



Evidence of the effects of ethnic diversity, years of residence, and location on migrant bridging, bonding, and linking, social capital: a New Zealand synthesis

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Abstract

New Zealand has one of the highest immigration rates in the developed world, resulting in a high share of foreign-born residents. Its population is highly urbanized, spatially uneven, ethnically diverse, and includes a significant indigenous Māori population. This paper synthesizes two decades of research on migrant social capital in New Zealand, drawing on data from multiple waves of the New Zealand General Social Survey and the Adult Literacy and Life Skills Survey. These datasets provide insights into community participation, volunteering, perceptions of safety and inclusion, and electoral engagement. We draw two main conclusions from our synthesis. First, although migrants arrive with limited local social capital, they gradually build bonding, bridging, and linking, social capital over time. In addition, reported experiences of discrimination decline with longer residence. However, pooled survey data reveal variation in these patterns across time. Second, social capital investment is shaped by the spatial distribution of ethnic groups. Migrants are more likely to engage in bridging social capital in regions where their group is underrepresented, and in bonding social capital in communities where ethnic clustering occurs.

Keywords Social capital · Migrant integration · Ethnic diversity · Spatial sorting

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1 Introduction

The number of international migrants has quadrupled since 1960 (Batalova 2022), prompting a vast literature on the impacts of migration on origin countries, host societies, and migrants themselves, commonly referred to as ‘migration impact assessment’ (Nijkamp et al. 2012). A recent strand of this literature focuses on migrant social capital and its relationship with socio-economic outcomes. The concept of social capital, developed in the late twentieth century by Bourdieu (1986), Coleman (1988), and Putnam (1993), has proven especially useful in studying immigrant integration.¹ This includes the social networks of second-generation migrants, as explored in the seminal work of Portes and collaborators (e.g., Portes and Sensenbrenner 1993; Portes and Zhou 1993; Portes 1995). For comprehensive reviews, see Cheong et al. (2007) and Nannestad et al. (2008).

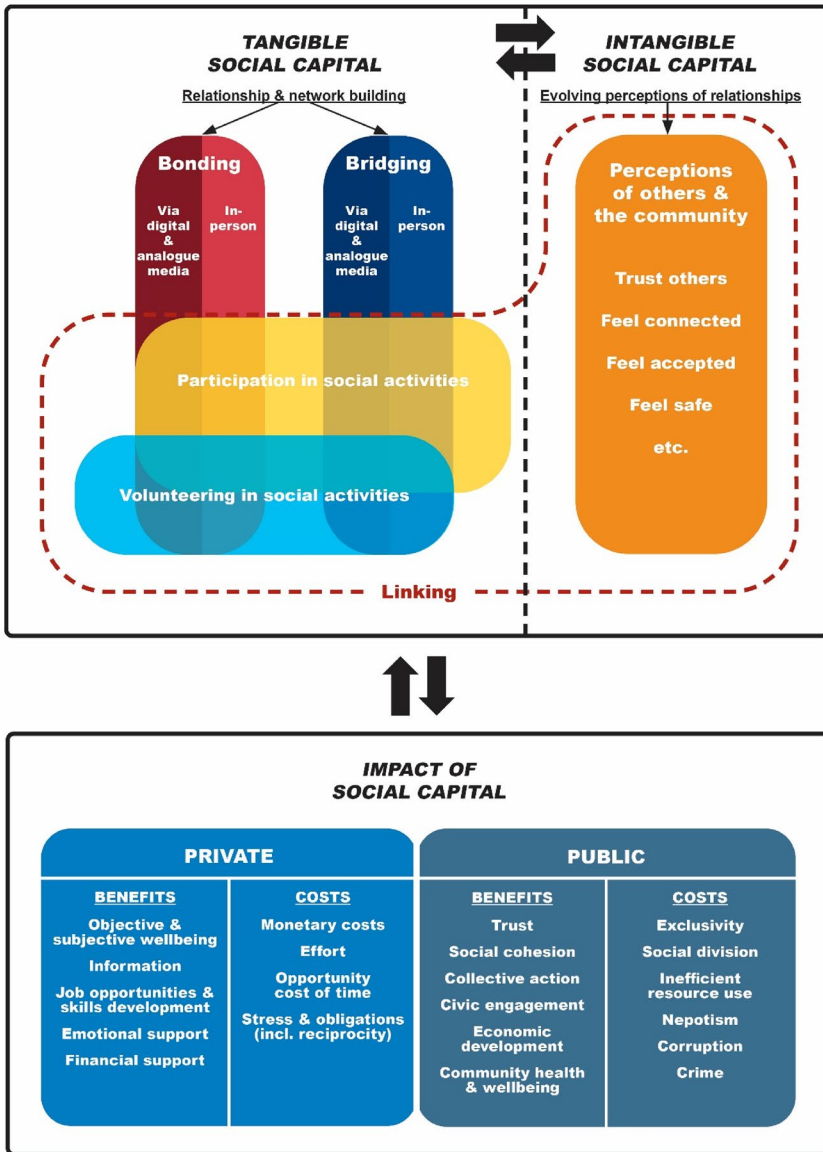
Westlund (2006) states that social capital has come to refer to social networks, relationships, norms and values. These are all related to the social situation in which an actor is embedded and may facilitate access to resources, trust, support, reciprocity, and opportunity. For international migrants, such networks may exist within co-ethnic communities, extend to others in the host country, or persist through ties to their country of origin.

The aim of this paper is to provide a synthesis of largely unpublished evidence from research during the last 2 decades on the role that social capital plays in migrant integration in New Zealand (referred to as Aotearoa in the language of the Indigenous Māori population). New Zealand (NZ) stands out among Organization for Economic Cooperation and Development (OECD) countries for its high immigration rate and foreign-born share, nearly 30% nationally (in a population of 5.3 million) and over 40% in Auckland (population 1.7 million). It also has a significant Indigenous population. Māori comprise almost one-fifth of residents. Overall, cultural diversity is high (Stone et al. 2021), and public attitudes toward migrants are among the most positive globally (Silver et al. 2021).

In the NZ context, migrants have ample opportunity to form co-ethnic networks while also engaging with other groups. Following Chetty et al. (2022a), we distinguish three forms of social capital. *Bridging* refers to connections between dissimilar groups; *bonding* captures ties within relatively homogenous networks; and *linking* denotes civic engagement, reflected in both actions (e.g., volunteering, voting) and perceptions (e.g., trust, safety). While bonding and bridging are mutually exclusive, linking can overlap with either. Like other forms of capital, social capital can be understood in terms of its *stock* (existing relationships), *investment* (efforts to build connections), and *depreciation* (decline from neglect or exclusion). These concepts are illustrated in Fig. 1.

Despite the rise of online interaction, in-person contact remains central to bridging, bonding, and trust formation (Misra et al. 2016). Actions like participation and volunteering generate *tangible* social capital, while perceptions of others and community, though *intangible*, are essential components of *linking* social capital.

¹ Recent texts such as Field (2017) and Cook (2022) discuss the evolution and pluralism of the concept of social capital.



Source: the authors.

Fig. 1 The structure of local and community social capital

Figure 1 outlines individual benefits from investing in social capital, which, like any investment, incurs private costs (e.g., expenses, effort). Impacts also occur at community and broader levels, with public costs and benefits listed in Fig. 1, such

as improved wellbeing from migrant social capital (Adedeji 2021). While we review some evidence on private and public impacts, this paper focuses predominantly on determinants of social capital levels and changes, as shown in the upper half of Fig. 1.

While this study focuses on social capital expressed through local and community-based networks, due to both theoretical interest in migrant integration and the nature of the available data, it is important to recognize that social capital exists and functions across multiple spatial and institutional levels. Westlund (2006) theorizes its presence across state, market, and civil society sectors. More recent work (e.g., Westlund and Larsson 2016) highlights the regional dimension of social capital, particularly its role in economic development while, for example, Isayan and Mayilyan (2022) analyze social capital and economic outcomes using national indicators. Our use of local social capital should therefore be seen as one level within a broader, multi-scalar framework.

Over the past two decades, a growing literature has linked social capital to migrant integration in destination countries. Li (2004) attributes this focus to policy concerns about improving migrant outcomes. Migrant networks, and thus social capital, aid both migration and settlement (Mouw 2006). Massey and Aysa-Lastra (2011) suggest social capital can substitute for human capital, enabling migrants with limited human capital to access resources and enhance outcomes through informal networks.

Migrants build social linkages in their new country while often maintaining social capital in their country of origin, enabled by modern travel and communication networks that lower the cost of long-distance connections (McCann et al. 2010). Online media particularly support refugees and displaced persons, for whom social capital boosts wellbeing (Moran 2023; Elliott and Yusuf 2014). Eckstein (2010) views remittances as investments in transnational social capital.

Migrants' social capital is expected to grow with years in the destination country through relationships built in communities and workplaces. However, discrimination and exclusion may limit some migrants' community participation and group membership compared to native-born peers (Pendakur and Mata 2012; Tegegne and Glanville 2019). Thus, while migrants seek to invest in social capital to enhance outcomes, overcoming social barriers is crucial for benefiting from bridging social capital.

Physical proximity to others in a personal network shapes migrants' opportunities for bridging and bonding social capital. Bonding supports cultural identity, while bridging enhances labor market outcomes and socio-economic progress. Lancee (2010) finds that bridging social capital boosts employment and income for migrants in the Netherlands, unlike bonding capital. Similar results exist for Mexican and Puerto Rican migrants in the United States (Aguilera 2002, 2005). Bridging capital investments post-migration yield significant economic returns, especially for white-collar workers (Piracha et al. 2016).

