

Size and ethnic homogeneity of extended social networks in the Netherlands: Differences between migrant groups and migrant generations

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Abstract

Extended social networks encompass both weak and strong ties to provide social support and resources. Hence, it is important to study what explains variation in these networks. This paper addresses this and examines the size and ethnic homogeneity of extended social networks, and group differences therein, and it aims to explain these differences based on a preference–opportunities approach through a decomposition analysis. We apply state-of-the-art NSUM methods to measure the extended networks for different ethnic-majority and minoritized groups, also considering migrant generation differences, in the Netherlands. Results show that group differences in network size reflect first-generation minority citizens having smaller networks and majority citizens having more ethnically homogeneous networks. More positive out-group attitudes among the Moroccan- and Turkish-Dutch partly explain why these groups have less homogeneous networks than Dutch majority members. Differences in the ethnic composition of neighbourhoods also contribute to explaining the homogeneity gap between Dutch majority and Turkish-Dutch.

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INTRODUCTION

The degree of interethnic contact among ethnic-majority and -minority members is an important indicator of social cohesion between ethnic groups within society. The extent of interethnic contacts of ethnic minoritized persons also indicates their cultural integration, by way of their integration in the social structures of the host society (Gordon, 1964). While interethnic closer contacts (friends, colleagues, neighbours) have been extensively studied from a multi-ethnic group perspective, larger *extended* social networks of minority groups, vis-a-vis the ethnic-majority, have received little attention (for notable exceptions, see Vacca et al., 2018, 2022).

Extended social networks are composed not only of close friends, confidants and kin (so-called strong or intimate ties) but also of acquaintances with whom we interact far less and experience less emotional connection. Such weak ties connect us to distinct social circles beyond our core network thereby offering access to novel information (Granovetter, 1973; Rajkumar et al., 2022) and they may reduce ethnic hostility if weak ties are ethnically heterogeneous (Hofstra, 2022). Ergo, the extended network is important for many life outcomes, including interethnic contact and cultural integration. It is thus key to understand what causes variation in the size and (ethnic) composition of the extended networks.

Previous studies on extended networks suggest that such networks are more ethnically homogenous than could be expected based on societies' ethnic diversity (DiPrete et al., 2011; Hofstra et al., 2017). However, these prior studies did not employ a detailed, ethnic multi-group perspective on extended networks that differentiates between people with roots in different countries (i.e. in Morocco or Turkey) or between people born abroad (i.e. 'first generation') and their descendants who grew up in the host country (i.e. 'second generation'). This is surprising as migration as well as differences in socio-economic integration and acculturation processes are not unlikely to lead to differences in the size and (ethnic) composition of people's extended social networks, as we will theorize more extensively below. Here, we contribute one of the first rigorous studies of group differences in size and ethnic homogeneity of extended social networks *between* (a) ethnic-majority and ethnic-minority members and (b) *among* ethnic-minority members between first- and second-generation migrants.

Subsequently, we contribute explanations of how differences in extended social network size and ethnic homogeneity come about for both ethnic-majority and ethnic-minority members. We again particularly emphasize differences between ethnic-minority groups and between generations. The literature on core network formation generally focuses on contact preferences and opportunity structures for contact (Blau, 1977; Feld, 1981; McPherson et al., 2001), yet it is not self-evident that explanations for the size and ethnic homogeneity of core networks apply to extended networks or across migrant generations too. We integrate recent network literature (Hofstra et al., 2021; Lubbers et al., 2019) with acculturation theory and the notion of 'the integration paradox' (Geurts et al., 2020; Tolsma et al., 2012; Verkuyten, 2016). This enables us to derive explanations for the size and ethnic homogeneity of extended networks for ethnic-majority and ethnic-minority groups and the different migrant generations. Specifically, we argue that members of different ethnic groups have on average different 'profiles' of preferences and meeting opportunities, and this implies that there are ethnic group-specific determinants of the size and ethnic homogeneity of extended networks.

The empirical core of our study is a state-of-art method to measure the extended social network: the Network Scale-Up Method (NSUM) (DiPrete et al., 2011; Killworth et al., 1998; Maltiel et al., 2015; McCarty et al., 2001; McCormick et al., 2010; Zheng et al., 2006). This method is increasingly used to study *extended* networks and we are among the first to use this method to detail the extended social networks of members of ethnic-minority groups, with theoretical and empirical attention to within-group variation. We provide a detailed description (in the main text and appendices) of our NSUM measurement instrument.

Datawise, we make use of the Netherlands Longitudinal Lifecourse Survey 2022 (NELLS 2022) (Jeroense et al., 2023). NELLS includes an oversample of Moroccan-Dutch and Turkish-Dutch respondents and a new NSUM instrument tailored to this study. These data allow us to study differences between migrant and non-migrant background groups and to zoom in on differences *within* these ethnic-minority groups considering migrants and

their direct descendants. Applying decomposition analyses, we test to what extent differences in the *prevalence* and *impact* of network determinants across and within ethnic groups exist.

A THEORY OF MINORITIZED PERSONS' EXTENDED SOCIAL NETWORKS

Acculturation and integration of minoritized communities

We compare the size and ethnic homogeneity of the extended social network of minoritized persons of different migrant generations with Dutch majority members. These network characteristics—size and homogeneity—provide valuable insights into the level of interaction with the host society. This is a key step in the acculturation processes, whereby size and homogeneity help understanding whether assimilation (i.e. adoption of new culture at the cost of heritage) or integration (i.e. combining new culture and heritage) takes place. This is opposed to separation or marginalization (Berry, 1992), as social networks are an important source of exposure to norms. Moreover, networks and acculturation are argued to be key steps for structural assimilation (i.e. entrance into social and economic structures of host societies (Gordon, 1964)).

According to classic assimilationist theories, acculturation and integration processes are interpreted as multiple dimensions that linearly follow each other (Gordon, 1964). This assumes that integration on one domain is followed by integration on another domain. For instance, structural integration (economic or educational) is beneficial for cultural integration and national belonging. Yet, more recent work on the integration paradox has demonstrated that acculturation does occur linearly. For instance, despite achieving greater labour market integration and higher educational levels, individuals may not necessarily develop a greater sense of belonging or positive attitudes towards the host society (Geurts et al., 2020; Tolsma et al., 2012; Verkuyten, 2016). Structurally integrated migrants, often the second-generation, are more likely to experience ethnic discrimination and to become aware of institutionalized discrimination. Thereby structurally integrated migrants may turn away psychologically from the host society and eschew contact with citizens without a migrant background.

