Hunkering Down or Catching Up? No Long-Term Effect of Ethnic Minority Share on Neighborhood Contacts

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Abstract: This study reexamines the relationship between the coexistence of distinct ethno-cultural groups and social connectedness. Although previous research suggests a negative association between neighborhood-level ethnic diversity or ethnic minority shares and individual integration, alternative theoretical perspectives propose that integration can occur equally well in neighborhoods with distinct ethnic groups but may require more time. Moreover, the causal nature of the observed negative relationship is unclear due to potential confounding biases related to neighborhood selection. To address these issues, this study presents a framework for estimating the longitudinal effects of neighborhood ethnic composition on social ties with neighbors. The objective is to estimate the differences in neighborly contacts between individuals in low- and high-minority share neighborhoods, under a counterfactual scenario where all households stay in their neighborhood for the same period. The findings challenge previous research by showing that the ethnic composition does not impact the quality of neighborly contacts. In addition, residing in a neighborhood for five years significantly enhances social connectivity, regardless of ethnic composition. These results suggest that reduced cohesion in areas with higher minority presence may be due to other factors such as socioeconomic disadvantage and housing instability.

Keywords: ethnic diversity; social cohesion; neighborhood effects; contact; immigration; social networks

THE impact of local ethnic composition on social cohesion has received widespread scientific attention (Alesina, Baqir, and Easterly 1999; Baldassarri and Abascal 2020; Dinesen, Schaeffer, and Sønderskov 2020; Putnam 2007; Schaeffer 2014), resulting in mixed findings and ongoing scholarly debate. This article reexamines one of the more consistent findings in this literature: individuals living in ethnically diverse residential areas or areas with relatively high ethnic minority populations,[1] "hunker down" (Putnam 2007), that is, report lower connectivity with neighbors and less trust toward them (Dinesen et al. 2020; van der Meer and Tolsma 2014).

However, there is a lack of research on the dynamic effects of ethnic composition over time and few studies explicitly focus on causal inference (Dinesen et al. 2020). This study addresses two notable gaps in the literature. First, the role of length of residence as a central process variable is currently understudied. This is despite the fact that Putnam's (2007) article, which popularized the "hunkering down" claim, argued that the negative effect distinct ethnic group presence in neighborhoods might be temporary. This assumes that individuals can learn to navigate contexts with distinct ethnic groups in the long run, suggesting a pivotal role of time. In addition, several authors argue that fruitful social exchange in contexts where encounters between different ethnic groups are commonplace can be fostered through universal norms of reciprocity (Baldassarri and Abascal 2020; Gundelach and Traunmüller 2014). However, forming enduring relationships based on reciprocity likely requires more time than social exchange grounded in familiar cultural practices (Windzio 2018), suggesting that individuals in neighborhoods with noticeable ethnic boundaries may initially have fewer contacts but can "catch up" over time *if* they remain in the same area for an extended period.

Second, the shortage of studies posing clear causal research questions remains a critical research gap (Dinesen et al. 2020). Naïve estimates of the effects of local ethnic composition are likely biased due to selective neighborhood choices: Households that settle and remain in areas with high ethnic minority populations may differ markedly from those in low-minority areas in ways that affect their social integration (Dinesen et al. 2020). Consequently, previous studies have adjusted for various individual and neighborhood-level confounding factors, often using cross-sectional data and standard methods (Dinesen et al. 2020; Letki 2008; for more elaborate attempts, see the Previous research section). However, their study designs raise concerns about whether the control variables are truly exogenous or are themselves influenced by ethnic composition, which leads to over-control bias (Kohler, Class, and Sawert 2023; Dinesen et al. 2020, p. 447). In addition, previous analyses include both long- and short-term residents, but long-term residents may remain in their neighborhoods for reasons closely associated with local ethnic composition and neighborhood contact acquisition. The resulting "survivorship bias" significantly complicates the interpretation of previous effect estimates.

This study proposes a selection-on-observables approach using household-level panel data, inspired by the idea of emulating randomized trials with observational data (Hernán and Robins 2016). Instead of asking for a general effect of neighborhood ethnic composition, this study asks a clearly defined causal question (Hernán 2016; Lundberg, Johnson, and Stewart 2021): "What is the effect of *moving to*, and *staying in*, *one* specific neighborhood with a given share of ethnic minorities for a pre-specified period on individuals' contacts with neighbors?" The design differentiates the selection process of moving into a neighborhood from the subsequent selection process of leaving a neighborhood by tracking households directly after relocation to a new neighborhood, the "baseline neighborhood," and following them for a set period until neighborly contact quality is assessed.

Although the design focuses on recent movers, it enables testing the general claim that the presence of distinct ethnic groups, here measured as the share of ethnic minorities, undermines social connections. According to prevailing theories,

newcomers to neighborhoods with larger minority populations should face significant challenges in forming social bonds—challenges that are presumably absent in neighborhoods with smaller minority populations. The design is feasible with the panel data available to social scientists, addresses survivorship bias, clarifies the population for which inferences can be drawn (recent in-movers), and provides guidance on which confounders to adjust for (Kohler et al. 2023) and how to employ this adjustment. In addition, the estimand is policy relevant as it reflects the potential effect of interventions that relocate households to neighborhoods with specific characteristics, similar to real-world trials such as Moving to Opportunity (Ludwig et al. 2008).

I apply this design to German panel data, focusing on neighborhood cohesion outcomes that are most likely influenced by ethnic composition. In Germany, studies using cross-sectional data have reported a negative association between minority share and cohesion indicators (Koopmans and Schaeffer 2016). As one of the world's leading immigration countries, Germany's migrant population has grown substantially in recent decades; in 2022, 24.3 percent of the population had a migration background.[2] Public discourse regularly features the topics of immigration and its effects on society (e.g., Czymara and Dochow 2018), making ethnic boundaries a salient feature of the political debates. For the outcome of interest, I focus on individual evaluations of contacts with neighbors. These evaluations are not only able to demonstrate "hunkering down" but are also consistently shown to be negatively associated with minority concentration and diversity indices (Gijsberts, Van Der Meer, and Dagevos 2012; van der Meer and Tolsma 2014).

The theoretical section of this article begins with a review of key findings from previous research, including the few studies with causally informative research designs. I then discuss previous conceptual contributions that inform my measurement of ethnic composition using the share of ethnic minorities. Next, I derive hypotheses from theoretical perspectives that seek to explain lower cohesion in neighborhoods with distinct ethnic groups. The Data and Measurement section outlines the details of data preparation, the types of neighborhood data used, and the main variables of interest. Following this, I describe the research design. Finally, I present results, distinguishing between households with first- or second-generation immigrant members and those with non-immigrant members. My results do not support the "hunkering down" claim. Instead, I find at most a small short-term and no long-term negative impact of minority presence after adjusting for factors that influence neighborhood selection and future neighborhood contact quality. This finding holds for native households and immigrant households.

Literature Review and Hypotheses

Previous Research

Although larger theoretical and conceptual debates continue (Baldassarri and Abascal 2020), a consistent finding emerged from the literature on "diversity effects": The presence of distinct ethnic groups, measured by fractionalization indices or the share of ethnic minority residents in small-scale, neighborhood-like contexts, is

negatively associated with trust and other cohesion indicators reported by residents (Dinesen et al. 2020; van der Meer and Tolsma 2014). This negative association is particularly evident in responses to items targeting neighborhood cohesion, such as trust in neighbors or the quality and frequency of neighborly contact (Dinesen et al. 2020; Laurence 2013; van der Meer and Tolsma 2014). Although seminal studies were conducted using U.S. data (Alesina et al. 1999; Putnam 2007), this association has also been observed in Germany (Koopmans and Schaeffer 2016; Schaeffer 2013) and in other Western European countries with similar immigration histories (Lancee and Dronkers 2011).