Li (2004) argues that bridging social capital aids migrant integration, while bonding capital fosters local support and community development, preserving cultural practices and identities for broader societal benefit. However, excessive bonding may strain individual resources through network demands. Friessen (2003) suggests that dense

intra-migrant interactions can increase segregation, limiting social capital's societal spillovers. In contrast, bridging capital fosters dense relations beyond migrant communities, enabling wider societal benefits. Figure 1's "public costs" section shows that high bonding and low bridging social capital, as seen in groups involved in organized crime or affected by discrimination, can cause segregation and exclusion of outsiders, negatively impacting community economic outcomes, health, and wellbeing (Villalonga-Olives and Kawachi 2017).

Discrimination hinders social capital formation (Bloemraad and Ramakrishnan 2008). In New Zealand, the population generally supports immigration and multiculturalism (Ward and Masgoret 2008; New Zealand Productivity Commission 2021), but discrimination persists, particularly for culturally distinct migrants. Positive attitudes toward migrants are highest among Asian New Zealanders, Wellington residents, and those born overseas, but lowest among those without foreign-born friends (New Zealand Productivity Commission 2021). Institutional racism negatively affects community health and wellbeing (Talamaivao et al. 2020). Migrants report more workplace discrimination than NZ-born workers, though this decreases with years in New Zealand (Daldy et al. 2013).

We report in this paper two types of regression analyses. In the first we investigate how migrants arrive with limited local social capital but gradually build the bonding, bridging, and linking capital shown in Fig. 1. We show that accumulation rates vary by social capital type, migrant characteristics (compared to native-born), and socio-economic conditions, which fluctuate over time, leading to varied survey responses. The second issue we investigate with regression analysis is whether the ethnic makeup of neighborhoods and cities influences migrant bonding, bridging, or linking. Bonding prevails in areas with clusters of culturally similar people, while bridging is more likely where few share migrants' backgrounds. We also show that the latter is likely to yield employment benefits. We find that linking is associated with ethnic fractionalization, but in a varied way, while polarization is associated with lower social cohesion and less civic engagement.

The paper is structured as follows. Section 2 outlines the methodology used in our regression analyses, focusing on both personal and spatial determinants of migrant social capital. Section 3 introduces the data, primarily drawn from the New Zealand General Social Survey (NZGSS) and the Adult Literacy and Life Skills (ALL) Survey, and presents descriptive statistics comparing recent migrants, long-term migrants, and the native born. Section 4 reports regression of measures of social capital on characteristics of the native born and migrants, including duration of residence of the latter. Section 5 examines how different social activities relate to bridging, bonding, and linking, and explores how these vary with spatial settlement patterns. Section 6 models the relationship between regional ethnic diversity and individual-level social capital. The final section summarizes the findings and outlines directions for future research.

2 Methodology

A migrant's accumulation of social capital over time can be analyzed analogously to how earnings convergence has been studied between migrants and the native born. This approach, first introduced by Chiswick (1978) using U.S. data, models outcomes as a function of years since migration (YSM). In our context, the outcome of interest—social capital of individual i (denoted as K_i^S) is expressed as a function of years lived in the destination country, (YSM_i). When comparing social capital between groups, YSM_i is only defined for those born abroad. This is accounted for in regression analysis by interacting YSM_i with a dummy variable FB_i that is one when individual i is born abroad and zero otherwise.

Much of the variation in social capital can be attributed to variation in observable characteristics. Variables such as gender, education, and ethnicity are particularly relevant, as they also shape socio-economic status (Lin 2000). In this study, ethnicity is defined by country of birth for migrants and by self-identified ethnicity for the native born. Ethnicity is represented using dummy variables ETH_i^p , which are equal to one when individual i belong to ethnic group p ($p = 1, 2, \dots, P$) and zero otherwise. The first F of these ethnic groups represent foreign birthplaces and, hence, $\sum_{p=1}^F ETH_i^p = FB_i$. A total of Q other characteristics of individuals that are likely to be associated with an individual's social capital can be assembled in a vector ($X_i = (X_i^1, X_i^2, \dots, X_i^Q)$).

Given data on individuals at time t , this framework leads to the following regression equation to identify the determinants of the social capital of migrants and the native born:

$$K_{it}^S = \beta_0 + \beta_1(YSM_{it} \times FB_i) + \sum_{p=1}^P \beta_{p+1} ETH_{it}^p + \sum_{q=1}^Q \beta_{q+P+1} X_{it}^q + \varepsilon_{it} \quad (1)$$

in which ε_{it} represents the regression error term. Heterogeneity can be investigated by testing whether specific coefficients that are defined for both the native-born and migrants differ between these two groups. Our expectation is that social capital of migrants increases with years in the destination country. This would imply that the estimate of β_1 is greater than zero. However, the possibility that re-migration may be affected by social capital (endogeneity) or the presence of heterogeneity in mobility (selection effects) can impact on the estimate. We return to this matter when we introduce the data.

When data on years since migration are only available in intervals, such as 0–4 years, 5–9 years, etc. coefficients can be estimated for each interval. This has the added advantage that nonlinearity in the relationship between YSM_{it} and K_{it}^S can be detected. Also note that the migrant identifier FB_i , which signals a foreign birthplace, is time invariant. In summary, we report coefficient estimates of regressions of the following form:

$$K_{it}^S = \beta_0 + \sum_{y=1}^Y \beta_y (YSM_{it}^y \times FB_i) + \sum_{p=1}^P \beta_{p+y} ETH_{it}^p + \sum_{q=1}^Q \beta_{q+Y+P} X_{it}^q + \varepsilon_{it} \quad (2)$$

in which YSM_{it}^y refers to a dummy variable for the y th time interval.

As noted in Sect. 1, physical proximity continues to shape social relationships. Accordingly, the type and extent of social capital migrants invest in is influenced by the geographic distribution of their co-ethnic group. This distribution can be quantified using measures of spatial clustering across regions and local sorting (or segregation). While the literature offers many such measures (Nijkamp and Poot 2015), we focus here on the most widely used.

Keeping notation to a minimum, we denote N_{pra} to represent the population of group p (with $p=1, 2, \dots, F$ referring again to foreign birthplaces, and $p=F+1, F+2, \dots, P$ to the native born ethnic groups) in region r (with $r=1, 2, \dots, R$) and local area unit a (with $a=1, 2, \dots, A$). Summing populations over indices is denoted by *. Hence N_{p**} refers to the national population of ethnic group p , N_{*r*} refers to the total population of region r , N_{*ra} to the total population of local area a within region r , and N_{***} refers to the total population nationally. The relative spatial concentration of migrant group p in region r , i.e., the spatial clustering of migrants across the nation, can then be measured by a location quotient:

$$LQ_{pr} = \left(\frac{N_{pr*}}{N_{*r*}} / \frac{N_{p**}}{N_{***}} \right) \quad (3)$$

When the proportion of migrants from a particular birthplace group in a particular region is exactly equal to national proportion of migrants from that group in NZ, the corresponding LQ_{pr} for that region will equal 1. When the proportion in the region is greater than the national proportion, $LQ_{pr} > 1$, and if there are less than the “expected” number of migrants from that group within the region, given the region’s share of the national population, $LQ_{pr} < 1$. The higher the value of LQ_{pr} , the greater the clustering of migrants in that region compared to other regions.

To measure the sorting, or segregation, of migrants of a particular group within a region, we use the conventional segregation index (SI) introduced by Duncan and Duncan (1955). In the present context, SI_{pr} is given by

$$SI_{pr} = 0.5 \sum_a \left| \frac{N_{pra}}{N_{pr*}} - \frac{(N_{*ra} - N_{pra})}{(N_{*r*} - N_{pr*})} \right| \quad (4)$$

which examines how clustered migrants from ethnic group p are across area units a within a region r . This index has a simple interpretation, namely the fraction of migrants of group p that would have to move from their current residential location to make the spatial distribution of group p across the area units of region r the same as the distribution of the total population of region r across its area units. When $SI_{pr} = 0$, the migrants of group p are distributed across the region’s area units proportionally to the total population of the area units. The larger the value of SI_{pr} , the

greater the segregation of group p in the region. When $SI_{pr} = 1$, the migrants of group p are residing only in area units in which there are no other ethnic groups.

Neither of the two measures of the spatial distribution of migrants of a particular origin informs on the diversity they experience locally. This local diversity may have an impact on their relationship building, given that many relationships are formed in close physical proximity, as we noted above. We therefore also consider several popular measures of diversity (Nijkamp and Poot 2015). The first of these is FI_{ra} , the fractionalization index of area unit a of region r :

$$FI_{ra} = 1 - \sum_{p=1}^P \left(\frac{N_{pra}}{N_{*ra}} \right)^2 \quad (5)$$

This diversity index has been extensively applied internationally and in New Zealand as well (Maré and Poot 2023) and has a very simple interpretation. It measures the probability that two randomly selected individuals in area unit a of region r belong to different groups. FI_{ra} varies between a minimum of 0 (when there is only one ethnic/birthplace group present) and a maximum of $1 - \frac{1}{P}$ (when all groups have equal shares of the population).

It has been generally acknowledged in the literature that the fractionalization index tends to be strongly correlated with the share of the foreign born in areas in which the foreign born are jointly a minority of the population or, in other words, in which the share of the native born is greater than one half (Ozgen et al. 2012). This is clearly a very common situation. To differentiate between the cases in which the minority of foreign born either consist of only one group or, alternatively, consist of many groups, we calculate an index of fractionalization of migrants, FM_{ra} (recall that there are F of these groups among the P ethnic groups):

$$FM_{ra} = 1 - \sum_{p=1}^F \left(\frac{N_{pra}}{\sum_{j=1}^F N_{jra}} \right)^2 \quad (6)$$

Hence researchers sometimes replace FI_{ra} in regressions with two variables, the share of foreign born in the population, SF_{ra} ,

$$SF_{ra} = \frac{\sum_{j=1}^F N_{jra}}{N_{*ra}} \quad (7)$$

and the index of fractionalization of the foreign born as defined by Eq. (6). This is useful because FM_{ra} and SF_{ra} convey different information about the ethnic diversity of the population.

