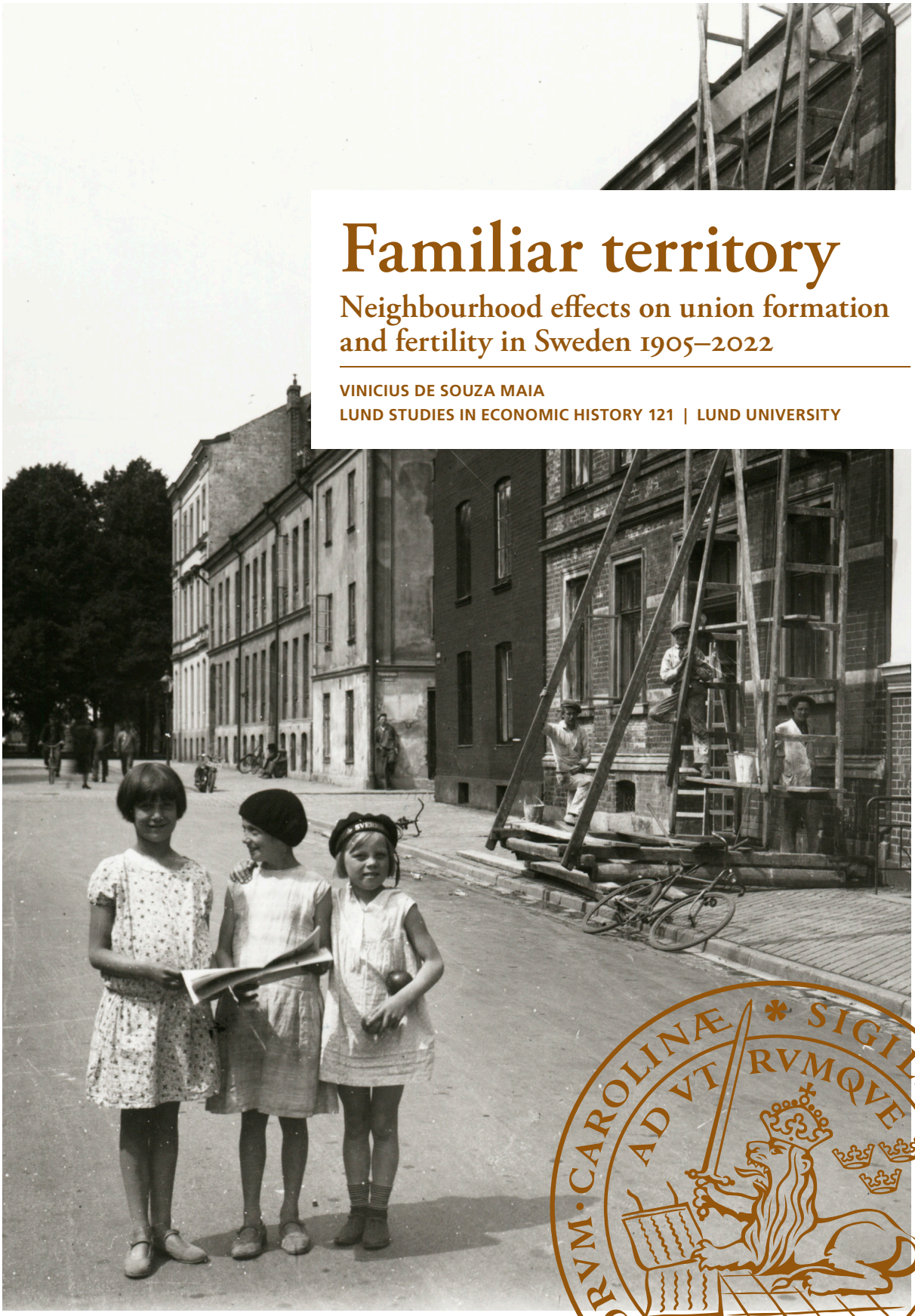

Familiar territory

Neighbourhood effects on union formation and fertility in Sweden 1905–2022

VINICIUS DE SOUZA MAIA

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Familiar territory

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Abstract:

Our relationships with others structure many aspects of our lives, especially during important moments such as choosing an education, entering the workforce, forming partnerships or starting a family. While the influence of family and parenting has been widely studied, less is known about the role of non-family connections, such as neighbours. One reason is that the data needed to study these relationships is often difficult to obtain.

This dissertation contributes to this field by expanding existing high-quality longitudinal databases with detailed geographic information, allowing for a richer understanding of people's neighbourhood environments across their lives. Using advanced spatial methods, I construct measures that reflect the social settings in which children grew up and young adults lived, following them to union formation and fertility later in life.

The thesis links historical and contemporary Sweden. It studies early 20th-century demographic patterns in Landskrona, a mid-sized industrial city in southern Sweden. It then follows individuals who spent their childhoods in Landskrona during the mid-century and tracks their lives into adulthood. Finally, the study turns to contemporary Sweden, examining national trends in union formation.

The findings show that neighbourhoods in the past were less socioeconomically segregated than they are today. Nevertheless, living among high-status neighbours was associated with a greater likelihood of marrying, marrying someone with higher education or social status, and postponing parenthood. These patterns were generally observed across social backgrounds, though some effects were context and outcome dependent.

In summary, the findings highlight the role of collective socialisation processes within neighbourhoods, that is, the ways in which individuals are influenced by those around them, both directly and indirectly. The evidence indicates that social interactions in neighbourhood settings are linked to demographic behaviours in adulthood, even in contexts where socioeconomic segregation is relatively low. In light of increasing segregation trends in Sweden and other parts of Europe, this dissertation contributes to ongoing research and policy discussions concerning neighbourhood environments and the influence of non-family social networks on individual life trajectories.

Key words: neighbourhood effects, union formation, marriage, partner selection, assortative mating, fertility, fertility timing, social-interactive mechanisms, cure models, competing risks, k-nearest neighbours, event-history, Sweden, life course.

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Vinicius de Souza Maia

LUND
UNIVERSITY

Cover image: *Prästgatan mot Sofia Albertina närmast Anton Hagmans hus. By* Anton Hagman 1925. Reprinted with permission from the Landskrona Museum.

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MADE IN SWEDEN

To Laura, Linete and Cipriano

Terra
Terra
Por mais distante o errante navegante
Quem jamais te esqueceria
Caetano Veloso

If you can't see the life around you
You'll always walk alone
Michael Kiske

Table of Contents

List of figures

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Doing a PhD is inevitably a challenge, even under the best of circumstances. Doing so alone would be impossible. It is a collective achievement and the fact that a single name is printed on the cover of this thesis does not do it justice. Writing these words fills me with a deep sense of gratitude for each and every one who extended a helping hand throughout these turbulent four years.

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List of papers

I. Social-class segregation in Landskrona. *Co-authored with Gabriel Brea-Martinez, Finn Hedefalk and Therese Nilsson. Published in M. Dribe, T. Nilsson and A. Tegunimataka (Eds), (2024). Urban lives: An industrial city and its people during the twentieth century, by Oxford University Press.*

II. Neighbourhood effects in the marriage transition: a cure model analysis of Landskrona (Sweden), 1905–1967. *Single authored.*

III. Local context and marriage choices: the role of neighbourhood status in early 20th-century southern Sweden. *Single authored.*

IV. Childhood neighbourhoods and life-time fertility in twentieth-century Southern Sweden: A *k* -nearest neighbour approach. *Co-authored with Martin Dribe and Finn Hedefalk. Published in Population, Space and Place (2024)*, 30(7).

V. Childhood neighborhoods and partner selection by education, Sweden 1990–2022. *Co-authored with Martin Dribe and Finn Hedefalk*.

In Papers I, IV and IV, which are co-authored, the conceptualization, research design and final conclusions were done collectively. I have conducted statistical and spatial analysis, and contributed to the draft of the manuscript and final revision in Paper I. I have conducted geocoding and creation of databases, statistical analysis, drafted the first version of the papers and contributed more than 50% of the final work in Papers IV and V.

Related papers

The long-term effect of childhood family and neighborhood poverty on adult income: A Swedish cohort study (1947–2015). *Co-authored with Gabriel Brea-Martinez and Finn Hedefalk*. *Under review*.

Introduction

Motivation and aim

The social sciences are built on the premise that human development and behaviour are shaped by social-interactive contexts, such as families, friendships, labour relations, and local communities. Local contexts such as neighbourhoods are not just physical spaces or administrative units, but social environments where individuals interact, form networks, and are exposed to norms and resources that influence life decisions (Galster & Sharkey, 2017; Wilson, 1987). These social processes are important determinants of demographic outcomes. However, because of the scarcity of adequate data and methodological challenges, it has been difficult to reach a consensus on neighbourhood effects until very recently. As a result, their importance in explaining demographic patterns and changes has been underestimated (Chyn & Katz, 2021).

Moreover, urban areas are marked by striking differences between neighbourhoods, not only in their built environments, but also in the lived experiences of their residents. These boundaries, sometimes as subtle as a single street, structure opportunities, behaviours, and life chances. While it is widely acknowledged that growing up in different neighbourhoods can have lasting consequences, the mechanisms underlying these effects are often overlooked in demographic research.

Over the last 30 years, the field has grown substantially (Oakes et al., 2015), and the perspectives on it have broadened. Neighbourhoods are not merely sites of concentrated poverty, but environments of social interaction, socialisation and intergenerational transmission of resources (Galster & Sharkey, 2017; Sampson et al., 2002; Sampson, 2012). Historically, the literature has focused on concentrated poverty and neighbourhood disadvantage (Friedrichs et al., 2005; Sampson et al., 2002; Wilson, 1987), but recently, neighbourhood advantage has been highlighted for its role in individual's life chances (Brea-Martinez et al., 2024; Brandén et al., 2023; Hedefalk & Dribe, 2020; Malmberg & Andersson, 2019).

The implications of neighbourhood context for life chances are of obvious policy relevance, and have received much attention from government programs. In the United States (U. S.), initiatives such as Gautreaux, Moving to Opportunity (MTO), and Denver Housing Authority residential relocation programs are often at the centre of both scholarly and policy debates (Eshaghnia & Heckman, 2025;

Sampson, 2012). In Sweden, while the approach towards housing is more universalistic, with roots in the ambitious goals of the Million Homes Program (Hall & Vidén, 2005), recent initiatives to improve public safety and overhaul deprived areas have also put neighbourhoods under scrutiny (Gerell et al., 2022). Unlike family background, which is considerably more difficult to address directly, neighbourhood context is often seen as amenable to intervention, with optimistic expectations for affected individuals, although the effectiveness of such interventions is controversial.

The neighbourhood effects literature has sought to connect the consequences of spatial segregation to individual life trajectories. However, much of the existing research has focused on socioeconomic status (SES) and health outcomes (e.g. Andersson et al., 2023; Brandén et al., 2023; Hedefalk & Dribe, 2020; Hedefalk et al. 2023, 2025; Hedman et al., 2015; Wodtke et al., 2011), with less attention paid to core demographic processes such as partnering, marriage, and fertility (Chetty & Hendren, 2018; Malmberg & Andersson, 2019).

Early studies often relied on cross-sectional data, which posed challenges related to reverse causality and selection bias (Crane, 1991; Hogan & Kitagawa, 1985). Later longitudinal approaches have improved upon these limitations and advanced our understanding of mechanisms (Baumer & South, 2001; South & Baumer, 2000; South & Crowder, 1999, 2000, 2010), but they have often faced short follow-up periods and limited geocoded data. Much of the recent work has tried to address these issues (Haandrikman, 2019; Malmberg & Andersson, 2019), but much remains to be done, particularly in relation to marriage timing and probability, partner selection, fertility timing and completed fertility. These outcomes are especially understudied in historical contexts and outside large metropolitan areas.

Moreover, there is still no consensus on the mechanisms driving neighbourhood effects (Galster, 2012). Questions remain about the relative importance of long-term exposure during critical life stages versus the influence of current neighbourhood conditions, and understanding these mechanisms is important from both research and policy perspectives (Galster et al., 2015). Furthermore, debates persist about whether neighbourhood effects are distinct from family background, as neighbourhoods themselves reflect parental resources and residential choices (Eshaghnia, 2023; Harding et al., 2021). Despite these challenges, the literature increasingly recognises that neighbourhoods exert independent influences through social interaction, socialisation, and the transmission of resources and norms (Chyn & Katz, 2021; Sampson, 2012).

In summary, this thesis is motivated by the need to better understand how neighbourhood contexts influence demographic behaviour across the life course. I use new geocoded data and advanced spatial methods to provide evidence on the long-term effects of neighbourhoods on union formation and fertility, building on previous studies while addressing common issues, such the scarcity of detailed

longitudinal geographic measures. In doing so, this research highlights the demographic significance of neighbourhoods as settings in which social processes affect life course outcomes. Hopefully it will also help those interested in interventions understand the consequences of neighbourhood context on demographic outcomes.

Aim, research objectives, and outline of the thesis

The aim of the thesis is to investigate how neighbourhood context influences family formation, specifically union formation and fertility. The overarching research question of this thesis is: To what extent do neighbourhood environments in childhood, adolescence and early adulthood shape demographic outcomes such as partnering, marriage, and fertility? I approach this question by consistently measuring neighbourhood context in childhood and early adulthood and linking these environments to later-life outcomes using longitudinal data, event-history and life-course modelling, and advanced spatial methods. Furthermore, I aim to extend neighbourhood studies into the past, addressing a gap in the current literature.

The analytical strategy combines descriptive and spatial demographic techniques with multivariate and event-history analysis. Time-varying variables are used to follow individuals over time, while cross-sectional analyses assess long-term effects. This life-course approach contributes to our understanding of how early conditions shape later demographic behaviour and helps address concerns around reverse causality and selection bias.

Methodologically, I improve upon existing data sources and apply state-of-the-art techniques to produce reliable and comparable estimates of neighbourhood effects. I control for established determinants of demographic behaviour, such as parental social class and education, household and individual characteristics, and marriage market indicators, to isolate the role of neighbourhood context. Importantly, I focus on demographic outcomes that have received less attention in the neighbourhood literature, namely union formation and fertility.

The aim of the thesis is operationalised through four research objectives:

- **RO1**: create geocoded data sources that enable the analysis of historical segregation patterns and neighbourhood effects.
- **RO2**: describe segregation trends in the first half of the 20th century, a period for which no current quantitative data exists.
- **RO3**: improve our understanding of the long-term effects of childhood conditions beyond family background and individual characteristics, in both historical and contemporary contexts.

- **RO4**: contribute methodologically and substantively to the literature on neighbourhood effects on partnering, marriage and fertility, with a focus on long-term and life-course effects.

RO1 underpins the empirical work by providing the necessary data. RO2-RO4 guide the applied analyses. These objectives are realised in five papers:

- **Paper I** examines segregation patterns in Landskrona from 1905 to 1967, providing essential context on the spatial distribution of social classes for the historical analyses that follow.
- **Paper II** investigates the relationship between neighbourhood status and the probability and timing of marriage, exploring variation over time and by social class.
- **Paper III** analyses neighbourhood influences on partner selection by social class origin, linking neighbourhood context to trends in assortative mating.
- **Paper IV** bridges the historical and contemporary analyses by following individuals born in Landskrona between 1939 and 1967, linking their childhood neighbourhoods to fertility behaviour in adulthood using national register data up to 2015.
- **Paper V** focuses on cohorts born between 1974 and 1982, examining how adolescent neighbourhood contexts relate to the educational attainment of their partners later in life in the period 1990–2022.

Papers I, II and III draw on the geocoded data developed in RO1. Paper I addresses RO2 by describing segregation patterns. Papers II and III contribute to RO4 through analyses of marriage and partner selection. Papers IV and V address RO3 and RO4 by linking early-life neighbourhood contexts to adult demographic outcomes.

Together, these studies provide a comprehensive account of how neighbourhood contexts influence family formation over a century of Swedish history, encompassing partnering, long-term cohabitation, marriage, and fertility across both historical and contemporary periods.