There has been considerable debate on whether integration in the host society implies disintegration from the country of origin (see Geurts et al., 2022; Guveli et al., 2016). While in some cases, such as cultural norms on a single issue, integration can be a zero-sum game, in other domains of cultural and social integration this is not the case. For extended networks, more intra-ethnic connections do not necessarily have to translate into fewer connections with ethnic-majority members. At the same time, it is known that certain communities have stronger within-group bonds, which lessens the need for creating outward ties (see for instance, Vermeulen et al., 2014).

We integrate this theoretical background from migration and integration studies into social network theory, particularly for the formulation of our multi-group expectations.

The Moroccan- and Turkish-Dutch

We focus on persons with a Turkish or Moroccan migration background, that is, the two largest migrant background, minoritized groups in the Netherlands.¹ Many Turkish and Moroccan citizens, predominantly young men, migrated to the Netherlands in the 1960s. They were recruited for employment in the industrial sector, and in the 1970s, their family often followed them to the Netherlands (Guveli et al., 2016). Family reunification is still the most common reason for Turks and Moroccans to migrate to the Netherlands (de Mooij et al., 2020). However, since 2010, migration for work, study or political reasons has increased among Turkish migrants, while the migration motivations remain largely unchanged for Moroccans (de Mooij et al., 2020).

The average Turkish-Dutch and Moroccan-Dutch persons have different socio-economic positions than average Dutch non-migrant background persons, due to a variety of causes (de Mooij et al., 2020). On average, the

former attain lower educational levels and earn lower salaries, and demographically, Turkish-Dutch and Moroccan-Dutch are younger and have more children. Turkish-Dutch and Moroccan-Dutch predominantly live in the bigger cities, while their cultural and moral orientations are, on average, more conservative.

In the last decade, the so-called *second generation*—the children of migrants—increasingly resemble the ethnic-Dutch majority in socioeconomic and cultural terms (Blommaert & Spierings, 2019), and the second generation is higher educated and earn more than their first-generation counterparts (de Mooij et al., 2020). Still, a socio-economic gap to the Dutch majority persists, which can be partly attributed to segmented labour markets and discrimination in both education and the labour market (Blommaert et al., 2012; Blommaert & Spierings, 2019).

Extended social network formation

We define extended social networks as the collection of social relations with others you know personally and are likely to interact with in daily life, given the chance (cf., DiPrete et al., 2011, p. 1242; Hofstra et al., 2021, p. 1277; Lubbers et al., 2019, p. 60; McCarty et al., 2001, p. 29). Extended networks thus encompass, but far extend core networks. Theories on network formation often draw attention to how preferences and meeting opportunities work in tandem during tie selection processes (Blau, 1977; Feld, 1981; Marsden, 1988; McPherson et al., 2001; McPherson & Smith-Lovin, 1987) and tie deselection processes (Jeroense et al., 2024; Tulin et al., 2021).

The impact of preferences

Preferences are important for the genesis of social ties. They can consist of preferences for more/fewer social ties (i.e. sociability), more/fewer introvert alters, more/fewer women alters and so forth. One consistent finding in social network research is a preference for ethnic homophily, which connects strongly to ethnic and migrant backgrounds. As such, this is a core preference that we emphasize here. Ethnic homophily is a preference of individuals to acquaint ethnically similar others and this contributes to ethnically homogenous networks (McPherson et al., 2001; Wimmer & Lewis, 2010). Explanations for ethnic homophily are that similar people share cultural norms and practices which reduce interaction costs and that social relations among similar people have more returns on relational investments given that there are fewer cultural boundaries to overcome (Windzio & Bicer, 2013). The inverse is an aversion to contact with ethnic out-group members, negative out-group bias, which may drive tie selection decisions. This causes fewer ties as the pool of alters is smaller and more ethnically homogeneous (less out-group selections). Therefore, we expect that negative out-group bias is related to smaller and more ethnically homogenous extended networks.

The attitudes of the Dutch majority towards Turkish-Dutch and Moroccan-Dutch are oftentimes more negative than vice versa (Tolsma & van der Meer, 2018). We therefore expect that networks of Dutch majorities are more homogenous than those of Turkish-Dutch or Moroccan-Dutch. Concurrently, minoritized persons are less able to transform positive out-group attitudes (or less strong positive in-group bias and negative out-group bias) into intergroup contact as they face an uphill attitude battle with Dutch majority members rejecting interethnic social relations despite the, in general, more positive intergroup attitudes of minoritized persons. Thus, both the relatively strong negative out-group bias among the Dutch majority and group biases of the minority groups themselves are expected to contribute to smaller extended networks among minoritized groups compared to the Dutch majority. Regarding minorities' out-group bias, this might hold particularly for the so-called second generation as we can derive from the integration paradox literature that has argued that host society rejection and discrimination are particularly noticed and experienced by this second generation, leading to more negative out-group attitudes (Geurts et al., 2020).

The impact of opportunities

The size of a specific group in society determines to a large extent the probability of meeting members of this group (Blau, 1977). Consequently, members of larger groups—here, majority Dutch—have more opportunities to meet and form relationships with similar people. Second, people of different (ethnic) groups spread unequally over various social contexts, or *foci*, such as sports clubs, families, schools, neighbourhoods and occupations (Feld, 1981). People are thus more likely to form a social relationship with those with whom they share such a focus. Therefore, *participating in more foci is expected to increase meeting opportunities and thus the size of one's extended social networks*. Because of segregation processes, such participation is especially likely to increase the meeting opportunities to similar others and hence *participating in more foci is expected to contribute to the degree of homogeneity* as well.

For *foci*, it is relevant that the second generation's socio-economic position and educational level did increase compared to the first generation and particularly attendance in tertiary education increases the likelihood of acquainting Dutch majority members (de Mooij et al., 2020). Furthermore, the second generation participate less often in, relatively ethnically homogeneous, religious practices (Maliepaard et al., 2010). At the same time, they also perceive more discrimination and feelings of relative deprivation, which may be followed by a stronger integration into the in-group community, although the evidence thereof is less clear (cf. Geurts et al., 2020; Guveli et al., 2016). So *in terms of integration in socio-economic foci, it can be expected that the second generation has less homogeneous and larger extended networks than first-generation migrants*.

People also meet and acquaint others in neighbourhoods, particularly during various activities around the house, such as taking the trash outside, retrieving parcels from neighbours and general talks. Subsequently, meeting opportunities are to some extent determined by who lives in your neighbourhood. Because we assume that people are more likely to be acquainted with similar people than dissimilar people, the greater the number of ethnically similar inhabitants in one's residential neighbourhood, the larger and the more homogeneous the extended social network is expected to be. Moreover, the social life of members of ethnic-minority groups revolves, in general, more within the neighbourhood, and they are more likely to acquaint and befriend people from the neighbourhood than the majority group (Tolsma & van der Meer, 2018). *We thus expect that the impact of the neighbourhood composition on the size and degree of homogeneity of the extended network will be stronger for members of ethnic-minoritized groups*.