The final diversity index that we consider is the polarization index, PI_{ra} :

$$PI_{ra} = \sum_{p=1}^P \left(\frac{N_{pra}}{N_{*ra}} \right)^2 \left(1 - \frac{N_{pra}}{N_{*ra}} \right) \quad (8)$$

Like FI_{ra} , this index has a minimum of 0 when there is only one ethnic/birthplace group present but takes the value $\frac{1}{p} - \frac{1}{p^2}$ when all groups represent equal shares of the population. Hence, with many small groups, PI_{ra} approaches zero. The index reaches a maximum of 0.25 when there are only two groups that each represent half the population, which explains why it is called a polarization index. Because the spatial clustering measures (LQ_{pr} , SI_{pr}) are the same for all persons of group p in region r , and the diversity measures (FM_{ra} , SF_{ra} , PI_{ra}) are the same for all persons in region r and area unit a , corresponding clustering of the errors ε_{it} in Eqs. (1) and (2) must be assumed in regressions that include these variables.

The methodology, and the extant literature, provides the basis for the selection of variables and the specification of the regressions. To investigate robustness of the results, measures of social capital and regression specifications have been, where possible, replicated across data sets.

3 Data and descriptives

The primary source of information on self-reported social relationships is the New Zealand General Social Survey (NZGSS), conducted biennially by Stats NZ since 2008. NZGSS collects nationally representative data on wellbeing, social connections, and living conditions. Topics include income, housing, health, trust, and safety, with an emphasis on life satisfaction. NZGSS is broadly comparable to the General Social Survey in the United States and in Canada, but places stronger emphasis on wellbeing.

Table 1 combines descriptive statistics from the 2016–17, 2018–19, and 2021 NZGSS waves to highlight key differences in social capital between migrants and the New Zealand (NZ) born, as well as recent trends.²

Migrants represent a growing share of the NZ population. The proportion of NZ-born residents has declined from 69.6% in 2016–17 to 68.1% in 2021. The share of recent migrants (those residing in New Zealand for less than five years) rose from 5.2% in 2016–17 to 6.3% in 2018–19 but fell to 4.1% in 2021 due to COVID-19-related border closures.

Patterns of perceived safety are striking. Recent migrants consistently feel safer than long-term migrants, who in turn feel safer than the NZ born. This applies to both walking alone after dark and using the internet for online transactions. These patterns likely reflect migrants' comparisons with safety conditions in their countries of origin. In 2021, 71.7% of recent migrants reported feeling safe walking alone after dark, compared to 57.1% of the NZ born.

Discrimination is reported more often among migrants than the native-born. In 2021, 22.5% of recent migrants and 21.1% of long-term migrants reported experiencing discrimination. Notably, discrimination increased among the New Zealand-born and long-term migrants between 2016–17 and 2021, but not among recent migrants.

² The 2020 survey was delayed to 2021 due to Covid 19. The 2023 NZGSS was not yet accessible at the time of writing of this paper.

Table 1 Recent trends in selected indicators of social capital in Aotearoa New Zealand: migrants and New Zealand born

Measure	Migrant status April 2016 - April 2017		Migrant status April 2018 - March 2019		Migrant status April 2021 - August 2021	
	Born in NZ Long-term migrant	Recent migrant ⁽¹⁾	Born in NZ Long-term migrant	Recent migrant ⁽¹⁾	Born in NZ Long-term migrant	Recent migrant ⁽¹⁾
Population distribution	69.6	5.2	68.7	6.3	68.1	4.1
Safety and discrimination						
Feeling of safety when walking alone in the neighbourhood after dark ⁽²⁾						
Very safe/safe	58.2	72.4	60.2	76.8	57.1	71.7
Feeling of safety when using the internet for online transactions ⁽²⁾						
Very safe/safe	71.7	88.7	70.8	81.2	68.2	74.1
Experience of discrimination in last 12 months						
Experienced discrimination	16.6	25.8	16.5	21.2	20.8	22.5
Social contact and loneliness						
Contact with family and friends ⁽³⁾						
Had face-to-face contact with family at least once a week	68.4	36.7	64.3	38.1	67.3	46.5
Had non-face-to-face contact with family at least once a week	81.1	87.9	79.8	86.6	82.0	89.1
Had face-to-face contact with friends at least once a week	76.5	75.0	74.0	75.3	69.7	64.0
Had non-face-to-face contact with friends at least once a week	81.2	85.7	78.5	83.0	79.0	78.8
Felt lonely in last four weeks						
Some, most, or all of the time	16.0	30.7	15.6	28.0	17.5	27.1
Generalised trust ⁽⁴⁾						
Trust held for people in New Zealand						
7 to 10	64.6	81.1	62.1	82.7	60.1	77.2

Table 1 (continued)

Measure	Migrant status April 2016 - April 2017		Migrant status April 2018 - March 2019		Migrant status April 2021 - August 2021	
	Born in NZ Long-term migrant	Recent migrant ⁽¹⁾	Born in NZ Long-term migrant	Recent migrant ⁽¹⁾	Born in NZ Long-term migrant	Recent migrant ⁽¹⁾
Culture and identity						
Acceptance of diversity						
Feeling about a new neighbour who was a different ethnicity to you						
Very comfortable/comfortable	88.0	88.8	88.4	88.4	90.5	84.9
Ability to express identity						
Very easy/easy	89.4	73.9	87.4	67.7	83.2	62.1

Source: Stats New Zealand, General Social Surveys, 2016, 2018 and 2021. The sample size is approximately 12,000 individuals in each survey

¹Recent migrant refers to people who arrived in New Zealand in the last five years

²Percentage excludes responses of 'not applicable'

³Contact in the last four weeks with family/friends living in another household

⁴Based on a scale where 0 is not trusted at all and 10 is trusted completely

Non-face-to-face contact with family and friends, likely through social media, email, or phone, exceeds face-to-face contact across all groups and survey years. Migrants, particularly recent arrivals, report less face-to-face contact with family than the NZ born, largely due to geographic separation. In 2016–17, 36.7% of recent migrants had weekly face-to-face contact with family; by 2021, this rose to 46.5%, possibly reflecting increased use of video calling platforms such as WhatsApp. For long-term migrants, this figure declined from 60.4% in 2016–17 to 54.4% in 2021. This pattern suggests that migrants initially have limited local networks, but these expand over time, leading to greater in-person interactions, but more so with family than with friends. Family reunification likely contributes to this shift.

Feelings of loneliness are more common among migrants than the NZ born but decline with time spent in the country. Among recent migrants, 30.7% reported feeling lonely in 2016–17, dropping to 27.1% in 2021. This downward trend reflects growing integration and will be further supported by the regression results that follow.

In contrast to patterns of discrimination and loneliness, migrants report higher levels of trust than the NZ born. Trust in others is particularly strong among recent migrants: in 2018–19, 82.7% reported high trust (a rating of 7–10 on a 0–10 scale), compared with 62.1% of the NZ-born population. Acceptance of ethnic diversity is also high and consistent across groups. In 2016–17, 88% of NZ-born respondents said they felt comfortable or very comfortable with a new neighbor of a different ethnicity, increasing to 90.5% in 2021.

However, migrants, especially recent ones, report lower ability to express their identity than the NZ-born. In 2016–17, 89.4% of NZ-born individuals found it easy or very easy to express their identity, compared to 73.9% of recent migrants. This gap narrows with time spent in the country, though the ability to express identity has declined across all groups between 2016–17 and 2021.

Of course, these descriptive patterns from Table 1 may not hold once other variables are controlled for. The next section reports multivariate regression analyses. To assess robustness across data sources, we supplement the NZGSS with the ALL from 2006–07. For comparability, we match ALL with the 2008 NZGSS wave. While these datasets are older, ALL includes unique items on social activities relevant to bonding, bridging, and linking. We find that results from ALL are broadly consistent with the NZGSS findings and those from more recent data sources.

ALL collected data from a representative sample of 7,131 individuals aged 16–65, of whom 25% were foreign born.³ It includes geographic identifiers, allowing analysis of how spatial clustering of migrant populations affects social capital. In contrast, the 2008 NZGSS Confidentialized Unit Record File (CURF) lacks detailed geographic data and cannot be used to assess spatial clustering. The NZGSS 2008 sample comprises 8,721 individuals aged 15 and over, with 23% born overseas (Crothers 2023; Stats NZ 2010).

To ensure comparability, both datasets were restricted to respondents aged 20–65. In both surveys, more than half of participants were female (ALL: 57%; NZGSS:

³ Sampling weights were applied when calculating means, but not in the multivariate regression analysis (see Winship and Radbill 1994).

54%), and about 40% had dependent children at home. Average years of schooling were slightly higher in the ALL (13.5 years) than in the NZGSS (12.7 years), as was the employment rate (ALL: 87%; NZGSS: 80%).