Contribution

The thesis makes significant contributions to the literature in several ways. First, it contributes to neighbourhood studies by providing a uniquely detailed spatial and temporal reconstruction of urban development in Landskrona, enabling the study of neighbourhood effects with high geographic precision. By integrating address-level and block-level geocoded data with historical maps, aerial photography, and population registers, the dataset captures the evolution of the built environment and residential patterns from 1905 to 1967. The ability to locate households within specific urban contexts over time allows for nuanced analyses of how neighbourhood characteristics influence individual life courses. This longitudinal spatial framework offers a valuable resource for examining the interplay between urban planning, socio-economic conditions, and demographic outcomes at the neighbourhood level.

The thesis also advances neighbourhood studies by demonstrating how spatial context affects life course outcomes in historically contingent and gendered ways. It shows that Landskrona, despite its modest size, followed urban development patterns similar to larger cities, allowing for the study of suburbanisation and social stratification. It also reveals that neighbourhoods influenced marriage behaviour through gendered opportunity structures, with high-status contexts reinforcing career-family trade-offs for women and becoming increasingly beneficial for men as economic conditions improved. The findings further show that neighbourhoods affected partner selection, supporting theories of collective socialisation and third-party influence, while showing limited evidence for relative deprivation. The work highlights the role of childhood neighbourhoods on fertility timing later in life, particularly among higher-status groups, though completed fertility was more influenced by adult conditions. Furthermore, the thesis demonstrates that adolescent neighbourhoods significantly affect educational homogamy, suggesting that partner preferences are formed early and shaped by local peer networks and normative exposure. These findings demonstrate the importance of neighbourhood context in shaping demographic behaviour and social inequality, especially in settings with moderate segregation and relatively stable educational structures.

Finally, Sweden offers a compelling case: its relatively low social inequality and strong welfare state make it an interesting foil to more unequal contexts. If neighbourhood effects are found here, it strengthens the argument for their relevance elsewhere.

Theory and previous research

What is in a neighbourhood?

Neighbourhoods are one of many social contexts that individuals inhabit throughout their lives, alongside families, schools, peer groups and institutions. The definition of neighbourhood varies, sometimes defined by shared social-structural issues such as concentrated poverty, joblessness, and limited access to mainstream institutions (Wilson, 1987). Others argue for more dynamic definitions, highlighting a research-oriented approach, that places human agency and dimensions of local social and spatial context of interest, analytical tools and available data as the building blocks for a neighbourhood definition (Entwisle, 2007). Sampson (2012) argues for a definition of neighbourhood based on shared life contexts of residents, or socially embedded contexts. Neighbourhoods are not geographic units, but meso-level social systems, with their patterns of interaction, shared norms, institutional presence and collective efficacy. Van Ham et al. (2012) argue for a context-dependent and multidimensional concept of neighbourhood, accounting for both its physical boundaries and social perceptions. The authors see neighbourhoods as socially constructed spaces where interactions, reputations and shared norms influence individual outcomes.

These two definitions overlap significantly and form the basis for the definition I adopt in this thesis. I consider neighbourhoods to be socially embedded, meso-level contexts, but unlike Sampson (2012) and Van Ham et al. (2012), I focus primarily on the social-interactive and social capital aspects of neighbourhoods. One of the consequences of this choice is that geographic aspects like centrality, density and physical infrastructure take a backseat to the role of shared social environment. Another is that diverse geographic contexts are treated as similar if their social context characteristics are similar, and vice versa for areas that are geographically close but socially distinct.

While neighbourhoods can be treated as hierarchical units (individuals nested within households, households within neighbourhoods, and so forth), this structure oversimplifies the dynamic and reciprocal relationships between these contexts. Neighbourhoods can shape household behaviour, for example by influencing parenting strategies in response to local stressors (Elder et al., 1995) and are differentially affected by economic crises depending on their physical, historical and demographic characteristics (Rugh et al., 2015). These interactions create feedback loops of advantage and disadvantage across generations (Galster & Sharkey, 2017), requiring complex models that account for family background, local opportunity structures and normative climates (Brewster, 1994).

Neighbourhoods can be understood as meso-level contexts in which individuals are embedded throughout their lives, encompassing residential location, social networks, and elements of social capital (Balbo et al., 2012). These contexts often overlap with kin propinquity, though the two literatures have typically operated at different scales. Neighbourhood studies focus on local communities and interactions with non-family actors, while kin propinquity research tends to examine broader spatial contexts, such as cities (Kolk, 2017), where strong family ties do not necessarily require close physical proximity (Granovetter, 1973, 1983).

This section introduces segregation as a precursor to neighbourhood effects, as it affects the spatial distribution of social groups and resources. It then connects neighbourhood context to the life course, recognising it as a useful lens to understand context exposure and life chances. Theoretical models are presented to explain how neighbourhoods influence individual behaviour through mechanisms such as social norms, resource access, and institutional constraints. Specific outcomes, including union formation and fertility, are then examined through a review of existing research. Finally, the section addresses heterogeneity in neighbourhood effects, considering variation by individual characteristics and neighbourhood types.

Segregation and the origins of neighbourhood effects

Segregation is a key mechanism in the formation of neighbourhoods. Historically, cities have been divided by SES, ethnicity and religion, enforced through institutional arrangements such as walled districts, ethnic enclaves, legal apartheid systems, restrictive covenants and discriminatory lending practices (Nightingale, 2016). Segregation may be voluntary, driven by homophilic preferences (Schelling, 1971), or imposed through structural discrimination (Logan, 1978; Yinger, 1995). Proximity to kin and intergenerational transmission may also contribute to spatial homophily (Jarvis et al., 2023), making segregation both a cause and consequence of social reproduction. Segregation is a persistent and cyclical process, inscribed in the existing urban structure, and reinforced by SES patterns in residential mobility (Krysan & Crowder, 2017). For some, segregation is a permanent feature of urban life, maintained through institutional arrangements that serve the interests of the elite (Nightingale, 2016). Others see it more as the outcome of competing social forces, which vary across contexts and time (York et al., 2011).

Three major theoretical frameworks explain segregation: preferences (Clark, 1991), spatial assimilation (Massey & Denton, 1985), and place stratification (Logan, 1978). Preferences suggest that segregation patterns are primarily driven by homophilic tendencies, or the desire to live near others who are similar to themselves. SES groups and ethnic communities, for example, tend to cluster geographically because individuals prefer proximity to peers and avoid those

perceived as different. This framework aligns with Schelling's (1971) model, which demonstrated that, in theory, even minimal homophilic preferences can produce pronounced segregation over a long enough period.

Spatial assimilation theory (Massey & Denton, 1985), by contrast, suggests that homophilic preferences are dynamic. Individuals may be willing to adjust their residential choices and openness to diversity over time. It has been used to explain long-term trends in socioeconomic segregation in the U. S., suggesting that newly arrived migrants lack the resources to access majority-dominated neighbourhoods. Conceptually, newly arrived migrants lack the social, cultural and economic resources to acquire scarce spatial resources, which are held predominantly by the majority. However, as immigrants gradually assimilate economically and culturally, they slowly convert their resources into spatial resources, and socioeconomic segregation diminishes.

Place stratification theory offers a more structural perspective. Logan (1978) argues that segregation is maintained not merely by individual preferences or resource limitations, but by external forces, both formal institutions and informal practices, that reinforce segregation. As Krysan and Crowder (2017) emphasize, various forms of discrimination restrict access to integrated neighbourhoods, even for individuals with the desire and the means to live in more diverse communities.

Regardless of its origins, segregation raises important questions about its consequences. The neighbourhood effects literature emerged to address these questions, asking how growing up in different neighbourhood contexts shapes life chances, preferences and behaviours. I examine segregation trends in Paper I using the block-level data created for Landskrona (Hedefalk & Souza-Maia, 2023), descriptive spatial patterns analysis and exposure segregation measures.

Neighbourhood effects and the life course perspective

Neighbourhood effects research is closely aligned with the life course tradition in the social sciences, which emphasises how conditions at different stages of life shape long-term outcomes (Elder, 1977). This perspective is particularly relevant for understanding how early-life environments, such as childhood neighbourhoods, interact with family background and institutional settings to influence later decisions and behaviours.

A central concern in the neighbourhood effects literature is the distinction between compositional and contextual effects. Since neighbourhoods often reflect family resources and residential preferences, it is challenging to determine whether observed outcomes are due to the neighbourhood itself or the characteristics of the families who live there (Harding, 2003; Harding et al., 2021; Jencks & Mayer, 1990; Wilson, 1987). This issue is especially salient in studies of childhood development,

where parental SES, parenting styles and mobility patterns are known to strongly influence life chances.

Contemporary research continues to grapple with this challenge, seeking to isolate the independent role of neighbourhood context beyond well-established family-level determinants. The life course approach is particularly useful here, as it enables researchers to track how early exposures accumulate and interact with subsequent experiences. It also encourages attention to timing, sequencing and duration of exposure. Altogether, these factors are crucial for understanding how neighbourhoods shape demographic outcomes such as union formation and fertility. A life course perspective informs the analytical framework across all papers, incorporating age, period, and cohort effects, modelling neighbourhood exposure across distinct life stages, and differentiating between long-term and contemporaneous influences.

Neighbourhood theory and family dynamics

Neighbourhood theory provides a framework for understanding how local environments shape individual behaviour and life outcomes. Galster (2012) categorises neighbourhood mechanisms into four broad types: social-interactive, environmental, geographical, and institutional. Social-interactive mechanisms refer to endogenous processes within neighbourhoods, such as peer influence, role modelling, and social norms, which influence individual attitudes and behaviours across the life course. Environmental mechanisms involve natural and man-made features, like pollution or noise, that affect residents' well-being without necessarily altering behaviour. Geographic mechanisms relate to the neighbourhood's location in relation to broader political and economic structures, such as proximity to employment opportunities or kin networks. Institutional mechanisms involve external actors, including schools, healthcare providers, or police, who control important resources within the neighbourhood but do not reside there. These mechanisms interact in complex ways, and their influence may vary depending on the life stage, SES background, and individual characteristics of residents.

Among these types, social-interactive mechanisms are particularly relevant to understanding family dynamics. Processes such as union formation, fertility behaviour, household composition, gender roles, and parenting practices are shaped by social relationships both within and beyond the family. These dynamics are influenced by socialisation, peer interactions, parental guidance, and access to resources embedded in social networks. Understanding how these contextual social processes influence demographic behaviour is important for explaining variation in union formation and fertility at the individual level.

Several theoretical models have been developed to explain how neighbourhoods influence behaviour. Collective socialisation theory (Wilson, 1987) emphasises the role of adult role models in guiding youth toward mainstream pathways, including education, employment, and formal marriage. The presence or absence of such figures shapes young people's perceptions of opportunity and influences their attitudes and behaviours. Social contagion and peer effects theory (Crane, 1991) suggests that behaviours, positive or negative, spread through peer networks.

By contrast, relative deprivation theory (Turley, 2002) posits that individuals assess their well-being relative to their neighbours. Those with fewer resources may feel socially distant from more affluent neighbours, which can affect their social integration and life choices. Resource competition theory offers a complementary perspective, arguing that neighbourhood resources, such as quality schools or access to potential partners, are limited and unequally distributed. Residents with greater resources are better positioned to access local assets, leaving others at a disadvantage.

In turn, parental mediation theory focuses on how neighbourhood conditions affect parents, who in turn influence their children. Stressors such as poverty or violence may alter parenting styles, coping mechanisms, and emotional availability, thereby shaping children's development and future family behaviour (Elder et al., 1995).

Given the diversity of theories and mechanisms, some scholars classify their expected effects according to diverse criteria. Jencks and Mayer (1990) distinguish between beneficial, detrimental, and irrelevant effects of advantaged neighbours. Beneficial theories, such as peer effects, collective socialisation, and parental mediation, suggest that higher neighbourhood SES leads to better outcomes. Detrimental theories, such as relative deprivation and resource competition, suggest that affluent neighbours may exacerbate inequality. Irrelevance theories, often rooted in economic models, contend that individual and family characteristics override neighbourhood influences.

Irrelevance theories are connected to the oft-discussed issue of neighbourhood selection. The underlying phenomenon in neighbourhood selection is socially stratified residential mobility. Because urban areas have scarce spatial resources, families compete for the most desirable areas using economic and social means at their disposal. These resources interact with the historical development of urban areas, public policies and social relations to produce highly unequal urban spaces (Gottdiener, 1994). This underlying phenomenon affects statistical models of neighbourhood effects because this process of residential sorting into neighbourhoods by SES and resources is not easily disentangled from the context measures used in neighbourhood studies (Ellen & Turner, 1997).

Economists often approach selection problem with an individualistic lens, prioritising personal traits and decisions over contextual or structural influences (Jencks & Mayer, 1990). Even those who acknowledge the importance of family and parenting tend to downplay neighbourhood effects, arguing that strategic relocation by parents explains outcome differences (Heckman & Landersø, 2022). This view, however, conflates two distinct endogeneity issues: compositional and consequential. While it is true that neighbourhood composition reflects residential choices, this does not negate the possibility that neighbourhoods themselves shape life outcomes. In fact, strategic relocations by parents implicitly affirm the importance of neighbourhood context: seeking better schools, safer environments, and stronger peer networks.

Concerns arise out of a mismatch between the experimental evidence and observation studies (Harding et al., 2021), noting limited improvements in economic outcomes and even negative effects for some, once selection bias is accounted for (Clampet-Lundquist, 2011), and the role of parental residential location strategies in determining child outcomes (Heckman & Landersø, 2022).

Several residential relocation programmes in the U. S. have served as experimental settings for studying neighbourhood effects, most notably the Moving to Opportunity (MTO) programme (Katz et al., 2001). Designed with a randomised voucher system to relocate families from high-poverty to lower-poverty neighbourhoods, MTO was expected to offer a definitive test of neighbourhood effects, overcoming the limitations of observational studies. The high expectations for causal identification made it a landmark in the field, with the potential to confirm or refute the theoretical relevance of neighbourhood context (Sampson, 2012). However, initial results showed limited impact on employment, income, and welfare receipt (Katz et al., 2001), leading some to question the significance of neighbourhoods. Yet, the programme did improve safety and well-being, and later analyses revealed that families often moved to only marginally better areas (Sampson, 2012). Long-term follow-ups found positive effects on children's outcomes (Chetty et al., 2016), suggesting that neighbourhood influences may be gradual, cumulative, and context dependent.

Sampson (2012) proposes an alternative view of selection and causality in neighbourhood studies. He argues that neighbourhoods are not passive backdrops but active social structures that shape individual outcomes because of their role as durable social structures. Selection bias is part of the causal process and merges with social organisation, norms, and institutional arrangements embedded in places. Through mechanisms like collective efficacy and durable spatial inequality, neighbourhood context constrains and enables individual choices, contributing to the production of social outcomes.

Another source of scepticism relates to school effects, due to the prominent role schools play in the socialisation of children and adolescents. However, schools can also be understood as mediators of residential context, since school attendance is typically determined by neighbourhood catchment areas. In this way, the social and institutional characteristics of schools are closely tied to place of residence. The relative importance of school quality compared to peer influence and social networks has been questioned (South & Baumer, 2000), and in some contexts, schooling effects may be less relevant to life course transitions due to other overriding factors (Hedefalk & Dribe, 2020). Moreover, the limited availability of linked data that simultaneously captures both school and neighbourhood environments has constrained the ability to fully assess the effects of schooling relative to those of neighbourhood. As a result, schooling plays a relatively minor role in this thesis, which focuses more directly on neighbourhood-based socialisation and meso-level mechanisms.

Despite these difficulties in measuring and identifying neighbourhood effects, neighbourhoods may influence union formation and fertility by influencing individual life courses both directly and indirectly (Brewster, 1994; Kalmijn, 1998; Elder, 1977). Social environments affect preferences, attitudes, and behaviours regarding family size, marriage timing, education, and partner selection. Social relationships, whether supportive or stigmatising, can constrain choices and influence outcomes. Neighbourhoods also form part of the opportunity structure, shaping the transition to adulthood and family life through both social norms and material conditions. These influences are cumulative and often interact with family background, institutional settings, and individual agency, making neighbourhood context an important component of family dynamics.