Lastly, *these neighbourhood effects are expected to be potentially weaker for second-generation than first-generation migrant groups*, because the former are more highly educated and it is known that higher educated people are less influenced by their neighbourhood and more likely to move within a country, for instance as a result of moving into student housing and being able to afford more expensive housing (Schlueter, 2012).

DATA AND METHOD

Data

We use data from the Netherlands Longitudinal Lifecourse Study 2022 (NELLS 2022) (Jeroense et al., 2023). Uniquely, these data include an oversample of Dutch inhabitants who immigrated from Morocco or Turkey (first generation) and their direct descendants (second generation) and a Network Scale-up module. The sample was randomly drawn from the Dutch population registry, targeting 17,133 people between the ages of 16 and 45. Between May and October of 2022, in total 3017 persons filled in the survey (response rate: 17.8%). People were invited by mail to complete an internet survey, with our NSUM module being part of the (random) split ballot design part of the survey. Therefore, our final sample consists of 1204 respondents. After excluding respondents with missing values on our NSUM questions, we retained 1177. A further 51 migrant-background respondents were dropped because they did not have Moroccan or Turkish roots. Finally, omitting network size outliers ($>\text{mean} + 3\text{SD}$) reduces the effective sample by another 32

respondents. Our final sample consists of 1096 respondents; 164 Moroccan-Dutch; 274 Turkish-Dutch and 658 labelled as Dutch ethnic-majority members.

Measuring acquaintanceship networks

Capturing social ties with surveys has traditionally been reserved for measuring *strong social ties*. Measuring extended network ties at some further distance is more challenging as they and their demographic information are harder to recall (Marin, 2004). Therefore, a multitude of alternative strategies have been used, including scraping social media contacts, summation methods of contacts or using address book pages to count contacts (Hofstra et al., 2021; McCarty et al., 2001). A widely agreed-upon method to measure acquaintances remained elusive, until scientists turned to advances in network scale-up methods (NSUMs) (Bernard et al., 1991; DiPrete et al., 2011; Hofstra et al., 2021; Killworth et al., 1998; Lubbers et al., 2019; Maltiel et al., 2015; McCarty et al., 2001; McCormick et al., 2010; Zheng et al., 2006). The scale-up method is the current state of the art to assess the extended social network in surveys. It is easily included as a short survey module and can be filled in by many respondents. This is essential here, as we want to combine network size and homogeneity by covariates derived from surveys to generalize our results.

Network scale-up method and network size

In NSUM questions, respondents are prompted to fill in whether they know certain *categories* of persons: 'How many [X]s do you know?' For instance, 'How many people do you know named Ellen?' As we know that there are 23,000 Ellens in the Dutch population of about 17 million people, we can scale up a respondent's answer. If you know two of 23,000 Ellens, you know 0.008696% of the Ellens. Extrapolated to a population of 17,000,000, you know 1478 people. The more categories (Xs) are used (e.g. other names, people in university, etc.), the more precise the (average) estimate.

NELLS' NSUM

Respondents were asked: 'The following questions concern people that you know personally *in the Netherlands*. This means you know this person by name and will start a conversation when you randomly meet them on the street or in a shop. How many [X]s do you know?' Following prior work, we used interval-censoring (0, 1, 2–5, 6–10, 11–20, 21–50, or >50) to reduce respondent burden (DiPrete et al., 2011; Hofstra et al., 2021) and (approximate) midpoints (e.g. 3 for 2–5) to set an integer to the number of people known in that category. Following Lubbers et al. (2019), 11 is used as the largest realistic number for 'name' X-categories.

Based on McCormick et al.'s (2010) guidelines, we sought the most suitable names for [X] (see Appendix S1). Names should not be too (in)frequent (leading to over-/underestimation) and should be representative of the target population (e.g. the proportion of NSUM men should reflect the population). Consequently, we selected our categories representative to the Dutch population based on age, gender and migration background. First, we selected names based on their associated gender and migration background (Bloothoof & Groot, 2008), employing the Meertens Dutch population first name data bank (Meertens Institute, 2021) to identify the associated age and to select names that were not too (in)frequent (0.1%–0.2%).² Our resulting Dutch majority-typed names are Emma (female, <30), Daan (male, <30), Kevin (male, 30–45), Linda (female, 30–45), Ingrid (female, 45–65), Edwin (male, 45–65), Albert (male, >65), Willemine (female, >65).

It is more challenging to adhere to the NSUM guidelines for ethnic-minority-typed names. There are no typical Moroccan and Turkish names that capture 0.1%–0.2% of the Dutch population. For instance, about 0.4% of the

Turkish minority population is named 'Ibrahim', though 'Ibrahim' captures less than 0.01% of the Dutch population. To ascertain that our results are insensitive to this name-selection issue, we selected four different ethnic-minority names that each represent one gender and (typically) one minorized group in the Netherlands: Ibrahim (male, Turkish), Mohammed (male, Moroccan), Esra (female, Turkish) and Fatima (female, Moroccan). With four names, we can estimate network size via the NSUM method multiple times by selecting different combinations of minoritized names. Doing so demonstrates that network size estimates and group differences therein are robust to different name-inclusion scenarios.³ We can carefully assume that network sizes of minoritized groups are estimated reliably and can be compared to those of majority members. We report the results of the estimates including Ibrahim as the sole ethnic-minority name in the main text as this NSUM estimate was least sensitive to gender effects.

We also inquired about a set of social categories: respondents reported how many people they knew who were currently enrolled in secondary education, MBO [tertiary vocational], HBO [tertiary-higher vocational] and university; who were 'currently unemployed'; who 'own a second home'; and who were 'currently incarcerated'. We use the midpoint rules discussed above and for 'currently incarcerated' we set 11 as the highest value.

Following Maltiel et al. (2015), Lubbers et al. (2019) and Hofstra et al. (2021), we used the Bayesian NSUM application to estimate network size, using the 'NSUM' R package.⁴

Ethnic homogeneity

The degree of ethnic homogeneity of respondents' extended networks was based on NSUM estimates in which only the name questions were included. Note that here we are using *all four* minoritized names, which we assume will provide a more precise estimate of the relative prevalence of ethnic-minority names in people's networks.⁵ The numerical response to each name question was divided by the name frequency in the population. We then calculated a total sum for each set of distinct ethnic-group names and for all names. By dividing the total sum of co-ethnic names by the total sum of all names multiplied by 100, we derive our relative ethnic homogeneity measurement, running from 0 to 100.