In both datasets, 41% of the foreign-born population had resided in New Zealand for less than 10 years. Birthplaces of migrants were grouped into four regions: Western (ALL: 13%; NZGSS: 11%), Asia (ALL: 7%; NZGSS: 6%), Pacific (ALL: 5%; NZGSS: 3%), and Middle Eastern, Latin American, and African (MELAA) (ALL: 1%; NZGSS: 3%). Among the New Zealand-born, ethnic identity was grouped into four categories: European (ALL: 61%; NZGSS: 68%), Māori (ALL: 16%; NZGSS: 12%), Pacific (ALL: 5%; NZGSS: 2%), and Other (ALL: 2%; NZGSS: 1%).⁴

Seventy% of ALL respondents reported participating in at least one community activity, and 57% engaged in some form of volunteering in the previous 12 months. In contrast, NZGSS 2008 recorded lower rates—40% for participation and 32% for volunteering, but measured activity over the past three months, not 12. Comparing migrant and non-migrant groups, community participation was slightly higher among the foreign born in both surveys (ALL: 72% vs. 70%; NZGSS: 41% vs. 40%), while volunteering was less common (ALL: 52% vs. 59%; NZGSS: 31% vs. 32%).

NZGSS 2008 includes three social interaction indicators not available in ALL. Among the NZ born in NZGSS 2008, 94% felt they had sufficient interpersonal contact, compared to 93% of the foreign born. 82% of NZ-born respondents felt they were not isolated from others, compared to 77% of migrants. Interestingly, migrants reported feeling safer: 70% felt safe in their neighborhood after dark, compared to 66% of the NZ born.

These descriptive findings align with the more recent NZGSS results presented in Table 1.

4 Determinants of social capital in Aotearoa New Zealand: migrants and native born

Table 2 presents regression results based on Eq. (2) from Sect. 2, using both ALL and NZGSS data. Combining these datasets allows for robust findings and multiple perspectives on social capital formation. Both surveys include information on participation and volunteering, activities that may reflect bonding, bridging, or linking social capital. Data on interpersonal contact, perceived safety, and inclusion are available only from NZGSS. As the dependent variables are binary (e.g., participation or not), coefficients are estimated using logit regression models.

Table 2 presents regression results identifying the partial correlates of social capital across various dimensions. Regarding gender, no difference is observed in participation in community activities. However, males are less likely to volunteer than females, although this effect is statistically significant only in the ALL sample. Men are also more likely to feel safe in their neighborhood after dark. Having dependent children shows no significant effect on participation in the ALL sample but has

⁴ Survey respondents could identify with multiple ethnicities. Hence the sum of the percentages exceeds the share of the New Zealand born in the population.

Table 2 Determinants of social capital in Aotearoa New Zealand: migrants and New Zealand born

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Participation (ALL)	Participation (GSS)	Volunteering (ALL)	Volunteering (GSS)	Contact (GSS)	Safe (GSS)	Inclusion (GSS)
Male	-0.030 (0.056)	-0.062 (0.054)	-0.306*** (0.052)	0.047 (0.057)	-0.032 (0.110)	1.615*** (0.065)	0.097 (0.067)
Dependent children	0.081 (0.058)	0.109* (0.057)	0.459*** (0.054)	0.471*** (0.061)	0.228** (0.113)	-0.002 (0.064)	0.028 (0.069)
Age	0.019*** (0.002)	0.010*** (0.002)	0.017*** (0.002)	0.026*** (0.003)	-0.003 (0.004)	0.000 (0.003)	0.013*** (0.003)
Years of schooling	0.152*** (0.011)	0.166*** (0.012)	0.133*** (0.010)	0.153*** (0.012)	0.137*** (0.029)	0.071*** (0.014)	0.037** (0.015)
Employed	0.164** (0.083)	0.142** (0.068)	0.152* (0.078)	0.035 (0.073)	0.669*** (0.118)	0.302*** (0.077)	0.576*** (0.077)
Region of birth: western	-0.196* (0.109)	-0.017 (0.104)	-0.159 (0.100)	-0.154 (0.110)	-0.192 (0.212)	0.336*** (0.124)	-0.154 (0.131)
Region of birth: asia	-0.282* (0.162)	-0.336** (0.151)	-0.608*** (0.152)	-0.214 (0.164)	-0.697*** (0.265)	-0.573*** (0.181)	-0.367** (0.177)
Region of birth: pacific	0.785*** (0.158)	0.259 (0.158)	-0.052 (0.133)	0.320* (0.165)	-0.438 (0.269)	-0.042 (0.201)	-0.144 (0.192)
Region of birth: melaa	-0.039 (0.417)	-0.081 (0.182)	-0.519 (0.363)	-0.183 (0.199)	-0.275 (0.366)	0.008 (0.229)	-0.433** (0.208)
nz born—other ethnicity	0.535** (0.216)	-0.226 (0.465)	0.427** (0.187)	-0.053 (0.499)	-2.016*** (0.521)	0.685 (0.761)	-0.539 (0.521)
nz born—pacific ethnicity	0.695*** (0.145)	0.413** (0.177)	0.408*** (0.127)	0.476*** (0.184)	-0.686** (0.291)	0.228 (0.204)	-0.075 (0.211)
nz born—maori ethnicity	0.192** (0.078)	0.053 (0.084)	0.326*** (0.074)	0.194** (0.088)	-0.254 (0.158)	0.215** (0.097)	-0.220** (0.099)

Table 2 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Participation (ALL)	Participation (GSS)	Volunteering (ALL)	Volunteering (GSS)	Contact (GSS)	Safe (GSS)	Inclusion (GSS)
0–4 years since migration	-0.011 (0.177)	-0.175 (0.161)	-0.368** (0.165)	-0.299* (0.177)	-0.728*** (0.269)	0.353* (0.205)	-0.407** (0.181)
5–9 years since migration	0.062 (0.162)	-0.083 (0.154)	-0.129 (0.151)	-0.247 (0.171)	0.199 (0.310)	0.235 (0.186)	0.035 (0.184)
10–14 years since migration	0.154 (0.202)	-0.118 (0.189)	0.312* (0.182)	-0.038 (0.198)	0.129 (0.358)	0.157 (0.228)	-0.226 (0.210)
15–19 years since migration	0.465** (0.224)	0.076 (0.220)	0.335* (0.192)	0.237 (0.233)	0.531 (0.484)	0.438 (0.278)	0.116 (0.278)
Constant	-2.110***	-3.062***	-2.022***	-4.098***	0.738*	-1.150***	0.016
Observations	6605	6257	6605	6254	6257	5844	6250
R_p^2	0.04	0.029	0.048	0.037	0.038	0.112	0.023

Logit regressions. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

New Zealand born of European ethnicity is the omitted category of the birthplace/ethnicity classification

20 or more years since migration is the omitted category of the years since migration classification (only defined for foreign born)

Source: Roskrue (2013), merger of Table 5–4 and Table 5–5

a marginally positive effect in NZGSS. In both surveys, those with children report greater interpersonal contact. Volunteering is significantly (1% level) more likely among parents in both datasets.

Findings on age and education are consistent across datasets and align with prior research (Glaeser et al. 2002; McDonald and Mair 2010; Huang et al. 2009). Among working-age adults (20–65), older individuals participate and volunteer more, and report stronger feelings of inclusion. Higher educational attainment is associated with increased participation, volunteering, and stronger perceptions of interpersonal contact, safety, and inclusion. Roy et al. (2022) find that trust, political engagement, and commitment to family protect against loneliness.

Employment is positively associated with all forms of social capital, except for volunteering in the NZGSS data. The direction of influence may run both ways. Gërzhani and Kosyakova (2022) find little direct causal impact of migrant social networks on employment in a natural experiment in Germany. Franzen and Hangartner (2006) and Park et al. (2022) suggest that social capital may reduce search costs, or improve job matching, rather than directly affect wages.

Turning to ethnicity and region of birth, migrants from Western countries and Māori report feeling safer than NZ-born Europeans. Māori also show higher levels of participation and volunteering, except for reported participation in NZGSS. However, Māori report feeling less socially included. NZ-born Pacific Island respondents similarly show high participation and volunteering but lower perceived interpersonal contact.

Migrants from Asian countries report lower levels of safety, participation, and inclusion, with consistently lower social capital across both tangible and intangible measures. MELAA migrants also feel less socially included. Among all groups, only Asian-born migrants show significantly lower social capital outcomes across all dimensions compared to NZ-born Europeans, suggesting greater barriers to social capital formation. These may stem from experiences of discrimination, linguistic or cultural distance, or visible minority status.

The regressions show that social capital generally increases with years spent in New Zealand, consistent with theory and the descriptive findings in Table 1. However, the increase is not uniformly statistically significant, suggesting considerable heterogeneity in migrant integration trajectories. There may be heterogeneity in the sense that those who are less inclined to form social networks may be geographically more mobile, creating a selection effect. In addition, years since migration may be endogenous given that those who are not successful in establishing local networks may have a greater probability of re-migration than those who are. These effects would generate an upward bias in the estimates of the causal effect of duration of residence on social capital. However, we expect this bias to be small. MBIE (2018) concludes that “Most migrants granted residence stay on in New Zealand on a long-term basis, and this ‘retention rate’ has been slowly increasing. Of those people granted residence in 2001/02, 79.6% were still in New Zealand after five years compared with 89.1% of those granted residence in 2011/12.”⁵ Interestingly,

⁵ In addition, at the local level, our own estimates from 2023 census data show that 82.7% of the residents of any city in New Zealand were still residing in the same city five years later.

migrants initially report feeling safer than in later years, a likely effect of comparing New Zealand to their country of origin, with perceptions adjusting over time.

These findings do suggest that time since migration may be a less reliable predictor of social outcomes than of economic ones (see Duleep 2015). Zhang et al. (2023) argue that community participation does not automatically equate to integration, the *type* of participation (bridging, bonding, or linking) is likely crucial. This is explored further in the next section.

