Dynamics of Segregation: Linking Lives and Life Courses across Changing Neighbourhoods

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Rationale and Positioning

Research on residential segregation has largely traced ethnic patterns and their drivers as static spatial outcomes (Galster & Sharkey, 2017; Kaupinnen & van Ham, 2019). Traditional scholarship, grounded in theories of spatial assimilation and place stratification, assume a linear relationship between socioeconomic mobility and spatial integration while neglecting the continual reshaping of urban contexts through selective mobility and demographic change. Recent frameworks, such as the social structural sorting perspective and cycle of segregation (Krysan & Crowder, 2017), spatial opportunity structures (Galster & Sharkey, 2017), multiple-context approaches (Park & Kwan, 2017), and vicious cycles of segregation (Tammaru et al., 2021), highlight that segregation experienced in one domain or life stage tends to be reproduced across others, and that intergenerational ties mediate social and spatial outcomes.

Building on this shift, a growing body of longitudinal research conceptualises segregation as trajectories unfolding across individual life courses. A life-course perspective situates residential (im)mobility within the temporal rhythms of individual and family lives, as they coincide with key transitions such as leaving home, entering work, or forming families (Coulter, van Ham, & Findlay, 2016). This approach emphasizes the cumulative imprints of neighbourhood exposures on social and economic outcomes (Manley, van Ham, & Hedman, 2020) and foregrounds the concept of linked lives, where residential choices are relational, shaped by social ties, obligations, and shared trajectories (Mulder, 2007). Thus, segregation is not merely the outcome of structural constraints or preferences but a process through which family strategies, intergenerational ties, and opportunity structures become spatially expressed.

Additionally, neighbourhood conditions remain a strong predictor for descendants of migrants, particularly those of non-European origins (McAvay, 2018), and only be partly mitigated through own and parental attainments or status (Sharkey, 2008; van Ham et al., 2022). Initial neighbourhood contexts, whether experience in childhood or the time of adult settlement, affect long-term residential trajectories and opportunities for spatial integration (Hermansen et al., 2022; Andersson, Musterd, and Galster 2018).

Despite the call for more holistic and dynamic approaches to segregation and neighbourhood (Tammaru et al, 2021; Hedman, 2011; Galster et al., 2007; Tienda, 1991), few studies integrate individual trajectories within evolving neighbourhood dynamics and contexts. This study addresses this gap by examining ethnic residential segregation as a dynamic, intergenerational process unfolding across life courses, while accounting for the dynamic nature of neighbourhood contexts. It explores how exposure to ethnically differentiated neighbourhoods during adolescence interacts with parental and individual backgrounds and socioeconomic attainments to shape residential trajectories in adulthood. The focus on Turkish-origin young adults in Belgium's largest cities offers an analytically valuable case, given their long-term immigration history in Belgium and the enduring spatial clustering observed across generations. In Brussels, for instance, increasing diversity coexists with persistent Turkish and Moroccan clusters, where residential immobility and within-neighbourhood moves prevail despite socioeconomic and educational progress (Imeraj & Gadeyne, 2024). By tracing long-term residential trajectories across changing neighbourhood contexts, this study moves beyond cross-sectional accounts of segregation to capture *in-situ* neighbourhood change and cumulative exposure

over time, thereby rethinking ethnic residential segregation as a non-linear, path-dependent process shaped by linked lives, cumulative inequality, and evolving urban contexts.

Data and Methods

This study investigates residential trajectories and patterns of ethnic segregation among descendants of Turkish immigrants in Brussels, Ghent, and Antwerp through a longitudinal life-course lens. Using unique longitudinal linked Belgian census and population register data, it traces individuals born between 1984 and 1986 with at least one parent with Turkish descent over a 24-year span and enables a fine-grained analysis of neighbourhood exposure across the transition to adulthood.

Unlike conventional typologies of fixed "high" or "low" diversity or segregation categories, this study adopts a dynamic, data-driven approach and typology to capture neighbourhoods' co-varying changes in diversity and segregation over time. The typology relies on several indices for diversity and sergeration. Neighbourhoods are grouped into typologies based on co-variation in diversity and segregation, using indicators such as the Location Quotient (LQ) for ethnic concentration, the Fractionalization Index (FI) for diversity, and a normalized LQ-based measure for segregation. Together, these indicators trace how ethnic composition and balance shift within and across city neighbourhoods over time.

Residential trajectories are then modelled using sequence analysis (TraMineR in R), where each individual's annual neighbourhood type constitutes a state in the sequence. Pairwise sequence dissimilarities are calculated through optimal matching, and the resulting distance matrix is subjected to two-step clustering: first using the Ward method to identify initial structure, followed by Partition Around Medoids to optimize cluster assignment. The robustness of the clustering solution is validated by the Average Silhouette Width.

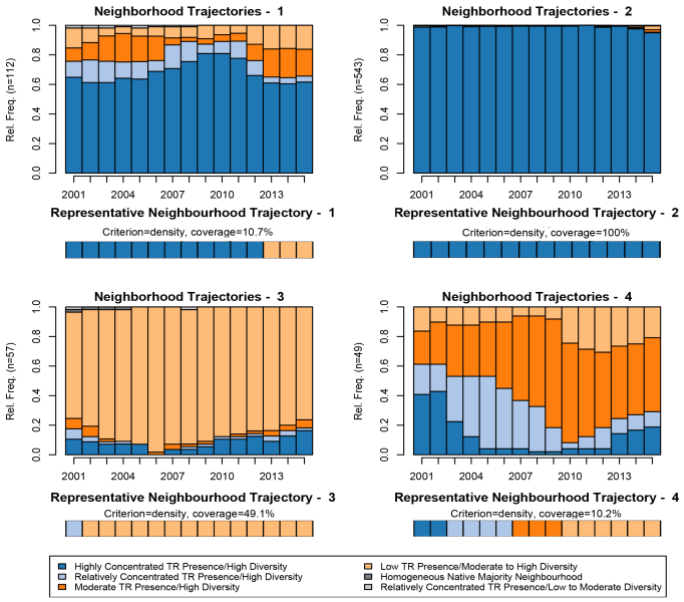
To identify factors associated with different trajectory types, a multinomial logistic regression model estimates the probability of belonging to each cluster based on individual (gender, age of arrival in Belgium, education level in adulthood) and family-level (parental migration background, parental education level, and parental housing tenure) variables. This design captures how life-course timing, intergenerational resources, and cumulative (dis)advantages structure patterns of residential (im)mobility over time.