Independent variables

Ethnic background group

Group membership is measured by the country of birth of the respondent, their father or their mother. Someone is classified as Dutch majority if they and their parents are born in the Netherlands. First generation refers to respondents born in either Turkey or Morocco and second-generation Moroccan-Dutch or Turkish-Dutch if the respondent was born in the Netherlands and one or both parents were born in Morocco or Turkey. Mothers' birth country was prioritized if non-Dutch countries differ between by parent.

Out-group bias

This is measured with a thermometer item: 'How positive do you feel towards [group]?' A score ranges between 0 (highly negative) and 100 (highly positive). This was asked for 'Dutch', 'Turkish-Dutch' and 'Moroccan-Dutch'. We tap into out-group bias by subtracting respondents' in-group attitude from the average of the two respective out-group attitudes. A greater score indicates less negative out-group bias. We mean centred the variable.

Foci participation

We measure participation in foci for religious communities, education and work. Participation in religious communities is measured by the item 'How often do you attend a religious meeting in a church, mosque, synagogue,

temple, or shrine?', ranging in eight steps from 'Never' to 'multiple times a week', where we combined 'once a month' onwards (more frequent) due to low cell sizes. Employment status ('Do you currently perform paid work, yes/no?') proxies participation in work foci, and being enrolled in a full-time educational program proxies participation in educational foci ('Are you currently enrolled in a full-time educational program, yes/no?').

Neighbourhood

We match neighbourhood data (based on the first four digits of Dutch zip codes) from Statistics Netherlands to NELS. To measure the ethnic compositions of neighbourhoods, we calculate a neighbourhood's percentage of non-western migrants.

Control variables

We control for having a romantic partner (yes/no), age in years, educational attainment and gender (woman/man). These are all found to be related to both network size and ethnic homogeneity in prior work (Hofstra et al., 2017, 2021; Lubbers et al., 2019) and ethnic minorities are on average for instance younger and lower educated than ethnic majorities, so we need to take these covariates into account in our analyses. Regarding neighbourhoods, we control for the number of inhabitants and the mean property valuation in neighbourhoods, as the former is related to the number of meeting opportunities and the latter to neighbourhood socio-economic status, where we assume that higher SES neighbourhoods offer more favourable contact opportunities.

Table 1 depicts descriptive statistics. Continuous variables are mean-centred.

Analytical strategy

We estimated (ln) network size and network co-ethnic share with a series of linear regression models in three steps: including ethnicity and migration generation; separate models per ethnic group; and separate models per ethnic-generation group. We present the first models below; the others are reported in the appendix and referred to where relevant.

To decompose observed group differences in the outcome, we used the Blinder-Oaxaca twofold decomposition method, with the pooled model group indicators' coefficients as reference coefficients (Blinder, 1973; Oaxaca, 1973). Doing so, differences between groups are decomposed into a part that can be attributed to differences in group characteristics, normally labelled as the explained part and into an unexplained part. Assuming that all relevant variables are included in the explanatory model, the 'unexplained part' suggests that explanatory variables have different impacts across groups (i.e. group-specific effects).

RESULTS

Describing extended social network size and homogeneity

Who has larger extended social networks?

We estimate a median extended network size of 778 (see Figure 1), with an interquartile range from 478 to 1271, which is in line with NSUM estimates from earlier studies (DiPrete et al. (2011): 550, IQR 400–780; Zheng et al. (2006): 472, Lubbers et al. (2019): 536, IQR 337–830; Hofstra et al. (2021): 892 among Dutch adolescents).

TABLE 1 Descriptive statistics full sample.

	Mean	SD	Median	Min	Max
Network size	943.463	639.821	778.346	48.220	3592.104
Network size (ln)	6.635	0.673	6.658	3.896	8.187
% Co-ethnic	58.828	31.522	57.368	0.000	100.000
Group [Dutch majority]	0.599			0.000	1.000
[1st-generation Turkish-Dutch]	0.128			0.000	1.000
[2nd-generation Turkish-Dutch]	0.122			0.000	1.000
[1st-generation Moroccan-Dutch]	0.066			0.000	1.000
[2nd-generation Moroccan-Dutch]	0.084			0.000	1.000
Age	0.000	8.804	0.290	-15.710	23.290
Gender [Female]	0.540			0.000	1.000
Educational attainment	0.000	1.516	-0.189	-4.189	1.811
Partner [Has a partner]	0.655			0.000	1.000
Paid work	0.820			0.000	1.000
Currently in education	0.259			0.000	1.000
Religious attendance [Never]	0.602			0.000	1.000
[1-2 times a year]	0.170			0.000	1.000
[3-11 times a year]	0.073			0.000	1.000
[Once a month or more]	0.155			0.000	1.000
Out-group attitude	0.000	20.804	1.808	-88.192	92.808
Neighbourhood: % non-western migrant	0.000	16.696	-5.692	-17.748	65.773
Neighbourhood: mean property valuation	0.000	97.381	-17.765	-157.765	910.235
Neighbourhood: # inhabitants	0.000	4788.646	-282.805	-9112.81	19347.195

Note: Descriptive statistics per group: Appendix S2. N = 1096.

Next, in line with our expectations, Figure 2, panel a shows that Dutch majority members have larger extended networks than both minoritized groups, the difference being greatest between the Turkish-Dutch (Median: 654) and Dutch majority members (Median: 864). Additionally, panel b shows that second-generation migrants have larger extended networks than first-generation migrants, as expected. This difference is greatest for the Turkish minority group, with an ~240 difference (490 vs. 730 ties), versus ~135 within the Moroccan minority group, which suggest that denser organized communities (i.e. the Turkish-Dutch) have less preference for additional tie formation.

Who has more ethnically homogeneous extended social networks?

To understand the ethnic composition of networks, we first consider the estimated number of known names (Figure 3). These data already show clear ethnic divisions in knowing people with typical minority names (panel a) or to a lesser degree ethnic-majority names (panel b). For instance, the Dutch majority members seem to know more Lindas and Edwins, yet not more Willeminas, Alberts or Emmas. The differences between generations are also not clear-cut, at least not across all names separately. Because ethnic minorities were particularly more likely to know more ethnic-minority persons, their networks seem less homogeneous than those of the Dutch non-migrant ethnic-majority members, which aligns with our expectations.