5 Bridging, bonding, and linking

ALL includes information on the types of social activities migrants participate in and/or volunteer for, allowing us to infer the potential for forming different types of social capital, bridging, bonding, or linking, as summarized in Fig. 1. The type of capital generated likely depends on the nature of interaction (e.g., face-to-face or online) and the social context. A recent systematic review by Ahmad et al. (2023) found that social media use has a statistically significant positive effect on bridging social capital, particularly in Western countries. Their findings support Granovetter's (1973) early argument that weak ties can play a critical role in expanding social networks.

In the absence of direct network data (e.g., from social media) that would allow us to clearly distinguish between bonding (among similar individuals) and bridging (among dissimilar individuals)—as done in studies by Chetty (2022a; b), we classify social activities by their potential to foster each form of social capital. This potential is assumed to relate to the spatial distribution of migrants across and within regions: bonding is more likely where migrants are highly clustered, while bridging is more likely when migrants are a small minority. Linking, in contrast, depends more directly on the nature of the activity.

Table 3 lists ten types of social activities identified from the ALL dataset, based on a sample of 1656 foreign-born adults. One-third or more of the migrants participated in religious activities, fundraising, and organized sports; fewer than 10% engaged in community service or political organizations, consistent with Carey's (2019) finding of lower electoral participation among migrants in New Zealand (pp. 22–23).

We now proceed to consider in which spatial context these activities take place. Figure 2 provides maps of fractionalization (as defined in Sect. 2) of NZ Territorial Authorities (TAs) in terms of birthplace (Fig. 2a) and ethnicity (Fig. 2b). The maps are quite different because the concentration of migrants in the metropolitan areas Auckland, Wellington and Christchurch, and in Queenstown (a major tourist destination), leads to high birthplace fractionalization in those TAs, whereas the relative concentration of Māori in Northland, Auckland, plus the central area and east coast of the North Island, contributes to high ethnic fractionalization in those TAs.

The TA of residence is known for each person in the ALL data. Using data on the spatial distribution of migrants and the corresponding distribution of the native born, we calculated the correlation of migrant social activities with the Location

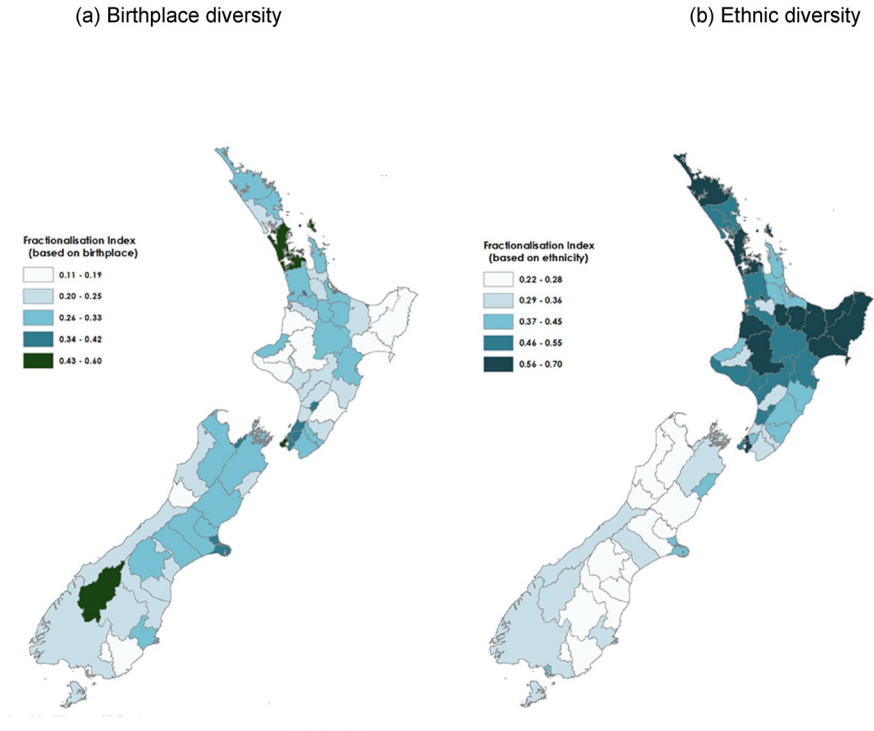
Table 3 Migrant social capital by type of social activity.

Type of social activity	Fraction participating	Correlation with LQ	Correlation with SI	Bonding	Bridging	Linking	Employment rate of those participating in this activity	Employment rate of those not participating in this activity	Difference
Participating in religious activities	0.378	0.253	0.312	+++	+	++	0.829	0.859	-0.030*
Volunteering for a charity	0.175	0.038	0.083	+++	+	+++	0.810	0.856	-0.046**
Participating in political organisations	0.055	0.005	0.014	+++	+	+++	0.824	0.849	-0.025
Volunteering to fundraise for an organisation	0.339	-0.023	-0.006	++	++	++	0.851	0.846	0.005
Participating in hobby clubs	0.296	-0.025	0.013	++	++	+	0.845	0.849	-0.004
Participating in school activities	0.237	-0.026	0.038	++	++	++	0.839	0.850	-0.011
Participating in community services	0.066	-0.044	-0.034	+	+++	++	0.873	0.846	0.027
Volunteering to be a member of a committee or board	0.199	-0.087	-0.074	+	+++	+++	0.836	0.851	-0.015
Volunteering as a sports coach	0.221	-0.109	-0.074	+	+++	++	0.852	0.847	0.005
Participating in organised sports	0.330	-0.119	-0.117	+	+++	+	0.894	0.825	0.069***

$n = 1656$ foreign born adults; + refers to low likelihood; ++ refers to medium likelihood; +++ refers to high likelihood;

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; LQ location quotient (see Eq. (3)); SI segregation index (see Eq. (4))

Source: calculated by the authors by means of the Adult Literacy and Life Skills Survey 2006



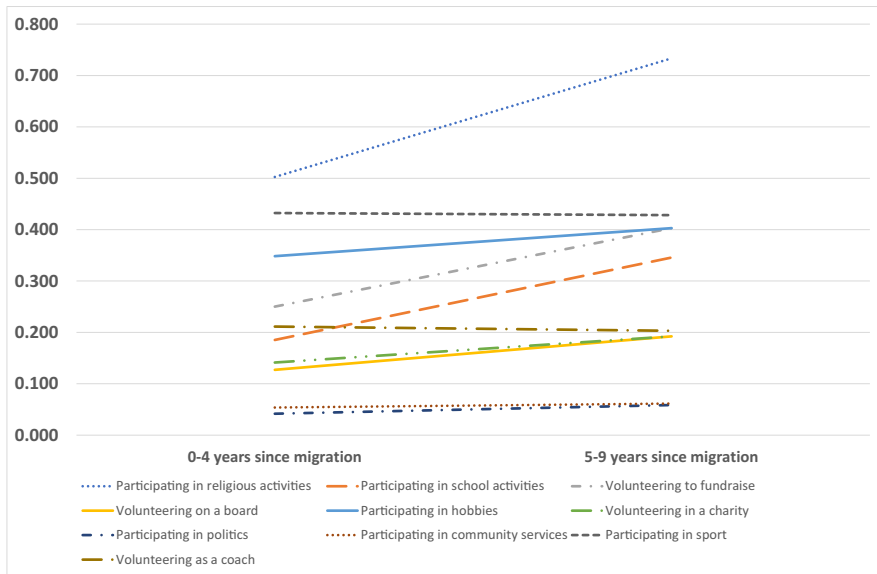
Source: Poot (2016).

Fig. 2 Birthplace and ethnic diversity of New Zealand Territorial Authorities

Quotient LQ_{pr} and the Segregation Index SI_{pr} , using Eq. (3) and Eq. (4) respectively. Both indices were created using the 2006 census administered by Stats NZ with population data coded to the TA and area unit level for each of the four overseas birth regions (listed in Table 2). At the time these data were collected, there were 74 TAs within NZ, representing administrative boundaries which are broadly like counties in the U.S. and U.K. geographic hierarchies. Each TA is comprised of area units, which represent between 3000 and 5000 individuals.⁶

The results are shown in the second and third columns of Table 3. The ten social activities are ranked in descending order by the values of their correlations with LQ_{pr} . The correlations with SI_{pr} are very similar. If migrants are demographically overrepresented in a TA, they also tend to be spatially clustered within it. These correlations, combined with knowledge of the nature of various activities, inform our subjective classification of each activity's potential to generate bonding, bridging, or linking social capital.

⁶ The geographic hierarchy in official statistics has been subsequently changed. See <https://www.stats.govt.nz/methods/geographic-hierarchy/>. There were about 1900 defined area units in 2006 census data.



Note: Based on coefficients of logit regressions with ALL data.

Source: the authors.

Fig. 3 Change in migrant social activities with increasing years of residence

For instance, religious participation is likely to generate bonding capital due to homophily and ethnic sorting across religious denominations (Emerson et al. 2015). However, religious involvement may also foster a sense of civic responsibility, trust, and safety within church communities, elements of linking capital. In contrast, organized sports are more likely to generate bridging capital, as sports clubs are typically run by the host population rather than migrant groups. Linking capital is strongest in explicitly civic activities, such as volunteering for a charity, participating in political organizations, or serving on community boards.

Importantly, bonding and bridging are not necessarily inversely related. As Tuominen et al. (2023) show using Finnish data, individuals with higher education levels often exhibit strong bonding and bridging social capital. Income also plays a role. In Table 5, we present similar evidence, along with a positive association between age and both bonding and bridging capital.

While our primary focus is on the determinants of social capital, Table 3 offers preliminary insight into its association with employment. Following Lancee's (2010) hypothesis, subsequently confirmed in other contexts, that bridging social capital better supports migrant employment outcomes than bonding capital, we compare employment rates for participants and non-participants across ten social activities. We find that migrants who engaged in bonding-oriented activities (e.g., religious groups, charity volunteering) tend to have lower employment rates, whereas those involved in bridging activities (e.g., organized sports) show higher

rates. However, caution is needed when interpreting these correlations causally (Gërzhani and Kosyakova 2022).

