mapped in-person social networks in a large number of representatively sampled communities. Such data collection efforts are rare. A sizable share of the networks-related economics literature is based on data gathered in 75 villages in rural Karnataka, India (Banerjee et al. 2013, 2019, 2024; Breza and Chandrasekhar 2019; Breza, Chandrasekhar and Larreguy 2014; Chandrasekhar, Kinnan and Larreguy 2018; Chandrasekhar, Larreguy and Xandri 2020; Jackson, Rodriguez-Barraquer and Tan 2012). More recently, Beaman et al. (2021) mapped networks in 200 villages in Malawi, and Heß, Jaimovich and Schündeln (2021) did so in 56 communities in Gambia. We move beyond the name-generator designs used in these three cases, in which households provide census data and names of contacts concurrently and these details are later matched, and use a more robust roster-based design, in which each household is visited twice: once to provide census data that is then used to construct digital village rosters, and a second time for the roster-based identification of contacts.[3]

Third, we contribute to a literature that examines the role of information frictions as a barrier to migration (Baseler 2023; Beber and Scacco 2022; Bryan, Chowdhury and Mobarak 2014; Frohnweiler, Beber and Ebert 2024). While our analysis does not speak to the quality of migration information, it shows that households with migrants exchange migration information with other migrant households, and are sought for advice more broadly by non-migrant households. With this, we also expand on a literature on the role of destination networks for migration decisions and outcomes. Destinations networks influence destination choices and can improve social and economic integration at destination (Blumenstock, Chi and Tan 2025; Boyd 1989; Massey et al. 1993; Munshi 2003). Our results suggest that origin networks may fulfill similar functions.

Fourth, we contribute to a literature on the joint interaction between migration and participation in informal risk-sharing schemes (Meghir et al. 2022; Morten 2019; Munshi 2020). Our results suggest that migrant households reduce net transfer amounts to other households.

The remainder of the paper is structured as follows. Section 2 describes the study

[3]We know of only one study with a similar scope and approach, which focused on health interventions in 32 villages in Honduras (Kim et al. 2015).

context. Section 3 describes our sample and the measurement of networks and migration. Section 4 explains our empirical approach. Section 5 presents results on the relationship of social network ties with the migration status of the household. Section 6 explores access to information, financial resources and social status as functions of the social network and thus incentives to generate or maintain social ties with migrant households. Section 8 concludes.

2 Context

Senegal is a lower-middle income country located in West Africa where the population is split approximately evenly across rural and urban areas (Rigaud et al. 2021, 9). Urbanization has to an extent catalyzed shifts away from the agrarian economy and into informal trade and commerce, but agriculture continues to constitute a prominent source of employment (Rigaud et al. 2021, 10). Moreover, broader structural transformation involving the growth of manufacturing and technology sectors remains limited (Rigaud et al. 2021, 12).

Rates of internal and external migration have historically been high in Senegal (Ba, Bourgoin and Diop 2018; Rigaud et al. 2021). Internal migration dominates, though the intensity of movements varies considerably across regions (Rigaud et al. 2021, 14). Data from 2013 highlight that Senegal had close to 1.9 million internal migrants, constituting 14.6% of the population of approximately 13 million at the time (Ndione 2018, 56). Especially among youth in rural areas, limited access to agricultural production factors such as land paired with droughts and land degradation alongside better educational and economic opportunities in cities motivate internal migration (Ba, Bourgoin and Diop 2018; Rigaud et al. 2021).[4] Economic migration is particularly common among males, whereas female migration typically occurs for marriage (Chort, De Vreyer and Zuber 2017).

[4]Most contemporary internal migration occurs for economic reasons, but separatist conflict in Senegal's Casamance region that began in the 1980s also created significant internal displacement (Ndione 2018). The Internal Displacement Monitoring Centre has not reported new displacements since 2012.

Short-term circular mobility is a particularly prominent form of internal migration, although it is rarely captured in migration statistics such as those above (Gubert and Blanchard 2024; Lalou and Delaunay 2017). Using Call Detail Records (CDR) from mobile phones of millions of Senegalese adults across the country, Gubert and Blanchard (2024) estimate that 33% of the adult population was involved in one or more migrations of at least 20 days in 2013. In contrast, the rate of long-term migration in the same year was approximately 2% (Gubert and Blanchard 2024, 2). As in other areas in the Sahel and rural contexts in the Global South more broadly, households often rely on these short-term movements of its members to diversify income across markets given the volatility in production and income associated with rain-fed agriculture (Gubert and Blanchard 2024; Morten 2019). Households as a whole rarely relocate entirely.

Internal migration occurs primarily but not exclusively from rural areas to cities, with Dakar as the primary destination (Ba, Bourgoin and Diop 2018). Migration to Dakar, Thies, and Touba (in the Diourbel region) (known as the "Dakar-Touba" axis) combined accounts for 75% of internal migration destinations (Ba, Bourgoin and Diop 2018, 19). Most employment in these and other urban centers is restricted to the informal economy.[5] Our survey data (described in Section 3) suggests that common activities among migrants include informal transport (for example, auto or motorcycle taxi driver) and small scale commerce.

External migration occurs at lower rates, but exerts considerable influence on Senegalese society and the economy. Remittances from the Senegalese diaspora constitute an important income revenue for many households in the country and a considerable share of GDP (Jegen 2020). Further, migration holds an important place in Senegalese society not only because it can offer a means to overcome financial hardship, but also because of a culture that presents migration as an "an almost obligatory rite of passage among young men, and a central part of the everyday lives of the populations" (Mondain and Diagne 2013, 512). Emigration patterns have been mainly directed towards Europe and other African countries (Beauchemin et al. 2018; Jegen 2020). After independence, most

[5]Employment more broadly is also dominated by the informal sector, with 92% of the work force estimated to be employed in the informal labor market (World Bank Group 2018, 18).

migration outside of the continent was to France, however, migration into France has become increasingly restrictive and emigration routes and destinations have diversified to other countries including Italy, Spain, and the USA (Beauchemin et al. 2018; Jegen 2020; Tall and Tandian 2011).

3 Data

3.1 Sample

The data we collected for this study are part of the 2022 Senegal Migration Panel.[6] The sample includes 145 rural villages in Senegal, grouped into three sub-samples: (1) a nationally representative sample of rural villages (35 villages), (2) representative rural samples from three departments: Kaolack, Matam, and Sedhiou (30 villages each), and (3) a set of 10 rural villages in Thies and Diourbel departments that were targeted by the NGO Eclosio for an irrigation intervention and 10 matched villages in the same departments (for a total of 20 villages of this type). Villages were sampled from location-based strata, namely within district for focus departments and within region for the national sample. The sample excludes all urban communes and communes in the Dakar region. It also excludes certain areas bordering the Gambia, Mali, or Guinea for security reasons (specifically, the departments of Bignona, Bounkiling, Medina Yoro Foulah, Saraya, Bakel, Salemata, and the district of Fongolembi). National-level representativeness is conditional on these exclusions. Overall, the sampling frame covers 3,082 out of 3,463 rural villages across all regions and 35 of 41 departments outside of Dakar.[7]

We targeted all households in our sample villages for enumeration during face-to-face surveys conducted in July and August 2022 resulting in a dataset of 9,655 households. At this time surveyors collected basic household information and roster-

[6] For additional project details, see https://www.rwi-essen.de/en/smp.

[7] Senegal's administrative units are arranged hierarchically such that settlements (*quartiers/villages*) are nested within communes, which in turn are nested within districts (usually referred to as *arrondissement* or denoted as *cav* for *commune/arrondissement/ville*), which combine to form departments, several of which then constitute a region.

based demographic characteristics and internal and external migration histories of each household member. In September and October 2022, survey teams revisited enumerated households to collect network and other household- and individual-level data. At that time, the household head, or another knowledgeable adult if the head was unavailable, and a randomly selected male aged 18-40 completed the network module.[8] This two-step process – full enumeration of village residents first, followed by the identification of network links from the complete village roster – is designed to improve data quality and reliability, a common challenge with network data constructed on the basis of matching names in free-entry text fields. Few studies have been able to deploy the kind of closed-list procedure we use here (Comola and Mendola 2015; Kim et al. 2015), and none to our knowledge at this scale.

3.2 Network measurement

We map entire village networks of 9,322 households in 145 villages for four different network types using the following survey questions:

1. Social: "*Who comes by your house regularly*?" and "*Who do you or members of your household regularly visit in the village*?"

2. Personal advice: "*If you or members of your household had to make a difficult personal decision, whom would you or these household members ask for advice?*"

3. Migration information: "*Who would you or members of your household ask for advice and information about migration?*"

4. Organizing an event: "*If I wanted to organize an event in the village and had to inform people in the village, who should I talk to?*"

In addition, we collected data on risk sharing in just under half of the households (N = 3,935). We have information about whether a household is a recipient and sender

[8]The network module questions were asked even if only one of these individuals was available. In some cases, other household members were also present, and we record the total number of household members present. We account for the number of members present during network enumeration in the analysis.

of transfers and the total amounts received and sent. However, we lack information on who the counterpart recipient or sender was.[9]

For the four network types (social, personal advice, migration information, and organizing an event), we collect information on links from members of all 9,340 households within villages.[10] Collecting such detailed data helps mitigate inference problems linked to estimating networks using incomplete or sampled network data (Chandrasekhar and Lewis 2011).[11]

We use the village as the network boundary and take nodes to be households rather than individuals as the household is the most relevant unit for economic and social decision-making, including members' migration decisions in the rural Senegalese context (Chort and Senne 2013).[12] Using household-level networks assumes that information and resource flows across household units are shared within households. Our other data match the household as the level of aggregation.

We elicit ties by asking respondents to list any applicable individuals outside of their household. There was no maximum number of names that could be listed, other than the total number of village residents. Enumerators digitally recorded each listed contact by selecting the person from a drop-down list of pre-filled detailed roster information. To ensure that the intended person was correctly identified, enumerators worked with respondents to verify the person's gender, age, name of the head of household, the

[9]The transfer data was collected about 7 months after the network data was collected to follow up a sample that participated in in-depth interviews in 2022. To generate the smaller sample for these in-depth interviews, households were randomly sampled from the July/August 2022 village census. Within-village household samples were drawn in proportion to village size, and households were stratified based on roster-reported migration experiences among men between 18-40 years old, such that those who have migrated either domestically or internationally in the previous twelve months were under-sampled roughly by a factor of two. Within each stratum, household selection probabilities were proportional to the number of within-household target individuals.

[10]We exclude unreached households across the two data collection rounds. Overall, enumerators reached 9,340 of the 9,655 (96.7%) households successfully surveyed in the first round. We omitted 19 observations due to enumeration errors related to inconsistent characteristics reported for individuals across rounds.

[11]For example, sampled network data can induce non-classical measurement error, consequently biasing estimates of regression coefficients.