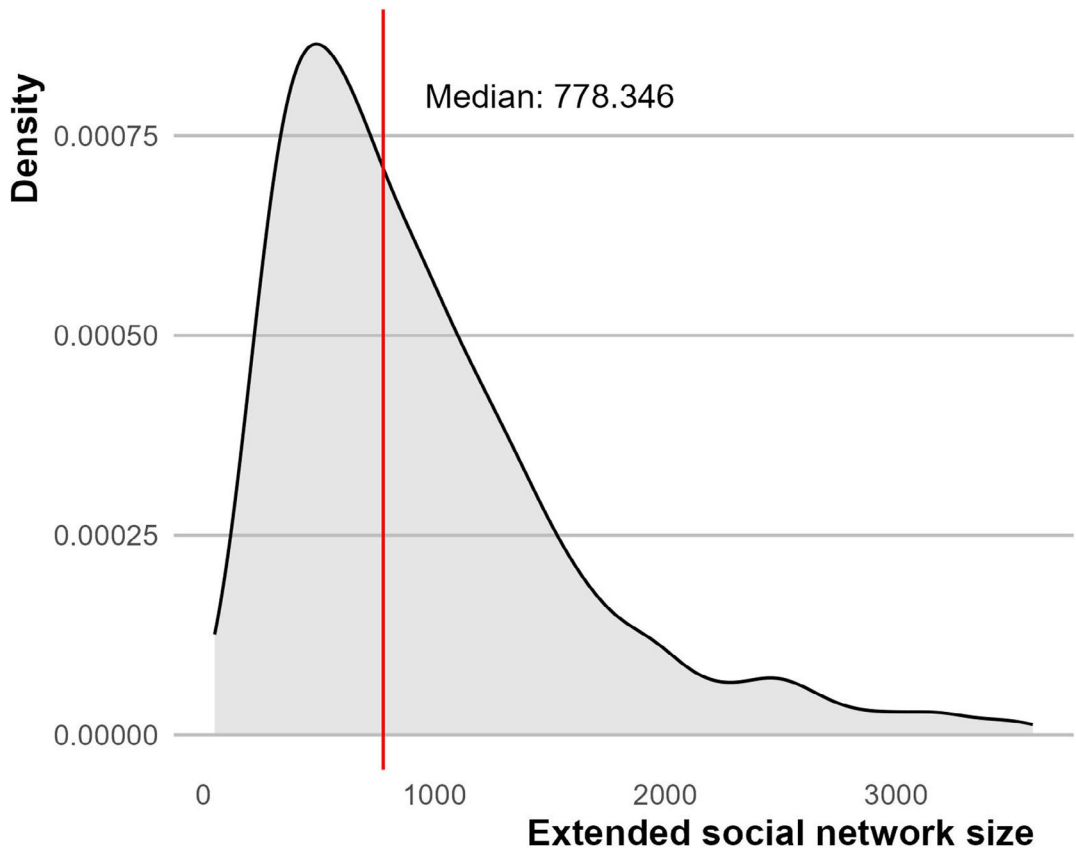


FIGURE 1 Density graph.

Figure 4 in turn shows the estimates on the percentage of co-ethnics in one's extended networks. The first takeaway underscores the conclusion derived from Figure 3: Ethnic homogeneity seems significantly higher in the networks of ethnic-majority members than for minoritized groups. And, in line with our reasoning in intragroup organizational strength, Turkish-Dutch have on average stronger co-ethnic networks than the Moroccan Dutch.

Second, in contrast to network size and our expectations, ethnic homogeneity differences are less acute *between* migrant generations. The difference between first- and second-generation migrant groups is relatively small for Moroccan-Dutch, yet ethnic homogeneity is slightly higher for the second-generation Turkish-Dutch than the first. The latter goes directly against our expectation that second-generation migrants would have less homogeneous networks than that of first generation (due to increased meeting opportunities). However, it does resonate with the *integration paradox* logic that second-generation migrants might separate themselves from the host society more, despite or even due to relative economic success.

Explaining network size and ethnic homogeneity

We regress the logged network size and ethnic homogeneity on our antecedents (Table 2).⁶ Then, in the decomposition analyses (Table 3), we assess the extent to which group differences (in the effect of) antecedents explain differences in network size and homogeneity.

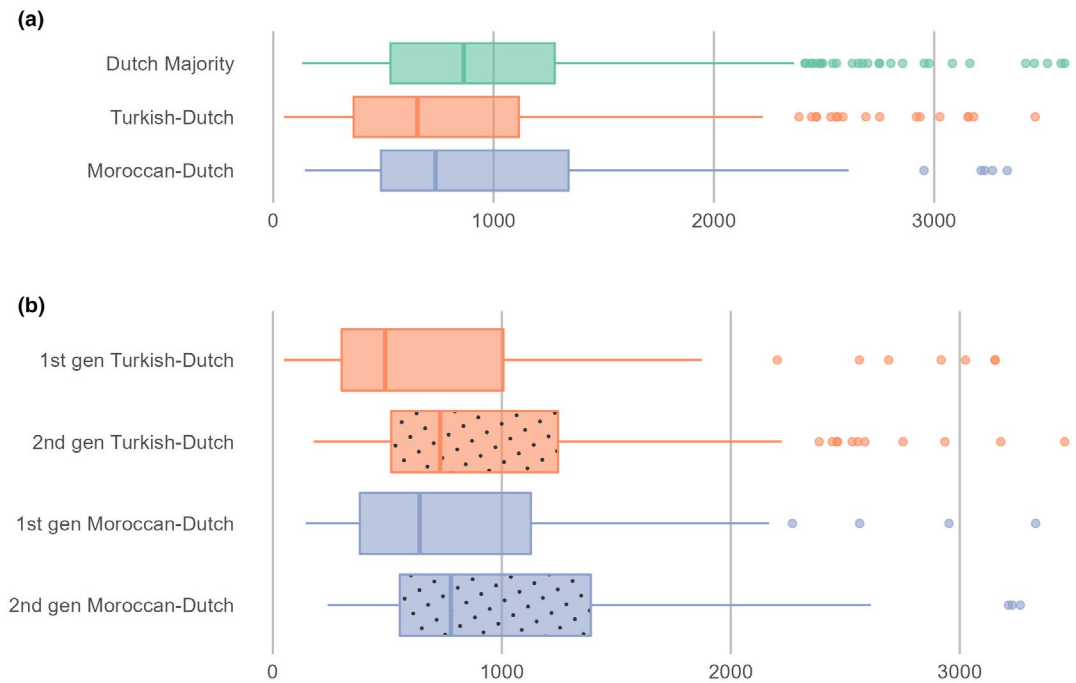


FIGURE 2 Group differences in extended social network size. To test ethnic-group differences, we ran a one-way ANOVA with a Tukey HSD. (Appendix S4).

Explanatory factors of network size and homogeneity

Table 2 shows that favourable out-group bias does not significantly relate to extended network size. In line with our conjecture, however, favourable out-group bias does negatively relate to ethnic homogeneity.