Roskruge et al. (2016) found that higher levels of linking capital, measured by participation in civic and political organizations or on committees, are associated with greater entrepreneurial activity (self-employment). Again, this may reflect underlying personality traits rather than a causal link. Their findings also show variation by migrant origin: individuals from MELAA, Asian, and Pacific backgrounds had worse outcomes in both entrepreneurship and living standards, suggesting possible discrimination. However, for all migrant groups, both self-employment and living standards improve with longer residence in New Zealand.

As done previously in Tables 1 and 2, we again check whether migrant social capital increases with duration of residence. We do this formally using logit regressions for each of the ten activities in Table 3. Figure 3 shows predicted changes in participation rates between migrants who have lived in New Zealand for 0–4 years and those resident for 5–9 years. The results suggest growing engagement in religious activities, fundraising, and school involvement over time, while participation in sports, coaching, and civic activities remains largely unchanged.

Table 4 reports the coefficients of the demographic variables in the logit regressions for each of the ten types of activities listed in Table 3. Note that these regressions were estimated with the ALL sample of 1656 foreign born only. Table 4 shows that there are clear gender effects: male migrants are less likely to participate in most of the ten social activities than female migrants, except that males are more likely to volunteer as a sports coach (and participate in political organizations, but this is only statistically significant at the 10-% level). The coefficients of having dependent children are, as expected, mostly positive.

With respect to human capital, the effects of age and years of schooling align with theoretical expectations and prior findings: more human capital is associated with greater social capital. In the regressions, both variables are generally statistically significant, and their coefficients are consistent with those reported in Table 2 using ALL data.

Region of birth remains a key source of variation. The highest participation levels—indicated by the least negative intercepts—are found among migrants born in the Pacific Islands across nine of the ten social activities. The sole exception is volunteering as a sports coach, where migrants from Western countries show the highest participation. Conversely, migrants from MELAA countries report the lowest participation rates in most activities, with exceptions for religious participation, charity volunteering, and hobby club involvement (where Western-born migrants have the lowest participation). The lowest sports coaching rates are observed among Asian-born migrants.

To examine the effects of spatial clustering on social capital formation, we dichotomize the activities listed in Table 3 into bonding or bridging and run regressions on each. Given the subjective nature of this classification, we conduct robustness checks by reassigning activities one at a time from bonding to bridging (and vice versa). The results remain robust under this sensitivity analysis (Roskruge 2013).

The dependent variables are integer counts of the number of bridging or bonding activities participated in (ranging from 0 to 5), and we estimate tobit

Table 4 Demographic determinants of migrant social activity: participation and volunteering

	Participating in religious activities	Volunteering for a charity	Participating in political organisations	Volunteering to fundraise for an organisation	Participating in hobby clubs	Participating in school activities	Participating in community services	Volunteering to be a member of a committee or board	Volunteering as a sports coach	Participating in organised sports
Male	-0.282** (0.111)	-0.441*** (0.136)	0.419* (0.218)	-0.400*** (0.108)	-0.352*** (0.112)	-0.286** (0.121)	0.213 (0.201)	-0.106 (0.128)	0.625*** (0.108)	0.126 (0.123)
Dependent children	0.224* (0.115)	0.270* (0.142)	-0.386 (0.222)	0.535*** (0.114)	0.00832 (0.115)	0.596*** (0.130)	-0.111 (0.209)	0.179 (0.135)	-0.0693 (0.111)	0.321** (0.131)
Age	0.0243*** (0.005)	0.0290*** (0.006)	0.0138 (0.009)	0.0105** (0.005)	0.0175*** (0.005)	0.0158*** (0.006)	0.0459*** (0.009)	0.0350*** (0.006)	-0.0078 (0.005)	0.0155*** (0.006)
Years of schooling	0.0524*** (0.016)	0.0342* (0.019)	0.0672** (0.032)	0.0564*** (0.016)	0.111*** (0.017)	0.106*** (0.018)	0.123*** (0.028)	0.110*** (0.019)	0.0525*** (0.016)	0.135*** (0.019)
Region of birth: western	-2.805*** (0.370)	-3.327*** (0.446)	-4.882*** (0.717)	-1.470*** (0.349)	-3.193*** (0.370)	-3.184*** (0.397)	-6.661*** (0.689)	-4.258*** (0.430)	-1.171*** (0.347)	-3.687*** (0.408)
Region of birth: asia	-1.813*** (0.346)	-2.747*** (0.420)	-5.061*** (0.697)	-1.936*** (0.341)	-3.069*** (0.357)	-3.082*** (0.382)	-6.691*** (0.662)	-4.713*** (0.424)	-2.026*** (0.343)	-4.402*** (0.409)
Region of birth: pacific	-0.668** (0.319)	-2.571*** (0.389)	-4.187*** (0.625)	-1.152*** (0.311)	-2.698*** (0.328)	-2.640*** (0.349)	-6.359*** (0.622)	-4.216*** (0.388)	-1.498*** (0.313)	-3.425*** (0.363)
Regional of birth: melai	-2.572*** (0.491)	-3.272*** (0.615)	-5.064*** (0.998)	-2.805*** (0.560)	-2.838*** (0.476)	-3.511*** (0.556)	-7.129*** (0.996)	-5.409*** (0.684)	-1.659*** (0.465)	-4.606*** (0.606)

Logit regressions without a constant term (dummy variables are included for each of the four regions of birth). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: 2006 Adult Literacy and Life Skills Survey, $n = 1656$

models to account for censoring at both bounds. The mean participation level is slightly higher for bonding (1.208) than bridging (1.088). The results are shown in Table 5.

Human capital again matters. Age and education are positively and significantly associated with both bonding and bridging participation. Gender and parental status are not significant predictors of bridging activity, but female migrants and those with dependent children engage in more bonding activities. Rural residency is associated with more bonding activity, echoing Sørensen's (2016) identical finding that bonding capital tends to be higher in rural areas.

Compared to Western-born migrants (the reference group), Pacific-born migrants report the highest investment in both bridging and bonding capital, although the effect for bridging is only significant at the 10% level. These results are consistent with the group intercepts observed in Table 4.

Bridging social capital is lowest among migrants who have been in New Zealand for fewer than five years. While keeping in mind the caveat regarding the interpretation of the coefficients due to potential reverse causation and sample selection, social capital increases significantly with years of residence in both bridging and bonding regressions. Migrants who arrived 15–19 years before the ALL survey show the highest levels of investment, with statistically significant coefficients, confirming that time in the country fosters social integration.

Turning to the effect of spatial clustering of migrants, Table 5 shows that the Location Quotient LQ_{pr} has a negative and statistically significant effect on bridging activities. This suggests that migrants are more likely to invest in bridging social capital when they are underrepresented in a TA. A similar finding was reported by Fajth and Bilgili (2020) using Dutch data. One explanation may lie in labor market dynamics: in areas with fewer co-ethnic peers, migrants cannot rely on ethnic-specific networks for employment support and may instead seek bridging connections to improve labor market outcomes.

In contrast, the Segregation Index, SI_{pr} , which captures the degree of within-region spatial clustering has a positive and statistically significant effect on bonding social capital. Migrants living in more clustered communities appear more likely to form within-group networks, likely due to lower transaction costs and greater opportunities for frequent interaction. There may also be self-selection, with migrants favoring bonding capital choosing to live in proximity. Supporting this, Battisti et al. (2022), using German data, show that migrants in areas with large co-ethnic networks are more likely to be employed shortly after arrival, although this advantage diminishes after four years as investments in broader forms of capital accumulate.

6 Effects of ethnic diversity on linking social capital

Our findings indicate that spatial clustering of migrant groups shapes the nature and extent of their social engagement, influencing residential sorting and potentially causing spillover effects on other groups' clustering. Figure 2 highlights distinct spatial distributions of foreign-born and ethnic groups. This section

Table 5 The effect of migrant clustering between and within regions on migrant bridging and bonding activities

	(1) Bridging	(2) Bonding
Male	0.051 (0.080)	- 0.307*** (0.081)
Dependent children	0.034 (0.102)	0.327*** (0.126)
Age	0.013*** (0.004)	0.025*** (0.003)
Years of schooling	0.114*** (0.017)	0.091*** (0.013)
Employed	0.050 (0.099)	0.028 (0.069)
Region of birth: asia	- 0.182 (0.153)	- 0.040 (0.146)
Region of birth: pacific	0.408* (0.214)	0.888*** (0.188)
Region of birth: melaa	- 0.107 (0.236)	- 0.580 (0.362)
0-4 years since migration	- 0.312** (0.153)	- 0.217** (0.106)
5-9 years since migration	- 0.179 (0.118)	0.247* (0.136)
10-14 years since migration	0.024 (0.148)	0.383** (0.157)
15-19 years since migration	0.219* (0.131)	0.566*** (0.145)
Rural	0.109 (0.204)	0.400** (0.165)
LQ	- 2.385*** (0.480)	- 0.788 (0.544)
SI	0.266 (0.777)	1.182** (0.571)
Sigma	1.737*** (0.051)	1.674*** (0.036)
Constant	- 1.530*** (0.406)	- 1.855*** (0.321)
Observations	1656	1656
R_p^2	0.022	0.036

Tobit regressions. Robust standard errors, clustered by area, in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

LQ: Location Quotient (see Eq. (3)); SI: Segregation Index (see Eq. (4)). Region of birth: Europe is the omitted category of the birth-place classification. 20 or more years since migration is the omitted category of the years since migration. Bridging activities in column (1) include: participation in organized sports, volunteering as

Table 5 (continued)

a sports coach, participation in community services, participation in hobby clubs and volunteering for a charity. Bonding activities in column (2) include: participation in religious activities, participation in political organizations, volunteering to fundraise, participation in school activities, volunteering to be a member of committee or board. The results are robust to reassignment of activities along the lines of Table 3, as discussed in the text. Source: Roskrug (2013), Table 5.7

examines how birthplace and ethnic diversity in localities affect social capital formation. We merged NZGSS 2008, 2010, and 2012 data (25,731 observations, about 8500 per survey) in the Stats NZ Datalab, calculating regional diversity indexes (defined in Sect. 2). Table 6 reports prevalence rates for eight linking social capital activities and perceptions (as discussed in Sect. 1).