[12]This is also in keeping with the approach taken by virtually all studies that have collected data on village social networks.

name of the head's spouse(s), and nickname where possible.[13]

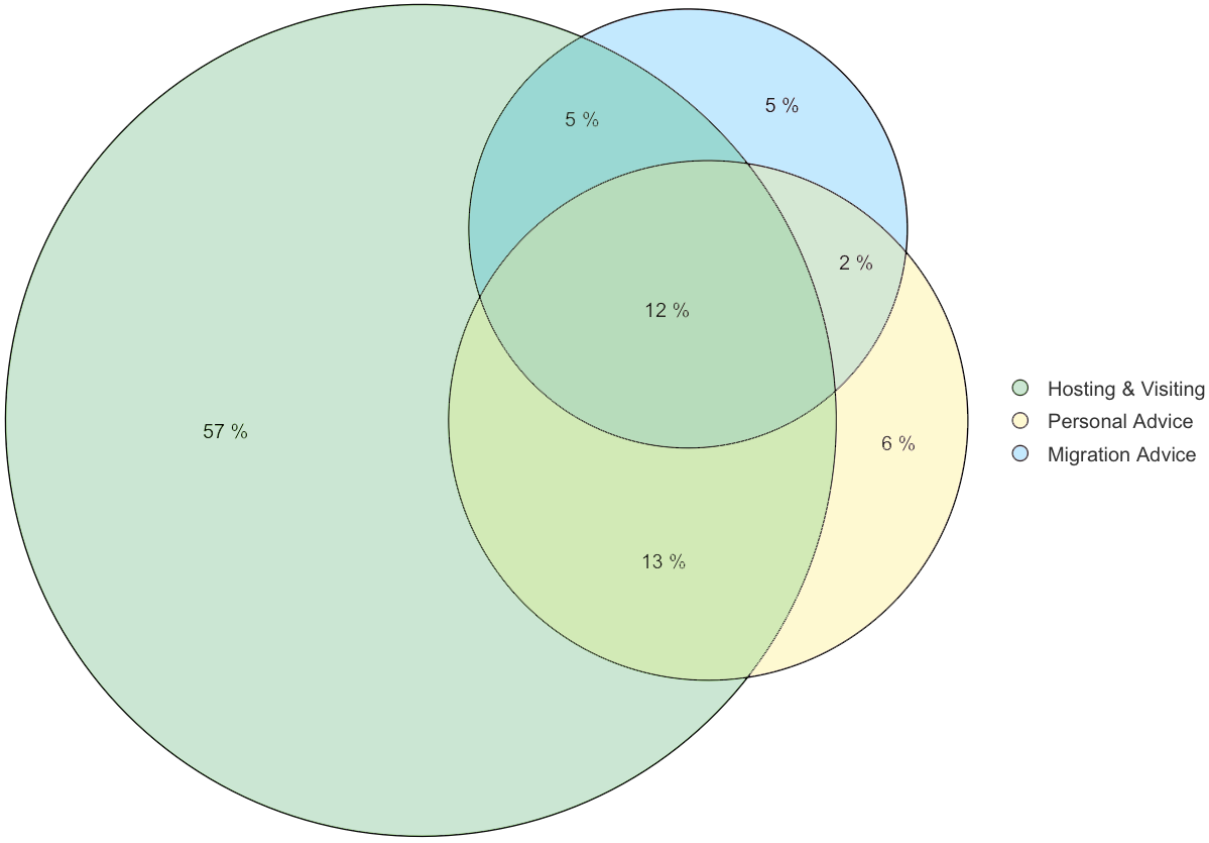
The social network is our main outcome measure. It is the broadest network, serving multiple functions – including personal advice, migration information, and likely risk sharing (though we do not directly observe risk-sharing links) – and these functions will be used in downstream analyses of the social network. The event organizing network does not measure connections between households to the same extent as the other networks do, but it allows us to identify households with greater "diffusion centrality", i.e., those who have a large reach in the community, following Banerjee et al. (2019).

Figure 1 describes the overlap in "between-household" ties of the social, personal advice and migration information networks. It shows the proportion of unique undirected household pairs that report a tie under each of the three network questions. These connections are not exclusive so that, on average, 87% of all connections are social ties, 33% are personal advice ties and 24% are migration information ties. There exists considerable overlap between networks: 75.8% of personal advice connections and 70.8% of migration information connections are also social ties; 42% of personal advice connections are also migration information ties and 58% of migration information connections also personal advice ties. Thus, a relatively smaller but still considerable share of personal advice (24.2%) and migration information (29.2%) is attained from households outside their social network.

Given that the broad social network is measured in terms of home visits, this implies that relevant interactions occur in private places rather than in public, or in public places with people whom they are also meeting in private. For example, gift-giving is unlikely to occur in the public sphere between two households in the Senegalese context. While information may also commonly be passed between villagers in public settings, such as a village meeting, connections involving home visits are probably still the most likely to be activated. Connections comprised of private home visits likely also send stronger

[13]This information was included in the drop-down list. When the respondent listed a name that was not in the list, enumerators added the name, age, and gender of this individual. This happened in 3% of cases. In cases where individuals listed members of their own household, we drop this self-referential link from the data. Repeated links to the same household within the same question were also dropped.

Figure 1: Overlap in network measures



Notes: Shares represent the proportion of unique undirected household pairs that report a tie under each network question. Each colored region corresponds to one type of relationship, and the overlapping areas indicate pairs for which multiple types of ties are reported. All measures are constructed from undirected edges: a connection is counted if either household reports it, and duplicates are removed.

signals about who is connected, especially when social status is a function of network formation. Observing individuals interact outside of the home may only signal a weak tie, but learning or seeing that they frequent each other's homes sends a signal about a stronger connection.

Our primary outcome of interest is a binary indicator for the existence of a tie between household i and another household j in a dyadic data structure. We will analyze the network data as undirected and directed connections. In the undirected dyadic setup, each household pair $\{i, j\}$ appears only once in the data and there is a tie if either i listed j as a connection, or j listed i. In the directed dyadic setup, each household pair appears twice in the data, once as (i, j) with i as a source and j as a target (tie equals 1 if i lists j and 0 otherwise) and once as (j, i) with j as a source and i as a target (tie equals 1 if j lists i and 0 otherwise).

Table 1 summarizes the centrality of households in each network by household migration status (measurement of migration is discussed in Section 3.3) in the estimation sample of 9,194 households. For each network, the table shows the number of undirected first-order total degree ties, the number of first-order in-degree ties (i.e., i is mentioned by j), the number of first-order out-degree ties (i.e., i mentions j), the betweenness of the household measured by the fraction of shortest paths between node pairs that pass through the node of interest, and the eigenvector centrality of the household measured by the values of the first eigenvector of the graph adjacency matrix. The last two measures, betweenness and eigenvector centrality, describe the influence of the node in the respective network.

As discussed before, most of the household ties are social connections. The average total degree in the social network is 7.4, whereas it is less than half and of similar size for the personal advice and migration information networks. For all networks and centrality measures migrant households are significantly more central than non-migrant households.

The fact that the total degree is almost twice the size of the in- and out-degrees suggests that there is limited reciprocity, i.e., when i mentions j, j also mentions i.

Table 1: Summary statistics of network measures by migration status of the household

	No migration	Migration	
	Mean SD	Mean SD	Difference p-value
Social (Visit & Host)			
Total degree	7.30	7.95	−0.64
	(3.67)	(3.70)	[0.000]
In-degree	4.01	4.81	−0.79
	(3.16)	(3.34)	[0.000]
Out-degree	4.21	4.25	−0.04
	(2.15)	(2.10)	[0.508]
Betweenness	0.02	0.03	−0.00
	(0.03)	(0.03)	[0.000]
Eigenvector	0.37	0.42	−0.04
	(0.22)	(0.22)	[0.000]
Personal advice			
Total degree	2.82	3.15	−0.33
	(1.99)	(2.21)	[0.000]
In-degree	1.47	1.80	−0.33
	(1.74)	(2.00)	[0.000]
Out-degree	1.55	1.58	−0.03
	(1.02)	(1.09)	[0.348]
Betweenness	0.04	0.05	−0.01
	(0.06)	(0.08)	[0.000]
Eigenvector	0.21	0.24	−0.03
	(0.23)	(0.25)	[0.000]
Organize an event			
Total degree	2.81	3.22	−0.41
	(3.68)	(4.34)	[0.000]
In-degree	1.42	1.79	−0.37
	(3.58)	(4.31)	[0.000]
Out-degree	1.50	1.55	−0.06
	(1.04)	(1.10)	[0.054]
Betweenness	0.03	0.04	−0.01
	(0.08)	(0.10)	[0.000]
Eigenvector	0.16	0.17	−0.02
	(0.18)	(0.20)	[0.001]
Migration advice			
Total degree	2.00	2.27	−0.28
	(1.80)	(1.91)	[0.000]
In-degree	1.02	1.26	−0.24
	(1.45)	(1.64)	[0.000]
Out-degree	1.07	1.13	−0.06
	(0.99)	(1.00)	[0.041]
Betweenness	0.03	0.04	−0.01
	(0.07)	(0.07)	[0.003]
Eigenvector	0.15	0.17	−0.02
	(0.22)	(0.24)	[0.001]
N	7,709	1,485	9,194
Transfers			
Received (yes/no)	0.59	0.64	−0.05
$N = 3,894$	(0.49)	(0.48)	[0.019]
Received amount (CFA)	27,165	28,533	-1,368
$N = 1,606$	(46,511)	(39,115)	[0.647]
Sent (yes/no)	0.75	0.76	−0.01
$N = 4,056$	(0.43)	(0.43)	[0.755]
Sent amount (CFA)	37,063	38,400	-1,337
$N = 2,301$	(48,217)	(49,264)	[0.624]

Notes: This table reports household-level network and transfer summary statistics for the SMP 2022 survey. Means are shown with standard deviations (SD) in parentheses. A migrant household is defined as a household with at least one person who migrated and left the household permanently within the past ten years. The p-value reports a two-sided t-test of equality of means between migrant and non-migrant households.

Specifically, the rates of reciprocity are 23.2% for the social network, 12.8% for the personal advice network and 8.3% for the migration information network. Limited reciprocity is a common phenomenon with network data (Comola and Fafchamps 2017). For advice and information we would generally not expect high reciprocity. For example, if someone asks a higher-skilled colleague for advice, the colleague in turn might ask a third person with better skills than hers for advice. However, for social network ties this may be different (and reciprocity is in fact also considerably higher), i.e., one might commonly expect that considering a person a friend implies being considered a friend in turn. We interpret limited reciprocity in the social network as a sign of the importance of salience, given subjective perceptions of friendships. For example, think about individual i who meets with some friends everyday and with another friend j only once a month; j however, meets no more than once a month with friends. Then j likely mentions i, but i not necessarily j. Alternatively, we could think about the limited reciprocity as in Comola and Fafchamps (2017), but would then have to form a prior about whether households are systematically under- or over-reporting, while both over-reporting (i.e., desired links) and under-reporting (i.e., missing links) are equally likely in our set-up. We prefer not to postulate either direction of error but to use only reciprocal links in the undirected analysis as a robustness check.[14]

The bottom of Table 1 also includes summary statistics on intra-village transfers in the smaller sample. About two-thirds of households received transfers worth an average total amount of EUR 41, and three-quarters reported to have sent transfers worth an average total amount of EUR 56. The fact that the proportion of households sending money and the amounts they sent are higher than what we see for households receiving money likely relates to the norm that it is more socially desirable to give than to receive. Migrant households are more likely to receive transfers but not to send transfers, and the amounts they send or receive are comparable to non-migrant households.