As expected, employment, attending educational programmes and religious attendance are significantly and positively related to extended network size. However, employment and education do not relate to ethnic homogeneity, whereas religious attendance significantly increases ethnic homogeneity. This can be understood by ethnic sorting in different religious foci (i.e. ethnoreligious segregation): Moroccan- and Turkish-Dutch are very predominantly Muslim and the Dutch majority members are almost exclusively non-religious or Christian.

Lastly, the percentage of non-western ethnic minorities in a neighbourhood relates to neither extended network size nor ethnic homogeneity, at least not when all groups are jointly analysed. In line with our expectation, extended networks of Dutch majorities become less homogenous with more neighbours of non-western descent, but more non-western neighbours did not impact network size and homogeneity of Turkish-Dutch and Moroccan-Dutch (Appendix S3). Thus, neighbourhoods do not impact the networks of minority groups stronger.

Decomposition analyses

The extent to which group composition differences in our covariates explain ethnic differences in network size and ethnic homogeneity is depicted in the 'explained' panel in Table 3. To what extent covariates are likely to have

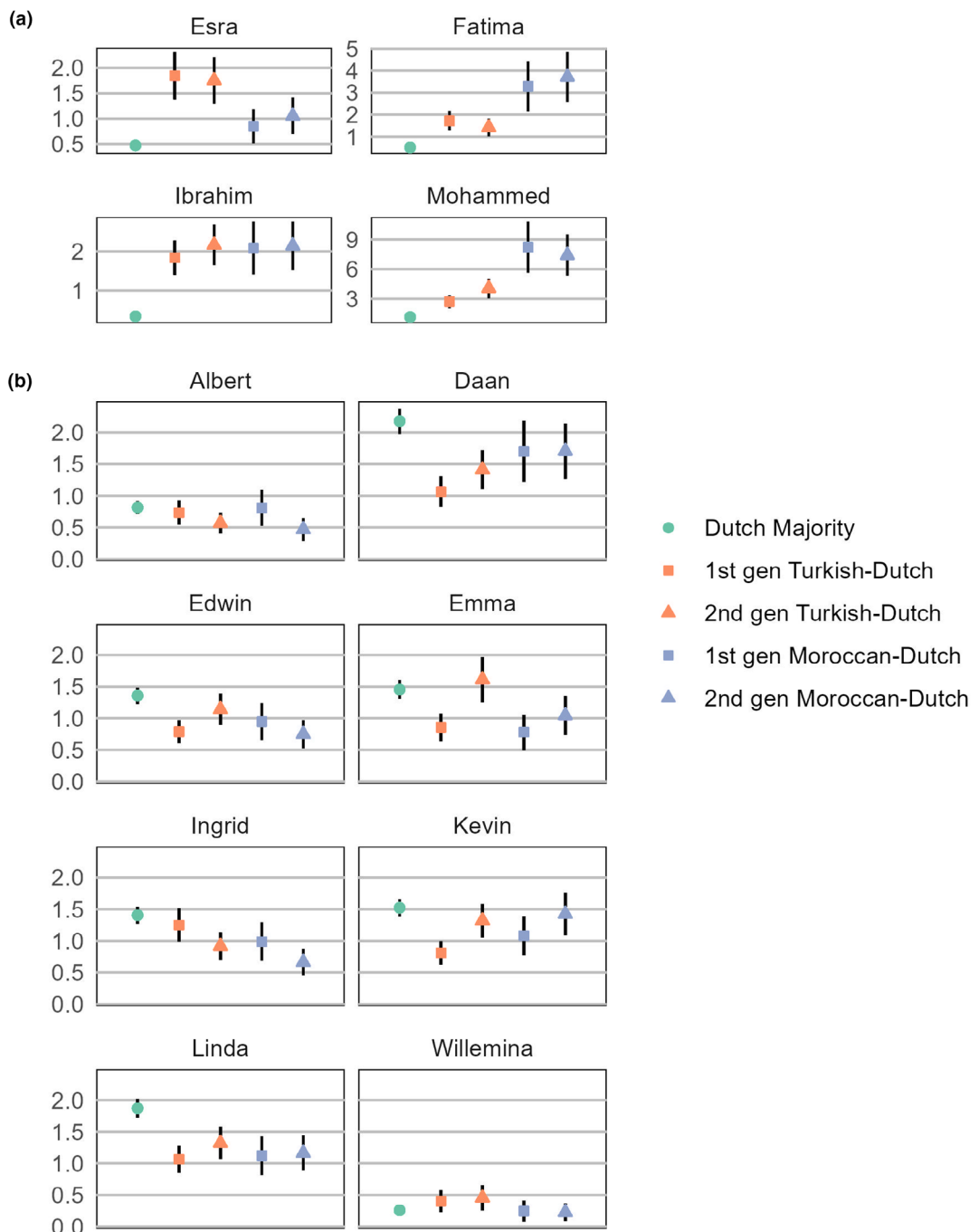


FIGURE 3 Estimated number of knowing people with a certain name. (1) Estimates are obtained from binomial regression analyses with the names as dependent count variables and the groups as explanatory variables. Markers represent the predicted number of names, with 95% confidence intervals. (2) Please note that in panel (a) we did not fix the y-axis to be equal across facets.

group-specific effects is shown in the 'unexplained' panel in Table 3 (see also Appendix S3). We assessed this for four comparisons: between the ethnic-majority and the Moroccan-Dutch and Turkish-Dutch, respectively, and between the first and second generation for both ethnic minorities separately.