The evidence for the negative association between measures of distinct ethnic group presence and local cohesion primarily comes from cross-sectional studies that regress local cohesion outcomes on ethnic composition variables and various controls. This is also true for the few studies reporting null results (Letki 2008). Fewer studies employ causal research designs with outcomes indicative of neighborhood cohesion, and none specifically examine neighborhood contacts. The results of these studies are mixed. Algan, Hémet, and Laitin (2016) analyze public good outcomes in buildings blocks in the French public housing sector in a natural experimental setting. They find that a higher ethnic fractionalization index is associated with more vandalism and less collective efforts to improve housing quality. Although their design is particularly powerful, their results cannot be easily generalized to typical neighborhoods and families. Fumagalli and Fumagalli (2019) apply an instrumental variable approach and find that a higher ethnic fractionalization index is negatively associated with hanging around but not with purposeful social activities among adolescents in Great Britain. Finally, Laurence and Bentley (2016) employ panel fixed-effect models to study how changes in neighborhood composition affect neighborhood attachment with British panel data spanning 18 years. A key contribution of their study is the differentiation between changes in ethnic composition that occur when households move and changes that happen while households remain in place. They find that an increase in the ethnic fractionalization index for households that stay in their neighborhood is associated with a decrease in attachment. Moreover, households moving from neighborhoods with high ethnic fractionalization scores to those with lower scores experience a rise in attachment. However, moving into neighborhoods with a higher ethnic fractionalization index is not associated with a decline in attachment.

Measuring Ethnic Composition: Ethnic Diversity or Share of Ethnic Minorities?

Researchers have devoted significant effort to analytically refining and operationalizing the relevant ethnic composition variable (Abascal, Ganter, and Baldassarri 2023; Kustov and Pardelli 2018; Schaeffer 2013). Most studies rely on the concept of "diversity," which implies a unique effect of the number of ethnic groups and their parity in relative size in a certain context, regardless of which groups are present. However, in the countries where most of the above-mentioned findings emerged, diversity indices, such as the Hirschman–Herfindahl index, are closely correlated with simple measures of ethnic minority or immigrant shares (Abascal et al. 2023;

Kustov and Pardelli 2018; Schaeffer 2013). This correlation occurs because ethnic majority natives are typically the largest group numerically in most contexts, and in those areas where substantial minority populations exist, these minorities often belong to multiple small groups rather than few large ones (for Germany, Schaeffer 2013; Schönwälder and Sohn, 2009). Consequently, what is attributed to "diversity" effects might actually reflect the effects of the proportion of non-dominant ethnic groups. To avoid this ambiguity in interpreting my data, I rely on the share of visible ethnic minorities to measure ethnic composition over other, more obscure, diversity measures.

As outlined in the following section, most mechanisms that explain low cohesion assume that neighbors can either perceive ethnic markers in daily interactions or, that cultural norms and behaviors among the respective out-groups are sufficiently distinct to affect interpersonal exchange and norm formation (Abascal et al. 2023). In European countries, where the largest group is typically native nationals, cultural differences with this group most significantly shape communication and everyday behavior. Therefore, measuring the share of non-dominant ethnic groups in a given context is capturing the theoretically relevant aspect of ethnic composition in these national contexts. Research indicates that the share of visible minorities can predict cohesion outcomes as effectively, or even better than, other diversity measures (Dinesen and Sønderskov 2015; Kustov and Pardelli 2018).

Theory and Hypotheses

A central idea within the literature of "diversity" effects is that the local presence of distinct ethnic groups reduces trust and social interactions among all residents, regardless of their own ethnic group membership. This encompassing negative effect is explained by a neighborhood-wide sense of anomie and social reservation (Algan, Hémet, and Laitin 2016; Dinesen et al. 2020; van der Meer and Tolsma 2014). Schaeffer (2014) proposes that this anomie results from ethnic homophily in social networks, asymmetrically distributed preferences about desirable neighborhood characteristics, and coordination problems in everyday interactions. These mechanisms presuppose cultural differences in habits, language, or norms between the ethnic groups in each context. A multitude of encounters between neighbors that are characterized by these mechanisms result in larger knock-on effects for social life in the neighborhood, for example, leading to difficulties in finding a common denominator in cooperative neighborhood actions such as sanctioning deviant behavior or shared childcare responsibilities. In addition, Dinesen and Sønderskov (2015) propose that cumulative exposure to perceived ethnic out-group members in daily neighborhood encounters reduces trust in neighbors (Dinesen et al. 2020). This is because individuals use ethnicity as a cue to infer the trustworthiness of people in their social environment and ethnic out-group members are perceived as less trustworthy, for example, due to internalized stereotypes.

These accounts suggest that establishing ties with neighbors is inherently more challenging in contexts in which distinct ethnic groups are present because of a prevailing sense of uncertainty and anomie, resulting in less frequent and lower quality contact with neighbors, even after extended periods of exposure. Dinesen

and Sønderskov's (2015) account even suggests that households retreat from social life with longer tenure in neighborhoods where they are exposed to ethnic group cues that are unfamiliar to them. These predictions can be meaningfully tested by tracking the integration of households that recently relocated to neighborhoods with different minority concentrations. If the above-mentioned mechanisms are operating, newcomers should face substantial difficulties in establishing contacts because of the general social isolation in neighborhoods with higher share of ethnic minorities, particularly if they are themselves ethnic majority members (Abascal et al. 2023).

Hypothesis 1 ("hunkering down"): Households that recently moved to neighborhoods with a high share of ethnic minorities experience lower initial quality of contacts with neighbors and smaller increases in contact quality compared to households that recently moved to neighborhoods with a lower share of ethnic minorities, even after prolonged tenure in the neighborhood.

However, length of residence can be seen as a prerequisite for successful contact formation with neighbors on the individual level, especially in social contexts characterized by initial uncertainty and reservation toward others. This applies to exchanges across ethnic boundaries, where differing expectations about shared norms and interpretations of behavior can complicate initial exchanges (Windzio 2018). This also applies to exchange with neighbors of the same ethnic group if the presence of distinct ethnic groups increases general uncertainties about the social norms operating in the neighborhood, as argued above. Importantly, however, once a successful exchange occurs, it is likely to trigger positive emotions (Lawler, 2001) and obligations of reciprocity (Gouldner 1960; Gundelach and Traunmüller 2014; Windzio 2018), which extend and sustain the relationship. Evidence for this phenomenon has been found in network studies of interethnic tie formation (Munniksma et al. 2017; Windzio 2018). This suggests that while integration into neighborhoods with higher minority shares might require more time than in homogeneous neighborhoods, residents may eventually reach similar levels of neighborhood contact than households in homogeneous neighborhoods.

Hypothesis 2 ("catching-up"): Households that recently moved to neighborhoods with a higher share of ethnic minorities start with lower quality contacts than those in neighborhoods with a lower share of ethnic minorities but are able to reach similar levels after prolonged neighborhood tenure.

Hypotheses 1 and 2 imply that the estimand of interest is the causal effect of ethnic minority share on contacts with neighbors under the hypothetical, counterfactual scenario where all households *stay in their neighborhood for the same period*. Beyond theoretical interest, there are three more practical considerations to target this estimand. First, contacts with neighbors are not transferable to other neighborhoods. This emphasizes the importance of comparing levels of contact quality in the same neighborhood over time. Although effects of complex neighborhood histories, including exposure to several different neighborhoods, might influence outcomes such as educational achievement (Wodtke, Harding, and Elwert 2011) or trust, I consider them beyond the scope of this study. Second, neighborhoods with higher shares of ethnic minorities generally experience greater population turnover (van Ham and Clark 2009). Thus, an effective approach to learn about the

effects of the presence of distinct ethnic groups in neighborhoods is to target an estimand that holds constant neighborhood tenure. Third, focusing on the effect of one neighborhood simplifies addressing confounding bias due to selective mobility, as outlined below.