[14] Appendix Figure A1 presents the distribution of total degrees, in-degrees and out-degrees for the social network.

3.3 Migration and household characteristics

We measure each household's migration status with an indicator for whether the household has any member who moved away in the ten years prior to the survey and who is not a member of the household anymore. By this definition, 16% of households in the sample are migrant households. The migration indicator does not capture short-term movements or seasonal mobility and is therefore similar to the types of migration captured in studies on internal migration and risk-sharing networks (Meghir et al. 2022; Munshi and Rosenzweig 2016). While short-term mobility is the most common form of migration, individuals that move short-term often remain a member of the household and the interaction between such mobility and social connections becomes fuzzy.

Table 2 shows that by far the most common form of migration, with 13% of the sample, is internal migration. Only 2% migrate internationally to non-OECD and OECD countries, respectively. Of the individual migrants, 59.6% are females and the majority of these migrate for marriage, while males typically migrate for work.[15] Our analysis will also provide results by gender of the migrant.

Table 2 further describes the sociodemographic background characteristics of our sample. Almost all households are Muslim, and the two largest ethnicities are Fulani (locally: Peulh, 37%) and Wolof (25%). The average median age of adult household members is 33.5 years and the average median level of education is less than completed primary education.

Migrant households have more adult household members (excluding migrants), are slightly younger, have higher socioeconomic status, are more likely to have a marabout (religious leader) or the village chief as a member, and are less likely to be of Fulani ethnicity but more likely to be of Mandinka or Diola ethnicity than non-migrant households.[16] Thus, migrant and non-migrant households do differ in a number of

[15] The motives for migration were not collected for migrants who are not part of the household anymore, but data from more recent migrants from the same households can provide some insights. Appendix Table A1 shows that among those recent migrants, 74% of males and 27% of females migrated for work. For women, the most common type of migration is for marriage (45%).

[16] The socioeconomic status index is based on a principal component analysis of items from the Poverty Scorecard Assessment Tool for Senegal (Schreiner 2017).

Table 2: Summary statistics of background characteristics by migration status of the household

	All	No migration	Migration	
	Mean SD	Mean SD	Mean SD	Difference p-value
Migration				
Any	0.16			
	(0.37)			
Internal	0.13			
	(0.34)			
OECD	0.02			
	(0.15)			
Non-OECD	0.02			
	(0.14)			
Socio-economic				
Median age	33.53	33.48	33.75	−0.26
	(8.39)	(8.41)	(8.27)	[0.267]
Median education	0.58	0.58	0.61	−0.03
	(0.81)	(0.81)	(0.79)	[0.144]
Share age 15-30	0.20	0.21	0.20	0.01
	(0.10)	(0.10)	(0.08)	[0.011]
Share age 31-64	0.42	0.42	0.42	0.00
	(0.10)	(0.10)	(0.09)	[0.101]
Share age 65+	0.37	0.37	0.38	−0.01
	(0.08)	(0.08)	(0.07)	[0.000]
SES index	−0.00	−0.03	0.13	−0.16
	(1.40)	(1.40)	(1.38)	[0.000]
Male adults in HH	3.41	3.36	3.70	−0.34
	(2.26)	(2.24)	(2.34)	[0.000]
Female adults in HH	3.57	3.49	4.01	−0.53
	(2.28)	(2.24)	(2.45)	[0.000]
Marabout household	0.05	0.05	0.06	−0.01
	(0.22)	(0.21)	(0.23)	[0.090]
Chief household	0.02	0.01	0.02	−0.01
	(0.12)	(0.12)	(0.15)	[0.010]
Religion				
Islam	0.97	0.97	0.98	−0.01
	(0.17)	(0.17)	(0.14)	[0.062]
Christian	0.02	0.03	0.01	0.01
	(0.15)	(0.16)	(0.12)	[0.009]
Other	0.00	0.00	0.00	−0.00
	(0.03)	(0.02)	(0.05)	[0.009]
Ethnicity				
Fulani	0.37	0.39	0.32	0.07
	(0.48)	(0.49)	(0.47)	[0.000]
Wolof	0.25	0.25	0.26	−0.01
	(0.43)	(0.43)	(0.44)	[0.545]
Mandinka	0.15	0.14	0.21	−0.07
	(0.36)	(0.35)	(0.41)	[0.000]
Serer	0.14	0.14	0.13	0.01
	(0.34)	(0.35)	(0.33)	[0.210]
Diola	0.03	0.03	0.04	−0.01
	(0.18)	(0.18)	(0.20)	[0.053]
Other	0.04	0.05	0.04	0.01
	(0.21)	(0.21)	(0.20)	[0.349]
N	9,194	7,709	1,485	9,194

Notes: This table reports household-level summary statistics for the SMP 2022 survey. Means are shown with standard deviations (SD) in parentheses. A migrant household is defined as a household with at least one person who migrated and left the household permanently within the past ten years. The p-value reports a two-sided t-test of equality of means between migrant and non-migrant households.

background characteristics. Some of these differences stem from regional variations (especially in ethnicity), which will be controlled for in the analysis through village fixed effects.

4 Empirical strategy

We estimate the relationship of household i's migration status X_i with its network ties Y_{ij} for all $j \neq i$ in the same village v in two ways. First, we consider undirectional dyadic relationships, where each potentially linked pair of households i and j is included as a single observation, and $Y_{ij} = Y_{ji}$ by construction. Symmetry implies that $\beta X_{ij} = \beta X_{ji}$ for any X, and so we follow the commonly used approach of Fafchamps and Gubert (2007) and regress our outcome of interest on within-dyad sums and absolute differences as follows:

$$Y_{ij} = \beta_0 + \beta_1(X_i + X_j) + \beta_2|X_i - X_j| + \gamma C_{ij} + \eta_v + \varepsilon_{ij}, \tag{1}$$

where C_{ij} is a $k \times 1$ vector of controls, including the geographic distance between households as well as within-dyad sums and absolute differences of household characteristics, and η_v are village fixed effects to control for heterogeneity across villages in features that correlate with migration propensity and social network structures such as village size, economic opportunity, proximity to urban areas, or norms toward migration. We cluster standard errors at the household and village level. Coefficient β_1 measures the effect of the dyad's combined migration exposure on whether this link is active, and β_2 provides an estimate of the effect of differences in this exposure. That is, we interpret the coefficient on the sum as a measure of the importance of migration to forming a connection and the coefficient on the difference as a measure of migration-related heterophily (i.e., the opposite of homophily) when connections are formed.

Second, we consider directional relationships, where Y_{ij} need not equal Y_{ji}, and each potentially linked pair of households i and j is included twice, with indices ij and ji. Outcome Y_{ij} now captures whether i has reported a link to j, regardless of whether j

has reciprocated. In this case, we estimate

$$Y_{ij} = \beta_0 + \beta_1 X_i + \beta_2 X_j + \beta_3 X_i X_j + \gamma D_{ij} + \eta_v + \varepsilon_{ij}, \quad (2)$$

where D_{ij} is a vector of controls that again includes geographic distance as well as household characteristics for i and j and – in one specification – their interactions. We cluster standard errors by sender household i, receiver household j, and village v (Cameron, Gelbach and Miller 2011). Coefficient β_1 now tells us the effect of migration in the link-reporting household on whether an active tie is reported (contributing to i's out-degree), and β_2 measures the effect of migration in receiver households on inward links (adding to j's in-degree). When we include the interaction term $X_i X_j$, we interpret its coefficient β_3 as an indicator of homophily.

We report two versions of our main models, a sparse specification with a limited set of control variables and a more saturated specification with an extended set of potential confounders. All specifications include key household composition and interview characteristics that are particularly relevant for the measurement of networks, namely household size, gender composition, and the number of individuals who were present for the network module of the survey.

5 The social networks of migrant households

5.1 Main estimation results

Table 3 presents the results from the undirectional analysis of social network ties. Coefficient estimates are reported as percentage point changes in the probability that a social network tie, as described in section 3.2, has been established in a dyad. On average, about one in ten within-village household dyads is socially networked in this way. We focus in our main analysis on households' social network, because this most broadly captures community embeddedness. The coefficients of primary interest are those reported in the first two rows for the within-dyad sum of and difference

in migration exposure. We show a sparse specification in column (1) and a more saturated specification in column (2), but results do not vary meaningfully across these specifications and so we focus on the second specification in the following.

We find that dyads in which both households have had a member migrate are about two percentage points (twice the coefficient on the sum of migration exposure, or 20% relative to the average) more likely to be socially linked than a dyad in which neither household has had a migrating member. This is a sizable effect estimate – for comparison, being of the same ethnicity boosts the chance of being socially linked by one percentage point. With one migration-exposed household, the effect drops to less than half of a percentage point, since the coefficient on the difference in migration exposure now bites. We can directly interpret this coefficient on within-dyad differences as a measure of heterophily, so its negative sign suggests homophily in social interactions – the marginal effect of a household having a migrant member on being socially connected is much larger if the household on the other side of the dyad also has a migrant member. Migrant households flock together. But they are not disengaged from village life. If anything, they appear overall more socially active than they would otherwise be.[17]

The results of the directional analysis in Table 4 also shows that migration-exposed households are on average more socially engaged, with significant coefficients on the migration indicators having positive signs, and it again suggests homophily, with a positive and significant coefficient on the interaction of these migration indicators. As in the previous table, we report different specifications: A sparse model in column (1), a model containing a larger set of potential confounders in column (2), and finally a model that additionally contains interaction terms in column (3). Results are consistent across columns, and so we focus on the last set of estimates.

An advantage of the directional analysis is that it allows us to disentangle the extent to which migrant households are more likely to initiate social interactions from the

[17]Appendix Table A2 shows that our results also hold when we consider only reciprocal links as social ties in an undirectional analysis, i.e., we consider two households to be socially connected only if both of them report this to be the case. Effect sizes are smaller in that analysis, but remain highly significant, and consistent with arguments about migrant households' homophily and heightened social involvement.