Union formation

Marriage in the early twentieth century was shaped by a combination of economic incentives and socially structured expectations. Economic theory, particularly Becker's model (1973, 1974), conceptualised marriage as a rational choice that enhanced household efficiency, reflecting a traditionalist division of labour where men specialised in market work and women in childbearing and household work. Social background and material conditions are also expected to affect the propensity to marry, whether marriage is considered desirable or even achievable (Cherlin, 2014). Throughout the 20th century, marriage was a route to household independence and family formation, but also a socially sanctioned life course transition (Elder, 1977), tied to the economic and cultural lives of working people (Van de Putte, 2007).

Sweden was no exception. Marriage decisions during this period were shaped by structural determinants, especially social class and economic resources (Quaranta & Stanfors, 2024; Sandström, 2017), reflecting access to material means and social

prestige. Although urbanisation was expected to weaken parental control over marriage choices (Shorter, 1979), class-based differences in marriage outcomes persisted. Economic independence, particularly for men, was often a prerequisite for establishing a separate household, and the time needed to accumulate sufficient resources could delay marriage or increase the risk of remaining unmarried (Engelen & Kok, 2003). These dynamics were further influenced by evolving gender norms and labour market opportunities (Stanfors & Goldscheider, 2017), underscoring the interaction between social background and economic conditions in the transition to marriage.

While family and economic factors have received considerable attention, other aspects of the life course, such as the local context, also have implications for marriage, although they have been less thoroughly examined. Neighbourhood context may contribute to decisions about marriage and family formation through attitudes and behaviours learned from role models and peers, preference formation from non-family actors, and the horizon of opportunities individuals consider, depending on the local context where they grow up (Wilson, 1987). Growing up in neighbourhoods with a social composition different from one's own may reduce the time to marriage and increase the likelihood of marrying, by altering social homophily preferences and lowering the perceived cost of intermarriage across class lines (Schwartz, 2013). This process may complement family socialisation and social mobility in shaping an individual's SES in adulthood, with implications for both the timing and probability of marriage.

Other aspects of geographic context also matter, including propinquity (Haandrikman, 2019; Morgan, 1981; Ramsoy, 1966), and the role of local organised settings where potential partners can meet, such as churches, sports clubs, associations, ballrooms, and workplaces (Kalmijn & Flap, 2001). These contribute to the opportunity structure of marriage by affecting how easily individuals can form social ties and meet potential partners. In areas with sparse social networks or higher levels of social isolation, partner search may be more difficult, potentially leading to lower marriage rates. We know that at the country (Kalmijn, 2011) and metropolitan area levels (Qian & Lichter, 2018), the availability of marriage partners is an important part of the opportunity structure of marriage, and it is possible that the same applies to local contexts. I examine union formation in Paper II, using adult neighbourhood context measures as proxies for exposure earlier in life, and cure models to address both the probability and timing of marriages. Union formation is also discussed in Papers III and V, but the analysis is primarily about partner selection and assortative mating.

Partner selection and assortative mating

Positive assortative mating (or homogamy) is the tendency of individuals to partner with those who are similar to themselves (Lichter & Qian, 2019). It is a feature of

social homophily, or the tendency that social groups have to promote relationships between individuals who are part of an in-group, whether that group is defined in terms of social class background, wealth and income, religious affiliation, ethnicity or educational level. Assortative mating patterns are the result of individual preferences, social group pressures and opportunity structures that increase the likelihood of such unions (Kalmijn, 1998).

A central aspect of assortative mating patterns is the partner market (Blau et al., 1982). Partner markets are abstractions of the search process for individuals with whom to form unions (Oppenheimer, 1988). Partners are either expected to match on shared traits or compete for the most desirable individuals, but regardless of the underlying mechanism, the results are often highly socially stratified unions (Schwartz, 2013). Intermarriage across group lines is less frequent (Lichter et al., 2007; Qian & Lichter, 2018), and often involves status exchange (Davis, 1941; Merton, 1941), where individuals from different backgrounds partner by exchanging desirable characteristics that compensate for the breaking of social homophilic tendencies. A classic example is female hypergamy, whereby women trade individual characteristics such as age or physical beauty for the social status or ethnicity of male partners.

These preferences for partner characteristics depend on gender relations in society. With a traditional division of labour, men specialise in paid work and women in unpaid housework, and education and SES of women are not of prime importance for partner choice (Becker, 1991; Blossfeld, 2009). Men's earnings potential is extremely important, while women's most important roles are those of mother and housewife. This results in a pattern of hypergamy, where husbands of higher social status marry lower status women in a process of status exchange (Davis, 1941; Merton, 1941).

Conversely, in more gender equal contexts, both men and women are expected to work, and therefore the education and social status of both spouses are important (Blossfeld, 2009). As a result, the hypergamic tendency weakens in favour of high educational homogamy, since high educational levels signal both increased earnings potential in both partners and a degree of cultural similarity between them (Kalmijn, 1994).

The secular increase in educational homogamy (Kalmijn, 1991; 1994) is consistent with both *matching* and *competition* hypotheses (Schwartz, 2013). Matching on similarity, where partners prefer to marry those who are most similar to themselves, means that both highly educated individuals and those with less education prefer to marry within their respective group, resulting in a *voluntary* homogamous pattern in terms of education. Competition, on the other hand, implies that all participants in the marriage market want to marry the most desirable partners. However, the highly educated are at an advantage in the competition, so they marry each other

first (Shafer & Qian, 2010). This also produces a homogamous pattern in terms of education, but the "losers" in the competition respond to a *constrained opportunity structure*, rather than exercising their preferences. Individuals then respond differently to constrained choice depending on how well positioned they are in the partner market. They may choose to marry heterogamously or to stay unmarried (Shafer & Qian, 2010). This is also the case with remarriages, where the disadvantaged – especially women – may face demographic shortages of potential partners, leading to lower marriage rates and heterogamous patterns of mate selection (Qian & Lichter, 2018).

Although achieved social status and cultural similarity are believed to be considerably more important today than in the past (Kalmijn, 1991; 1994), social origin and parental education have a persistent impact on partner selection, and there are several reasons for this (Blossfeld & Timm, 2003). For example, parental education impacts social networks, which are important when searching for partners. Upwardly mobile individuals are expected be more likely to marry hypogamously because of the network they inherited from their upbringing, while downwardly-mobile individuals may have better chances of marrying hypergamously from the network they inherited from their parents. This is a typical example of how the opportunity structure of marriage might be shaped by social origin.

These social networks may also impact partner selection decisions through parental and peer pressure. These networks may pressure individuals to find partners within the same social circles, in terms of SES, religion, or ethnicity (Blau & Duncan, 1967), as well as pressure them to pursue higher education or follow certain career paths, which indirectly affects migration decisions, educational attainment and the opportunity structure of partner selection.

Neighbourhoods play a potentially important role in shaping assortative mating patterns, even though direct empirical evidence remains limited (Schwartz, 2013). Theoretically, neighbourhoods influence partner selection through three interrelated mechanisms: preference formation, social pressure, and opportunity structures.

First, neighbourhoods of upbringing contribute to the development of values, attitudes and aspirations through collective socialisation and peer influence (Duncan et al., 1968; Galster, 2012 Wilson, 1987). These processes shape individuals' expectations about education, family life and suitable partners. Adults in the neighbourhood act as role models, reinforcing norms around union formation and social boundaries. Exposure to peers with similar or different SES backgrounds can either strengthen or weaken preferences for homogamy.

Second, neighbourhoods generate durable social networks that influence partner selection. These networks, formed in childhood and adolescence, often persist into

adulthood and can exert social pressure to conform to group norms (Blau & Duncan, 1967). Both strong and weak ties, such as friendships, acquaintances, and institutional contacts, can affect how individuals evaluate potential partners and where they search for them (Granovetter, 1973; 1983). In this sense, neighbourhoods are not only sites of socialisation but also part of the search pool for partners.

Third, neighbourhoods structure opportunities for contact and exposure to potential partners. Even if they are not the primary marriage market, residential areas influence who individuals meet and interact with in everyday life, through schools, workplaces, leisure spaces and local institutions (Kalmijn & Flap, 2001; Van Leeuwen & Maas, 2005). These settings shape the likelihood of meeting similar or different partners, thereby influencing the feasibility of homogamous or heterogamous unions.

Theoretical models of neighbourhood influence on partner selection offer contrasting expectations. Collective socialisation, peer effects and institutional theories suggest that advantaged neighbourhoods promote favourable life-course outcomes, including normative family transitions and educational homogamy (Galster, 2012; Jencks & Mayer, 1990). These neighbourhoods provide access to resources, safety and social control, reinforcing aspirations and facilitating partner matching among peers with similar status.

By contrast, relative deprivation and resource competition theories argue that proximity to advantaged neighbours may heighten perceived disadvantage among lower-status individuals, dampening aspirations and reducing the likelihood of homogamous unions (Jencks & Mayer, 1990; Turley, 2002). In this view, neighbourhoods may reinforce social boundaries rather than erode them, depending on the individual's background and relative position.

As previously mentioned, schools are important sites of peer influence and network formation and can be seen as competing explanations for neighbourhood effects. However, recent research indicates that neighbourhood effects on outcomes such as education, fertility and mortality remain significant even after accounting for school district (Hedefalk & Dribe, 2020; Hedefalk et al., 2023; Souza-Maia et al., 2024). Growing up in a high-SES neighbourhood increases the likelihood of attending university (Andersson & Malmberg, 2015; Andersson & Subramanian, 2006), which in turn raises the probability of partnering with a highly educated spouse, especially as educational institutions have become central to assortative mating (Blossfeld & Timm, 2003).

Despite the abovementioned challenges, in sum, the reviewed theory imply that neighbourhoods influence partner selection independently of one's own education. Peer interactions and local norms influence preferences and expectations, while

growing up among highly educated families may promote different value sets than growing up in low-status environments (Morgan, 1981). Thus, neighbourhoods would contribute not only to the development of individual traits relevant to partner selection, but also to the social and spatial organisation of the partner market itself. I examine partner selection and assortative mating In Papers III and V, using neighbourhood context measures from both childhood and adulthood, in both historical and contemporary periods through event-history and long-term research designs.

Fertility

Fertility is shaped by a range of factors operating at micro, meso and macro levels, each of which has been extensively explored in the literature (Balbo et al., 2012). Micro-level determinants include sociodemographic, psychological and biological influences on fertility intentions and decisions (Becker, 1960; Kravdal, 1992; Wachter & Bulatao, 2003; Westoff & Ryder, 1977). These encompass individual characteristics such as age, health, education, income and personal values, as well as intra-couple dynamics and decision-making processes. Meso-level factors refer to the influence of social networks, kinship ties and community belonging, which shape fertility preferences and behaviours through mechanisms of social interaction and social capital (Bongaarts & Watkins, 1996; Flap, 1999; Montgomery & Casterline, 1996). Macro-level determinants include broader societal and institutional forces, such as economic conditions, welfare regimes, cultural norms and technological change (Easterlin, 1976; Oppenheimer et al., 1997; McDonald, 2000), which affect fertility trends across populations and cohorts.

At the micro-level, fertility decisions are often linked to neuropsychological processes, shared decision-making between partners, and the perceived costs and benefits of childbearing (Balbo et al., 2012). Factors such as income, education and employment status influence both the ability and desirability of having children, as well as the timing of fertility. At the macro-level, national and global trends, such as economic uncertainty, unemployment, and family policies, help explain differences in total fertility rates and age at first birth across countries and regions (Alderotti et al., 2021; Easterlin, 1976; Oppenheimer et al., 1997).

This thesis focuses particularly on meso-level influences, including social interaction, place of residence and social capital. Social interaction theories highlight the diffusion of fertility-related behaviours within kinship networks, friends, coworkers and media (Bongaarts & Watkins, 1996), emphasising the role of social learning and normative influence (Montgomery & Casterline, 1996). Studies on place of residence examine regional and local variation in fertility patterns, often contrasting urban and rural contexts (Hank, 2002; Hank & Kreyenfeld, 2003). Social capital approaches consider the material and emotional

resources available through social networks (Flap, 1999), which can support individuals before and after childbearing and influence fertility decisions.

Although place of residence studies have been criticised for weak theoretical links between geography, network formation and fertility behaviour, several frameworks offer compelling connections. For instance, Bongaarts and Watkins (1996) emphasise the role of social interaction in fertility transitions, Granovetter (1973) highlights the importance of weak ties in spreading new behaviours, and Flap (1999) conceptualises social capital as a key resource in shaping life outcomes. These perspectives suggest that residential context is not merely a backdrop but an active component in the social processes that influence fertility.

Furthermore, in the neighbourhood effects literature, several explanations have been proposed. Social contagion (Crane, 1991) and collective socialisation theories (Wilson, 1987) suggest that behaviours and norms around childbearing are shaped by peer influence and adult role models within the neighbourhood. Social networks provide access to information and resources that can affect decisions about education and family formation, while neighbourhood cohesion and institutional quality (e.g. schools) help reinforce behavioural norms (Sampson et al., 1997). Parental mediation also plays a role (Elder et al., 1995), as parents may buffer or amplify neighbourhood effects through strategies like relocation (Brattbakk, 2022) or increased involvement in their children's development, which in turn can influence fertility timing and intentions.

Relative deprivation (South & Crowder, 2010; Turley, 2002) introduces a contrasting perspective, suggesting that individuals from lower SES backgrounds may experience worse outcomes when surrounded by higher-status neighbours. Feelings of inequity and limited life chances can lead to riskier behaviours, including earlier childbearing. Importantly, neighbourhood effects are not uniformly experienced across social groups, as children tend to interact within their own SES group (Chetty et al., 2022a; 2022b), and parental strategies vary by SES, further moderating these influences (Brattbakk, 2022).

Ultimately, I expect neighbourhoods to shape fertility through processes of social learning and social influence (Bongaarts & Watkins, 1996), which lead to the creation of normative environments and perceived life opportunities (Brewster, 1994). Neighbourhood context can affect individuals' views of the ideal family, such as ideal family size, and the ideal age to start a family, while neighbourhood disadvantage may contribute to a loss of self-efficacy and low expectations, which reshuffle the traditional scripts of adulthood transition (Hogan & Kitagawa, 1985; Wilson, 1987). The fate of adult neighbours and peers signals to individuals the expected benefits of engaging in schooling and the labour market, indirectly affecting the timing of family formation. In contexts where individuals do not see

viable paths into adulthood, they may reevaluate alternative pathways, such as early and non-marital fertility (Hogan and Kitagawa, 1985; South and Baumer, 2000).

While the lack of viable paths into adulthood is likely less pronounced in Sweden than in the U. S., expectations for the future and their consequences for the sequence and timing of transitions to adulthood are just as important in Sweden as elsewhere. Youths who anticipate higher education and career prospects may delay parenthood, while those facing limited opportunities may transition earlier to family formation (Malmberg & Andersson, 2023). These trajectories are also shaped by gender norms and local labour markets, which influence whether young adults stay in their communities or pursue opportunities elsewhere (Forsberg, 2019). Fertility outcomes thus reflect both intentional choices and structural constraints, mediated by the social fabric of the neighbourhood. I study neighbourhood effects on fertility in Paper IV, using a long-term effects design of childhood neighbourhood exposure linked to fertility outcomes in adulthood.

Heterogeneity

Issues of causality in neighbourhood effects research are addressed in detail in the Area, Data and Methods section. However, it is important to note that the trajectory of this literature has been shaped by the assumption that neighbourhoods should function like other socio-economic determinants, such as education or income. Despite the existence of theories like relative deprivation, which challenge this linear view, much of the early research operated under the expectation that neighbourhood advantage or disadvantage would affect all individuals equally (Small & Feldman, 2012). If such effects were not observed, they were often dismissed as spurious, attributed to endogeneity or unmeasured confounding factors. Experimental studies, such as those by Kling et al. (2007), complicated this picture. While neighbourhood context was found to significantly affect health outcomes related to stress and exposure to violence, anticipated improvements in economic outcomes during young adulthood were not consistently observed.