Data and Measurement

This study uses data from the German Socio-Economic Panel (SOEP) (Liebig et al. 2021) from the years 2009 to 2019, combined with neighborhood data provided by the private marketing company Microm (Goebel et al. 2014). In 2009, 2014, and 2019, respondents were asked three survey questions about their experiences with their neighbors. Because responses to these items are only collected from one respondent per household and because contacts with neighbors are a collective household endeavor, I treat the household as the main unit of analysis.

The data setup of this study is shown in Figure 1. The idea is to create a sample of households that just started to live in their new neighborhood and track them over a five-year period. Neighborhood contacts are assessed in the first year and final year of their neighborhood tenure, allowing the investigation of longitudinal trends. I track the households that moved into a new neighborhood shortly before 2009 from 2009 until 2014 and those who moved in shortly before 2014 from 2014 until 2019. I restrict my sample to households that transitioned to a new neighborhood up to one year prior to the baseline years of 2009 and 2014. To avoid the survivorship bias that this article is aiming to overcome, the ideal restriction would be to follow households directly after moving in. However, this is not feasible with the SOEP because of sample size constraints. If a household moves out between 2009 and 2014, remains in the SOEP, and moves into a new neighborhood not more than one year before 2014, this household is included as a separate unit of analysis in the 2014 baseline sample. Figure S1.1 in the online supplement presents a flow chart showing the steps of selecting the sample.

In the Microm data, neighborhoods are operationalized as small-scale geographical areas, so-called PLZ-8 (postal-code-8) regions (microm, 2023), subdivision of postal code areas, which encompass on average 1326 inhabitants in the baseline sample. Microm data have been used and validated in several research articles (Kruse and Dollmann 2017; Lancee and Schaeffer 2015; Maxwell 2019). The data provide a unique opportunity to study small-scale geographical contexts in Germany, where neighborhood-level data are scarce.

Ethnic Neighborhood Composition

Ethnic neighborhood composition is captured by the share of ethnic minorities in a given SOEP household's neighborhood in the baseline years 2009 and 2014. The share of ethnic minorities is the sum of the shares of inhabitants belonging to visible minority groups, namely households of African, Asian, Balkan, Eastern European, Turkish, and non-European Muslim origin. Information on the origin of respondents' neighbors comes from an analysis that traces the linguistic origin of the names of household heads living in the PLZ-8 regions (Kruse and Dollmann 2017;
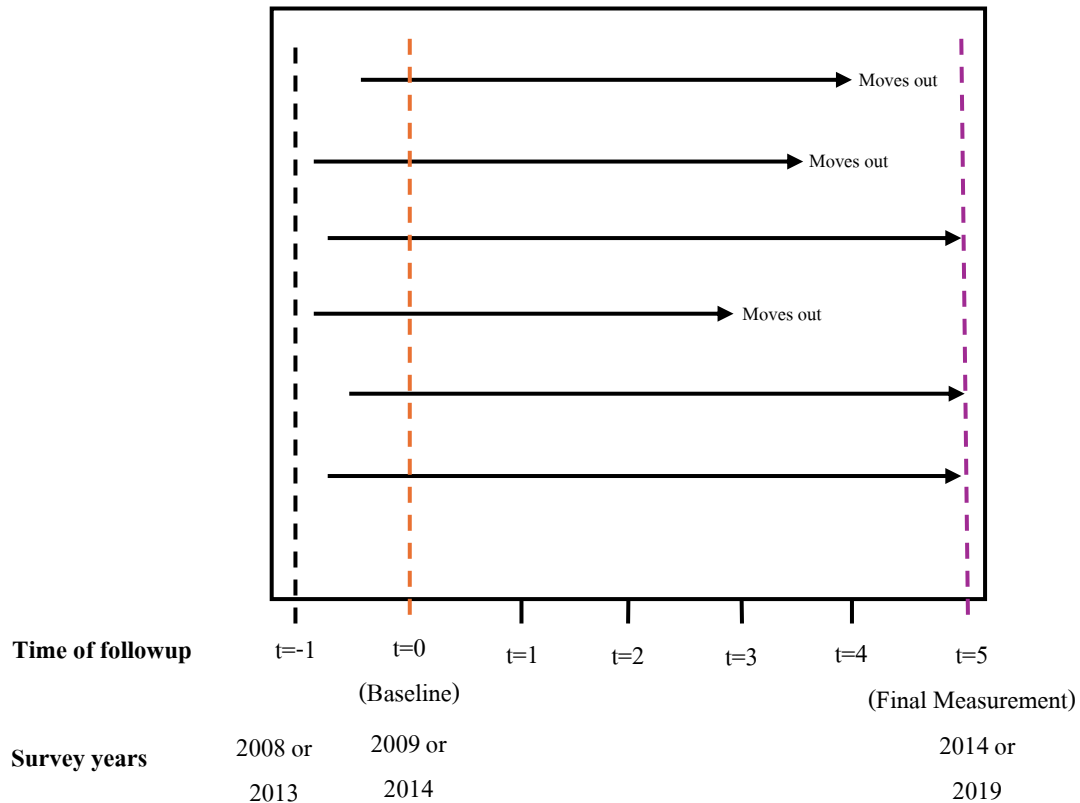
Figure 1: General data setup for the study. Arrows indicate individual households observed over time. Each household panel starts with a move to a new neighborhood between t_{-1} and t_0. In the first SOEP interview after moving, initial contacts with neighbors and baseline confounders are measured. Household panels can end either because the household moves out of the baseline neighborhood, drops out of the SOEP, or reaches the final measurement of neighborhood contacts five years after baseline.

microm 2023). Beyond the arguments about cultural difference to the dominant group mentioned above, an advantage of using this measure is that name-based approaches are less error prone when identifying immigrant groups that are more socioeconomically disadvantaged and easier algorithmically distinguishable from the majority population (Kruse and Dollmann 2017). The results are robust to using the Ethno-Linguistic fractionalization index (one minus the Hirschman–Herfindahl index) as an alternative indicator of ethnic composition (see the section 5 in the online supplement).