Table 3: Migration and social ties (undirected dyadic analysis)

	(1) Tie exists (pp)		(2) Tie exists (pp)	
	β	SE	β	SE
Migration Sum	1.041***	(0.227)	0.950***	(0.230)
Migration Difference	−0.593**	(0.238)	−0.560**	(0.240)
Sum of:				
Household size	0.412***	(0.026)	0.429***	(0.029)
Share female	−1.880***	(0.338)	−1.710***	(0.350)
No. of network respondents	0.696***	(0.090)	0.676***	(0.093)
Education			0.091	(0.067)
SES index			0.212***	(0.066)
Married share			0.158	(0.164)
No. of children			−0.115*	(0.062)
Share age 15-30			0.879	(1.053)
Share age 31-64			1.901*	(1.009)
Share age 65+			2.674**	(1.141)
Share in non-agricultural occupation			−1.309***	(0.285)
Head born in village			−0.298	(0.229)
Marabout			1.960***	(0.573)
Chief			5.608***	(0.713)
Difference in:				
Household size	0.056***	(0.015)	0.064***	(0.016)
Share female	−2.151***	(0.393)	−1.679***	(0.388)
Education			0.151**	(0.074)
Scorecard index			−0.390***	(0.086)
Married share			−1.796***	(0.357)
No. of children			−0.201***	(0.060)
Share age 15-30			−0.999**	(0.491)
Share age 31-64			−0.389	(0.510)
Share age 65+			−2.168***	(0.803)
Share in non-agricultural occupation			−1.959***	(0.368)
Head born in village			−1.196***	(0.260)
Marabout			−2.503***	(0.628)
Dyad characteristic:				
Log distance (m)	−6.384***	(0.685)	−6.303***	(0.708)
GPS missing	−0.832	(0.977)	−0.691	(1.010)
Same ethnicity	1.033***	(0.235)	0.997***	(0.242)
Observations	321,243		308,465	
Mean (%)	9.979		10.02	
Fixed effects	Village		Village	
Cluster	HH_i, HH_j, Village		HH_i, HH_j, Village	

Notes: This table reports OLS estimates from dyadic regressions where the unit of observation is an unordered household pair within the same village. "Sum" variables add the characteristics of the two households, and "Difference" variables take the absolute difference between them. Models include village fixed effects. Standard errors are clustered at the household and village levels. Coefficients are reported in percentage-point units. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

effect of migration exposure on being sought out for social encounters. In the top row, we report coefficients and standard errors for migration in the sender household, i.e., the effect on outgoing links. The second row shows results for migration in receiver households, i.e., the effect on inward links. We see that migration-induced changes in households' overall social connectivity are driven by changes in in-degree, not out-degree. In columns (1) and (2), the out-degree coefficients are close to zero and not statistically significant, while the in-degree coefficients show meaningful effects, with migrant households being about 0.8 percentage points more likely to have an inward link reported (a 14% increase relative to the average of 5.7).

Column (3) shows additionally that migrant households are particularly likely to connect with each other. Compared to a dyad in which neither household has had a migrant, dyads of migrant households are 1.3 percentage points more likely to be socially linked, dropping to 0.6 of a percentage point for dyads in which only the receiver household has had a migrant, and a statistically insignificant -0.2 for dyads with a migrant sender household only. While about one in twenty intra-village directed dyads are socially active on average, this increases to one in fourteen for dyads among migrant households, a sign of homophily for this type of household. In terms of effect size, this appears roughly comparable to the difference in social connectivity between households of married adults (or households of unmarried individuals, which are similarly connected among each other) and the dyads in which one and only one household consists of married adults.[18]

5.2 Results by gender of migrants, migration destinations, and time period

We next seek to better understand which types of migration are driving the results observed in Tables 3 and 4. Figure 2 shows coefficient estimates and confidence intervals

[18]The coefficients we observe for our control variables paint a broadly reasonable picture and suggest that the data captures key patterns of social interactions in the study villages. Among the most powerful predictors of a socially active dyad are geographic distance, the extent to which households are of the same gender, and similarities in education levels, occupation, and indigeneity.

Table 4: Migration and social ties (directed dyadic analysis)

	(1) Tie exists (pp)		(2) Tie exists (pp)		(3) Tie exists (pp)	
	β	SE	β	SE	β	SE
Migration (i)	−0.019	(0.103)	−0.016	(0.108)	−0.190	(0.124)
Migration (j)	0.856***	(0.135)	0.835***	(0.140)	0.661***	(0.148)
Migration (i×j)					0.883***	(0.320)
Household size (i)	0.050***	(0.010)	0.059***	(0.015)	0.003	(0.021)
Household size (j)	0.429***	(0.025)	0.509***	(0.029)	0.453***	(0.030)
Household size (i×j)					0.007***	(0.003)
Share female (i)	−0.302	(0.199)	−0.181	(0.210)	−2.761***	(0.620)
Share female (j)	−1.872***	(0.275)	−1.848***	(0.288)	−4.428***	(0.660)
Share female (i×j)					4.955***	(1.102)
No. of network respondents (i)	0.445***	(0.063)	0.442***	(0.064)	0.446***	(0.064)
No. of network respondents (j)	0.369***	(0.071)	0.359***	(0.072)	0.363***	(0.072)
Share married (i)			0.172	(0.224)	−1.168***	(0.443)
Share married (j)			1.198***	(0.254)	−0.142	(0.448)
Share married (i×j)					2.282***	(0.607)
No. of children (i)			−0.065	(0.068)	−0.033	(0.074)
No. of children (j)			−0.489***	(0.089)	−0.456***	(0.098)
No. of children (i×j)					−0.027	(0.024)
Share age 15-30 (i)			2.415***	(0.713)	1.471	(0.930)
Share age 15-30 (j)			0.691	(0.928)	−0.253	(1.109)
Share age 15–30 (i×j)					1.951*	(1.022)
Share age 31-64 (i)			2.362***	(0.711)	2.099**	(0.807)
Share age 31-64 (j)			1.630*	(0.917)	1.368	(0.916)
Share age 31–64 (i×j)					0.952	(1.104)
Share age 65+ (i)			1.957***	(0.715)	1.740**	(0.739)
Share age 65+ (j)			1.426	(0.979)	1.210	(0.966)
Share age 65+ (i×j)					5.081*	(2.913)
Median education (i)			0.006	(0.042)	−0.228***	(0.064)
Median education (j)			0.017	(0.063)	−0.218***	(0.083)
Median education (i×j)					0.319***	(0.058)
Share in non-agri. occ. (i)			−0.384**	(0.177)	−1.445***	(0.453)
Share in non-agri. occ. (j)			−0.907***	(0.219)	−1.968***	(0.460)
Share in non-agri. occ. (i×j)					1.724***	(0.607)
Scorecard PCA (i)			0.061	(0.057)	0.063	(0.057)
Scorecard PCA (j)			0.307***	(0.070)	0.309***	(0.070)
Scorecard PCA (i×j)					0.031*	(0.019)
Head born in village (i)			0.036	(0.120)	−1.174***	(0.283)
Head born in village (j)			0.470***	(0.147)	−0.740**	(0.291)
Head born in village (i×j)					1.458***	(0.334)
Marabout (i)			0.076	(0.170)	−0.222	(0.175)
Marabout (j)			−0.188	(0.208)	−0.486**	(0.218)
Marabout (i×j)					2.760***	(0.706)
Chief (i)			1.144***	(0.385)	1.149***	(0.386)
Chief (j)			4.652***	(0.687)	4.657***	(0.690)
Chief (i×j)						
Log distance (m)	−4.003***	(0.436)	−3.987***	(0.452)	−3.967***	(0.451)
Same ethnicity	0.706***	(0.145)	0.726***	(0.148)	0.694***	(0.150)
GPS missing (i)	−0.600	(0.581)	−0.590	(0.612)	−0.604	(0.605)
GPS missing (j)	−0.449	(0.714)	−0.372	(0.750)	−0.386	(0.745)
Observations	642,486		616,930		616,930	
Mean (%)	5.645		5.671		5.671	
Fixed effects	Village		Village		Village	
Cluster	HH_i, HH_j, Village		HH_i, HH_j, Village		HH_i, HH_j, Village	

Notes: This table shows OLS estimates from directed dyadic regressions where each observation is a household pair (i, j), with i as the sender and j as the receiver. Covariates measured at the household level are included for sender i and receiver j, and with their interactions. Models include village fixed effects. Standard errors are clustered by sender, receiver, and village. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

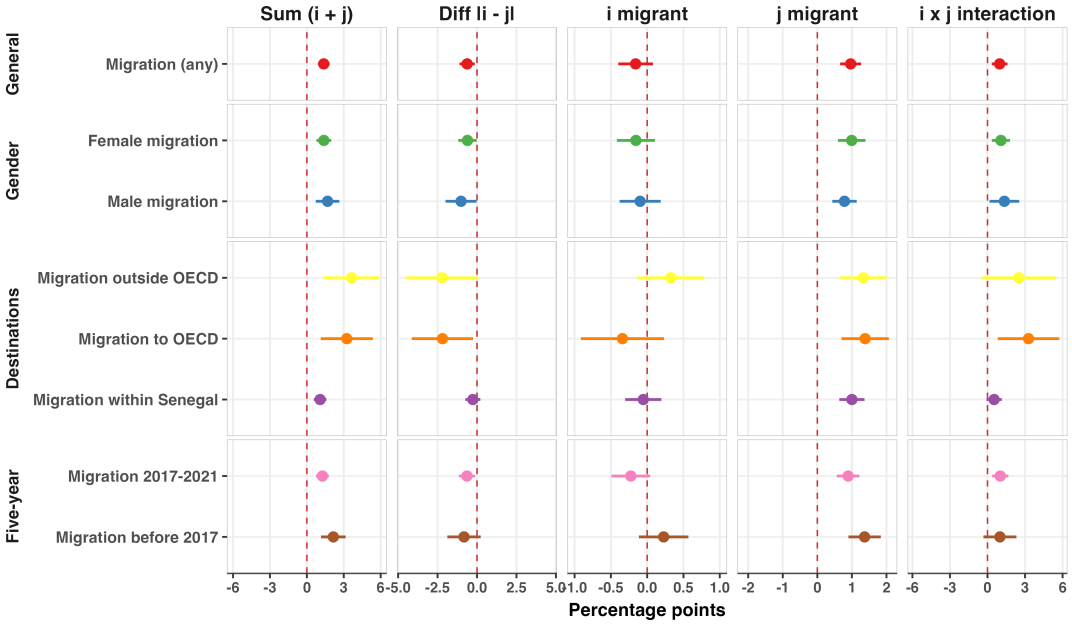
from a set of regressions that implement the same types of undirectional and directional dyadic analysis used for our main results, but where we now code household migration exposure in different ways. For the sake of comparison, our main estimates are shown in the first row of the figure.

In the second and third row, we consider female and male migration separately. Women and men tend to be embedded in different social networks and in Senegal they tend to migrate for different reasons, with women migrating for marriage – Senegal is generally a patrilocal society – and men migrating for work as a typical income diversification strategy. However, we do not see much divergence in terms of effects on the social networks of migrant-sending households. For both female and male migration, we see greater social connectedness (column 1), driven by incoming (column 4) as opposed to outgoing links (column 3), and characterized by homophily (columns 2 and 5), as in our main results.