Further complicating the narrative, studies on mediating outcomes such as educational performance or delinquent behaviour revealed gendered effects (Clampet-Lundquist et al., 2011), prompting broader discussions about the mechanisms through which neighbourhoods exert influence. Even before new causal evidence emerged (e.g. Chetty et al., 2016), the field had already begun to shift focus from whether neighbourhood effects exist to more nuanced questions about *who* is affected, *when*, *where*, and *why* (Galster, 2012; Sampson, 2012; Small & Feldman, 2012).

The timing of exposure is now widely recognised as critical (Wodtke, 2013; Wodtke et al., 2011; 2016). Neighbourhoods are most likely to exert influence during life-course stages when individuals are particularly susceptible to social-interactive

mechanisms, especially adolescence and early adulthood, when autonomy increases and peer networks expand (Elder & Shanahan, 2007). The question of for whom neighbourhoods matter has also gained attention. Despite early assumptions of uniform effects across gender, studies from the late 1990s and early 2000s already indicated significant gender differences (South & Crowder, 1999; 2000). Societal norms and parental supervision have likely shaped the nature and extent of girls' exposure to non-family actors, often in ways that can differ markedly from boys. Even today, parental monitoring practices remain gendered, despite parents' claims of neutrality (Waylen & McKenna, 2009).

Galster (2012) likens neighbourhood exposure to a drug dosage, suggesting that not only the type but also the intensity of exposure and moderating influences must be accounted for. Family SES may influence both the quantity and quality of neighbourhood exposure, with parents often acting as buffers, either amplifying or mitigating the effects of their residential environment. The dosage analogy can also extend to the interpretation of how important a neighbourhood effect should be in relation to well-known determinants such as family SES.

Neighbourhood effects also interact with macro-level trends. Economic cycles, such as recessions or periods of growth, may not directly alter local social interactions but can reshape neighbourhood dynamics depending on their demographic composition and physical infrastructure. This was central to Wilson's (1987/2012) argument about concentrated poverty in U. S. cities and has been echoed in studies of the Great Recession (Rugh et al., 2015).

Finally, spatial segregation and social isolation within cities can moderate neighbourhood effects. High levels of segregation reduce opportunities for cross-group interaction (Stearns & Logan, 1986), potentially limiting the diffusion of norms and behaviours. Moreover, the nature of neighbourhood interaction has evolved. While some argue that individualisation and weakened local ties have diminished the relevance of neighbourhoods (Putnam, 2020), others contend that community ties have transformed but remain strong (Sampson, 2012). These debates underscore the need to consider neighbourhood effects as dynamic and context-dependent, shaped by intersecting social, temporal and spatial processes. Heterogeneity is systematically addressed across all papers through stratified descriptive analyses and interaction modelling, capturing differential effects by gender, historical period, and social class.

Area, data and methods

Previous research

A seminal work in the field is William Julius Wilson's *The Truly Disadvantaged* (1987/2012), which marked a turning point in neighbourhood effects research. He sought to explain the visible concentration of social problems in a relatively small number of inner-city neighbourhoods in the U. S.. Drawing on sociological theory and spatial statistics from the 1980 Census, he presented a wide-ranging analysis that connected family formation, teenage childbearing, unemployment, marital instability and single motherhood to broader structural forces such as deindustrialisation, chronic unemployment, disinvestment and the erosion of future prospects for residents of concentrated poverty neighbourhoods. His work set a high watermark for the ambitions of the field, combining demography, sociology, human geography and statistical methods with a long-term perspective on contextual effects across the life course. While later studies have refined (Sampson et al., 1997, 2002; Sampson & Sharkey, 2008) or challenged some of his conclusions (South & Crowder, 1999, 2000, 2010), *The Truly Disadvantaged* remains foundational to how scholars conceptualise the relationship between neighbourhood context and life chances.

Neighbourhood effects research has grown substantially since the publication of *The Truly Disadvantaged* in 1987. Subsequent studies have expanded the scope of neighbourhood effects to include several other outcomes, both in the U. S., where the field first expanded, and more recently in Europe. Studies have linked neighbourhoods to health and mortality (Hedefalk et al., 2023, 2025; Kivimäki et al., 2018), education (Galster et al., 2007; Hedefalk & Dribe, 2020), earnings, and intergenerational mobility (Chetty et al., 2014, 2022; Crowder et al., 2006). Demographic outcomes were the subject of many early studies in the U. S., such onset of sexual relations (Brewster, 1994; Baumer & South, 2001; Hogan & Kitagawa, 1985), teenage pregnancy (Harding, 2003), non-marital fertility (South & Crowder, 1999; South & Baumer, 2000), early marriage (South & Crowder, 2000), and divorce (South, 2001). More recently, studies in the Swedish and Nordic context have begun to address demographic outcomes such as partnering (Haandrikman, 2019), fertility (Bergsvik, 2020; Malmberg & Andersson, 2019), and divorce (Lyngstad, 2011).

Historically, a central methodological challenge has been disentangling neighbourhood effects from family background. Because residential location reflects parental resources and preferences, isolating the independent influence of neighbourhoods is difficult (Jencks & Mayer, 1990). Sociological approaches argue that neighbourhoods represent distinct social-interactive and institutional settings

that shape decisions and reproduce inequalities (Galster & Sharkey, 2017; Sampson, 2012). While scepticism remains about selection bias (Ellen & Turner, 1997), experimental and quasi-experimental studies have since shaped a consensus on the role of neighbourhoods as a determinant of life chances (Chetty & Hendren, 2018; Chyn and Katz, 2021; Katz et al., 2001; Kling et al., 2007). Furthermore, recent studies have done much to address the shortcoming of earlier observational research (Brandén et al., 2023; Hedefalk & Dribe, 2020; Hedefalk et al., 2023; 2025).

Debates continue around the magnitude, linearity and heterogeneity of neighbourhood effects, whether they justify policy intervention and which kinds are most effective, and for whom. Evidence suggests that effects depend on timing, duration and individual characteristics (Lucero et al., 2018; Wodtke et al., 2016; Souza-Maia et al., 2024). Some scholars argue that the focus on causality distracts from the broader issue of persistent spatial inequality and its social consequences (Sampson, 2012; Sharkey, 2013).

Several literature reviews have synthesised findings across existing theoretical frameworks. Sampson et al. (2002) found empirical support for social-interactive mechanisms. Galster (2012) expanded the scope to include environmental, geographic, and institutional factors. More recently, Chyn and Katz (2021) compared experimental and observational studies, highlighting the role of selection bias and its implications for policy interventions.

Despite advances, historical and geographical dimensions remain underexplored. Most studies focus on contemporary metropolitan areas, overlooking smaller cities and earlier periods. Yet if social-interactive mechanisms are as influential in the past as they are today, historical segregation patterns and their consequences deserve closer attention (Logan & Shin, 2012; Massey & Denton, 1993).

Segregation

Segregation remains a contested concept in both theory and empirical research. In the U. S., some scholars argue that residential segregation is largely driven by self-selection and stated preferences for ethnically homogeneous neighbourhoods (Clark, 1991; Ibraimovic & Masiero, 2014). However, it is among white residents where self-segregation preferences are stronger, as they tend to avoid neighbourhoods with significant black populations (Krysan & Bader, 2007). Although minority preferences are also shaped by concerns about acceptance and discrimination (Charles, 2006), minorities are more open-minded about living in mixed settings (Krysan & Crowder, 2017).

Other research emphasises structural explanations, such as spatial assimilation and place stratification. These frameworks suggest that segregation results from SES disparities and discriminatory practices in housing and credit markets (Logan et al., 2004; Massey & Denton, 1993; Roscigno et al., 2009; Rugh et al., 2015).

Importantly, stated preferences do not always translate into actual residential choices, and declines in expressed preferences for segregation have lagged behind significant changes in segregation patterns (Logan et al., 2004).

In Europe, the picture is more complex. While some evidence suggests a decline in ethnic discrimination over time (Auspurg et al., 2019), socioeconomic segregation has increased in many cities due to rising income inequality (Musterd et al., 2017; Tammaru et al., 2020). Discrimination persists in housing and credit markets, including against Muslims in Sweden (Ahmed & Hammarstedt, 2008), same-sex couples in Portugal (Gouveia et al., 2020), and self-employed migrants (Aldén & Hammarstedt, 2016). Statistical discrimination (Phelps, 1972) or discriminating against a group because of a belief that group membership proxies for undesirable characteristics, even in the absence of racist or sexist preferences, appears to play a role, with studies showing that providing additional information about individuals can reduce discriminatory outcomes (Auspurg et al., 2019; Ahmed et al., 2010).

Compared to the U. S., European housing markets are more regulated, with less local policy variation and generally lower levels of segregation (Andersson et al., 2018). The state is more likely to intervene to mitigate segregation (Friedrichs et al., 2003). Nonetheless, segregation has been linked to reduced social cohesion (Malmberg et al., 2013), though it has also been shown to offer benefits to migrants, such as access to ethnic goods and services and a stronger sense of belonging (Waldfogel, 2008; Iceland & Wilkes, 2006).

In Sweden, research on segregation has grown in recent years, although studies using spatial quantitative methods prior to the 1970s remain scarce (Molinder & Söderhäll, 2020). Recent work suggests that income segregation is increasing, bringing Sweden closer to high-segregation contexts, such as the U. S. (Mutgan & Mijs, 2023). Prior to the study of Landskrona presented in this thesis (see Paper 1), little was known about the extent of socioeconomic segregation in Swedish cities during the 20th century. Evidence from Uppsala, in Sweden, suggests that urban growth before the advent of transport infrastructure led to increased density and mixing rather than segregation (Molinder & Söderhäll, 2020). Comparable historical studies in Copenhagen are limited to the period before 1845 (Perner, 2019).

Partner selection and assortative mating

Sweden is often regarded as one of the most socially and gender egalitarian countries among developed nations. However, research shows that both social origin and achieved status continue to shape partner selection (Henz & Jonsson, 2003). Educational homogamy has increased in recent decades, reflecting a growing tendency for individuals to form unions with partners of similar educational attainment. This pattern is not only driven by individual preferences but also shaped

by parental background, which influences access to education, social networks and cultural norms relevant to mate selection (Blossfeld, 2009). While women's educational attainment has become increasingly important in partner choice, which is consistent with expectations in more gender-equal societies, the evidence suggests that both inherited and achieved characteristics remain influential (Blossfeld & Timm, 2003). Assortative mating in Sweden thus reflects a complex interplay between egalitarian ideals and persistent social stratification (Henz & Jonsson, 2003).

Neighbourhoods contribute to assortative mating patterns of married couples as organised settings in which individuals can meet (Kalmijn & Flap, 2001). Furthermore, having a higher proportion of high-SES neighbours may increase the chances of finding a high-SES partner through friend groups, or increased likelihood of pursuing education. For example, in the ethnic intermarriage literature, there is evidence that childhood neighbourhoods are associated with the likelihood of intermarriage in adulthood (Feng et al., 2010; Lievens, 1998; Muttarak & Heath 2010; Puur et al., 2022), and it is therefore reasonable to expect that neighbourhood SES in childhood can produce similar outcomes.

Another way in which the neighbourhood may affect partnering is through the mediating role of neighbourhood institutions, like schools. The literature on neighbourhood institutions has primarily focused on education (Jargowsky & El Komi, 2009; Wodtke et al., 2023) and health (Morland et al., 2002), with mixed results. Recent studies on Landskrona have found little support for school quality mediation in neighbourhood links to education and health outcomes (Hedefalk & Dribe, 2020; Hedefalk et al., 2023). Finally, propinquity, or geographic proximity to potential partners, has been found to be a determinant of partner selection behaviour in the Netherlands and Sweden (Haandrikman, 2019; Haandrikman et al., 2008, 2011; Haandrikman & van Wissen, 2012). No studies linking neighbourhood context to partner background have been found in the literature.

Union formation

Until recently, marriage was the dominant and socially sanctioned pathway to family formation in Western Europe. For much of the 20th century, it was the institutional framework within which most fertility events occurred. This began to change in the latter half of the century, as cohabitation emerged as a socially acceptable alternative, gradually reshaping the landscape of family life (Cherlin, 2020; Hiekel et al., 2014; Ohlsson-Wijk et al., 2020). The shift was not only about the rise of cohabitation, but also about broader changes in the timing and prevalence of marriage. Age at first marriage increased, and the proportion of individuals who never married rose steadily. These changes reflect a broader transformation in the meaning and function of marriage, which has been described as a process of universalisation and deinstitutionalisation (Cherlin, 2004).

The postwar period, particularly during the baby boom era, was marked by high and relatively uniform marriage rates across social classes (Sandström, 2014). Marriage was widely accessible and expected, forming a central part of the normative transition to adulthood. However, from the 1970s onwards, this pattern began to unravel. The emergence of late marriage, cohabitation and non-marital fertility as legitimate and increasingly common family formation paths has been seen as a Second Demographic Transition (SDT, Lesthaeghe, 2011). According to the SDT, these shifts reflect changing values around individual autonomy, gender equality and the role of institutions in private life, but they are also partly a return to marriage patterns that existed before the baby boom, where cohabitation before marriage and high proportions never-married were a common for a large part of the population, including in Sweden (Sandström, 2014).

Empirical research from the U. S. has shown that neighbourhood effects on marriage are not uniform but vary significantly by social class and ethnicity. South and Crowder (1999, 2000) demonstrated that concentrated poverty in neighbourhoods diminishes life chances for youth, and that early marriage and fertility are often viewed as desirable markers of transition to adulthood. These transitions are shaped by gendered and racialised expectations, with different groups experiencing distinct pressures and constraints. For example, early marriage may be more common among some ethnic minorities, not necessarily as a cultural preference, but as a response to limited opportunities and structural disadvantage.

More recent quasi-experimental studies have strengthened the case for a causal link between childhood neighbourhood SES and marriage outcomes. Chetty and Hendren (2018), using U. S. data, and Deutscher (2020), using Australian data, found that growing up in higher-SES neighbourhoods increases the likelihood of marrying in young adulthood. In these studies, marriage is framed not as a retreat from disadvantage, but as a normative milestone facilitated by access to resources, stability and opportunity. Neighbourhoods thus function as springboards for life course transitions, with poverty associated with reduced means and incentives to an otherwise desirable marriage.

European research on neighbourhood effects and marriage remains limited. One study from Germany found that higher unemployment at the district level was associated with lower marriage rates (Hank & Huinink, 2015), suggesting that local economic conditions may influence union formation. In Sweden, Malmberg and Andersson (2019) showed that teenage neighbourhood SES was associated with delayed first births, particularly in areas with restricted housing supply. While this study focused on fertility, it provides indirect evidence of neighbourhood influence on marriage timing, given that first births often coincide with or follow union formation.

Naturally, whether marriage is considered desirable is context dependent, as long-term cohabitation is often seen as a viable alternative to marriage in many European countries, including Sweden (Ohlsson-Wijk et al., 2020), but the framing around means and opportunity could also be applied to stable and successful long-term cohabitation. To my knowledge, no studies linking neighbourhood context to cohabitation exist.

Fertility

Neighbourhood effects on early childbearing have been extensively studied, particularly in the U. S.. Early work by Wilson (1987/2012) and others highlighted the rise in nonmarital fertility among black families in inner-city areas, linking it to concentrated poverty and structural disadvantage. Studies such as those by Crane (1991) and South and Baumer (2000) emphasised peer influence and attitudes over institutional factors like school quality. More recent research has explored relative deprivation, showing that living near more affluent neighbours can increase nonmarital fertility among disadvantaged youth (South & Crowder, 2010).

In contrast, European findings are more mixed. Studies in Germany found no significant contextual effects on birth risks once individual characteristics were accounted for (Hank, 2002; Hank & Kreyenfeld, 2003), but the study was done at the level of district (comparable to a municipality or county) rather than the neighbourhood. In the UK, local unemployment delayed fatherhood for older men but had no effect on women or younger men (Berrington & Stone, 2014). In Italy, Meggiolaro (2011) found that neighbourhood vitality and perceived safety influenced fertility intentions. Both of these studies were based on survey data with short follow-up periods, which limits the researchers' ability to study long-term exposure. Nevertheless, these studies show that neighbourhood context is mediated by broader structural and individual-level factors, and that longitudinal data availability remains a constraint in many countries.