In the main sample, the minority share variable has a mean of 5.2 percent and a standard deviation of 4.8 (Table S1.1 in the online supplement). When compared to official statistics on non-German citizens in Germany,[3] these numbers seem small. This is partly due to the restrictive definition of ethnic minorities applied here. In addition, name-based measures tend to underestimate minority shares in some instances, often capturing first-generation migrants more accurately than later generations (Kruse and Dollmann 2017). Figure S1.2 in the online supplement shows the ethnic concentration of the baseline neighborhood and the previous
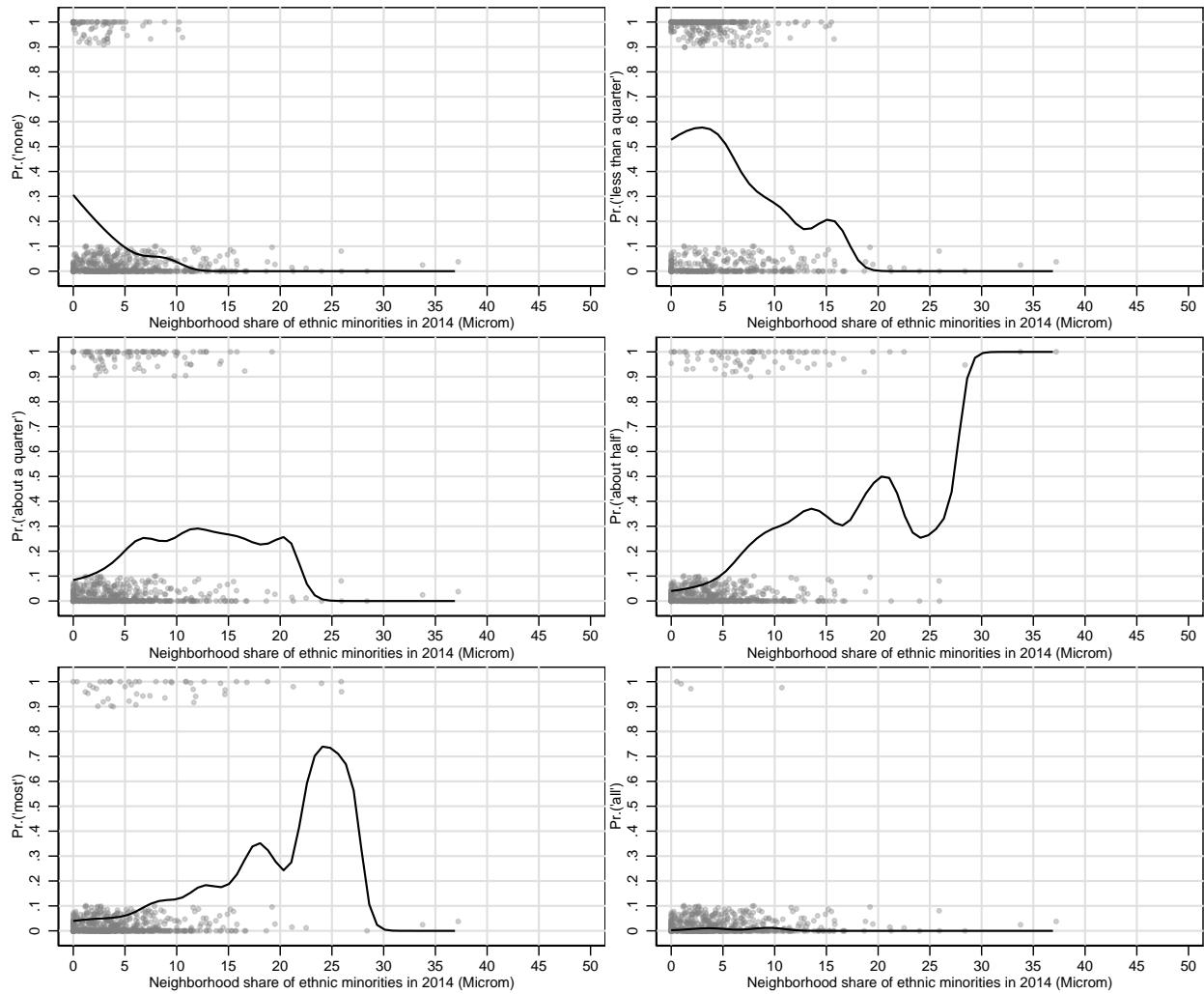
Figure 2: Proportion of respondents choosing one out of six response categories describing the ethnic composition of their neighborhood in 2014 (*y*-axis) by objective minority concentration (*x*-axis). Black line represents the local polynomial fit. Gray dots indicate the jittered data points.

neighborhood before the move into the baseline neighborhood. Importantly, as a random sample of the German population, the SOEP does not include sufficient respondents from German neighborhoods that have the largest minority concentrations, which limits the inferences that can be drawn from this sample to typical German neighborhoods.

Figure 2 validates whether higher values of the ethnic minority variable actually predict the perception of "non-native" groups in the neighborhood. In 2014, respondents were asked, "How many families in this residential area do not originate from Germany?" Figure 2 shows that as the share of minorities (measured by the Microm variable) increases, individuals perceive more families from abroad. The upper left graph indicates that the perception of "no" immigrants declines rapidly with an increasing share of minorities. At levels of more than 10 percent minorities, most re-

spondents perceive "about a quarter," "about half," or "most" of the neighborhood as immigrants. Figure S1.3 in the online supplement presents similar findings from the 2009 sample, where 40 percent of respondents report "many" in neighborhoods with 10 percent ethnic minorities. This suggests that even in neighborhoods that appear to have relatively small minority shares according to the Microm variable, residents perceive sizable numbers of immigrants in their area.

Ethnic composition is treated as time invariant in this study, using the value in the baseline year as treatment. This is for two reasons. First, large changes in neighborhood social composition are unlikely to occur within five years (Zwiers, van Ham, and Manley 2018). In my sample of stayers, limited to those unaffected by artificial neighborhood boundary changes, the standard deviation of yearly within-household deviations from the household's over-time average is 0.033, which is negligible. Although accounting for factors that lead to changes in neighborhood ethnic composition is generally possible in the overall methodological framework by additionally modeling the evolution of neighborhood-level share of minorities, it would add too much complexity given the short period of five years in my analysis. Second, Microm changed the boundaries of the neighborhood units in 2010. Although the neighborhood definition from 2010 onwards is very similar to the one before, the change in boundaries would introduce artificial over-time changes in compositional variables on the neighborhood level.

Most prior research assumes a linear relationship between ethnic composition measures and social cohesion. I model ethnic concentration as a restricted cubic spline function with knots at 2, 5, and 10 percent minorities to allow greater flexibility. The knot values were chosen because there are more observations below 10 percent minorities, allowing more flexible estimation within this range of the variable.

Neighborhood Contact Experiences

The outcomes of interest are the household head's evaluations of social contacts with neighbors and perceptions of the overall connectedness in the neighborhood. They are reported by one person per household. Table 1 shows three different outcome measures with their respective questionnaire items, their response categories, and the statistical methods used to model a given outcome. The first item measures respondents' *closeness of contact* with their neighbors, indicating trust and a certain familiarity with neighbors. The second item asks respondents to report whether they visit neighbors at home. It captures a behavioral and intimate dimension of social embeddedness. The third item asks for an assessment of the *relations between neighbors*. The response to this item captures general perceptions of the neighborhood community that go beyond a single respondent's ego network.

The neighborhood contact items do not ask respondents to specify their contacts' ethnicity. This allows me to compare between areas with low and high shares of ethnic minorities. Items that ask for contact with members of specific ethnic groups would likely confound the theoretical mechanisms outlined above with a simple opportunity structure effect: It would not be surprising to find that those living in neighborhoods with few minorities also have few contacts with them in their

Table 1: Measures of social ties in the neighborhood used in this study.

Dimension of Social Cohesion	SOEP Item	Item Responses and Value Coding	Statistical Model Used
Perception of closeness of contact with neighbors	"How close is your contact with your neighbors in this building or in this neighborhood?"	1. Fleeting 2. No contact 3. Moderate 4. Close 5. Very close	OLS linear regression
Visiting neighbors at home	"Do you have neighbors who you get along with so well that you visit each other at home?" (yes/no) If reply was "yes": "How often do you visit each other?"	1. No 2. Less than once a month 3. At least once a month 4. At least once a week 5. Almost daily	Ordered logistic regression
Perception of relations among neighbors	"How would you evaluate the relationships among people in this neighborhood? Which statement fits best?"	0. People barely know each other / It varies widely / unable to comment 1. People talk to each other occasionally / Fairly strong relations	Logistic regression

neighborhood. One downside of not targeting specific ethnic groups is that the items in Table 1 do not allow an assessment of ethnic segregation in neighborhood networks (see the final discussion).

Research Design

Obtaining unbiased estimates of the individual-level longitudinal average causal effect of neighborhood ethnic composition on neighborhood contacts requires addressing confounding due to selective mobility. This is complicated by the interrelationship between exposure time, composition effects, selection bias, and the potential for households to move between neighborhoods (Hedman, 2011). This study aims to mitigate these complexities and answer the causal question posed in the introduction by emulating a randomized trial with observational data (Hernán and Robins 2016). The emulated trial involves randomly assigning a sample of households into neighborhoods with varying ethnic compositions and monitoring their integration while they remain in their assigned neighborhood over a specified period.