The eight types of linking social capital are grouped into 3 categories (prevalence rates in the pooled sample in parentheses): networking, including volunteering (31.2%), social activities (40.7%), and unpaid help (63.4%); social cohesion and inclusion, reflected in feeling safe at night (51.2%), feeling included (83.0%), and not experiencing discrimination (89.9%); and civic engagement, measured by voting in general (78.8%) and local elections (63.3%). Compared with the responses in Table 1, Table 6 shows increased discrimination between 2008 and 2021 (from 10 to 20%) but a slight rise in feeling safe at night (from 43% to 60–70%) over a decade of rising immigration.

The regional diversity measures were calculated at the TA level by means of unit record data from the 2006 NZ Census. The mean value of the fractionalization index of ethnicity FI_{ra} (as defined in Eq. (5)) is 0.501. This implies that in a random encounter of two individuals, the likelihood that they belong to two different ethnicities was in 2006 about 50%. As expected, fractionalization by birthplace is much less, given that more than three quarters of the 2006 population was born in New Zealand (compare also Fig. 2a and b). The mean value is 0.255. However, fractionalization among the foreign born (FM_{ra} , defined in Eq. (6)) is much greater, with a mean of 0.726. Finally, ethnic polarization as defined by PI_{ra} (see Eq. (8)) has a mean value in the 2006 census of 0.729.

Table 7 presents logit regression results for the eight linking social capital types from Table 6, using pooled NZGSS 2008–2012 data, enabling broader determinant analysis. The variables that were already discussed in Tables 2, 4, and 5 behave similarly in Table 7.

Greater ethnic diversity, as measured by the fractionalization index FI_{ra} , is associated with less networking social capital: volunteering, participation in social activities, and giving unpaid help. This NZ evidence reconfirms what is concluded in the literature by, among others, Putnam (2007), Gesthuizen et al. (2009), Laurence (2011), and Abascal and Baldassarri (2015). Fractionalization is also negatively associated with feeling safe at night but with fewer perceptions of discrimination. Fractionalization is associated with more civic engagement in terms of voting in general and local elections. In contrast, ethnic polarization PI_{ra} is associated with more discrimination and less voting in general elections. These

Table 6 Prevalence of social activities and perceptions in the General Social Survey, 2008, 2010 and 2012.

Observations	Pooled	GSS 2008	GSS 2010	GSS 2012
	25,731	8721	8550	8460
Type of activity or perception	Social capital group			
Activity: volunteering	31.2%	32.1%	31.6%	29.8%
Activity: participation	40.7%	42.3%	42.5%	37.2%
Activity: has given unpaid help	63.4%	63.5%	64.7%	61.9%
Perception: feel safe at night	51.2%	43.4%	54.9%	55.3%
Perception: feeling included	83.0%	82.2%	83.5%	83.5%
Perception: not experiencing discrimination	89.9%	90.2%	89.6%	89.9%
Activity: voted in general election	78.8%	78.6%	79.3%	78.5%
Activity: voted in local election	63.3%	62.9%	62.6%	64.3%

Source: calculated by the authors

findings are mostly consistent with what Mavridis (2015) concluded with data from Indonesia: greater ethnic diversity leads to lower social capital outcomes, but polarization has an even larger negative effect. In terms of measuring fractionalization, the distinction between the foreign born and the native born appears to matter more than local ethnic diversity among the foreign born. FM_{ra} is statistically insignificant in all regressions.

Males network less, vote less frequently, but feel safer at night. Age has a quadratic effect with a positive trend: older individuals volunteer more, participate in social activities, vote more, and report greater social cohesion and inclusion. Family ties (being partnered, having children, larger households) enhance linking social capital.⁷

Overseas-born individuals show less networking, social cohesion, inclusion, and civic engagement than the NZ-born, except they feel safer at night, as seen in prior regressions. Asian ethnicity correlates with the lowest networking social capital, while Māori and Pacific groups have the highest. Asians (Pacific peoples) are less (more) likely to vote than Europeans. Non-Europeans report higher discrimination than Europeans.

The economic variables also behave as expected. Education increases networking and voting but reduces perceived inclusion and raises reported discrimination, as found in New Zealand previously (Daldy et al. 2013). Lower (upper) income quartiles show less or similar (more or similar) linking social capital than the interquartile range. Residents of prosperous areas (higher Economic Living Standard Index) have more linking capital but provide less unpaid help, likely due to time costs. People who are not working full-time network more than full-time workers. Mortgage-free homeownership or trust-owned homes boost all social capital types (see also Roskrige et al. 2013).

Social capital strongly correlates with physical and mental health and life satisfaction, with bidirectional relationships noted in Fig. 1. This is consistent with European data that show that health boosts social capital engagement, while social capital significantly influences health (Rocco et al. 2014).

7 Final reflections

Using data from the Adult Literacy and Life Skills Survey (ALL) and successive New Zealand General Social Surveys (NZGSS), this paper examined the demographic and socio-economic correlates of migrant social capital in New Zealand, and the role of migration-driven cultural diversity and spatial sorting in shaping social capital formation. The findings are consistent across datasets and time periods.

Social capital was measured through participation and volunteering in community activities, perceptions of safety and inclusion, and voting in elections. We found that migrants arrive with limited local social capital but gradually accumulated bonding, bridging, and linking, social capital. We also found that the spatial distribution of

⁷ The exception is a negative coefficient of “partnered” on “feeling safe at night”. In addition, adults in larger households are less likely to vote in general elections.

Table 7 Determinants of linking social capital

Social capital group	Networking		Social cohesion and inclusion			Civic engagement		
	Volunteering	Participation	Has given unpaid help	Feel safe at night	Included	No discrimination	Voted in General Election	Voted in Local Election
Fractionalisation index	-1.095*** (0.266)	-1.583*** (0.300)	-0.496** (0.216)	-2.709*** (0.405)	0.390 (0.444)	0.883*** (0.291)	2.132*** (0.439)	1.021*** (0.303)
Polarisation index PI	0.004 (0.522)	0.460 (0.522)	0.942* (0.534)	0.279 (0.772)	-0.914 (0.557)	-1.864*** (0.529)	-2.198*** (0.526)	-0.317 (0.678)
Index of fractionalisation among migrants FM	0.155 (0.555)	0.634 (0.477)	-0.265 (0.633)	0.079 (1.219)	0.140 (0.524)	-0.113 (0.514)	0.199 (0.702)	-0.968 (0.630)
Male	-0.050* (0.028)	-0.211*** (0.035)	-0.112*** (0.027)	1.482*** (0.033)	0.045 (0.041)	-0.050 (0.047)	-0.183*** (0.043)	-0.160*** (0.031)
Age	0.053*** (0.005)	-0.009** (0.004)	0.031*** (0.004)	0.061*** (0.005)	0.023*** (0.005)	-0.028*** (0.008)	0.058*** (0.008)	0.059*** (0.007)
Age-squared	-0.000*** (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.000** (0.000)
Partnered	-0.040 (0.041)	-0.025 (0.031)	-0.005 (0.036)	-0.112*** (0.036)	0.166*** (0.039)	0.204*** (0.056)	0.191*** (0.040)	0.217*** (0.042)
Lives with children	0.107** (0.050)	0.025 (0.054)	-0.059 (0.046)	-0.025 (0.043)	-0.120* (0.069)	0.146** (0.072)	0.229*** (0.059)	0.111** (0.056)
Born overseas	-0.071* (0.043)	0.035 (0.035)	-0.197*** (0.038)	0.330*** (0.032)	-0.353*** (0.053)	-0.155* (0.084)	-0.898*** (0.052)	-0.379*** (0.045)
Household size	0.127*** (0.022)	0.059*** (0.017)	-0.014 (0.016)	0.010 (0.015)	0.076*** (0.021)	0.005 (0.027)	-0.056*** (0.021)	-0.025 (0.018)

Table 7 (continued)