This patterns also largely repeats in the next three rows when we code migrant households based on migration to particular destinations, namely those within Senegal and those abroad in OECD and non-OECD countries. Again we see heightened connectedness across migration categories, driven by ingoing links. Given the relative rarity of international migration, coefficients related to migration to other non-OECD or OECD countries are less precisely estimated, but still significant and in line with the main results. In fact, homophily among migrant households appears to be driven by those with international – and in particular OECD – migration exposure. Among households with internal migration exposure, we do not find significant evidence of homophily.

Finally, in the last two rows of Figure 2, we separate relatively more recent migration exposure (during the five-year period prior to our survey) from more distant (pre-2017) migration events. Again, the estimates are broadly consistent across migration categories, although less precisely estimated when households are classified based on migration in the pre-2017 period. This concerns specifically the coefficients related to homophily in columns 2 and 5, which are similarly-sized across time periods, but too

Figure 2: Coefficient estimates by migration type



Notes: This figure reports estimates from dyadic regressions for the five migration terms in equations 1 and 2 (sum, difference, i, j, and $i \times j$). Each grouped set of rows corresponds to a migration typology (overall, gender-specific, destination-specific, and period-specific). Points show estimated percentage-point effects, and horizontal bars denote 95% confidence intervals. All models include the full set of control variables and multi-way clustering, corresponding to column (2) of Table 3 and column (3) of Table 4.

imprecise to be statistically significant for the pre-2017 period.

In summary, we see three persistent patterns across both our main specifications and models in which we focus on particular types of migration exposure. First, migrant household are more, not less, socially networked within their villages. There is no evidence that having a member migrate away in the past translates into households disengaging from their local community in the present. If anything, the opposite appears to be the case. Second, this increase in social connectedness does not seem to be driven by migrant households reaching out to others to a greater extent. Their level of reported outward engagement remains largely unaffected. Instead, we observe more inward links for migrant households, i.e., others are more likely to report social engagement with migrant households. Third, while migrant households do not disengage from their communities, they tend to involve themselves with households like them to a greater extent. In particular this kind of homophilic alignment seems to occur for households with international migrants.

6 Network functions

In this section, we explore the extent to which migrant households serve useful functions that incentivize other households to seek ties with them. We focus on incentives linked to the resources, material or immaterial, that migrant households can provide as a result of their migration status, and consider three functions of social networks: information, access to financial resources, and social status. While these functions are discussed in isolation, we consider these as neither all-encompassing nor mutually exclusive.[19]

6.1 Information capital

Migration behavior and social connectivity may be linked via an information transmission channel. The notion that social networks generate "information capital" –

[19] We borrow this language from Cruz, Larreguy and Marshall (2019)'s framework for understanding social networks' functions for shaping politics.

the ability to acquire valuable information and/or spread it to others through social connections (Jackson 2020, 4) – is widespread (Banerjee et al. 2019), and an extensive literature studies the role that social networks in *destination* areas play in providing such capital to shape migration behavior and outcomes (Banerjee 1983; Böcker 1994; Boyd 1989; Coombs 1978; Faist 2021; Fawcett 1989; Haug 2008; Massey and España 1987; Toney 1978; Wilpert 1992). More tangibly, information and social capital can help reduce uncertainty about the journey and conditions in the destination, including wage expectations and employment opportunities.[20]

Origin social networks' role in diffusing migration-related information is relatively less studied, although origin communities likely hold considerable information capital. Internal migrants typically return regularly to visit their home villages and can directly provide relevant information about destination conditions. In addition, information can spread through the migrant's origin household that remains in the village. Chen (2022) studies the role of internal migrants' networks at origin in China and finds that villagers with larger home-village networks of fellow migrants have higher incomes when migrating. Beyond migration-related information, migrant households likely also possess better information about the ways of life, norms and political processes outside the origin area (Batista, Seither and Vicente 2019; Ivlevs 2021; Kapur 2014).

To examine whether migrant households are sought out for information and advice, we reestimate equation 2 but replace the outcome of social network ties with ties of the migration information network ("*Who would you or members of your household ask for advice and information about migration?*"), the personal advice network ("*If you or members of your household had to make a difficult personal decision, whom would you or these household members ask for advice?*"), and the event organization network ("*If I wanted to organize an event in the village and had to inform people in the village, who should I talk to?*"). Table 5

[20] As Blumenstock, Chi and Tan (2025) note, counter to the prevailing view in the migration literature, connections in a particular destination may not always spur migration to that destination. Tougher competition for jobs and other resources can create a deterrent effect of networks (Beaman 2012; Calvó-Armengol 2004; Calvó-Armengol and Jackson 2004; Wahba and Zenou 2005), and Blumenstock, Chi and Tan (2025) find that while migrants are more likely to migrate to destinations where their social networks are interconnected, they are no more likely to migrate to destinations where their networks are extensive.

presents the results. The uneven columns include the full set of covariates as in Tables 3 and 4 except education and wealth, and the even columns include education and wealth.

Table 5: Migration and information transmission (directed dyadic analysis)

	Migration Advice		Personal Advice		Organize Event	
	(1)	(2)	(3)	(4)	(5)	(6)
Migration (i)	−0.076	−0.075	−0.040	−0.035	0.047	0.038
	(0.052)	(0.052)	(0.059)	(0.059)	(0.067)	(0.067)
Migration (j)	0.099	0.099	0.251***	0.244***	0.389**	0.377**
	(0.070)	(0.069)	(0.087)	(0.086)	(0.158)	(0.157)
Migration (i×j)	0.495***	0.492***	0.423**	0.413**	0.457**	0.467**
	(0.140)	(0.140)	(0.173)	(0.173)	(0.197)	(0.197)
Education (i)		−0.082***		−0.073**		0.034
		(0.028)		(0.034)		(0.039)
Education (j)		0.003		0.032		0.057
		(0.036)		(0.044)		(0.070)
Education (i×j)		0.080**		0.084***		−0.027
		(0.051)		(0.035)		(0.032)
SES index (i)		−0.027		−0.034**		0.025
		(0.026)		(0.014)		(0.019)
SES index (j)		0.088***		0.046**		−0.041
		(0.033)		(0.022)		(0.045)
SES index (i×j)		0.003		0.051***		0.032*
		(0.011)		(0.012)		(0.016)
Constant	8.527***	8.944***	7.427***	8.104***	9.538***	10.186***
	(1.274)	(1.253)	(0.948)	(0.919)	(1.132)	(1.098)
Observations	620,664	620,050	620,664	620,050	620,664	620,050
Mean (%)	2.031	2.032	1.454	1.455	2.089	2.089
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Village	Village	Village	Village	Village	Village
Cluster	HH_i, HH_j, Village	HH_i, HH_j, Village	HH_i, HH_j, Village	HH_i, HH_j, Village	HH_i, HH_j, Village	HH_i, HH_j, Village

Notes: All specifications estimated using OLS. Standard errors are clustered by sender, receiver, and village. In addition to the covariates listed, the specifications also include variables for i's, j's, and the interaction of i's and j's female share of members in the household; number of married members; number of children of household members; household size; the number of respondents to the network module; shares of members in the age group 15-30, 31-64, and 65+; share of members working in non-agricultural occupations; chief household indicator; marabout household indicator; whether the head was born in the village; and whether GPS information was missing. The log dyadic distance in meters is also included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5 shows that migrant households do not reach out more often to non-migrant households for migration information, personal advice and for organizing an event than non-migrant households. However, migrant households are significantly more often sought by non-migrant households for personal advice (0.24 percentage points)

and to organize an event (0.38 percentage points), but interestingly not for migration information. The homophily coefficients are relatively large and significant for all three network types, ranging between 0.41 and 0.49 percentage points. Thus, the exchange of migration-relevant information between migrant and non-migrant households is similar to that among non-migrant households. However, migrant households are more likely to talk about migration to each other.

The significant coefficients on these information and advice networks are roughly half the size of the migration coefficients for the social network, but capture percentage point changes relative to a lower control mean, so increases are quite comparable in percentage terms. The comparison of even and uneven columns shows that these associations are not driven by differences in education and wealth between migrant and non-migrant households.

6.2 Access to financial resources

Economic functions relate to migrant households' connectivity in complex ways. In rural areas in developing contexts, households face high-income volatility across seasons and years due to weather-dependent agricultural activities. Two important strategies to cope with this volatility are migration and risk-sharing schemes. A growing literature examines how migration and risk-sharing interact to affect incentives to participate in each (Meghir et al. 2022; Morten 2019; Munshi 2020; Munshi and Rosenzweig 2016).

Since participating in informal risk-sharing requires having substantial origin network ties, the relationship between migration and overall social connectivity in origin areas may be at least partially driven by the specific link between risk-sharing and migration. Migrant households' decisions to participate in risk-sharing likely depend on the riskiness of migration. When migration is relatively costly and risky, migration and risk-sharing may be characterized by a positive equilibrium relationship (Meghir et al. 2022). The riskiness of the migration and expectations about future average earnings may incentivize migrant households to join or remain in risk-sharing schemes in exchange for the benefit of a potentially large return that can facilitate future migration

(Meghir et al. 2022). In contrast, when migration and participation in local risk-sharing are substitutes, which is likely when migration-related costs and risks are low (Meghir et al. 2022), migrant household status and social ties may be negatively correlated. Migration can weaken post-migration incentives to participate in risk-sharing schemes because of the exit option migration provides, implying that migrant households likely exhibit weaker connectivity relative to non-migrant households.[21] Finally, if migrant households have greater access to resources, other households likely seek to have migrant households in their risk-sharing network.[22]

We explore the net association between migration status and participation in risk-sharing, measured as giving and receiving within-village transfers in a subsample. This data does not include information on who the counterpart recipient or sender was. Table 6 shows that engagement in within-village risk-sharing systems does not differ across migrant household types. However, conditional on giving, migrant households give significantly smaller amounts by approximately 11.7%. These findings align with the idea that migrant households can draw on an external income source, which can depress incentives to send (high) transfers as there is little need for these to be reciprocated in the future. The decline in transfer contributions does not seem to translate in measurable reductions in social connectivity, possibly because other functions offset the reduction.

6.3 Social status

Migration may enhance the social status of households, and their stronger local connectedness may reflect others' incentives to associate with this prestige. In some contexts, migrant households display distinct consumption patterns, such as the construction of

[21] Importantly, for both forms of migration, social connectivity and participation in informal insurance schemes may be important for understanding initial selection into migration. When migration is risky, social ties can facilitate access to resources to enable migration in the first place. In other cases when migration is not so risky, households without access to such social safety nets may be more likely than those without them to use the migration option to diversify income (Meghir et al. 2022).

[22] Note that migrant households may also have less resources when migration is used as a strategy to smooth consumption.