I model selection into and out of neighborhoods as two separate processes. For in-mobility, random selection into baseline neighborhoods of different shares of ethnic minorities cannot be assumed in the SOEP due to confounders affecting neighborhood choice and future contacts. The directed acyclic graph (DAG) shown
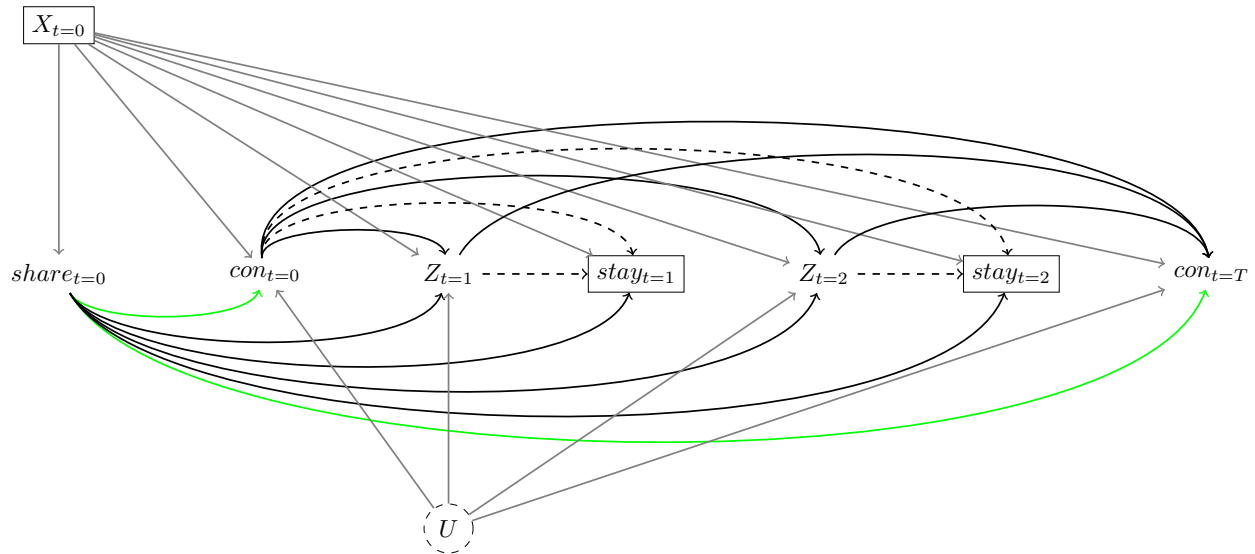
Figure 3: Directed acyclic graph for study design. Green arrows show the effect of interest of share of minorities at baseline ("$share_{t=0}$" on neighborhood contacts ["$con_{t=T}$"]). Boxes around "$stay_t$" indicate that the sample is conditional on staying in the baseline neighborhood. Z_t are time-varying causes of out-mobility and future contacts. Dashed arrows are erased by weighting the censored sample with inverse probability weights. $X_{t=0}$ are baseline confounders and conditioned on via regression. U_t are possible unmeasured factors that do not bias the estimate of interest.

in Figure 3 identifies these baseline confounders as $X_{t=0}$. I adjust for the variables in $X_{t=0}$ by including them as time-stable predictors in the regression models. In my data, $X_{t=0}$ is measured shortly after households move into their new dwelling, and I consider them informative about factors that affect the decision to move *into* a neighborhood with certain ethnic compositions. Although baseline variables, such as housing type, affect neighborhood selection only at baseline, they can influence out-mobility and contact acquisition over time (with time-constant effects in my specific application). Tables S1.1 and S1.2 in the online supplement show descriptive statistics for baseline variables. Tables S1.7, S1.8, and S1.9 in the online supplement show the full regression results for each outcome.

All regression models include an interaction between minority share, an indicator for non-immigrant or immigrant households, and time. A household is classified as an "immigrant household" if the majority of household members or their parents were born outside Germany. Including this interaction allows me to present results for non-immigrant and immigrant households separately.

I adjust for three sets of variables in $X_{t=0}$. The first set captures the social context in the target neighborhood that households might consider when choosing a neighborhood with a certain ethnic composition: neighborhood unemployment rate (Letki 2008), log number of residents, the type of building a household lives in (measured in five categories), the distance to the nearest large city center (in categories), and the type of residential area (mere residential, business/industrial, or mixed). I also control for the minority share in the previous neighborhood. A sec-

ond set includes variables capturing household-level factors that might factor into the decision to move and settle in certain areas. These are homeownership; the presence of preschool children, school-aged children, or children aged 12–18; average income satisfaction; highest educational attainment in the household; the presence of a married couple in the household; the average age of household members; and whether at least one household member is either not working, in training, unemployed, working, or recently changed their job. Third, I include attitudinal variables, such as the average household willingness to take risks when meeting strangers, average general risk aversion (Clark and Lisowski, 2017), and average concerns about immigration to Germany and xenophobic hostility (measured for each household member on a three-point scale from "not at all worried" to "very worried").

Even if neighborhood selection occurs randomly within strata defined by $X_{t=0}$, households may still choose to move out of their baseline neighborhood. Because my focus is on neighborhood contacts after a household has remained in the same neighborhood for five years, I need to account for selective out-mobility through time-varying Z_{it} (Fig. 3). I address this by using an approach designed to estimate per-protocol effects in randomized trials (Hernán and Robins 2017).

First, I censor household panels if households move out of their current dwelling between the baseline and final measurement. Thus, the sample is conditioned on staying in the initial home, as indicated by the boxes around the stay$_t$ variable in the DAG in Figure 3. In the main sample, of the 1045 households that are present at baseline, 32 percent were censored because they moved out before the final measurement of neighborhood contacts (Table S1.1 in the online supplement). Further households are lost due to panel attrition. This leaves 352 households that were interviewed again five years later. The substantial attrition highlights the importance of taking out-mobility into account and also raises sample size concerns. Therefore, I present robustness analyses with a larger but less causally informative sample in the section 3 of the online supplement.

Second, artificially censoring household panels after households leave their baseline home might introduce selection bias due to time-varying confounders Z_{it} that affect staying in a neighborhood and future contacts with neighbors. Further selection bias might occur because of panel attrition. Fortunately, however, the SOEP offers measurements of these potential time-varying confounders after baseline. This allows me to estimate the inverse probability of censoring weights (Robins, Hernán, and Brumback 2000) to account for possible selection bias due to out-mobility and panel attrition.

To estimate the weights, I first fit a pooled multinomial logistic regression with three outcomes—staying, moving out, or leaving the panel (panel attrition)—using data for each household-year observation between the baseline and final measurement. Although households that leave their homes after baseline are not included as observations in the outcome regression sample, they contribute to the estimation of the weights, which in turn can influence the results of the outcome regression. I then use the predicted probabilities of staying in the sample to construct what I will refer to as "inverse probability of out-mobility weights" (IPOW). Following Su, Seaman, and Yiu (2022), I calibrate these weights to achieve maximum covariate
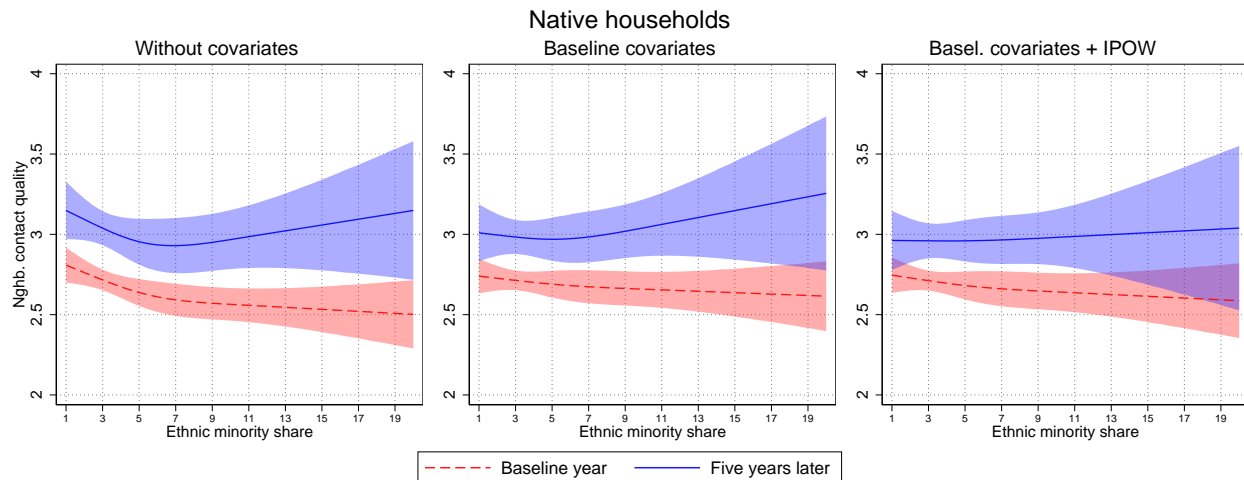
Figure 4: Predicted values of closeness of contact with neighbors for non-migrant households. Results from ordinary least squares (OLS) regressions. Full models are shown in the online supplement Table S1.7.

balance with minimal variability. The dashed arrows in Figure 3, from Z_{it} to stay$_t$, indicate that the confounding variables are balanced between those who leave the baseline neighborhood or the SOEP before the final measurement, and those who stay, thus adjusting for potential time-varying confounding.