Social capital group	Networking		Social cohesion and inclusion				Civic engagement	
	Volunteering	Participation	Has given unpaid help	Feel safe at night	Included	No discrimination	Voted in General Election	Voted in Local Election
Educ.: degree level education or higher	0.690*** (0.035)	0.657*** (0.040)	0.170*** (0.037)	0.276*** (0.063)	-0.194*** (0.059)	-0.455*** (0.064)	0.665*** (0.067)	0.294*** (0.041)
Educ.: vocational or diploma level education	0.357*** (0.029)	0.314*** (0.029)	0.277*** (0.032)	0.102*** (0.032)	-0.074* (0.042)	-0.254*** (0.038)	0.292*** (0.043)	0.132*** (0.032)
Personal income distribution: lower 25%	-0.062 (0.041)	-0.202*** (0.043)	-0.137*** (0.049)	0.113** (0.046)	-0.053 (0.059)	0.083 (0.056)	-0.021 (0.048)	-0.061 (0.047)
Personal income distribution: upper 25%	0.048 (0.044)	0.100** (0.051)	0.047 (0.044)	0.049 (0.037)	-0.004 (0.054)	-0.086 (0.086)	0.170*** (0.062)	-0.014 (0.053)
Household income distribution: lower 25%	0.012 (0.057)	-0.020 (0.039)	-0.054 (0.039)	-0.060 (0.054)	0.079 (0.054)	0.051 (0.075)	-0.048 (0.065)	0.047 (0.051)
Household income distribution: upper 25%	-0.024 (0.032)	-0.014 (0.033)	-0.053 (0.040)	0.236*** (0.050)	0.020 (0.057)	-0.021 (0.061)	0.201*** (0.067)	0.041 (0.051)
Labour force status: employed part-time	0.365*** (0.052)	0.316*** (0.060)	0.326*** (0.048)	-0.117*** (0.045)	0.106 (0.068)	0.002 (0.067)	0.299*** (0.063)	0.086* (0.049)
Labour force status: unemployed	0.482*** (0.069)	0.201** (0.082)	0.164** (0.074)	0.082 (0.099)	-0.024 (0.093)	-0.074 (0.099)	0.005 (0.084)	0.086 (0.085)
Labour force status: not in labour force	0.231*** (0.053)	0.295*** (0.048)	-0.045 (0.040)	-0.061 (0.055)	0.092 (0.067)	0.172*** (0.058)	-0.022 (0.050)	0.050 (0.049)
Tenure: homeowner with mortgage	-0.120*** (0.038)	0.009 (0.043)	-0.033 (0.044)	-0.131*** (0.038)	0.085 (0.056)	0.033 (0.077)	-0.052 (0.080)	-0.162*** (0.054)

Table 7 (continued)

Social capital group Type of activity or perception	Networking		Social cohesion and inclusion			Civic engagement		
	Volunteering	Participation	Has given unpaid help	Feel safe at night	Included	No discrimination	Voted in General Election	Voted in Local Election
Tenure: renter	-0.235*** (0.049)	-0.177*** (0.053)	-0.178*** (0.047)	-0.040 (0.042)	-0.075 (0.061)	-0.071 (0.078)	-0.600*** (0.075)	-0.570*** (0.056)
Tenure: home owned by trust	0.143*** (0.041)	0.178*** (0.042)	0.136*** (0.045)	0.075* (0.045)	0.014 (0.065)	0.052 (0.099)	0.240** (0.094)	-0.012 (0.056)
Ethnicity: Asian	-0.258*** (0.077)	-0.238*** (0.057)	-0.452*** (0.063)	-0.467*** (0.074)	-0.272*** (0.091)	-0.808*** (0.114)	-0.224*** (0.100)	-0.044 (0.052)
Ethnicity: Maori	0.322*** (0.043)	0.183*** (0.054)	0.195*** (0.050)	0.402*** (0.059)	0.033 (0.059)	-0.453*** (0.074)	-0.075 (0.069)	0.075 (0.053)
Ethnicity: MELAA	-0.035 (0.139)	-0.108 (0.157)	-0.345** (0.153)	-0.392** (0.172)	-0.249 (0.198)	-0.620*** (0.171)	-0.157 (0.210)	-0.251* (0.141)
Ethnicity: Not stated	-0.008 (0.489)	0.675 (0.534)	0.740 (0.616)	0.692 (0.621)	-0.009 (0.622)	-0.675 (0.810)	-0.120 (0.547)	-0.107 (0.486)
Ethnicity: Other	0.268*** (0.079)	0.258*** (0.088)	0.031 (0.106)	0.201* (0.122)	-0.103 (0.104)	-0.215 (0.142)	0.176 (0.138)	0.145 (0.103)
Ethnicity: Pacific	0.651*** (0.050)	0.637*** (0.077)	0.242*** (0.054)	0.139** (0.067)	-0.002 (0.079)	-0.322*** (0.105)	0.759*** (0.073)	0.777*** (0.102)
Economic living stand- ard index	0.007** (0.003)	0.016*** (0.002)	-0.010*** (0.004)	0.030*** (0.003)	0.051*** (0.003)	0.053*** (0.004)	0.014*** (0.004)	0.016*** (0.003)
Mental health index	0.007*** (0.002)	0.006*** (0.002)	0.005*** (0.002)	0.013*** (0.002)	0.058*** (0.002)	0.025*** (0.002)	0.000 (0.002)	0.007*** (0.002)
Physical health index	0.010*** (0.001)	0.010*** (0.001)	0.013*** (0.001)	0.014*** (0.002)	0.012*** (0.002)	0.015*** (0.002)	0.003 (0.002)	0.003 (0.002)

Table 7 (continued)

Social capital group Type of activity or perception	Networking		Social cohesion and inclusion			Civic engagement		
	Volunteering	Participation	Has given unpaid help	Feel safe at night	Included	No discrimination	Voted in General Election	Voted in Local Election
Satisfied with life	0.296*** (0.050)	0.214*** (0.049)	0.154*** (0.041)	0.022 (0.041)	0.422*** (0.044)	0.300*** (0.082)	0.312*** (0.046)	0.190*** (0.045)
Dummy: 2010	-0.025 (0.035)	0.028 (0.044)	0.100** (0.039)	0.484*** (0.044)	0.345*** (0.050)	0.026 (0.057)	-0.006 (0.059)	-0.046 (0.065)
Dummy: 2012	-0.127*** (0.038)	-0.218*** (0.058)	-0.040 (0.046)	0.509*** (0.056)	0.358*** (0.052)	0.083 (0.057)	-0.122** (0.049)	0.067 (0.047)
Constant	-3.687*** (0.400)	-1.955*** (0.431)	-0.623 (0.594)	-2.692*** (0.746)	-3.993*** (0.492)	0.168 (0.550)	-0.793* (0.476)	-2.077*** (0.575)
Observations	24,540	24,534	24,534	23,547	24,513	24,510	23,649	23,286
Pseudo R-squared	0.042	0.038	0.043	0.152	0.148	0.103	0.160	0.129

Logit regressions. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. FI: See Eq. (5). PI: See Eq. (8). FM: See Eq. (6). Omitted categories of categorical variables are as follows: education: no educational qualifications; personal income distribution: interquartile range; household income distribution: interquartile range; labor force status: employed full-time; tenure: owned without a mortgage; ethnicity: European. Source: calculated by the authors, using NZGSS 2008, 2010, and 2012

ethnic groups conditions migrants' social capital investments. We noted the possibility of reverse causation and sample selection upwardly biasing the calculated regression coefficients but correcting for this would have required longitudinal data or an experimental design—which was not available in the New Zealand context.

Like economic integration (Winkelmann and Winkelmann 1998), social capital differences between migrants and the native born diminish with longer residence. However, the accumulation of social capital varies across its different forms (Fig. 3), across demographic groups (Tables 2, 4, and 7), and over time (Tables 1 and 6). Temporal fluctuations were observed but not explored in depth, leaving this as an area for future research.

Table 5 shows that migrant investments in social capital are influenced by the spatial distribution of their co-ethnic group. When migrants are underrepresented in a region, they are more likely to invest in bridging capital. Where migrants are spatially clustered, bonding capital predominates. These outcomes are shaped by homophily and spatial sorting. Social capital, in turn, may support socio-economic outcomes, although this was only assessed informally in relation to employment (Table 3).

There is considerable scope for further research, particularly on causal mechanisms, measurement strategies, and the design of interventions to strengthen social capital for both economic and social benefit. Figure 1 highlights the complexity of social capital: it reflects the interplay of actions, perceptions, and outcomes, and resists a singular definition. Increasingly, researchers may shift from using stated preference data from surveys to revealed preference data from social media networks.

The findings offer implications for policy. Social networks matter. Policies that support connectivity can benefit individuals and communities. Policymakers should distinguish between bonding, bridging, and linking—and tailoring interventions accordingly, e.g., promoting bridging to improve labor market outcomes, or bonding to support wellbeing. Regional ethnic diversity also requires place-based approaches, informed by underutilized data on living standards, health, and life satisfaction available in New Zealand's national datasets.

Establishing causal direction remains a core challenge. This paper intentionally avoided making strong causal claims from correlational findings, recognizing the plausibility of bidirectional relationships. For instance, bridging social capital may help migrants find jobs in innovative firms, while such firms may actively recruit culturally diverse staff (Ozgen et al. 2014). Identifying valid instruments is difficult, and natural experiments (e.g., Algan et al. 2016; Gërçhani and Kosyakova 2022) may lack external validity. Experimental designs, such as lab-based game play (e.g., El-Bialy et al. 2023), offer promising alternatives. Longitudinal panel data tracking individuals' social capital formation and perceptions over time may also help disentangle causal effects (e.g., Dochow-Sondershaus 2024). In future New Zealand research there is a potential to address sample selection and reverse causation by linking the NZGSS cross-sectional surveys with administrative data in the Integrated Data Infrastructure (IDI, Stats NZ 2022).

Finally, the dynamics of social capital formation and impact merit greater attention. Effects may evolve over time, with some outcomes lasting across generations.

Zhang (2023), for example, finds that networks formed by African American veterans during the U.S. Civil War had long-term impacts on their geographic mobility and incomes. This underscores the importance of further research into the enduring consequences of bonding, bridging, and linking, social capital.

In sum, this paper demonstrates that migrant social capital in New Zealand grows over time, is shaped by geography and group characteristics, and holds meaningful, though complex, implications for integration and wellbeing.

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Data availability Access to the data used in this study was provided by Stats NZ under conditions designed to keep individual information secure and confidential in accordance with requirements of the Statistics Act 1975. The results presented in this study are the work of the authors, not Stats NZ.

Declarations

Conflict of interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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