Table 6: Migration and within-village transfers (non-dyadic analysis)

	Gave transfers (1)	Amount sent (log) (2)	Received transfers (3)	Amount received (log) (4)
Migration	−0.008	−0.117**	0.015	−0.070
	(0.020)	(0.051)	(0.024)	(0.087)
Share female household members	0.017	0.260	−0.055	−0.382
	(0.049)	(0.187)	(0.064)	(0.233)
Adults in HH	0.003*	0.020**	−0.001	0.002
	(0.002)	(0.008)	(0.003)	(0.011)
Number of network respondents	−0.006	−0.026	0.010	−0.004
	(0.008)	(0.025)	(0.007)	(0.037)
Share married	−0.016	−0.492	−0.002	−0.074
	(0.128)	(0.449)	(0.143)	(0.455)
Number of children	0.000	−0.001	−0.000	0.001
	(0.000)	(0.001)	(0.000)	(0.002)
Share age 15-30	−0.187	−0.053	−0.260*	−0.093
	(0.140)	(0.469)	(0.138)	(0.589)
Share age 31-64	−0.056	0.163	−0.188	0.246
	(0.196)	(0.547)	(0.190)	(0.622)
Median education	0.008	0.062	−0.009	−0.047
	(0.011)	(0.040)	(0.013)	(0.045)
Share in non-agri. occ.	0.074**	−0.039	0.037	0.059
	(0.036)	(0.128)	(0.036)	(0.146)
Asset index (PCA)	0.020***	0.066***	−0.006	0.041*
	(0.006)	(0.017)	(0.007)	(0.023)
Head born in village	−0.004	−0.051	0.024	−0.127
	(0.025)	(0.077)	(0.033)	(0.112)
Marabout household	0.021	0.072	0.036	0.056
	(0.030)	(0.091)	(0.042)	(0.105)
Chief household	0.004	0.326**	0.029	0.468**
	(0.051)	(0.152)	(0.059)	(0.220)
Observations	3,540	1,995	3,397	1,386
Mean	0.748	9.959	0.592	9.537
Fixed effects	Village	Village	Village	Village
Cluster	Village	Village	Village	Village

Notes: All specifications estimated using OLS with village fixed effects. Standard errors are clustered at the village level. Amounts in columns (2) and (4) are log values conditional on positive transfers. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

large houses or other displays of wealth that express upward social mobility (De Haas 2007). However, prestige is not always solely acquired through economic success. In Senegal in particular, a pervasive "culture of migration" celebrates migration and migrants and influences how they are perceived by their families and communities more broadly (Nyamnjoh 2010; Prothmann 2018). As Riccio (2005) state, migrants are often viewed as heroes because of "the efforts they undertake for the well being of their families despite being far from home" (Riccio 2005, 106), and this culture of reverence is visible in different domains of contemporary society (Riccio 2005).

Whether migrant households possess a high social status, and whether this induces other households to connect with migrant households to access (in the case of non-migrant households) or maintain (in the case of migrant households) prestige and influence, is difficult to measure. To explore this, we first assess whether the link between social ties and migration status holds after controlling for ties in the migration information, personal advice, and event organization networks in Equation 2. Appendix Table A4 presents the results of this specification. The additional network measures are highly positively correlated with the social network measure. The in-degree migration coefficient is reduced by about a third to 0.44 percentage points ($p < 0.01$) and the interaction homophily migration coefficient is cut in half to 0.49 percentage points, becoming only marginally significant, when the additional network measures are included. Thus, while information exchange accounts for a substantial portion of the association between social ties and migration, other functions, and possibly social status, likely play a role as well.

Next, we assess whether migrant households are more likely to be connected to "high-status" groups of local elites. In Appendix Table A5 we estimate separate regressions in a non-dyadic setup: one with a binary indicator for having an in-degree tie to the chief, and another with an indicator for having an out-degree tie to the village chief, each regressed on the household's migration status and the usual covariates. Migrant households are not more likely to be mentioned by a village chief as a social contact, but they are 1.8 percentage points ($p < 0.05$) more likely to list village chief households

as connections. Since only 6.7% of households list the chief as a social connection, the coefficient corresponds to a 26.9% increase. However, rather than the migrant household listing the chief household, the evidence would be much more compelling if the chief household listed the migrant household significantly more often. Consequently, we do not view these results as strong enough to support a social-status interpretation.

7 Associations by village characteristics

One implication of the result that non-migrant households seek out ties with migrant households, possibly due to their greater access to information, is that as out-migration rates increase, these incentives should wane. As more households send migrants abroad or to other areas in Senegal, they gain access to the benefits that connections to migrant households would otherwise provide.

In Table 7 we present how the association of social connectivity with migration status varies by village characteristics, such as its migration rates. Each panel of the table presents the results of a subsample analysis for the following village characteristics: migration rate, distance to Dakar, village size, network density, ethnic fractionalization and the share of households that rely on pastoral agriculture. We split villages at the median of the respective village characteristic such that column 1 presents the results for villages in the bottom half of the distribution of the village characteristic, and column 2 for villages in the top half. Note that the examined village characteristics are, of course, not randomly assigned but co-vary with other characteristics. For example, villages of smaller size tend to have higher network density.

Table 7 shows that, as hypothesized, social connectivity is less strongly associated with migration status in villages with migration rates above the median of 13.9% (min = 0, max = 46.7%). In low-migration villages, the in-degree coefficient is twice as large as in high-migration villages, and the homophily interaction coefficient is four times larger, amounting to 2.9 percentage points. Notably, the out-degree coefficient is also somewhat higher and marginally significant in low-migration villages, suggesting that

Table 7: Migration and social connectivity by village characteristics (directed dyadic analysis)

Sample split by village characteristics:	Social ties of households	
	< median (1)	≥ median (2)
Migration rate		
Migration (i)	–0.336*	–0.189
	(0.176)	(0.157)
Migration (j)	0.917***	0.453**
	(0.240)	(0.178)
Migration (i×j)	2.868***	0.657*
	(0.625)	(0.342)
Observations	342,770	277,280
Mean (%)	5.24	6.14
Distance to Dakar		
Migration (i)	–0.198	–0.232
	(0.169)	(0.175)
Migration (j)	0.567***	0.734***
	(0.192)	(0.218)
Migration (i×j)	0.419	1.779***
	(0.363)	(0.492)
Observations	284,870	335,180
Mean (%)	5.79	5.54
Village size		
Migration (i)	–0.260	–0.199
	(0.247)	(0.144)
Migration (j)	0.854**	0.537***
	(0.407)	(0.137)
Migration (i×j)	1.506**	0.669**
	(0.710)	(0.325)
Observations	150,026	470,024
Mean (%)	8.07	4.94
Network density		
Migration (i)	–0.044	–0.509*
	(0.130)	(0.275)
Migration (j)	0.611***	0.813**
	(0.157)	(0.332)
Migration (i×j)	0.434	1.689***
	(0.332)	(0.596)
Observations	440,116	179,934
Mean (%)	4.58	8.33
Ethnic fractionalization index		
Migration (i)	–0.296	–0.128
	(0.178)	(0.165)
Migration (j)	0.873***	0.426**
	(0.228)	(0.186)
Migration (i×j)	1.478***	0.624
	(0.446)	(0.395)
Observations	151,636	468,414
Mean (%)	5.72	5.58
Pastoral agriculture rate		
Migration (i)	–0.539***	0.102
	(0.186)	(0.156)
Migration (j)	0.468**	0.782***
	(0.202)	(0.193)
Migration (i×j)	1.332**	0.498
	(0.635)	(0.359)
Observations	350,270	269,780
Mean (%)	5.09	6.42

Notes: This table reports OLS estimates from directed dyadic regressions where each observation is a household pair (i, j), with i as the sender and j as the receiver, calculated separately for villages that are below (column (1)) and above (column (2)) the median for each of the five specified village characteristics. Standard errors are clustered by sender, receiver, and village. The specifications also include variables for i's, j's, and the interaction of i's and j's female share of members in the household; number of married members; number of children of household members; household size; the number of respondents to the network module; shares of members in the age group 15-30, 31-64, and 65+; share of members working in non-agricultural occupations; chief household indicator; marabout household indicator; whether the head was born in the village; and whether GPS information was missing. The log dyadic distance in meters is also included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

migrant households may partially withdraw ties to non-migrant households.

Next, we examine distance to Dakar and village size as indicators of remoteness and urbanization. Distance to Dakar, calculated using village GPS coordinates and OpenStreetMap data, has a median of 270 km (min = 42, max = 523), while the median village size is 65 households (min = 5, max = 147). In smaller and more distant villages, both the in-degree coefficient and especially the interaction homophily coefficient are larger, although the corresponding coefficients in larger and less remote villages remain significant. The homophily coefficient in more remote areas is more than four times larger than in less remote areas, reaching 1.8 percentage points.

A similar pattern emerges when splitting the sample by village density (median = 0.12, min = 0.04, max = 0.73): denser villages exhibit larger in-degree and interaction homophily coefficients, comparable in magnitude to the effects observed for village size and distance. The out-degree results, however, diverge. While the out-degree migration coefficient is similar across village sizes and distances, it is close to zero in low-density villages, whereas in high-density villages it is relatively large (0.51 percentage points) and marginally significant.

Next, we turn to ethnic fractionalization at the village level. The largest ethnic groups in Senegal and in our sample are Wolof (25.0%) and Fulani (37.0%), followed by Mandinka (15.2%), Serer (13.5%), Diola (3.5%), Balanta (1.3%), Soninke (0.8%), and Bainuk (0.2%).[23] Islam is the majority religion across these groups, with 97% of households in our sample identifying as Muslim, though traditional beliefs and practices vary across communities. We compute the ethnic fractionalization index for each village (EFI = $1 - \sum_{i=1}^{N} s_i^2$), which ranges from 0 (low fractionalization) to 1 (high fractionalization) and has a median value of 0.13 (min = 0, max = 0.74). Table 7 shows that villages with low ethnic fractionalization exhibit substantially larger migration in-degree and interaction homophily coefficients than highly fractionalized villages, while differences in the migration out-degree coefficient are relatively small.

[23]Our sample contains relatively more Fulani and fewer Wolof households than Senegal overall because it includes Matam in the North as a focus region, which is predominantly Fulani.

Finally, we consider the type of agricultural activity practiced in each village, measured by the share of households engaged in pastoral agriculture. The median pastoral share is 44.1% (min = 0%, max = 100%). Pastoral households – and the concessions in which they are organized – that primarily rely on breeding and herding differ from arable farming households in that they tend to be more dispersed and self-contained, and are generally more mobile (as they move with the herd). Table 7 shows that in low-pastoral villages the migration out-degree coefficient is negative and significant, suggesting that migrant households reduce their social ties, and the migrant homophily effects are larger and positive. By contrast, in high-pastoral villages the migration in-degree coefficient is larger, while the out-degree and migration homophily coefficients are not significant.