In the multinomial logit model, I include yearly indicators of the presence of a preschool-aged child, changes in household employment, average general risk aversion, average satisfaction with the current home, average satisfaction with income, and average worries about immigration to Germany. The model also includes a measure of closeness of neighborhood contacts in the baseline year to account for mobility related to initial values of the outcome. I interact all variables with the minority share at baseline and follow-up time. The online supplement presents descriptive statistics of the time-varying variables (Table S1.3), covariate balance information (Tables S1.4 and S1.5), multinomial logistic regression results (Table S1.6), distribution of IPOW (Fig. S1.4), and results with trimmed weights (section 6 in the online supplement).

Results for Non-Immigrant Households

I present results separately for immigration and non-immigrant households, starting with non-immigrant households (for aggregate effects across both groups, see section 2 of the online supplement). Figures 4 and 5 show the results for the first two outcomes: indicators of the closeness of neighborhood contact and the probability of visiting neighbors once a month or more often. The left panel of each figure displays predicted values of these outcomes as a function of the share of ethnic minorities in the baseline year (*x*-axis) and time (line color) without covariate adjustment. The red lines indicate that both outcomes are negatively associated with the ethnic minority share in the baseline year. The blue lines show that after five years, those who stayed in their baseline neighborhood report significantly
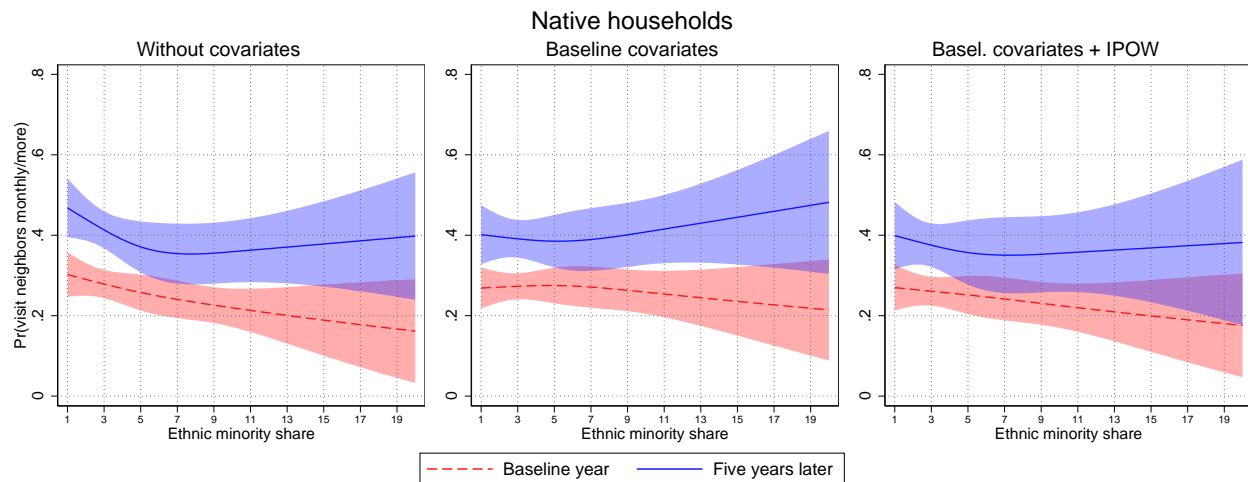
Figure 5: Predicted probabilities of visiting neighbors at least once a month for non-immigration households. Results from ordered logistic regression models (outcomes 3–5). Full models are shown in Table S1.8 of the online supplement.

higher quality of neighborhood contacts and more frequent visits. This increase is slightly more pronounced in neighborhoods with higher minority shares. Although a negative relationship between minority share and the frequency of neighbor visits persists after five years (blue line, Fig. 5), the closeness of contact reaches levels similar to those in neighborhoods with low-minority shares (Fig. 4). These comparable levels across neighborhoods with different ethnic compositions in this naïve analysis could result from confounding or selection bias. Nevertheless, even for contact closeness, the flexible spline function detects a negative association in neighborhoods with minority shares between 0 and 10 percent, where the larger sample size allows for more reliable inferences.

The middle panels in Figures 4 and 5 show the same associations after adjusting for baseline confounders via regression. The red line is now much flatter than in the left panels, indicating that the earlier observed negative association with minority share is largely due to confounding factors that influence neighborhood choice and initial contact measurements. Minority share appears to have only a small negative effect on the two outcomes after at most one year of neighborhood tenure. In addition, the blue lines in the middle panels suggest that after five years in a high-minority share neighborhood, residents report higher contact quality and more frequent visits than those in low-minority share neighborhoods. Although the large confidence intervals caution against interpreting this association as a positive effect of minority share, this finding is evidence against a negative causal effect. Comparing the blue lines in the middle and left panels of Figures 4 and 5 suggests that the blue line in the left panels is confounded by baseline variables that have lasting effects on neighborhood contact measurements. Given that confounders associated with moving to higher minority share neighborhoods, such as higher unemployment rates and fewer young children (see Table S1.2), are likely
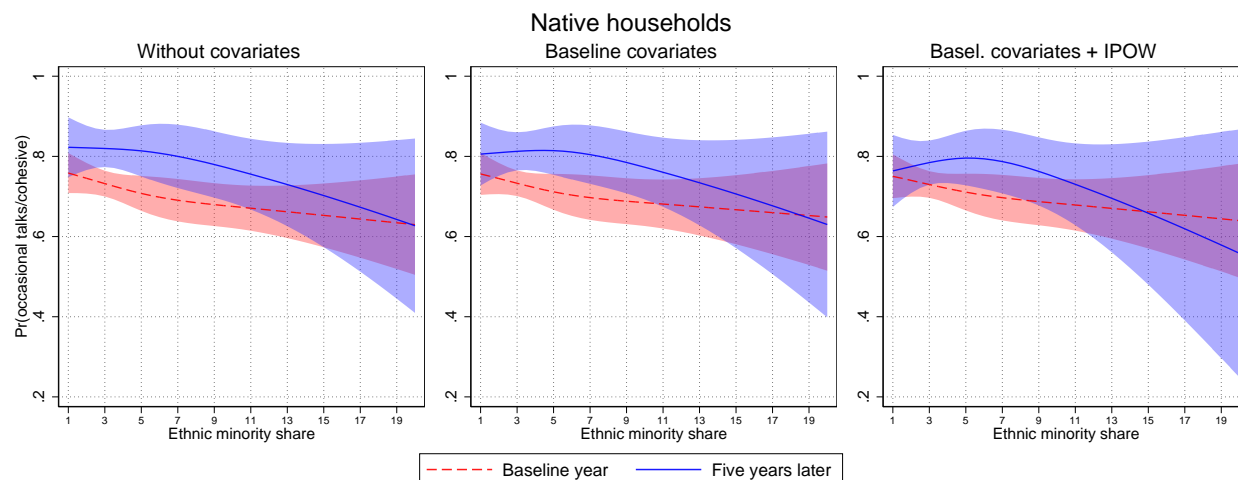
Figure 6: Predicted probabilities of perceiving occasional talks or cohesive relations between neighbors for non-immigration households. Results from logistic regression models. Full models are shown in Table S1.9 of the online supplement.

linked to lower connectedness, the relationship shifts from negative to positive after adjustment.