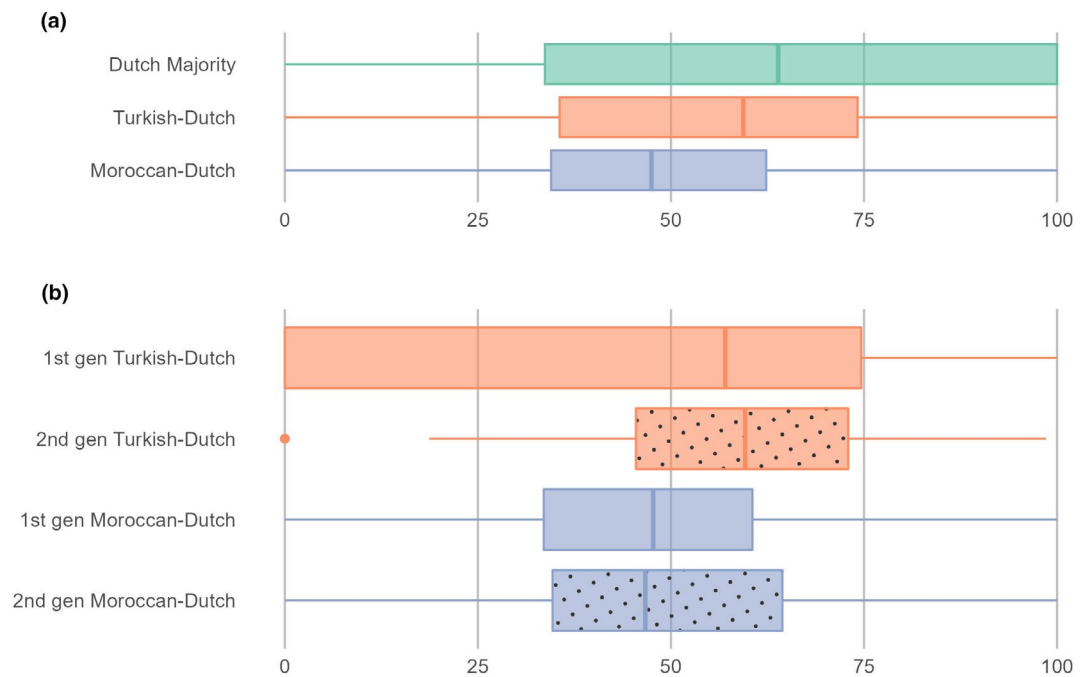


FIGURE 4 Extended social network co-ethnicity. To test the ethnic-group differences, we ran a one-way ANOVA with a Tukey HSD (Appendix S4).

Network size

The gaps in network size between the different ethnic groups and generations were not explained by differences in attitudes and meeting opportunities: None of the explained differences was significant. For instance, the difference between the predicted network sizes of Dutch and Turkish-Dutch is -2.252 , yet only -0.025 ($p > 0.05$) of that difference seems explained variation in included preferences and opportunities (or controls) of the groups.

Continuing on the example, the *unexplained* difference ($B = -0.227$) between Dutch majorities and Turkish-Dutch and between the generations within the ethnic-minority groups are statistically significant. This suggests that the covariates are likely to have different effects across ethnic groups and generations, and this causes some of the difference in network size between majority-Dutch and Turkish-Dutch and between first- and second-generation minority members.

When repeating these analyses per covariate (Appendix S5), we do not find a specific covariate that individually contributes substantively to the unexplained gaps found, despite their cumulative effect as reported in Table 3. We did find that Turkish-Dutch attended religious services more often than ethnic-majority Dutch, which partly *closes* (or suppressed) the network size difference between these groups. Also, Turkish-Dutch persons were on average less often employed in paid work than Dutch majorities, resulting in a larger difference in extended social network size.

Homogeneity

For ethnic homogeneity, we find that differences between Dutch majority members and Moroccan-Dutch are partly explained by variations in covariates. For instance, of the 15 percentage points more co-ethnic ties of ethnic-majority members, about a third is explained by different rates in covariates and the rest is likely explained by group-specific effects of our covariates (Table 3). For the Turkish Dutch and the ethnic-majority, we find a similar result regarding the differential *effects* of covariates. In line with Figure 4, we find no significant explanations for generational differences.

TABLE 2 OLS regression natural log of extended network size and ethnic composition (N = 1096).

	Ln(size)		% Co-ethnic	
	B	T-statistic	B	T-statistic
Constant	6.516	89.49	63.740	18.584
<i>Preferences</i>				
Out-group attitude	-0.001	-1.212	-0.188	-4.167
<i>Meeting opportunities: foci</i>				
Paid work	0.168	2.871	0.180	0.065
Currently in education	0.155	2.879	0.661	0.260
Religious attendance [1–2 times a year]	0.152	2.763	4.934	1.908
[3–11 times a year]	0.129	1.623	0.191	0.051
[Once a month or more]	0.181	3.027	5.670	2.012
<i>Meeting opportunities: neighbourhood</i>				
Neighbourhood: % Non-western migrant	0.000	-0.073	-0.085	-1.188
<i>Control variables</i>				
Age	0.000	0.100	0.034	0.231
Gender [female]	-0.048	-1.200	0.085	0.045
Educational attainment	-0.018	-1.226	0.102	0.145
Partner [has a partner]	-0.010	-0.200	-1.170	-0.506
Neighbourhood: mean property valuation	0.000	-0.513	0.000	0.025
Neighbourhood: # inhabitants	0.000	-1.460	0.000	0.257
<i>Migrant background groups</i>				
[Dutch majority]	ref.		ref.	
[1st-generation Turkish-Dutch]	-0.375	-5.590	-15.014	-4.745
[2nd-generation Turkish-Dutch]	-0.091	-1.348	-8.994	-2.829
[1st-generation Moroccan-Dutch]	-0.225	-2.561	-15.700	-3.799
[2nd-generation Moroccan-Dutch]	-0.075	-0.943	-13.496	-3.613
<i>Model statistics</i>				
R ²	0.089		0.074	

Note: Bold indicates $p < 0.05$.

Turning to the individual covariate contributions again, logically no significant contributions are found for the (minimal) *generational* differences within minoritized groups. Nevertheless, as expected, the more-positive out-group attitudes among Moroccan- and Turkish-Dutch explain why these groups have less homogeneous networks than Dutch majority members. Again, Turkish-Dutch attend religious services more often, which partly suppressed the ethnic homogeneity difference between Dutch and Turkish-Dutch, and the same holds for group-specific *effects* of religious attendance. Moreover, differences in the ethnic composition of the neighbourhood explain a part of the homogeneity gap between Dutch majority and Turkish-Dutch.

CONCLUSION AND DISCUSSION

Our study provides an interesting perspective on ethnic group differences and the social integration of first- and second-generation Turkish-Dutch and Moroccan-Dutch. The extended networks of the Dutch majority members

TABLE 3 Decomposition of extended network size and ethnic homogeneity.