Overall, these results reveal substantial heterogeneity across village characteristics. Villages that are more remote, smaller, denser, less ethnically fractionalized, have fewer pastoral households, and have lower migration rates exhibit stronger associations between migration status and social ties. This pattern suggests that incentives to connect with migrant households are greater in more cohesive and integrated networks, particularly where migration is rare. Yet these same contexts also appear to be those in which migrant households have stronger incentives to withdraw from certain social connections, an effect that could not be detected across all villages. Conversely, in networks that are more diffuse or where migration is common, the social capital effects of migration are weaker.

8 Conclusion

This paper documents clear differences in the network positions of migrant and non-migrant households in rural Senegal. Using dyadic analyses across multiple network layers and original data on nearly 10,000 households in 145 villages, we find that migrant households maintain more social ties and occupy more central positions in village networks than households without migrants. These differences hold across general

social networks as well as advice networks, including those in which migration-related information is exchanged. The patterns suggest that increased connectivity is not driven solely by economic resources; non-material factors such as access to migration-related information, but less so participation in risk-sharing schemes and the social recognition associated with migration appear to matter. In summary, we see no evidence to fuel the concern that households where a member migrated away might disengage from their community, and in fact the opposite seems to be the case.

Given that the analysis is observational, our estimates should be interpreted with caution. While we include a broad set of control variables in our regressions, and migration as used in the analysis precedes the measurement of the outcome of social ties, estimates could of course still be confounded. For example, while migration may raise a household's connectivity, it could also be that households that were already well connected may have faced fewer informational or social barriers to migration. However, at minimum we can say that we do not see evidence for severe migration-induced social disengagement, relative to typical levels of community involvement. On this basis we would not be concerned about migration-promoting policies leading to hollowed-out community relations and diminished social capital in this context, even if we cannot say with certainty that migration truly *causes* increased social connectivity.

The results also speak to broader implications for political and development-related communication in sending areas. More central migrant households may be better placed to access and relay political information, to interact with local elites such as village chiefs, and to shape how information reaches other households. Their positions suggest that migrant households could play a meaningful role in the diffusion of political or development-oriented messages. Understanding these processes is relevant for evaluating how migration interacts with influence, information flows, and governance in high-migration rural settings.

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Data availability

The analysis dataset and reproduction code will be made available upon publication.

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A Online Appendix

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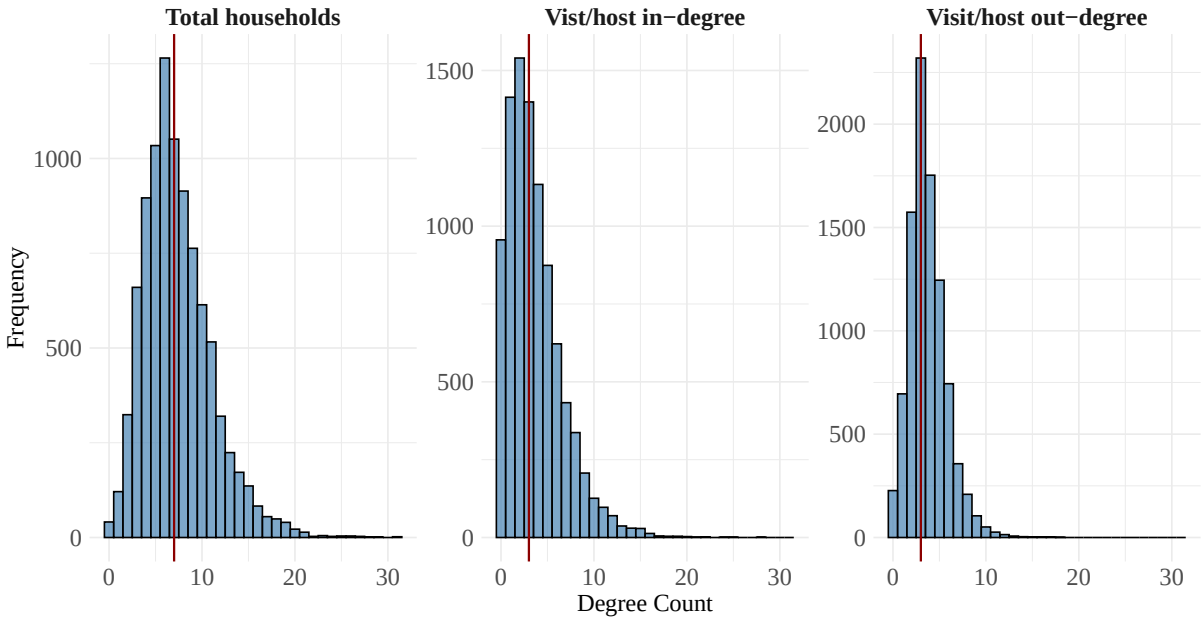
A.1 Additional summary statistics

Figure A1: Distribution of degree measures



Notes: This figure presents the distribution of households' total, in-, and out-degrees for the questions "Who comes by your house regularly" and "Who do you or members of your household visit regularly?"

Table A1: Distribution of short-term migrants by gender and migration reason

	Female		Male		Total	
Reason	Stock	Percent	Stock	Percent	Stock	Percent
Labor (non-seasonal)	760	16.6	4,709	45.5	5,469	36.6
Labor (seasonal)	547	12.0	3,426	33.1	3,973	26.6
Marriage	2,168	47.4	543	5.2	2,711	18.2
Education	722	15.8	1,392	13.4	2,114	14.2
Other	453	9.9	683	6.6	1,136	7.6
None	42	0.9	39	0.4	81	0.5
Covid	1	0.0	3	0.0	4	0.0
Governance	1	0.0	0	0.0	1	0.0
Violence	3	0.1	2	0.0	5	0.0

Notes: This table presents the distribution of short-term migrants by gender and migration reason. "Percent" columns present the percentage of individuals migrating for a given reason among all migrants of that gender. Multiple migration reasons could be selected for a given migration episode, so percentages do not sum to 100.

A.2 Robustness with reciprocated ties

Table A2: Migration and reciprocated social ties (undirected dyadic analysis)

	(1) Tie exists (pp)		(2) Tie exists (pp)	
	β	SE	β	SE
Migration Sum	0.354***	(0.085)	0.338***	(0.086)
Migration Difference	−0.343***	(0.105)	−0.328***	(0.107)
Sum of:				
Share female	−0.202**	(0.099)	−0.182*	(0.105)
Household size	0.060***	(0.007)	0.055***	(0.008)
No. of network respondents	0.112***	(0.031)	0.110***	(0.031)
Education			−0.030	(0.025)
SES index			−0.046	(0.029)
Married share			0.029	(0.055)
No. of children			0.040	(0.024)
Share age 15-30			0.284	(0.351)
Share age 31-64			0.514	(0.344)
Share age 65+			0.263	(0.381)
Share in non-agricultural occupation			−0.366***	(0.089)
Head born in village			−0.228**	(0.092)
Marabout			0.179	(0.119)
Chief			0.451**	(0.202)
Difference in:				
Share female	−0.309**	(0.131)	−0.234*	(0.137)
Household size	0.004	(0.005)	0.004	(0.005)
Education			0.051**	(0.025)
SES index			0.016	(0.031)
Married share			−0.401***	(0.108)
No. of children			−0.066***	(0.024)
Share age 15-30			−0.297	(0.191)
Share age 31-64			−0.189	(0.174)
Share age 65+			−0.243	(0.249)
Share in non-agricultural occupation			−0.623***	(0.118)
Head born in village			−0.254**	(0.109)
Marabout			−0.292**	(0.134)
Dyad distance:				
Log distance (m)	−1.627***	(0.191)	−1.624***	(0.198)
GPS missing	−0.203	(0.271)	−0.230	(0.282)
Observations	321,243		310,025	
Mean (%)	1.312		1.319	
Fixed effects	Village		Village	
Cluster	HH_i, HH_j, Village		HH_i, HH_j, Village	

Notes: This table reports OLS estimates from dyadic regressions where the unit of observation is an unordered household pair within the same village, with the outcome equaling one only for reciprocal ties (i.e., i lists j and j lists i). "Sum" variables add the characteristics of the two households; "Difference" variables take the absolute difference between them. Models include village fixed effects. Standard errors are clustered at the household and village levels. Coefficients are reported in percentage-point units. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.3 Other network measures

Table A3: Migration and social ties, controlling for other networks (undirected dyadic analysis)

	(1) Tie exists (pp)		(2) Tie exists (pp)	
	β	SE	β	SE
Migration Sum	0.508***	(0.178)	0.488***	(0.181)
Migration Difference	−0.276	(0.191)	−0.254	(0.196)
Personal advice tie	48.585***	(0.870)	48.505***	(0.883)
Organize event tie	14.531***	(0.980)	14.787***	(1.012)
Migration advice tie	25.102***	(0.737)	24.862***	(0.748)
Sum of:				
Share female	−1.192***	(0.260)	−1.131***	(0.271)
Household size	0.272***	(0.019)	0.296***	(0.024)
No. of network respondents	0.427***	(0.070)	0.399***	(0.072)
Education			0.038	(0.065)
Married share			0.067	(0.140)
No. of children			−0.154*	(0.090)
Share age 15-30			0.365	(0.918)
Share age 31-64			1.058	(0.888)
Share age 65+			1.852*	(1.034)
Share in non-agricultural occupation			−0.744***	(0.230)
SES index			0.063	(0.061)
Head born in village			0.034	(0.158)
Marabout			0.914*	(0.506)
Chief			−0.942	(0.650)
Difference in:				
Share female	−1.655***	(0.340)	−1.395***	(0.346)
Household size	0.044***	(0.012)	0.046***	(0.012)
Education			0.100*	(0.060)
Married share			−1.196***	(0.318)
No. of children			−0.059	(0.069)
Share age 15-30			−0.687	(0.438)
Share age 31-64			−0.082	(0.431)
Share age 65+			−1.740***	(0.625)
Share in non-agricultural occupation			−1.238***	(0.304)
SES index			−0.070	(0.062)
Head born in village			−0.636***	(0.176)
Marabout			−1.516***	(0.548)
Dyad characteristic:				
Log distance (m)	−4.087***	(0.465)	−4.046***	(0.477)
GPS missing	−0.750	(0.672)	−0.691	(0.702)
Same ethnicity	0.573***	(0.189)	0.525***	(0.195)
Observations	321,243		310,025	
Mean (%)	9.979		10.03	

Notes: This table reports OLS estimates from dyadic regressions where the unit of observation is an unordered household pair within the same village. "Sum" variables add the characteristics of the two households, and "Difference" variables take the absolute difference between them. Specifications include village fixed effects. Standard errors are clustered at the household and village levels. Coefficients are reported in percentage-point units. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Migration and social ties when controlling for other networks (directed dyadic analysis)