Preliminary Findings

Preliminary analyses, based on a subset of linked census and register data covering the years 2001–2015, provide an initial overview of the residential trajectories among Turkish-origin youth in Brussels. Although the full dataset (2001–2024) and refined segregation indicators are still being integrated, early results reveal meaningful patterns of spatial persistence, selective (im)mobility, and intersectional differentiation.

Sequence and cluster analysis identified four main residential trajectory types. The largest cluster (71.4% of the cohort) shows long-term stability in neighbourhoods characterised by high Turkish concentration, underscoring the role of co-ethnic networks, local infrastructures, and cultural familiarity in shaping residential continuity. A smaller group (14.7%) moved from high-concentration to more mixed neighbourhoods, suggesting partial upward residential mobility, while another (7.5%) relocates early to diverse, low-Turkish neighbourhoods and remains there, reflecting selective detachment from co-ethnic clustering. The smallest cluster (6.4%) shows gradual transitions from Turkish-dense to moderately diverse areas. Cluster robustness validated by an Average Silhouette Width of 0.708, indicates a well-defined trajectory structure. Across all clusters, transition matrices reveal strong path dependence: once individuals settle into a certain neighbourhood type, they tend to remain there. This stability highlights the enduring influence of early-life

neighbourhood exposure on subsequent mobility and the cumulative processes through which segregation is reproduced across the life course.



Preliminary multinomial regression models indicate that gender, migration timing, and family composition are central in differentiating trajectories. Women are more likely than men to move out of Turkish-concentrated areas, pointing to gendered life-course transitions linked to education, employment, and household formation. Those who arrived after early childhood also show greater likelihood of residing in diverse, low-Turkish neighbourhoods, potentially reflecting weaker ties to established co-ethnic networks or alternative pathways through education and labour markets. Family structure also matters. Individuals from households where only the mother is Turkish are somewhat more likely to exit high-concentration areas than those from dual-Turkish-parent households, possibly due to different relational resources or residential strategies. In contrast, parental education and housing tenure appear to exert limited effects once migration timing and gender are accounted for, suggesting that structural opportunity and social embeddedness outweigh static socioeconomic characteristics.

Multinominal Logit Model of Residential Trajectories, Average Marginal Effects and Standard Errors, N=761

Predictor & contrast	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Arrival Time (ref. Born in BE)				
Early childhood	−0.053 (0.057)	−0.013 (0.090)	0.113 (0.072)	−0.047 (0.041)
Later arrival	0.034 (0.104)	**−0.191** (0.160)	**0.242** (0.150)	**−0.085*** (0.017)**
Father's Education (ref. None)				
Low	−0.072 (0.065)	0.039 (0.080)	0.015 (0.046)	0.018 (0.044)
Post-secondary	−0.127 (0.086)	0.063 (0.121)	0.068 (0.081)	−0.004 (0.069)
Unknown	−0.031 (0.079)	0.044 (0.094)	−0.029 (0.045)	0.016 (0.052)
Mother's Education (ref. None)				
Low	0.007 (0.054)	−0.067 (0.071)	0.020 (0.040)	0.041 (0.039)
Post-secondary	0.052 (0.204)	−0.110 (0.213)	0.111 (0.130)	−0.054 (0.029)
Unknown	−0.012 (0.073)	−0.001 (0.098)	0.013 (0.060)	0.000 (0.051)
Gender (Female vs. Male)	**0.190*** (0.048)**	**−0.173** (0.057)**	0.009 (0.030)	−0.026 (0.031)
Housing tenure (Rent vs. Own)	−0.010 (0.069)	−0.058 (0.106)	0.031 (0.060)	0.037 (0.077)
Turkish-Parent Type (ref. Both Parents Turkish)				
Father-only	0.080 (0.117)	−0.157 (0.139)	0.078 (0.083)	−0.001 (0.081)
Mother-only	**−0.122** (0.040)**	0.039 (0.093)	**0.165** (0.086)	**−0.083*** (0.017)**

Notes: Standard errors in parentheses; average marginal effects calculated with other covariates values as observed; *P < 0.05, **P < 0.01,and ***P < 0.001.

These findings remain preliminary and will be revisited with the extended 2001–2024 dataset, which allows the inclusion of socioeconomic attainments of individuals in adulthood (as of 2021), such as their educational level,

employment status, into the multinomial model. This will enable testing how individuals' later-life achievements mediate or reinforce early residential pathways, thus operationalizing the cumulative (dis)advantage mechanisms central to life-course theory. Forthcoming analyses will also employ refined neighbourhood typologies integrating a normalized LQ-based measure over 24 years across Brussels, Gent, and Antwerp. These metrics capture the internal variability and proportional imbalance of ethnic composition, providing a more precise account of segregation intensity and its evolution. Together, these extensions will strengthen the explanatory power of the study by linking dynamic neighbourhood change, intergenerational context, and individual life-course trajectories within a unified analytical framework.

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