In terms of selection bias and cumulative exposure issues, Wodtke (2013) and Chetty and Hendren (2018) demonstrated that early-life exposure to disadvantaged neighbourhoods significantly affects teenage birth risks. In Sweden, Malmberg and Andersson (2019) used fine-grained register data to show that local education levels, income, housing supply and welfare receipt shape fertility timing, but no link to early fertility was found. These studies underscore the importance of both timing and duration of exposure to neighbourhood environments.

Research on completed fertility is limited. Wilson and Kuha (2018) found that childhood segregation among immigrants in England and Wales was associated with higher completed fertility, suggesting lasting cultural influences. Bergsvik (2020) showed that high-fertility neighbourhoods in Norway increased the likelihood of third births, while Li (2019) linked housing affordability to fertility

intentions in Australia. These findings point to the relevance of both developmental and contemporary neighbourhood context, with links to broader structures such as housing availability, suggesting that fertility outcomes are shaped by both early-life socialisation and adult residential environments.

Despite growing interest, several gaps remain in the literature on neighbourhood effects and fertility. Many studies focus on adult residential contexts, potentially overlooking the long-term influence of childhood socialisation and early exposure to neighbourhood norms and networks. Spatial data is often aggregated at large administrative levels, which may fail to capture the micro-level environments where daily interactions occur. Additionally, there are inconsistencies in outcome measures, with some studies examining realised fertility and others focusing on intentions. Geographic context is frequently underdeveloped, and while some studies employ detailed spatial data, they often lack longitudinal cohort information or sufficient follow-up periods to assess life course effects. These limitations highlight the need for dynamic and spatially granular approaches to studying fertility in relation to neighbourhood context.

Heterogeneity

As discussed in the Theory and previous research section, neighbourhood effects are expected to vary by gender and SES (Small & Feldman, 2012). Early studies in the 1990s struggled to identify gender differences due to data limitations, as research often focused on specific at-risk groups, such as teenage pregnancy among girls or delinquency among boys.

Empirical findings are mixed. Observational studies from the U. S. have shown that neighbourhood effects on marriage vary significantly by class and ethnicity. South and Crowder (1999; 2000) demonstrated that concentrated poverty diminished life chances for youth, but early marriage and fertility may have paradoxically been viewed as desirable markers of transition to adulthood in the absence of mainstream alternatives. Studies based on residential relocation experiments in the same country have also revealed significant gender differences (Kling et al., 2007; Clampet-Lundquist et al., 2011). Lucero et al. (2018), using data from another experiment in Denver, found that the impact of neighbourhood context on teenage parenting varied significantly by both gender and ethnicity.

In Sweden, register-based studies have shown that neighbourhood effects on first birth timing appear similar for men and women (Malmberg & Andersson, 2019), although gender differences have been observed in other outcomes such as mortality and health (Hedefalk et al., 2023, 2025). Another Swedish study found no SES differences in the influence of childhood neighbourhoods on educational attainment (Hedefalk & Dribe, 2020). Similarly, Brandén et al. (2023) examined Swedish cohorts born between 1983 and 1987 and found no SES-based variation in the likelihood of relying on welfare or in the probability of reaching the highest income

group in adulthood. These results suggest that heterogeneity neighbourhood effects may be outcome-specific and context-dependent.

Study area

This thesis examines neighbourhood effects on union formation and fertility in Sweden, combining historical studies of Landskrona in southern Sweden with a contemporary analysis of the entire country. Today, Sweden is widely recognised as a highly developed nation, characterised by high income levels, and a mix of advanced industrial production and post-industrial services sector, with a comprehensive welfare state (Schön, 2010). Over the past fifty years, Sweden has experienced significant economic transformation, with severe deindustrialisation of major sectors and a serious crisis in the 1990s, leading to a retrenchment of its expansive welfare policies. However, there was also significant success in the technology sector in recent years. Nevertheless, it remains among the world's wealthiest countries in per capita terms and is often seen as a forerunner in global demographic trends, such as women's labour force participation, cohabitation, delayed marriage and high divorce rates (Ohlsson-Wijk et al., 2020). Sweden is also frequently regarded as an outlier in terms of its value context (World Values Survey 7, 2023).

However, Sweden's current privileged position is the result of a long-term development process (Schön, 2010). In the nineteenth and early twentieth centuries, Sweden economic development was more typical of European countries, occupying a middle position. It has long been export-dependent, with mining and forestry playing central roles in supplying raw materials to larger continental neighbours (Schön, 2010). At the turn of the twentieth century, Sweden was also a country of emigration: harsh climatic conditions and precarious living standards led around a quarter of the population to emigrate between 1860 and 1930, mainly to North America (Bohlin & Eurenius, 2010). The transformation from a modest northern European economy to an industrial powerhouse unfolded gradually over several decades. In many respects, Landskrona exemplifies both the highs and lows of this process (Dribe et al., 2024).

Historically, Sweden was a part of the Western European marriage pattern (Hajnal, 1965), characterised by late ages at marriage and high proportions never married (Lundh, 1999). Especially for women, there were many barriers to marriage before the baby boom. Sweden's postwar and 1980s baby booms can both be seen as temporary reversals of long-term fertility decline trends, perhaps as a result of exceptionally beneficial environments for family formation (Comolli et al., 2021).

Landskrona (Figure 1), founded in the fifteenth century by the king of Denmark as a military outpost on the eastern side of the Öresund Strait, initially served as an agricultural and port town (Dribe & Svensson, 2024). Its deep natural harbour gave

it strategic and commercial significance, eventually making it the site of one of Sweden's major shipyards. Like many Swedish cities, Landskrona experienced significant industrial and population growth from the late nineteenth century through the 1970s. By the early twentieth century, industries such as metalworking, textiles, sugar processing and shipbuilding had been established, and the population had risen to around 14,000 by 1905, and peaked at around 30,000 in the 1960s. The establishment of a hospital, schools and various mechanical and agricultural processing industries further shaped the city's development. Landskrona's twentieth-century trajectory mirrors that of many industrial cities in developed countries: early industrial expansion and the rise of the shipyard in the 1910s and 1920s were followed by the adoption of Fordist production after the Great Crash of 1929, consolidation of industry and a marked improvement in living standards, especially after the Second World War (Dribe & Svensson, 2024). This period of prosperity culminated in the late 1960s but was followed by the industrial crisis of the 1970s, when international competition, particularly from Asia, eroded European manufacturing. The closure of Landskrona's major shipyard in the late 1970s marked the beginning of a prolonged period of decline, which would only be reversed in the 2000s.

Figure 1: Map of Landskrona circa 1960.
Note: Blocks for which there was at least one individual resident in 1960. The buildings and streets may be period-inaccurate, since exact construction year has not been added to the dataset. Source: Own elaboration based on data from SEDD and the Land Survey (*Lantmäteriet*).

Demographically, Landskrona has generally reflected national patterns, with marriage, birth, death and migration rates similar to those of comparable Swedish cities (Dribe & Svensson, 2024). While not statistically representative of Sweden,

Landskrona provides a valuable setting for studying individual-level demographic trends at a time when such data are rare.

The crude marriage rates in Landskrona (Figure 2) exemplify such similarities. They show the pattern of fluctuation at a lower level up to the mid 1930s, and the marriage boom connected to the baby boom in Sweden, peaking in the 1940s, and subsequently declining. These marriage rates are higher than the national levels reported by Sandström (2014), but they closely follow the same trends. Level differences are explained by rural-urban differences in marriage rates as demonstrated by Quaranta and Stanfors (2024). Other demographic rates such as fertility are also closely tied to national trends.

Figure 2: Crude marriage rates in Landskrona 1905–1967.
Note: Crude marriage rates per 1000 population. Gray line is observed rate. The trend line (black) is a loess smoother with a span of 0.3. Source: Author's calculations based on data from SEDD v8.2.

The same characterises the proportion of never-married individuals at age 50 (Figure 3). Unlike the national trends reported in Sandström (2014), showing that the proportion never-married at higher ages was lowest from the 1920s to the late 1940s, Landskrona showed a high and increasing proportion never married at these ages, peaking at 25% in 1940. These are also explained by urban-rural differences, since urban areas are considerably more attractive places for single individuals (Quaranta & Stanfors, 2024). Unmarried proportions remained high until the 1970s, but it clearly declined from the 1950s, as the cohorts with high marriage rates of earlier decades aged.

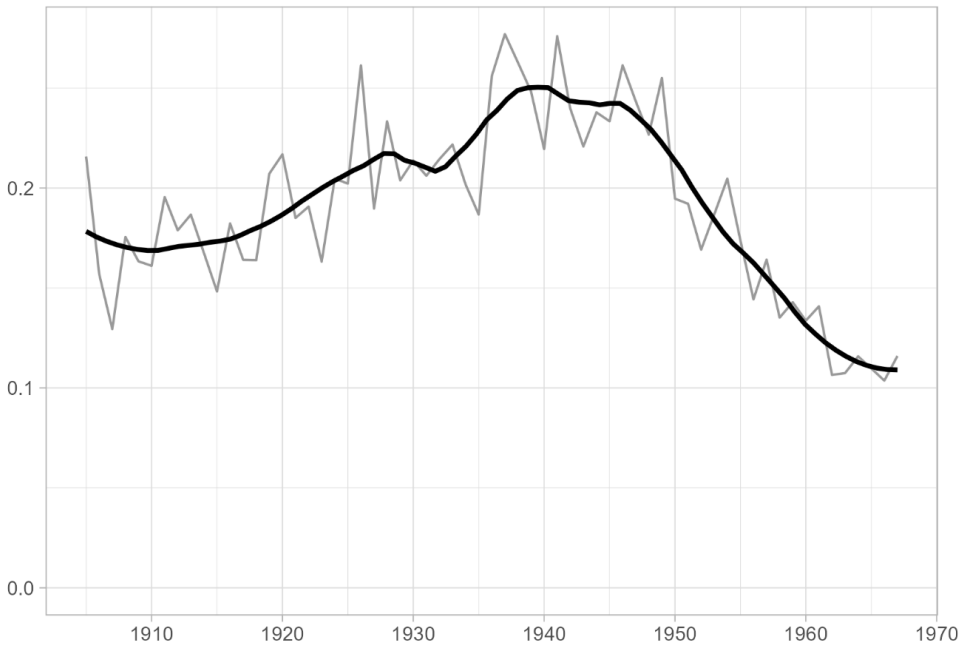

Figure 3: Proportion of the age 50 population that never married 1905–1967
Note: The trend line is a loess smoother with a span of 0.3. Source: Author's calculations based on data from SEDD v8.2.

This thesis connects neighbourhood context studies in Landskrona between 1905 and 1967, capturing the city during a period of growth and transformation, with national-level studies from the 1970s onwards, offering insights into both past and contemporary relationships between neighbourhoods and demographic behaviour.

Data

The thesis is based on two sources of demographic and geographic data. The Scanian Economic-Demographic Database (SEDD) covers the period 1905–1967 and provides the data for Landskrona. Meanwhile, the national registers maintained by Statistics Sweden from 1968 to 2022 (*Statistikmyndigheten*, or SCB) contain information for the whole country. Some of the geographic data from SEDD has been added by the efforts of previous researchers (Hedefalk & Dribe, 2020), but more has been digitised and added to it as part of the thesis work. The geographic data for the contemporary period is provided by SCB, which maintains geocoded information on the population from 1982 to 2022.

The Scanian Economic-Demographic Database

SEDD comprises a collection of population sources from five parishes and the city of Landskrona in southern Sweden, spanning from the 17th century to the mid-20th century (Bengtsson et al., 2025; Dribe & Quaranta, 2020). This thesis draws specifically on the subset of SEDD that covers Landskrona's population between 1905 and 1967.

The primary sources used are population registers, records of fathers' occupation at birth, and geocoded residential location data. The population registers originated in the 18th century, following a regulation that required parish priests to assess the biblical knowledge of parishioners (Dribe & Quaranta, 2020). This led to regular catechetical examinations, and priests becoming responsible for recording vital events and household information. Over time, the religious and clerical functions of these registers gave way to demographic and administrative roles. From 1895 onwards, they were renamed parish books (*församlingsböcker*), forming the basis of Sweden's population registration system until 1991. These parish books provide demographic and occupational data for Landskrona during the 1905–1967 period.

For all individuals in SEDD, the father's occupation at the time of birth has been traced back to the child's birth parish, using either birth records or parish books. This occupational information is used in Papers II and III to construct indicators of social class origin, which is crucial given the high rates of in-migration precludes using information from the family relations of children growing up in Landskrona.

Additional data include income information from income and taxation registers and mortality data obtained via linkage to the Swedish Death Index (Federation of Swedish Genealogical Societies, 2021). However, complete income data are only available for Landskrona between 1947 and 1967 (Dribe & Quaranta, 2020). For the earlier period (1905–1947), income records exist only for select years and vary in definition (Helgertz et al., 2020). Due to these limitations, the thesis focuses primarily on the occupational data from parish books, which cover the entire study period. Mortality data were used in Papers II–V to censor or exclude individuals from the analysis.

SEDD enables longitudinal follow-up of individuals across the life course, as the population registers were regularly updated over time. The database has also grown as additional sources have been added by other researchers. SEDD is part of the national research data infrastructure SwedPop (swedpop.se), which collects and distributes historical demographic databases from various regions in Sweden.

To facilitate analysis, the source material has been organised into the Intermediate Data Structure (IDS), a system of relational tables that records individual-level and contextual variables in a format suitable for constructing rectangular datasets for survival analysis (Alter & Mandemakers, 2014). To conduct longitudinal statistical analysis, data must be extracted from the IDS tables to create episode tables, which

record changes in time-varying variables and the timing of transitions to events of interest.

Quaranta (2015) developed a two-step procedure for this extraction process. In the first step, two files are generated from the IDS tables: a chronicle file, which contains all recorded attributes of individuals, and a variable setup file, which provides instructions for transforming these attributes into time-varying variables and event transitions. In the second step, a Stata program (Quaranta, 2016) generates an episode table that is ready for event-history analysis. This combination of structured data and automated extraction tools significantly simplifies the process of preparing survival analysis datasets. It also allows for the integration of additional contextual information over time, such as geocoded residential data, thereby simplifying the work of researchers when constructing longitudinal analysis datasets.

The occupational data in SEDD is pre-coded in HISCO, the Historical International Standard Classification of Occupations (Van Leeuwen et al., 2002). HISCO is a classification of historical occupations, developed to enhance the comparability of occupational titles across countries and over time. It is based on the ISCO68 classification (ILO, 1969). HISCO employs a hierarchical structure that includes eight major groups, eighty-three minor groups, and 1,881 occupational categories, grouping similar occupations into the same category. The version pre-coded in SEDD and used in the thesis is the harmonised version applied within SwedPop across all Swedish historical population databases. Occupational data is available for the head-of-household and the individual, but female occupations are typically not reported before 1947.

Based on these HISCO codes, I derived social class indicators in Papers II, III, and IV using the HISCLASS scheme (Van Leeuwen & Maas, 2011). HISCLASS is a historical international social class schema designed to improve comparability in studies of social stratification and social mobility within a European historical context. It is further described in the Main Variables subheading.

The Landskrona data in SEDD is particularly interesting for neighbourhood studies because it captures an industrialising city through major changes in living conditions in Sweden, while at the same time being a relatively homogenous population in terms of ethnicity and religion, with low rates of foreign in-migration. This sets it apart from other contexts in which neighbourhoods have been studied, where ethnicity, religion and migration background are of greater significance.

Geographic data in Landskrona and SEDD

The geographic data of Landskrona is constructed from economic and urban planning maps, and aerial photography, linked to the population registers described in the previous section and other geographic data sources in SCB to establish the location of households in space and across time (Hedefalk & Dribe, 2020; Hedefalk

& Souza-Maia, 2023). Address-level geocoded longitudinal data is available 1939–1967, and block-level (*kvarter*) geocoded data is available 1905–1967.