Finally, the right panels of Figures 4 and 5 show the results after weighting for the inverse probability of staying in the neighborhood and the SOEP sample. The similarity between the middle and right panels suggests that, once baseline variables are accounted for, weighting observations does not significantly alter the results. This finding may indicate that adjusting for a wide range of baseline confounders is sufficient to account for selective future out-mobility, at least within the observed five-year period. Therefore, characteristics that households possess at the start of their neighborhood tenure appear to be more influential in shaping future neighborhood integration and out-mobility than time-varying life-course events.

Overall, the results in Figures 4 and 5 contradict Hypothesis 1, the longitudinal "hunkering down" prediction. Rather than showing a negative effect of minority share on contact acquisition, my findings suggest that the negative association is due to confounding variables that influence settling in neighborhoods with certain ethnic compositions and have long-term effects on subsequent contact measurements. There is some tentative evidence supporting Hypothesis H2 ("catching up"), as households initially show slightly lower quality contacts in neighborhoods with higher minority shares at the first measurement (see the Discussion and conclusion section).

The final outcome variable captures responses to an item asking about perceived neighborhood relations. Figure 6 shows the predicted probability of households reporting either "fairly cohesive" neighborhood relations or that neighbors "occasionally talk to each other." The unadjusted predictions in the left panel of Figure 6 indicate that households in higher minority share neighborhoods perceive neighborhood relations as less cohesive than those in lower minority share neighbor-
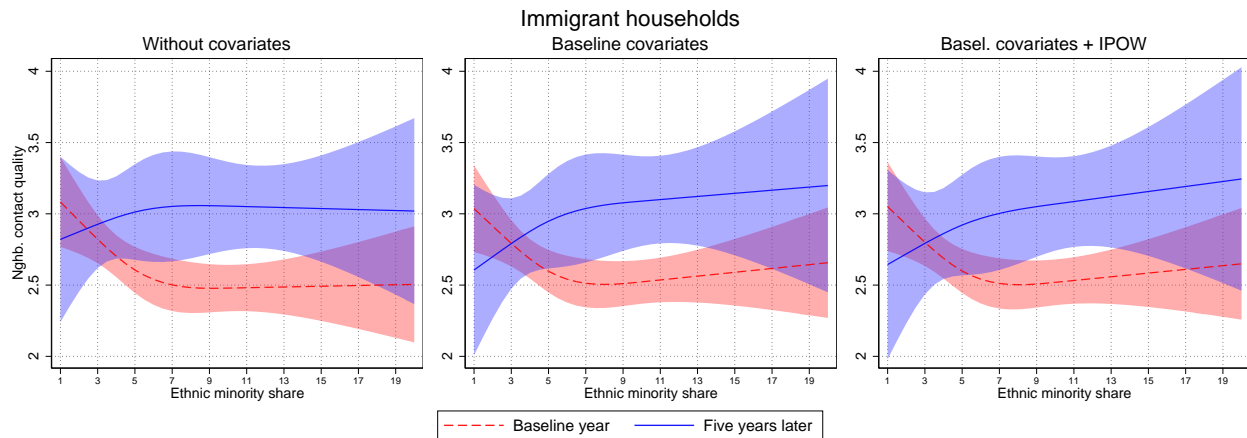
Figure 7: Predicted values of closeness of contact with neighbors for immigrant households. Results from OLS regressions. Full models are shown in Table S1.7 of the online supplement.

hoods. After adjusting for baseline variables and selective out-mobility (middle and right panels), the differences between neighborhoods with varying ethnic minority shares diminish. However, unlike the previous two outcomes, a negative association between perceived community cohesion and the share of ethnic minorities remains at baseline and after five years of neighborhood exposure.

The results for the third outcome (Fig. 6) are more ambivalent than the previous two, suggesting two possible interpretations. First, they could indicate a null effect. Because the negative association after five years of exposure (blue lines) only appears in neighborhoods with minority shares above 10 percent, where inferences are highly uncertain, a conservative interpretation would avoid inferring any causal effect of ethnic composition on perceived neighborhood cohesion. This aligns with the interpretation of the first two outcomes, which suggest no effect of minority share. Second, alternatively, the fact that the results for the third outcome differ from the previous two outcomes may imply that while close one-on-one relationships with neighbors are unaffected by ethnic composition, perceptions of neighborhood cohesiveness are negatively impacted. This suggests that the presence of distinct ethnic groups does not lead to "hunkering down" per se but could potentially negatively affect collective neighborhood efficacy (Algan et al. 2016; Sampson 2004).

Results for Immigrant Households

Results for households where most members are first- or second-generation immigrants differ enough to warrant closer inspection, although the overall conclusion remains similar. Figures 7 and 8 show the results for the first two outcomes. Similar to native households, immigrant households initially experience a contact penalty in neighborhoods with higher shares of ethnic minorities. However, after five years, this penalty turns into an advantage, resulting in a more pronounced positive effect of minority share. Unlike native households, immigrant households also
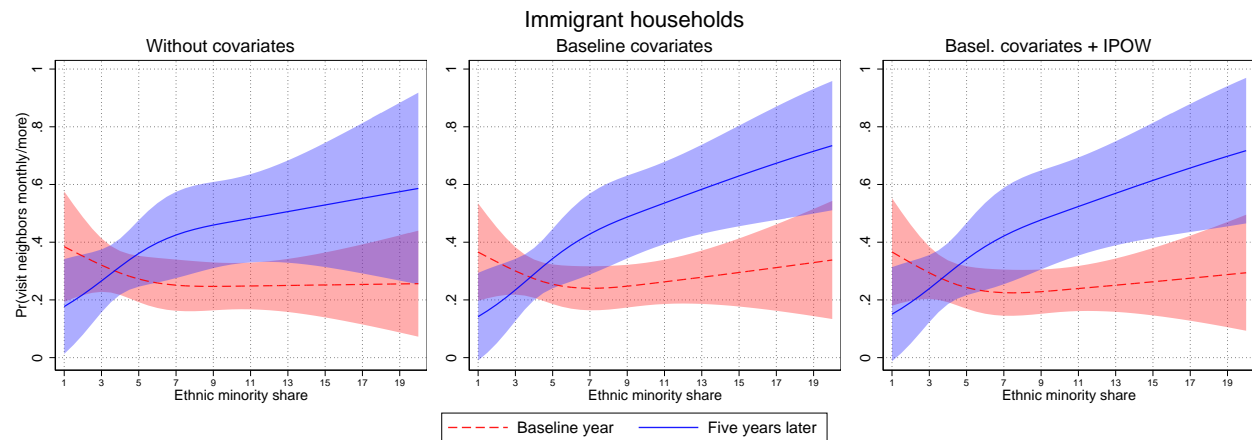
Figure 8: Predicted probabilities of visiting neighbors at least once a month for immigrant households. Results from ordered logistic regression models (outcomes 3–5). Full models are shown in Table S1.8 of the online supplement.

perceive higher general cohesion between their neighbors in neighborhoods with high-minority shares after five years (tentatively, Fig. 9). These results suggest that it may be easier for immigrants to integrate into neighborhoods with higher minority shares if they remain in these neighborhoods for a sufficient period. The results are similar when using the index of ethnic fractionalization as independent variable (see section 5 of the online supplement). Note that these analyses are tentative and investigating in-group/out-group dynamics (Abascal et al. 2023) properly would require to differentiate more fine-grained ethnic origin groups within the coarse category of "immigrant households."