	(1) Tie exists (pp)		(2) Tie exists (pp)	
	β	SE	β	SE
Migration (i)	−0.082	(0.104)	−0.177	(0.115)
Migration (j)	0.534***	(0.109)	0.439***	(0.115)
Migration (i×j)			0.485*	(0.252)
Personal advice tie	50.413***	(0.865)	50.384***	(0.865)
Organize event tie	15.774***	(1.088)	15.765***	(1.088)
Migration advice tie	25.199***	(0.790)	25.172***	(0.790)
Share female (i)	−0.185	(0.188)	−1.690***	(0.556)
Share female (j)	−1.154***	(0.232)	−2.659***	(0.577)
Share female (i×j)			2.911***	(0.999)
Household size (i)	0.048***	(0.012)	0.026	(0.016)
Household size (j)	0.302***	(0.020)	0.279***	(0.023)
Household size (i×j)			0.003	(0.002)
No. of network respondents (i)	0.235***	(0.055)	0.241***	(0.055)
No. of network respondents (j)	0.266***	(0.055)	0.272***	(0.055)
Share married (i)	−0.029	(0.155)	−1.079***	(0.324)
Share married (j)	0.231	(0.162)	−0.819**	(0.332)
Share married (i×j)			1.787***	(0.475)
No. of children (i)	−0.005	(0.033)	0.004	(0.037)
No. of children (j)	−0.120***	(0.038)	−0.111**	(0.043)
No. of children (i×j)			−0.005	(0.015)
Share age 15-30 (i)	1.619**	(0.698)	0.621	(0.859)
Share age 15-30 (j)	−0.748	(0.628)	−1.747**	(0.778)
Share age 15–30 (i×j)			1.882**	(0.846)
Share age 31-64 (i)	1.569**	(0.685)	1.614**	(0.742)
Share age 31-64 (j)	−0.161	(0.608)	−0.116	(0.680)
Share age 31–64 (i×j)			−0.068	(0.927)
Share age 65+ (i)	1.450**	(0.706)	1.159	(0.725)
Share age 65+ (j)	−0.572	(0.668)	−0.862	(0.651)
Share age 65+ (i×j)			4.892**	(2.400)
Median education (i)	0.000	(0.043)	−0.187***	(0.059)
Median education (j)	−0.039	(0.054)	−0.227***	(0.067)
Median education (i×j)			0.255***	(0.046)
Share in non-agri. occ. (i)	−0.243	(0.152)	−0.882**	(0.366)
Share in non-agri. occ. (j)	−0.427***	(0.163)	−1.066***	(0.357)
Share in non-agri. occ. (i×j)			1.046**	(0.466)
SES index (i)	0.047	(0.049)	0.049	(0.049)
SES index (j)	0.172***	(0.053)	0.174***	(0.054)
SES index (i×j)			0.018	(0.016)
Head born in village (i)	0.041	(0.107)	−0.620***	(0.186)
Head born in village (j)	0.413***	(0.112)	−0.249	(0.181)
Head born in village (i×j)			0.791***	(0.218)
Marabout (i)	0.067	(0.161)	−0.115	(0.161)
Marabout (j)	−0.517***	(0.183)	−0.700***	(0.182)
Marabout (i×j)			1.618**	(0.648)
Chief (i)	0.873**	(0.373)	0.886**	(0.374)
Chief (j)	−2.211***	(0.598)	−2.193***	(0.598)
Chief (i×j)				
Log distance (m)	−2.671***	(0.313)	−2.657***	(0.312)
GPS missing (i)	−0.637	(0.425)	−0.644	(0.421)
GPS missing (j)	−0.247	(0.560)	−0.253	(0.557)
Observations	620,050		620,050	
Mean (%)	5.675		5.675	
Fixed effects	Village		Village	
Cluster	HH_i, HH_j, Village		HH_i, HH_j, Village	

Notes: This table reports OLS estimates from directed dyadic regressions where each observation is a household pair (i, j), with i as the sender and j as the receiver. Covariates measured at the household level are included for sender i and receiver j, and with their interactions. Models include village fixed effects. Standard errors are clustered by sender, receiver, and village. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Migration and ties to the village chief

	Connected to village chief			
	In-tie		Out-tie	
	(1)	(2)	(3)	(4)
Migration	0.011*	0.008	0.021**	0.018**
	(0.006)	(0.006)	(0.009)	(0.009)
Share female household members		−0.018*		−0.005
		(0.011)		(0.016)
Adults in HH		0.004***		0.002*
		(0.001)		(0.001)
Number of network respondents		−0.004		0.002
		(0.004)		(0.004)
Share married		−0.013		0.023
		(0.026)		(0.043)
Number of children		−0.000		−0.000
		(0.000)		(0.000)
Share age 15-30		0.005		−0.090**
		(0.026)		(0.044)
Share age 31-64		0.028		−0.051
		(0.024)		(0.040)
Median education		0.002		0.001
		(0.003)		(0.004)
Share in non-agri. occ.		−0.024***		0.008
		(0.008)		(0.013)
SES index		0.000		−0.000
		(0.002)		(0.002)
Head born in village		−0.012		−0.018
		(0.008)		(0.011)
Marabout household		0.021		−0.016
		(0.013)		(0.012)
Outcome mean	0.039	0.039	0.066	0.067
Outcome SD	0.194	0.194	0.249	0.249
Observations	8,126	8,086	8,126	8,086
Village FEs	✓	✓	✓	✓
Respondent characteristics		✓		✓

Notes: This table reports OLS estimates from a household-level analysis in which the binary outcome indicates whether the respondent has a tie with the village chief, calculated separately for inward ties (columns (1) and (2)) and outward ties (columns (3) and (4)). Standard errors are clustered at the village level. In addition to the covariates listed, the specifications in columns (2) and (4) include indicators for whether any of the network module respondents included the household head, whether they included women only, and the share of network module respondents that had migrated in the past 12 months. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

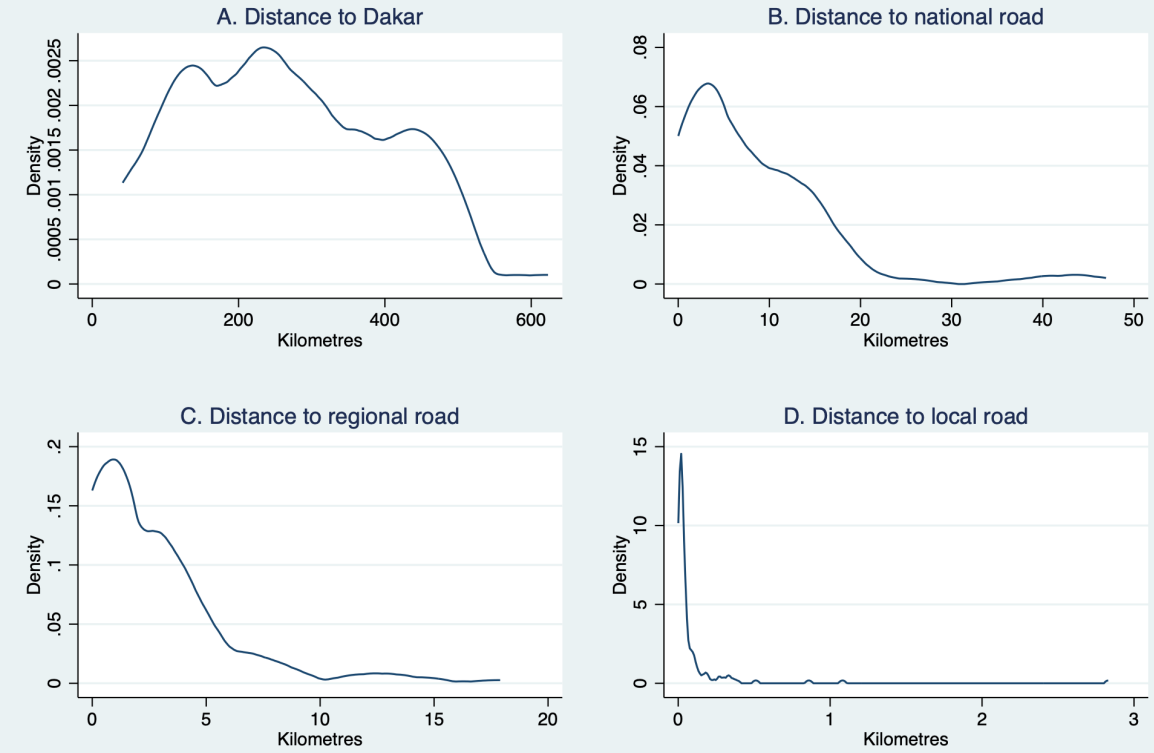
A.4 Village-level heterogeneity

Table A6: Migration & social connectivity by village characteristics (undirected dyadic analysis)

	Social ties of households	
Sample split by village characteristics:	< median (1)	≥ median (2)
Village size		
Migration Sum	1.643***	0.671***
	(0.426)	(0.247)
Migration Difference	−1.040*	−0.394*
	(0.558)	(0.235)
Observations	75,013	235,012
Mean (%)	14.03	8.80
Migration rate		
Migration Sum	2.782***	0.610***
	(0.645)	(0.209)
Migration Difference	−2.208***	−0.395
	(0.529)	(0.256)
Observations	171,385	138,640
Mean (%)	9.36	10.74
Ethnic fractionalization index		
Migration Sum	1.671***	0.560**
	(0.431)	(0.220)
Migration Difference	−1.162***	−0.274
	(0.386)	(0.270)
Observations	75,818	234,207
Mean (%)	10.19	9.77
Network density		
Migration Sum	0.762***	1.337***
	(0.262)	(0.399)
Migration Difference	−0.305	−0.980**
	(0.267)	(0.436)
Observations	220,058	89,967
Mean (%)	10.27	14.46
Distance to Dakar		
Migration Sum	0.466**	1.821***
	(0.230)	(0.387)
Migration Difference	−0.189	−1.318***
	(0.258)	(0.388)
Observations	142,435	167,590
Mean (%)	10.09	9.90
Breeding concession		
Migration Sum	1.117**	0.884***
	(0.425)	(0.271)
Migration Difference	−0.974**	−0.280
	(0.445)	(0.285)
Observations	175,135	134,890
Mean (%)	9.08	11.23

Notes: This table shows OLS estimates from dyadic regressions where the unit of observation is an unordered household pair within the same village. Standard errors are clustered at the village level. The specifications include sums and differences of the following covariates: female share of household members; number of married members; number of children of household members; household size; the number of respondents to the network module, shares of members in the age group 15-30, 31-64, and 65+; share of members working in non-agricultural occupations; chief household indicator; marabout household indicator; indicators for whether the head was born in the village and whether GPS information is missing. The log dyadic distance in meters is also included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure A2: Kernel density distributions of village-level distances to Dakar and the road network



Notes: Distances are computed from the geographic midpoint of each village (EA) to the nearest feature in each category: Dakar (Panel A), national roads (Panel B), regional roads (Panel C), and local roads (Panel D). Road classifications follow OpenStreetMap hierarchy (primary/motorway for national; secondary/tertiary for regional; all remaining for local). Densities are estimated using an Epanechnikov kernel.