The primary sources for the geocoded data span the period from 1895 to 1970 (see Figure 4). Economic and planning maps provide information about which blocks of the city contain existing buildings, distinctions between urban areas and green areas, as well as information about the currently occupied urban areas and areas earmarked for future development. Planning maps are available in 1895, 1918, 1951 and 1970 from the Landskrona City Archives (*Landskrona Stadsarkiv*). Aerial photographs appeared in the 1940s and 1960s, and show the built environment in a period not covered by economic and planning maps, as well as showing differences between planned and realised urban development. Combining these sources with data from the property register (*Fastighetsregister*), a database of blocks was constructed reflecting the city's occupied urban area at different points in time (Hedefalk & Souza-Maia, 2023).

Figure 4: Sources for geocoding blocks in Landskrona city.
Note: Planning maps in 1895 (A), 1918 (B), and 1951 (C); aerial photo from 1962 (D). Source: Landskrona City Archives.

The geocoded address data (Hedefalk & Dribe, 2020) has been built by comparing the occupied urban area, street network, and existing buildings between the planning maps of 1918, 1951 and 1970 and the aerial orthophoto of 1960 to establish which blocks and streets existed between 1939–1967, and determine the addresses of existing properties. This address information is visible in some of the planning maps but must be inferred from the streets and blocks found in the aerial photography and the 1970 map. These maps have been georeferenced and overlayed in ArcGIS to

create a geodatabase that facilitated cross-referencing of the various sources and the creation of the address point layer.

The list of existing addresses comes from the parish book data in SEDD, where addresses have been recorded regularly starting in the 1930s, and coverage became practically universal by 1939. The list has been standardised to remove variations in spelling and eventual transcription errors by manually comparing it to street names on the historical maps. Finally, Google Location Services is used to create an initial point layer of addresses in Landskrona by matching this list to the existing street addresses in Landskrona. Most of the automatic matches correctly place the address points at the matching locations from the historical sources, but the remainder require manual correction.

SCB national population registers

Contemporary data from SCB is used in Papers IV and V. Individuals who received personal numbers after their introduction in 1947, as well as their relatives and descendants, have been linked to national registers 1968–2015[1]. Among other variables, the registers include information on occupations, educational attainment, income, and fertility; however, they do not include detailed geographic information beyond the municipality/county of residence.

A second SCB data extraction originates from the Socioeconomic Segregation Research Environment[2]. This extraction contains full population register data from 1960 to 2023 and geographic data on households and places of work from the 1980s to 2023, as well as the aforementioned demographic and SES indicators.

SCB geodatabase

SCB creates their own geographic databases at various administrative and geographic levels, and these data are linked to other authorities' databases to produce local statistics on population, land use and the labour market (Statistics Sweden, 2025a). Much of this geographic data is freely available, but linked databases at low levels of aggregation require approval. The sources for this data are the total population registers maintained and updated yearly by SCB. These population data are linked to geographic coordinate data of residences and

[1] The collection of personal data and linkage to the contemporary registers were both made within the project Economic Demography in a Multigenerational Perspective, approved by the Regional Ethical Review Board in Lund (2010/627) in accordance with the EU's General Data Protection Regulation (GDPR) and the Swedish Law on the Ethical Review of Research on Humans (*Lagen om etikprövning av forskning som avser människor*).

[2] Data from Statistics Sweden were accessed in pseudominized form through the online micro data portal MONA. Data were delivered to the project "Socioeconomic Segregation" (PI Martin Dribe) with approval from the Swedish Ethical Review Authority (Dnr 2023-06435-01).

workplaces in the Addresses and Properties register of the Land Survey (*Lantmäteriet*).

The geographic data covers the period 1982–2022 for households, meaning that residential locations of the whole population are available and updated once per year. We use the most detailed level of grid data available, which has the population geocoded to 100x100 meter grids (Statistics Sweden, 2025b). The data is updated yearly and provides fine-grained information on residential areas allowing for the construction of detailed neighbourhood context measures, such as those created for Landskrona, for the entire country. The geodata from SCB is used in Paper V to measure neighbourhood context in adolescence.

Creation of the block-level data

The block data has been created from an initial layer of modern blocks from the Land Survey combined with digitized blocks from the historical maps in 1951 (Landskrona). Blocks from earlier maps have been added if changes such as merges, splits or area changes occurred, and their names have been standardised from block names from SEDD to identify when individuals lived in them. Finally, individuals in SEDD have been linked to their corresponding standardised blocks for each period of residence.

Ideally, an object life history would record the sequence of changes for each block, from its creation to its contemporary form or disappearance, chronicling changes in shape, area or name (Worboys, 2005). However, this is difficult to do in practice, as the geographic information is not updated as frequently as the population registers. For example, the property registers often mention a few blocks as first recorded in 1908–1909, but these blocks are already marked as occupied in the 1895 map. I have thus collated the different sources to provide as much information as possible about the object-lifeline, and have created two block datasets, one containing all the information from the source material, and a second one focusing on comparability across time.

The first dataset records all blocks ever mentioned in the historical maps, often containing overlapping geometries of blocks that were renamed, split or merged, with the attendant information on when they first appear on the maps, and when they last appear in case they no longer exist. In some cases, it is difficult to determine exactly when blocks have been split or merged, since there is a long period between the historical maps, and the population registers sometimes temporarily contain incorrect information on block names following changes. This dataset is less useful for spatial analysis, since it is likely to produce errors in algorithms which require objects to be independent and non-overlapping, which motivated the creation of a second dataset for analysis.

This dataset contains the “minimum common denominator” areas. Since the urban form is relatively stable over time, most of the street and block network of the city

has not changed significantly, meaning most block names and geometries are the same from 1895 to the present. For the remainder, I have applied the following rules. From 1905 to 1939, if a block is originally a large area that was split into two smaller ones, or vice-versa for two small blocks being merged into a larger one, I have kept the whole area as a single geometry. For the period 1939–1967, when the address data is available, I have cross-referenced information and have kept new blocks created in this period as separate areas, even in cases where they were later merged or renamed. This choice is a trade-off between resolution in the spatial data and accuracy in the geocoding of the linked population, as well as the possibility to do spatial analysis of the data, given the uncertainties in the exact timing of these splits and merges.

The final products are four polygon databases for Landskrona and Kävlinge, two for each city, containing the block geometries and associated information, such as names, start and end dates, and successor/predecessor blocks if applicable (Hedefalk & Souza-Maia, 2023). Each block geometry has a unique ID number that has been linked to the SEDD population. By linking individuals to their geographic locations, the data helps uncover spatial patterns and social dynamics that are not readily apparent in non-spatial data (Gregory & Ell, 2007). It is the basis for the analysis done in Papers I-IV, both to describe segregation patterns and to construct neighbourhood measures in childhood and adulthood.

Methods

General empirical approach

I focus on the social interactions in childhood and early adulthood that affect partnering, marriage and fertility, using a life course approach. I use the order and timing of phases in the life course to establish plausible links between these conditions and later life outcomes. While this does not mean that causal effects can be estimated, it does minimise the risks of reverse causality and selection bias.

In general, I avoid making causal claims, instead opting to describe patterns in neighbourhood associations, focusing on regression designs which control for potential sources of collider bias (Schneider, 2020). I attempt to isolate the plausible pathways from neighbourhood conditions in childhood and early adulthood and the outcomes of interest. Endogeneity in neighbourhood effect studies is, in a sense, unavoidable, because neighbourhoods are the result of individuals' and families' collective residential location choices and constraints, but this process is also part of the neighbourhood effect and its consequences (Sampson, 2012). Therefore, I investigate the potential impact of neighbourhoods on one's life chances beyond the role of family background and individual characteristics.

I have adopted different approaches to defining individuals as present in a given context, depending on the analytical requirements of each study. This decision is particularly important when considering whether an individual should be included in the population at risk for a given event, especially in light of the high rates of short-term migration during the historical period. In Papers II and III, I include all individuals present in Landskrona, regardless of the duration of their stay. This approach is motivated by concerns about selection bias. During this period, it was common for individuals, particularly women, to migrate to Landskrona shortly before marriage or to find a marriage partner soon after arrival. Furthermore, there are no theoretical grounds for excluding unmarried short-term residents from the pool of potential marriage partners, especially since survival models can account for their presence through left-truncation and censoring.

In contrast, Paper IV requires a more restrictive definition of presence. Individuals are included only if they have been observed in the same context for at least two consecutive years during childhood. Additionally, observation weights are applied so that individuals with longer durations of residence contribute more to the estimates. This approach is required because Paper IV is a long-term study on the effects of childhood neighbourhood context, and it is necessary to ascertain that the neighbourhood context individuals experienced in Landskrona are as representative of their childhood experience as possible. In Paper V, this criterion is not relevant, as all individuals are observed at the same age, and the analysis does not depend on duration of residence.

Approach to neighbourhoods

In the 1980s and 1990s, most quantitative neighbourhood studies were done using census data, which means that their analyses are cross-sectional. The way censuses collect geographic information is usually based on administrative rationale. For example, in the U. S., the most common geographies used are the ZIP code and the census tract (Entwisle, 2007). The ZIP code is used by postal services to distribute and coordinate mail delivery operations, and they are unlikely to reflect a sociospatial definition of neighbourhood (Kwan, 2018). Census tracts try to account for contiguous areas that approximate neighbourhoods, but their primary purpose is to organise data collection in the decennial censuses. They are also often quite large, including about 4000 people on average, and it is unlikely that individuals make meaningful social connections with such a large number of people.

From the late 1990s, panel data studies have tried to account for the limitations of cross-sectional studies, by following childhood neighbourhood trajectories over a number of years. Some of the seminal research on neighbourhood context and sexual initiation and marriage is from this period (Baumer & South, 2001; South & Baumer, 2000; South & Crowder, 1999, 2000). However, on the geography front, progress has been much slower. With few exceptions (e.g. Pebley & Sastry, 2004),

quantitative neighbourhood effects on the contemporary U. S. rely on administrative unit data collected in decennial censuses.

The main issue with administrative units in neighbourhood studies is that the geographic boundaries of an area can have large and unpredictable effects on the results of spatial statistics, an issue known as the modifiable areal unit problem (MAUP, Fotheringham & Wong, 1991). This means that changes in boundaries between two censuses or the choice of one administrative unit over another can overthrow the estimates of statistical models without any underlying changes in the social reality. As a result, the neighbourhood effects literature has suffered criticisms about the validity of estimates given this uncertainty.

Aside from the MAUP, data obtained from decennial censuses and, to a lesser extent, panel studies, contain a second issue that is well-understood in historical demography, namely the extent to which the data reflect which individuals are present in context during observation. An extreme example would be a young man that resides in his parents' neighbourhood in one census, only to move out shortly after to work in another city, living for 9 years in a different context, then returning to the parental home just in time for the next census round. Varying degrees of this phenomenon cast doubt on the estimates of a neighbourhood context effect if it is not possible to ascertain that individuals are in context during the time under observation. This is especially relevant in studies focusing on health outcomes based on environmental exposure to pollutants, for example, since the residential location may be a poor proxy for exposure if an individual has activity patterns that take them away from their residential area for much of the day. This issue is a general concern for any spatial analysis of neighbourhood context, which Kwan (2012) termed the uncertain geographic context problem (UGCoP).

One potential solution to the MAUP is to construct neighbourhood measures by aggregating data at the local level, thereby creating individualised and scalable neighbourhoods based on a focal individual (Östh et al., 2014). This way, there is no uncertainty introduced by boundary changes over time about the sociodemographic composition of the neighbourhood, as the factors determining local composition are consistent and depend only on the definition imposed by the analyst.

The UGCoP is trickier, since longitudinal follow-up geographic data is not a guarantee that individuals are present in context for the relevant social processes one might be interested in, and residential location may be considered a better or worse proxy depending on the definition of exposure and the outcome of interest, but it is a substantial step forward to be able to use register data that tracks residential locations longitudinally and regularly compared to decennial censuses and even panel studies that have a few years between interviews.

Such data has fuelled many studies on the Swedish context in recent years (Brandén et al., 2023; Hedman et al., 2015; Malmberg & Andersson, 2019), but there are

drawbacks. Important questions revolve around subjective as well as objective characteristics of neighbourhoods, for instance, perceptions about the area and its residences, social network data about friends and neighbours, and institutions operating in the area, to name a few. Unfortunately, register data does not and probably will never collect this kind of information, meaning that researchers either need to make inferences, collect data from other sources, or create it themselves.

Using the previously described geocoded longitudinal data for the Landskrona population in the SEDD, research has been able to construct such individualised, scalable neighbourhoods at the address level and apply a life-course perspective on childhood neighbourhood conditions and adult SES and health outcomes (Brea-Martinez et al., 2023; Hedefalk & Dribe, 2020; Hedefalk et al., 2023, 2025). These detailed measures and long-term design have mitigated methodological issues such as the MAUP and UGCoP, and findings show a persistent importance of childhood neighbourhood conditions. However, studies that use similarly flexible neighbourhood measures to examine outcomes related to marriage, partner selection, and fertility, especially in historical contexts, remain scarce. Moreover, historical studies that continuously time-update both detailed neighbourhood exposure and outcomes are also absent. In this thesis, these gaps are addressed.

However, the ability to construct neighbourhoods based on specific research questions introduces a coordination and comparability problem between researchers that fixed administrative boundaries do not. One illustrative case is the connection between an individual's neighbourhood and its size in terms of population and geographic area. Administrative units are often created to be relatively consistent in these measures, adjusting areas to either maintain an average population number or a coherent geography, but individual neighbourhood definitions can vary depending on how densely populated the local area is, or on which population a researcher focuses on. As a result, when developing research designs, care is needed to account for aspects such as population density, centrality, urban structure, transportation and communication, location of nearby schools, and so on. It is by no means an insurmountable problem, but it does require additional work on research designs and communication.

As discussed in the Theory and previous research section, a particularly salient example of this encoding and decoding problem is the debate about selection. Neighbourhoods encode both SES and social-interactive mechanisms. The solution is often to attempt to control for selection using experimental designs or statistical methods. Another approach is to, instead, attempt to decode these two aspects by including more information about individuals' activity spaces (Courgeau, 1985). These refer to the daily patterns of mobility that individuals perform for work, leisure, and consumption and therefore tend to include different parts of the city that are not accounted for in residential location. A potential benefit of this approach is that, by including other contexts, it might be possible to differentiate the residential-locational-constrained-choice implied in the neighbourhood of residence from the

social-interactive mechanisms in friendships, kinship networks, work colleagues, associations and so on. New data sources such as mobile phone data increasingly enable researchers to follow individuals in space beyond their residential location (Hedman et al., 2021; Kwan, 2013), allowing for the construction of activity spaces beyond the neighbourhood of residence. However, the opportunity to unbundle or decode residential neighbourhoods is also a challenge in terms of research design and interpretation. For example, it is less clear how to interpret activity space data when one considers interactions between SES differences in residential neighbourhood and activity space for individuals of high and low SES.

For the purposes of this dissertation, I treat individual activity spaces as a continuation of their residential location, which is consistent with the *geographic isolation* and the *domains* approaches (Müürisepp et al., 2025). Both perspectives emphasise continuity in social context between the neighbourhood of residence and the extralocal activity spaces of individuals (Hedman et al., 2021), but this view is contested. There are studies that show that extralocal activity spaces are less segregated than residential neighbourhoods and interpret this result as an over-estimation of segregation by the use of residential location measures (Hu et al., 2022). Furthermore, spatial proximity is not a guarantee of social mixing if large SES differences between neighbours exist (Browning et al., 2022). In summary, without further information about activity spaces, it is difficult to estimate the extent to which the neighbourhood is a good proxy for social-interactive context, but at least in a Nordic country, the literature has leaned on the side of continuity between residential and social contexts (Hedman et al. 2021; Müürisepp et al., 2025), even if there are SES differences in how important the neighbourhood of residence is.