Discussion and Conclusion

This study tests the causal claim that the presence of distinct ethnic groups reduces neighborly contact, even after prolonged exposure to a neighborhood. I propose an empirical approach that tracks the contact acquisition of cohorts of recent movers, suggesting that individuals who have recently settled in neighborhoods with higher shares of ethnic minorities are more susceptible to the alleged cohesion-eroding effects of culturally different groups. This approach facilitates accurate covariate measurement and adjustment and addresses survivorship bias due to long-term stayers.

Two findings stand out. First, after accounting for measured confounding, I find negligible associations between the share of ethnic minorities and both the quality of neighborhood contacts and the probability of visiting neighbors. This suggests that the presence of ethnic minorities in neighborhoods does not hinder the formation of close relationships with individual neighbors, rejecting Hypothesis H1 and the "hunkering down" claim (Putnam 2007). Although households in areas with higher shares of ethnic minorities are initially less connected than those in low-minority areas, connectedness increases over five years, leading to similar
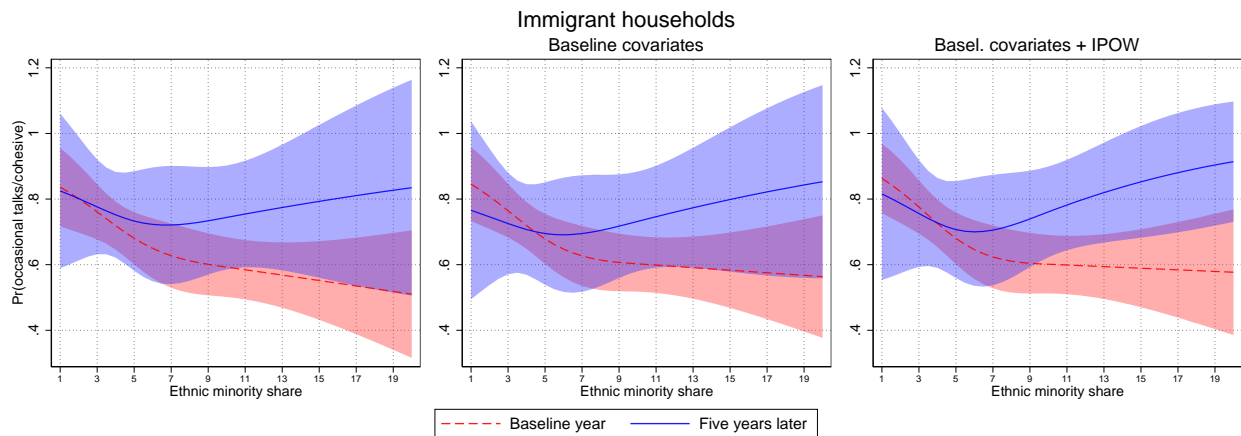
Figure 9: Predicted probabilities of perceiving occasional talks or cohesive relations between neighbors for immigrant households. Results from logistic regression models. Full models are shown in Table S1.9 of the online supplement.

levels of neighborhood contacts across different neighborhoods. This supports evidence for Hypothesis H2 ("catching up"). However, more detailed, consecutive measurements of neighborhood integration over longer periods are needed to test Hypothesis H2 more thoroughly.

Second, addressing selective out-mobility through inverse probability weighting does not alter the results after controlling for baseline variables. This suggests that factors influencing housing choices, such as the type of housing or neighborhood-level variables, drive the commonly observed negative association between the share of ethnic minorities and neighborhood contacts. In contrast, life-course events such as having children or increasing dissatisfaction with housing do not appear to further impact future integration. However, these time-varying variables, along with their cumulative effects, may become more significant in future studies examining household trajectories over periods longer than five years.

This study has several limitations related to both the data and research design. First, because SOEP respondents are part of a probability sample of the entire German population, they rarely live in the most immigrant-concentrated neighborhoods in Germany. This underrepresentation may lead to an underestimation of the effect of ethnic composition if negative effects of minority presence only manifest in neighborhoods with extreme compositions. Future research could address this by gathering longitudinal data from stratified samples that oversample movers to neighborhoods with large immigrant communities. Second, this study treats neighborhood composition as time constant. Future studies interested in the long-term effects of neighborhood composition should account for changes in composition due to time-varying confounding variables at the neighborhood level. Third, although the findings contradict "hunkering down" (Putnam 2007) in areas with higher shares of ethnic minorities, they do not rule out the possibility of ethnically segregated neighborhood networks. Future research should focus on longitudinal analyses of segregation in neighborhood networks to assess the impact of ethnic homophily relative to general opportunities for contact.

The finding of a negligible influence of ethnic minority presence on local neighborhood ties contrasts with previous studies, which report negative associations between neighborhood presence of distinct ethnic groups and neighborhood contacts (Gijsberts et al. 2012; van der Meer and Tolsma 2014). Three factors might explain this difference. First, the specific adjustment strategy and comprehensive set of variables used in this study could account for the negligible association. Assuming these adjustments were correct, future research should determine whether these results generalize to other countries or cohorts of movers. Second, the relatively small sample size could result in low statistical power, making it difficult to detect a true effect, especially in neighborhoods with high-minority shares. Beyond raising this statistical issue, the small remaining sample in these neighborhoods after five years points to an important theoretical mechanism that likely contributes to lower cohesion on the neighborhood level: the frequent out-migration from high-minority areas creates holes in neighborhood networks. Third, the two cohorts of movers studied here may not experience the negative effects of minority presence that longer term residents do. This raises questions about the experiences of long-term stayers who have witnessed demographic changes in neighborhoods that now have high-minority shares. Such experiences may cause a disconnect with the social environment (Laurence and Bentley 2016). However, my results imply that any potential lower connectivity among long-term stayers does not hinder newcomers from forming ties. Addressing the issues surrounding long-term stayers is complicated by the methodological issues raised in this article and requires sufficient long-term data on neighborhoods and selection processes. Another fruitful avenue for future research is a shift in studying neighborhood as the primary unit of analysis. Specifically, examining changes in the aggregate networks of ties between neighbors could explore the strategies that individuals use to build ties in different neighborhoods and how out-mobility (as an eradication of network nodes) contributes to lower cohesion.

Although the literature on diversity effects is rich in theoretical explanations (Dinesen et al. 2020; Schaeffer 2014; van der Meer and Tolsma 2014), there is a notable lack of studies that evaluate the causal relationship between ethnic diversity and cohesion. Adopting a causally informative selections-on-observables approach, this study suggests that the presence of ethnically distinct groups in neighborhoods does not impair the formation of one-to-one interactions in neighborhoods. In contrast to Putnam (2007), who argues that ethnic diversity has short-term negative effects on social life, and addressing those effects may require large-scale efforts to forge new collective identities, the results here indicate that such efforts are not necessary for building ties between single neighbors in minority-concentrated areas. Instead, the findings suggest that factors typically associated with minority presence, such as type of housing and socio-economic status of the residents, are key to understand the lower connectedness in neighborhoods with high-minority shares.

Notes

1 In the following, I refrain from using the term "diversity" to describe the ethnic composition of neighborhoods to avoid conceptual ambiguities that can translate into misleading interpretations of "diversity" effects (Abascal et al. 2023; Kustov and Pardelli 2018; Schaeffer 2013). In the empirical part, I operationalize ethnic composition as the share of ethnic minorities (see the Previous research and Data and measurement sections). The reasoning for this choice is outlined in the Measuring ethnic composition: ethnic diversity or share of ethnic minorities? section.

2 https://www.destatis.de/EN/Press/2023/04/PE23_158_125.html; https://worldpopulationreview.com/country-rankings/immigration-by-country. (accessed October 8, 2024).

3 See, for example, the 2011 German census, which allows visualization of the share of non-German citizens in geo-coded grids of 1 km^2: https://atlas.zensus2011.de/ (accessed October 8, 2024).

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