Comparison (a-b)	Pred. a	Pred. b	a-b	Explained		Unexplained	
				B	T	B	T
Ln(Size)							
Turkish-Dutch – Dutch majority	6.459	6.711	−0.252	−0.025	−0.722	−0.227	−4.103
Moroccan-Dutch – Dutch majority	6.613	6.711	−0.098	0.007	0.167	−0.106	−1.760
Turkish-Dutch 1st-generation – 2nd-generation	6.288	6.639	−0.351	−0.061	−1.045	−0.290	−3.240
Moroccan -Dutch 1st-generation – 2nd-generation	6.491	6.711	−0.220	0.074	0.800	−0.294	−2.154
%Co-ethnic							
Turkish-Dutch – Dutch majority	51.243	64.341	−13.098	−2.570	−1.621	−10.528	−3.402
Moroccan-Dutch – Dutch majority	49.325	64.341	−15.016	−4.782	−2.974	−10.234	−4.058
Turkish-Dutch 1st-generation – 2nd-generation	47.423	55.233	−7.810	−2.507	−1.112	−5.304	−1.239
Moroccan-Dutch 1st-generation – 2nd-generation	47.997	50.390	−2.393	1.993	0.654	−4.385	−0.973

Note: Bold indicates $p < 0.05$.

were larger than those of minoritized persons, mainly due to first-generation migrants having smaller networks, and minoritized persons' networks were more heterogeneous than those of the ethnic-majority. Interestingly, group differences in preferences and meeting opportunities did little to explain group differences in network size and only modestly explained ethnic homogeneity. Particularly group differences in out-group bias partly explained the homogeneity gap. There is a caveat, however, as we did not measure alternative preferences that could determine intergroup contact, such as preferences to integrate into Dutch society (Berry, 1992). Our study provides further evidence for the partial separation of the second-generation from the first-generation migrants. Even though the second generation has better socio-economic positions, this is not converted into more ethnically heterogeneous networks. This is in line with the non-linear acculturation perspective, where integration on one dimension does not automatically lead to integration on other dimensions (Geurts et al., 2022; Verkuyten, 2016). This is most strongly pictured for the Turkish-Dutch community, which is hardly surprising given the closer-knit organization of this community in the Netherlands (Vermeulen et al., 2014).

Our analytical approach further pinpointed a dynamic where Dutch-majority persons arrive at social situations with more-negative out-group attitudes than minoritized persons. This impedes Dutch majorities' relationship formation with ethnically dissimilar others and obstructs diversifying their ethnically homogeneous networks. This also blocks first- and second-generation migrants from forming relationships with Dutch-majority members and their structural assimilation into the host society (Gordon, 1964). Consequently, this may contribute to perceived discrimination of the second-generation Turkish-Dutch and Moroccan-Dutch and can form a significant hurdle for their integration into the social structures of Dutch society (Verkuyten, 2016).

Some advantages and limitations of our approach merit attention. Future research can build on our approach to measure extended social networks among minority groups. Choosing minoritized names is challenging and including multiple minority names easily leads to methodological difficulties (McCormick et al., 2010). There is no straightforward best practice to select minoritized-typed names. Yet, we provided a pragmatic example of how to robustly measure network size and how to exploit name selection for a detailed look into ethnic homogeneity.

Our study shows that theories of preferences and meeting opportunities partly explain network size and ethnic homogeneity, but they do not explain group differences well. This means that research on group differences in extended networks has a theoretical challenge, as we need to go further than (our operationalization of) the

meeting opportunities and preferences framework. Naturally, we need to acknowledge that we mainly used proxy measures for preferences and meeting opportunities. Nevertheless, we utilized a rich data set to measure participation in education, paid work and religious activities, but other foci may be important as well. For instance, going out or participating in voluntary organizations (Hofstra et al., 2021; Lubbers et al., 2019). Future research on group differences in extended social networks could take this into account.

Nevertheless, weak tie networks such as the extended network are likely to differ from strong tie networks such as friendship networks or core discussion networks, and this could be considered in future theories of weak tie formation. In addition, social relationship formation for migrants (i.e. first generation) is likely to be conditional on the migration itself which includes changes in language, cultural codes and capital, and time constraints due to maintaining origin country networks. Hence, we might need a tailored theory of relationship formation for migrants. Thus, future network research faces a theoretical challenge for weak tie formation in general and for people who migrated in particular.

In this research, we examined the size and homogeneity of the extended network as an indicator of the cultural integration of minority groups. Extending this focus, future research could also examine the effects of extended network size and homogeneity on forms of *social* and *economic* integration, or different forms of participation in the public sphere, such as volunteering or political participation. For those outcomes, longitudinal data would be preferred as the relationships between these forms of integration and network formation are likely to be reciprocal. Along these lines, the consequences of minoritized persons' extended network size or homogeneity are a fruitful avenue for future network integration research.

In the current research paper, we theorized and tested the effect of out-group bias on the extended social network. However, preferences such as negative out-group bias are in part moulded by their extended social network as well (Bracegirdle et al., 2022; Pettigrew & Tropp, 2006). We expect that the main causal direction is from preferences to extended networks rather than the other way around because previous research has indicated that there are diminishing returns of out-group network ties on prejudice, as an increasing number of out-group ties does not necessarily lead to less ethnic prejudice (Hofstra, 2022). Still, given the cross-sectional nature of our data, we cannot be entirely sure about the relative strength of the bidirectional pathways.

In this contribution to the special issue, we mapped the extended social network's structure for different majority and minoritized groups in the Netherlands. We showed that size differences are mainly driven by the gap between the Dutch majority and first-generation migrants. We also showed that Turkish-Dutch and Moroccan-Dutch have more ethnically heterogeneous networks than the Dutch majority. Moreover, even though the preferences and meeting opportunities framework can explain individual variation in extended social network structure, it fails to explain group differences.

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PEER REVIEW

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/imig.13252>.

DATA AVAILABILITY STATEMENT

All information on how we prepared and analysed the data, including additional and robustness analyses, can be found on our replication website: <https://thijmenjeroense.github.io/structure-minoritized-networks/>. Data are available upon request.

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ENDNOTES

- ¹ Statistics Netherlands: either an individual or their parents is born in another country than the Netherlands.
- ² See replication website for details on name selection.
- ³ Incorporating all four names simultaneously inflated network size estimates substantially, probably due to the four ethnic-minority names not proportionally reflecting the target population in terms of their prevalence across the NSUM questions nor its prevalence in the population distribution at large (McCormick et al., 2010). Estimates were stable when using one or two names. More details and sensitivity analysis on the replication website.
- ⁴ Starting points: basic scale-up estimator; MCMC: 40,000 iterations, burn-in of 1000; average network size computed based on 4000 retained chains. To counter barrier effects and transmission error, we followed Maltiel et al. (2015:1251): We adding a random effect for degree and a multiplier to the binomial proportion of people known in a given category, and allowed the probability that a respondent knows someone in a given category to vary randomly across individuals. This NSUM package requires estimating a hidden population's size, We ran the model 16 times 'hiding' each of our categories. All estimates correlate above 0.85. The model has 'people incarcerated' as hidden population.
- ⁵ This procedure will overestimate network size, particularly for ethnic minorities. This is exactly why for size we will rely on the previous described measure.
- ⁶ The control variables did not relate significantly to network size or homogeneity; analysis per ethnic group is given in Appendix S3.

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