Main variables

Social class

Social class is a central concept in the study of social stratification, serving as the foundation for several major theoretical perspectives. From a Marxist standpoint, class is defined by an individual's relationship to the means of production, which determines their position in society in terms of ownership, living standards, autonomy, and control. In Marx's formulation, the bourgeoisie are those who own the means of production, such as factories and capital, while the proletariat are those who own only their labour power, which they must sell to survive. The relationship between these two classes shapes the structure of the social hierarchy and determines the distribution of the products of labour (Marx, 1867), although other social classes also perform necessary work and relate to the social structure in particular ways. This relationship also influences individuals lived experiences and consciousness Marx (1844), depending on their position within the system of production.

From a Weberian perspective (Weber, 1921), social class remains a central concept, but it is understood in broader and more differentiated terms. While Weber also

links class to individuals' economic position in the market, he places greater emphasis on skills, education, and income levels. Moreover, Weber introduces the concept of status, referring to the social honour or prestige associated with particular occupations or lifestyles, and highlights the role of authority and bureaucratic power in shaping social hierarchies. Thus, Weber's approach incorporates both material and symbolic dimensions of stratification.

Both perspectives are reflected in the HISCLASS scheme, but the Weberian features more prominently (Van Leeuwen & Maas, 2011). Van Leeuwen and Maas classify historical occupations according to multiple (Weberian) dimensions of the world of work, including skill, supervision, manual versus non-manual labour, and economic sector. This multidimensional approach captures separate dimensions of social stratification.

Manual and non-manual work reflect social perceptions of occupational status and prestige, particularly the distinction between physical and intellectual labour. Skill level refers to the education, training, and expertise required for an occupation, and is linked to both human capital and social stratification perspectives. Supervision captures hierarchical position within organisations, while economic sector accounts for structural differences in capital intensity, division of labour, and opportunities for social mobility. HISCLASS has been operationalised into a twelve-class schema based on these dimensions, although coarser classifications using seven or fewer classes are also possible.

Throughout the thesis I have used coarser classifications of HISCLASS, due to the need to disaggregate data by neighbourhood status, gender, and period. In Paper I, my co-authors and I use the 7-class scheme. In Paper II, 6 classes are used, combining the lower and unskilled categories into one. In Paper III, only the manual/non-manual division is considered, which I refer to as blue and white-collar classes. In Paper IV, we use only three classes, the white-collars, the medium-skilled and lower and unskilled workers. Paper V does not use social class indicators, since the main variable of interest is educational level.

Neighbourhood context

Neighbourhood context is measured by the social class composition of a small number of geographically close neighbours of similar age, using a k-nearest neighbours (k-NN) search algorithm (Östh et al., 2014). This method constructs contextual indicators by aggregating spatial characteristics from an individual's own location and surrounding areas, producing measures that are comparable across individuals, geographies, and time periods. Crucially, this approach avoids the MAUP by not relying on arbitrary administrative boundaries.

The k-NN method is an example of adaptive bandwidth, where the local context is defined by the number of neighbours rather than a fixed geographic distance. In contrast, a fixed-bandwidth approach defines context based on a predetermined distance buffer around each individual. The adaptive nature of k-NN makes it

preferable to administrative units, as it is scalable and can be tailored to the analytical question. Smaller values of *k*, particularly when combined with demographic selection criteria, are more likely to capture social-interactive mechanisms, while larger values are suitable for examining broader contexts such as marriage or labour markets (Östh et al., 2014). The accuracy of the k-NN method also depends on the spatial resolution of the data; address-level geocoding may better capture social-interactive mechanisms, and because spatial relationships are seldom linear, non-linear distance-decay functions, such as the Gaussian function, are commonly used to model how neighbours' influence declines with distance (Fotheringham et al., 2009; for an address-level Gaussian-weighted k-NN implementation, see Hedefalk & Dribe, 2020).

In this thesis, local context measures have been generated for each individual and year. Geographic weights are applied to these measures to account for spatial variation. In Papers II, III, and IV, which use geocoded data from Landskrona, a distance-based weighting scheme was implemented using a Gaussian exponential decay function, assigning lower weights to more distant neighbours (Fotheringham et al., 2009). This approach is chosen to ensure comparability of social-interactive measures across areas with varying population densities. In Paper V, which utilises national data, a population-based weighting is applied, assigning greater weight to nearby geographies with higher resident populations. This choice reflects the concern that many grid cells in national data are sparsely populated or empty, and population weighting better captures areas with greater potential for social interaction.

I have typically defined neighbourhoods as consisting of 25 age-peers, a number chosen to approximate the size of a typical school class in Sweden. In comparative terms, this corresponds roughly to census block groups in the U. S.. In physical terms, it typically covers an area equivalent to that of a circle with a diameter of approximately 500 metres. In densely populated urban areas, this often includes three to five city blocks, while in less densely populated areas, the spatial extent can be significantly larger.

I tested several approaches to measuring neighbours' social class, which resulted in comparable estimates. However, I did not use income or HISCAM (Lambert et al., 2013) in Papers II–IV. As previously noted, income data were not consistently available for the full study period, and has therefore been infeasible to include.

HISCAM is an alternative to HISCO that, unlike the categorical approach of HISCLASS, provides a continuous measure. The scores assigned to occupations reflect the relative social positions of individuals employed in each occupation. These scores are derived from marriage records across twelve countries, based on empirical distributions of marriages by the occupations of the groom, bride, and their parents, which are then converted into a numeric scale. While HISCAM's continuous and empirically based nature may appeal to some researchers (Lambert

et al., 2013), these same features have led me to not use it. A continuous scale makes it more difficult to define neighbourhoods or interpret results in terms of theoretically meaningful categories. In contrast, HISCLASS offers discrete social class categories that can be conceptually linked to childhood socialisation and demographic behaviour in adulthood, which is not as straightforward with a continuous measure.

Throughout the thesis, I use the terms "neighbourhood context" and "neighbourhood status" to refer to the contextual variable. Neighbourhood context denotes the broader meso-level environment and is used descriptively, without implying a normative hierarchy. In contrast, neighbourhood status (typically described as high status or low status) refers to associations with advantage or disadvantage in the environments where individuals grow up or reside.

In Papers II–IV, neighbourhood context and status are operationalised using the share of white-collar neighbours. This measure is justified by the status advantages associated with white-collar occupations and their links to behaviours and attitudes that distinguish them from working-class groups (Cherlin, 2014; Van de Putte, 2007). High and low white-collar occupations are combined into a single category, which is not ideal given the substantial differences between them. However, the small number of high white-collar individuals in Landskrona makes separate analysis impractical.

Neighbourhoods are defined using age-peers, serving two key purposes. First, this approach approximates potential social-interactive mechanisms by focusing on individuals likely to interact in daily life. While proximity alone does not guarantee interaction, age similarity increases the likelihood of shared social spaces. Second, it ensures more consistent neighbourhood sizes, as demographic composition varies widely. Without this adjustment, neighbourhoods with many families would appear smaller than those dominated by single adults or elderly residents. Using age-peers thus improves comparability when constructing neighbourhoods based on a target number of individuals.

When measuring neighbourhood context in childhood, I have used the social class of the parents of age-peers to calculate the relevant shares. In adulthood, neighbourhood context is defined using individuals' own occupational class. The literature generally suggests that childhood neighbourhoods are more likely to reflect social-interactive mechanisms, particularly those related to developmental and socialisation processes. However, in Papers II and III, measuring childhood neighbourhoods is impractical due to the risk of introducing significant stayer bias into the sample. For this reason, I have used current neighbourhoods as proxies for childhood context, supported by evidence of continuity between childhood and adult neighbourhood environments (Hedman et al., 2015).

In Paper IV, I employ a continuous measure of the share of white-collar neighbours to examine associations with fertility outcomes. This approach is appropriate given

that the cohorts studied have been raised in a context where white-collar work was increasingly prevalent. In contrast, Papers II and III cover earlier periods when Landskrona's workforce was predominantly composed of low-skilled blue-collar labourers, followed by later periods with a growing white-collar presence. In these cases, a relative measure is more suitable. I have used a quartile in year approach, ranking neighbourhoods into quartiles annually based on their status, then using the rank measure as the context variable. This method also facilitates the identification of potential non-linear effects of neighbourhood context, as discussed in the literature (Crane, 1991; Galster et al., 2015; South & Crowder, 1999).

In Paper V, neighbourhood status is defined using the educational level of the parents of age-peers, rather than occupational class. Neighbourhoods are categorised as having low, average, or high education levels based on the share of parents with a university degree. This measure has been chosen because parental education is a well-established predictor of children's educational attainment and contributes to patterns of educational homogamy (Blossfeld, 2009).

Nuptiality

Marriage timing and the probability of ever-marrying are estimated using a cure model in Paper II. The differences between these two outcomes reflect the potentially different mechanisms by which neighbourhood context can influence marriage. Probability and timing have often been modelled jointly in Cox models, but if neighbourhoods affect one but not the other, the implication is that neighbourhoods facilitate the transition to marriage by reducing the threshold to entering marriage, rather than by accelerating the transition to marriage.

Partner selection

In Paper III, I use the social class origin of the partner as the measure of partner selection, while in Paper V, the educational level of partners at the time of union formation is used. Social class origin is a clear indicator of ascribed social status, which was very important in the first half of the 20th century. Marrying a partner of a high social status was desirable because it signified better earnings potential, high status for the new family, as well as social support from better-off relatives. Marrying high-status partners was especially important for women, who relied on men's income to a large degree in the more traditional labour market of the first half of the 20th century.

Fertility

The fertility measures used in Paper IV include age at first birth, age at last birth, completed fertility by age 45, birth spacing, and childlessness. These indicators have been selected because they capture both the timing and quantum dimensions of fertility, which are often influenced by attitudes and behaviours acquired in earlier social contexts. By examining these outcomes, the study aims to explore how neighbourhood environments during formative years may influence long-term fertility decisions.

Statistical analysis

Descriptive analysis of spatial patterns

Descriptive analysis of spatial patterns is used in Paper I, about segregation in Landskrona, and has also been an important part of the descriptive work of Papers II, III and IV. It consists of computing aggregate statistics at the local level, using blocks or addresses depending on the study in question. These statistics are calculated for demographic, household composition, social class, and educational level, depending on whether we are using SEDD or SCB data. Then, they are used to create colour maps at different points in time that show the spatial distribution of these characteristics.

Isolation index

In Paper I, we have calculated correlation ratios by social class. The correlation ratio is an indicator of exposure segregation, that measures the likelihood of people of different subgroups meeting each other at the geographic level of analysis (in this case, the block) if encounters were to happen at random (Stearns & Logan, 1986). It is an adjustment of the isolation index for population composition and is chosen because it measures exposure segregation (Massey & Denton, 1988), which connects to the thesis objective of studying social-interactive mechanisms at the local level. It differs from other measures, such as the Index of Dissimilarity (D), another widely used statistic, which measures the unevenness of the distribution of subgroups among neighbourhoods. Other possible alternatives are segregation measures related to concentration, centralisation and clustering of populations, but these were not relevant to the research questions of the thesis, so exposure measures have been prioritised.

Typically, the isolation index ranges from 0 to 1, and measures this likelihood for two groups, but in the paper, we use the correlation ratio, or η^2, a variation of the index that allows calculations for multiple groups and adjusts for their relative change in size over time (Massey & Denton, 1988), so that the index can be applied to the 6-class scheme used in that paper, for different family head age categories and remain comparable over time. This segregation measure is used as a control variable or in sensitivity analyses in Papers II and III. In Paper V, a variation of the isolation index and another segregation measure called the Theil index are used in a sensitivity analysis. The main difference from the measures described by Massey & Denton (1988) is an adjustment for individualised neighbourhoods, rather than fixed geographic boundaries (Östh et al., 2014).

Survival analysis and cure models

Kaplan-Meier survival curves are estimated for time-to-first marriage in Paper II. These are non-parametric estimations that provide an assumption-free description of different rates of progression in a time-to-event study by each factor considered

(Kaplan & Meier, 1958). The analysis of the curves in the study reveal that in some study periods, there were high proportions of the population that remained unmarried at the end of the observation window.

The Cox model is the standard procedure in time-to-event studies. They are semi-parametric regression models for the hazard in time-to-event, allowing for multivariate analysis of survival time with censored observations. They are quite flexible in specification and are thus the preferred method in survival analysis as long as the proportional hazards assumption is satisfied. This assumption states that the effect of a variable on survival time must be relatively constant throughout the observed survival time, which can be seen, for example, in a Kaplan-Meier estimator as a divergent pattern in survival time from the start of observation until the last individuals under observation experience the event or are censored. Under no circumstances should the survival curves "cross" over each other, indicating that the impact of the variable on survival changes over time. Cox models are the traditional choice in event history analysis, but they have limitations when it comes to estimating separately the impact of timing from the propensity to experience the event itself (Alter, 2020), which has been an important issue in the study of the fertility transition (Cilliers & Mariotti, 2021; Redivo et al., 2024).

I have tested Cox models in time-to-marriage, but decided against using them because of the high share of never-married individuals and because the neighbourhood variable violated the proportional hazards assumption. Instead, I have opted for a cure model, which estimates time-to-event while attempting to account for the share of individuals who never experience it before censoring time. In standard survival analysis, mortality is the outcome, and the assumption is that sick patients die eventually, whether under observation or after censoring. However, in practice, effective treatments often postpone death to such an extent that they are effectively cured, thus no longer at risk. There are different methods to estimate cure models, depending on how the fraction of individuals who never experience an event (the cure fraction) is modelled, and how one parametrises survival time for those who do. In the marriage study, I follow Cilliers and Mariotti (2021) and Redivo et al. (2024), who used cure models to estimate changes in stopping and spacing behaviour during the fertility transition in South Africa and Southern Sweden at the turn of the 20th century.

I employ a mixture cure model to analyse both the probability of ever marrying by age 50 and the timing of marriage among those who eventually married using the CUREREGR stata package (Buxton, 2013). In this framework, the population is assumed to consist of two distinct groups: those who are "cured" (i.e. will never marry) and those who are "uncured" (i.e. at risk of marrying). The overall survival function is expressed as a weighted average of the cure fraction and the survival distribution of the uncured group. An alternative approach is the non-mixture cure model, in which the cure fraction is not modelled directly but inferred from the tail behaviour of the survival function (older unmarried individuals). In the context of

marriage, the mixture cure model is preferable because it allows for explicit modelling of the cure fraction, whereas the non-mixture model applies the same survival function to both cured and uncured individuals.

To estimate the probability of never marrying, I use a logistic regression model, which is standard for binary outcomes. The timing of first marriage is modelled using an accelerated failure time (AFT) specification, a parametric survival model with a lognormal distribution for the time-to-marriage. The lognormal distribution has been chosen due to its good fit to the observed age distribution of marriage. This modelling strategy enables separate estimation of the effects of neighbourhood context on both the probability of never marrying and the timing of marriage.

Competing-risks Cox model

A competing-risks survival analysis is used in Paper III. The competing risks model is an extension of the Cox model, which is used when there is more than one event of interest. In this case, the possibility of marrying partners from different social origins. There are two ways to estimate competing risks models, with multiple Cox models or the Fine and Gray (1999) approach. The Fine and Gray model proceeds by attributing weights to individual observations based on their cumulative incidence functions. It is more computationally intensive and less flexible for register data, since it requires all subjects to have unbroken observation periods. The multiple-Cox-models estimation produces the same coefficient estimates, but the fit of the model to the data is different from the Fine and Gray approach. Additionally, it allows for individuals to have gaps in their observation time, and the estimation is computationally efficient. For these reasons, I opted for multiple Cox models.

For the non-parametric estimation of the cumulative incidence function of the competing marriage events, I use the Aalen-Johansen estimator (Aalen & Johansen, 1978). The estimator provides transition probabilities between the unmarried and the different potential marriage outcomes. It is the competing-risks equivalent of the Kaplan-Meier estimator and differs from it in two main ways. The first is its presentation of cumulative hazards rather than survival, with its characteristic increasing profile and the second is its requirement that there are no gaps in observation time. As its use is mainly in the illustration of descriptive patterns, this downside was minor, and the results of the paper present cumulative incidence functions only for the population without gaps in observation time.

The competing risks Cox model rests on the same proportional hazards assumption as the regular Cox model, and all competing events must satisfy it. In a competing-risks setting, estimation proceeds by censoring individuals who suffer other events, and hazards are computed for individuals who suffer the event of interest. The process repeats for all competing risks, and statistical software then produces separate covariate estimates for each transition from the initial state (unmarried) to each event of interest. Like in the regular Cox models, time-varying covariates can

be included. I have used the R survival package (Therneau, 2024) to estimate the competing risks Cox models.

Similar to Paper II, the Cox model violates the proportional hazards assumption. Since it is infeasible to conduct a competing risks cure model estimation, I have modelled the time-dependent relationship between neighbourhood status and competing hazards of marriage on the age scale, interacting neighbourhood status with age category. This interaction model satisfies the proportional hazards assumption, and I have used it to study partner selection in Landskrona in in Paper III. The competing risks were marrying partners from blue-collar, white-collar, or unknown class origins. The neighbourhood context variable was the current neighbourhood status, a relative measure of the SES of neighbours, a time-varying variable changing once per year.

Ordinary least squares and linear probability models

Ordinary least squares regression and its version applied to dichotomous outcomes is used in Paper IV. It is perhaps the most well-known and widely used estimation procedure in quantitative studies. It is generally preferred because of its efficient use of data and unbiased characteristics, while making relatively few assumptions. It involves estimating the average effect of a variable on an outcome by drawing the best-fitting straight line through the predictor space defined by covariates and then using the slope of that line as a coefficient. The resulting estimates show the effect of increasing a predictor by one unit on the outcome, net of other covariates. The linear probability model uses the same estimation procedure, but for a dichotomous outcome, which can be inadequate depending on the distribution of probabilities. For example, increasing the share of white-collar neighbours in the neighbourhood by 1% increased the age at first birth by 0.06 years in Paper IV.

The study uses a long-term effect design, combining background information from childhood with outcomes measured in adulthood in a cross-section. Childhood neighbourhood and other relevant variables are constructed, then summarised, while educational attainment and outcomes are followed up in adulthood. Ordinary least squares estimation is used on the neighbourhood associations with age at first and last birth, completed fertility, and birth spacing, and linear probability models are used for probability of childlessness. I have also conducted robustness checks using Poisson models for completed fertility, and logistic regression for childlessness, but the results are unaffected, so the simpler model is used.

Logistic regression models

A logistic regression model is used in Paper V. This model is the standard approach for estimating dichotomous outcomes, as it transforms binary responses into log-odds using the logit function while accounting for covariates. These log-odds can be converted into odds ratios, which express the effect of a unit change or categorical difference in a variable on the likelihood of experiencing the event.

Additionally, the model allows for the prediction of conditional probabilities of the outcome. In Paper V, I applied this model to cross-sectional couple-level data from Swedish birth cohorts born between 1974 and 1982.

While studies of assortative mating and partner selection have traditionally relied on log-linear models due to their ability to address the two-sex problem and shifting marginal distributions (Lichter & Qian, 2019), recent research has increasingly adopted multinomial or multilevel regression approaches. These alternatives offer greater flexibility in incorporating multiple covariates compared to log-linear models (Kalmijn & Van Tubergen, 2010). Although event-history methods have occasionally been used in this context (e.g. Henz & Jonsson, 2003), they are less frequently employed.

Event-history analysis offers some advantages for studying union formation, particularly its ability to incorporate time-varying individual characteristics such as educational enrolment or employment status and its ability to model population at risk. Its main limitation is that it cannot account for partner characteristics without violating the principle of not conditioning on future events.

In theory, event-history models would be more appropriate at estimating incidence of assortative mating than cross-sectional methods, because intact unions are subject to selection through attrition. Older unions tend to be more homogamous, because heterogamy is an important predictor of union dissolution (Lichter & Qian, 2019). However, this issue is not relevant in this study, because we have used register-data to record unions at the time of their formation rather than as a cross-section of existing relationships.

Given these considerations, I have chosen to analyse individuals in unions in Paper V, which precludes accounting for the population at risk but allows for the inclusion of partner characteristics. The use of register data also avoids the incidence bias associated with union dissolution. The logistic regression model was applied to a cross-sectional dataset, where both individual and partner characteristics are available, providing an advantage over event-history analysis. The main benefit of this approach is the ability to control for age homogamy, an important dimension of educational assortative mating (Blossfeld, 2009).

To estimate the role of neighbourhood context in the likelihood of having a university-educated partner, we measure neighbourhood context at age 16 using the k-NN method, controlling for parental education, individual characteristics at the time of union formation, and partner age.

Spatial autocorrelation

Spatial autocorrelation of residuals is a concern in spatial analysis, as ideally no spatial structure should remain once relevant variables are accounted for. In long-term effect analyses, this is particularly difficult to assess due to the aggregation of

neighbourhood exposures across childhood and the absence of corresponding spatial measures at the time of outcome measurement (Papers IV and V). In Paper IV, I tested for spatial autocorrelation and found no impact on results. Standard Cox and cure models do not accommodate spatial dependence and addressing this requires incorporating a frailty term at the geographic level (e.g. block). Prior analyses using such frailty components found no substantive change in results (Hedefalk et al., 2025).

Statistical software

Data management has been conducted using R software versions 4.1–4.4 (R Core Team, 2025). Cox models have been estimated using the survival package (Therneau, 2024). Cure models have been estimated using the CUREREGR package in Stata (Buxton, 2013). Geocoding has been conducted using ArcGIS (ESRI, 2015) and QGIS (QGIS Development Team, 2023). Maps were made in the tmap package (Tennekes et al., 2025), and spatial analysis using the sf package (Pebesma, 2018).

Summaries of papers

Paper I: Social class segregation in Landskrona, 1905–1967

Co-authored with Gabriel Brea-Martinez, Finn Hedefalk and Therese Nilsson

This study examines spatial patterns of demography, household composition, and social class in Landskrona from 1905 to 1967, and estimates exposure to segregation across social classes during this period. Socioeconomic segregation is increasingly viewed as a driver of inherited disadvantage and declining social cohesion, yet historical trends in Sweden remain largely unknown due to the absence of geocoded individual-level data. The study aims to describe segregation patterns over time in Landskrona, accounting for both demographic shifts and socioeconomic segregation.

Using block-level data covering over 90% of the city's population, we construct demographic indicators (e.g. mean age of family heads, number of children), household composition (e.g. household size, share of female-headed households), and social class. These are visualised through colour maps and analysed alongside isolation indices by class and age, capturing exposure to segregation over time.

Findings show that Landskrona remained socially mixed and spatially concentrated until the late 1950s. While demographic indicators show little spatial clustering of childbearing families, ageing influences household distribution. Social mixing is common in the urban core in the first half of the 20th century, but suburbanisation leads to increased isolation of higher white-collar households, who become four times more segregated than other groups by 1967. This shift is driven by younger higher white-collars relocating to newly built suburban areas.

Despite its modest size, Landskrona has followed a development trajectory similar to larger cities of the time, initially growing around a dense, mixed core, then expanding into socially stratified suburbs. Although motivations behind white-collar suburbanisation remain unclear, it likely reflects their market advantage, access to subsidised housing, and ability to absorb higher transport costs.

Paper II: Neighbourhood effects in the marriage transition: a cure model analysis of Landskrona (Sweden), 1905–1967

This study investigates how neighbourhood status influences transitions to first marriage in Landskrona, Sweden, between 1905 and 1967, a period marked by major demographic shifts, including the baby boom and the early stages of the Second Demographic Transition. While marriage patterns during this era have been widely studied in relation to macroeconomic and family-level factors, the role of local social context remains underexplored. The study aims to assess whether

neighbourhood status affects both the likelihood of ever marrying and the timing of marriage, and whether these effects vary by gender, social class, and historical period.

The analysis uses longitudinal, geocoded data from the Scanian Economic-Demographic Database, covering the entire adult population of Landskrona. The sample includes over 39,000 individuals aged 18–44, tracked annually until marriage or censoring. Neighbourhood status is measured using a k-nearest neighbour approach, based on the share of white-collar family heads among the 25 closest neighbours of similar age. The study applies mixture cure models to estimate both the probability of ever marrying and the timing of marriage, while controlling for age, period, social class origin and social class in adulthood, parental co-residence, premarital childbearing, segregation, and economic conditions.

The results reveal strong gender and temporal variation in neighbourhood effects. For women, living in high-status neighbourhoods is associated with a higher likelihood of remaining unmarried, particularly before 1960, though the ever-married tend to do so slightly earlier. For men, the opposite pattern emerges: high-status neighbourhoods increased the likelihood of marriage, especially during and after the baby boom. Timing effects are generally modest, but variation in marriage timing is greater among women in high-status areas, suggesting divergent life course strategies. Interaction models show that these patterns changed over time, with a U-shaped association for women in the 1960s and a reversal of neighbourhood effects for men after 1940.

These findings complicate the expectations of collective socialisation and similar theories, which predict that high-status neighbourhoods uniformly promote marriage. Instead, the results support the hypothesis that neighbourhoods interact with gendered constraints and opportunity structures. For women, high-status contexts may have reinforced trade-offs between career and family, leading to delayed or foregone marriage. For men, neighbourhood advantage becomes increasingly beneficial as economic conditions improve. The study contributes to the literature by demonstrating that neighbourhood effects on marriage are historically contingent and gendered, and that local social composition influences life course transitions in ways not captured by family or macro-level analyses.

Paper III: Local context and marriage choices: the role of neighbourhood status in early 20th-century southern Sweden

This study examines how neighbourhood SES composition influences partner selection in Landskrona, Sweden, between 1905 and 1967. While contemporary research on assortative mating focuses on achieved characteristics such as education, historical patterns have typically been determined by ascriptive traits, including family background and local context. The study aims to assess whether

neighbourhood status affected the likelihood of marrying partners of different social classes, and whether these effects vary by gender, class origin, and historical period. It tests four hypotheses: collective socialisation, relative deprivation, gender moderation, and change over time.

Using longitudinal geocoded microdata from SEDD, the sample includes 39,536 individuals aged 18–49, tracked until marriage or censoring. Neighbourhood status is measured as the share of white-collar individuals among the 25 nearest neighbours of similar age, converted into quartiles by year. Partner class origin is categorised as blue-collar, white-collar, or unknown. The study applies competing-risk proportional hazards models with age interactions, controlling for age, gender, class origin, parental co-residence, and marriage market structure. Analyses are stratified by gender and historical period (1905–1939, 1940–1959, 1960–1967). Sensitivity checks include alternative neighbourhood scales, principal component analysis, and robustness to gaps in observation time.

Neighbourhood status significantly influences partner selection. Individuals in higher-status neighbourhoods are more likely to marry white-collar partners and less likely to marry blue-collar ones, especially during prime marriage ages (18–29). These effects are comparable in magnitude to those of individual class origin. Women in high-status neighbourhoods consistently avoid blue-collar partners, while men show a stronger tendency to marry upward. Contrary to the relative deprivation hypothesis, neighbourhood status had a positive influence on marrying high-status partners across both blue- and white-collar class origins. Temporal variation reveals that neighbourhood effects on blue-collar marriage weaken after 1940, while associations with white-collar marriage strengthen. Interaction models show stronger effects among individuals of white-collar origin, though similar patterns are observed among blue-collar individuals.

The findings support theories of collective socialisation and third-party influence, showing that neighbourhoods are linked to partner preferences and opportunities. The absence of support for relative deprivation suggests that high-status contexts do not discourage upward mobility in partner selection. Gender differences are modest but aligned with prevailing norms of the time: women tended to avoid lower-status partners, while men are more likely to marry upward. The shift in neighbourhood effects over time reflects broader changes in economic opportunity, marriage norms, and gender relations. The study contributes to the literature by analysing an understudied period using high-quality longitudinal data in a relatively ethnically and religiously homogeneous population, allowing clearer identification of social class influences.

Paper IV: Childhood neighbours and life-time fertility in twentieth-century southern Sweden: A k-nearest neighbour approach

Co-authored with Martin Dribe and Finn Hedefalk

This study investigates the long-term impact of childhood neighbourhood SES on fertility outcomes throughout the life course. Motivated by the dearth of research combining detailed neighbourhood measures with a life-course perspective, the study aims to understand how growing up in different social environments influences fertility timing, spacing, and quantum. It uses information from individuals who grew up in Landskrona, a medium-sized Swedish industrial town, during a period of significant urban transformation and demographic change, including the onset of the Second Demographic Transition.

The analysis uses longitudinal geocoded data from SEDD (1939–1967), linked to national registers (1968–2015). The sample comprised over 15,000 individuals residing in Landskrona between the ages of 1 and 14. Neighbourhoods are defined using a k-nearest neighbour approach based on the social class of similarly aged peers, measured yearly at the address level and averaged over childhood. Fertility outcomes are age at first and last birth, number of children ever born, birth intervals, and childlessness. The study controls for cohort, physical neighbourhood characteristics, family background, class origin, and educational attainment.

The findings show that individuals who have grown up in neighbourhoods with a higher share of white-collar neighbours delay their first birth, with similar effects observed for both men and women. This association is strongest among individuals from white-collar class origins and remains significant even after controlling for education. However, there is no association between neighbourhood SES and completed fertility or childlessness. Birth spacing shows minor associations, with slightly shorter intervals among those from higher-status neighbourhoods, but the differences are small.

The study contributes to the literature by demonstrating that childhood neighbourhoods influence fertility timing but not fertility quantum. It supports theories of socialisation and normative influence from advantaged neighbours, while finding little evidence for relative deprivation effects. The results suggest that early fertility is influenced by social context, particularly among higher-status groups, but that completed fertility is likely more affected by conditions in adulthood. These findings are relevant for understanding fertility behaviour in less segregated urban settings and highlight the importance of developmental environments for demographic outcomes.

Paper V: Childhood neighborhoods and partner selection by education, Sweden 1990–2022

Co-authored with Martin Dribe and Finn Hedefalk

The study investigates how the educational level of the childhood neighbourhood influences the likelihood of having university-educated partners in adulthood. Motivated by the broader implications of educational assortative mating for social inequality, the study aims to understand whether neighbourhood context during adolescence contributes to partner selection by education, beyond individual and parental characteristics. The research is situated within the Swedish context, known for its gender equality and high levels of educational attainment, and explores how early social environments influence long-term preferences and behaviours related to union formation.

The analysis uses full population longitudinal register data from Statistics Sweden for cohorts born between 1974 and 1982. Neighbourhoods are defined using a k-nearest neighbour approach based on the educational level of parents of similarly aged peers at age 16. The study population includes heterosexual unions formed between ages 18 and 40, defined by formal marriage or cohabitation with common children. Logistic regression models are employed to estimate the association between neighbourhood education levels and the likelihood of having a university-educated partner, while controlling for own and parental education, income, demographic factors, and the size of the urban area.

The findings show a consistent positive association between growing up in a highly educated neighbourhood and the likelihood of having a university-educated partner. This relationship holds for both men and women, and across first and higher-order unions. Interaction models reveal stronger effects in metropolitan areas and larger cities, and for individuals without university education or highly educated parents. These results suggest that neighbourhoods are more important for individuals who have grown up in more segregated areas and with less overall education.

The study contributes to the literature by demonstrating that neighbourhood context during adolescence plays a significant role in partner selection by education, even after accounting for individual and family characteristics. It extends previous research on educational homogamy by incorporating socio-spatial environmental factors. Findings suggest that preferences for partner education are formed early in life and remain stable over time, and that neighbourhoods can influence these preferences through peer networks and exposure to norms and behaviours. These findings highlight the importance of considering neighbourhood effects in studies of family formation and social inequality and suggest that the results may generalise well in contexts with similar segregation and education levels.

Discussion

The aim of this dissertation is to investigate how neighbourhood context influences family formation, specifically union formation and fertility. The overarching research question is to what extent neighbourhood environments in childhood, adolescence, and early adulthood influence demographic outcomes such as partnering, marriage, and fertility later in life.

In terms of the main findings across the five papers, Paper I shows that Landskrona was not a socioeconomically segregated city until the mid-1950s. Segregation emerges during the 1950s and 1960s, driven by structural changes and the self-segregation of affluent groups. Paper II shows that in the first half of the twentieth century, neighbourhood status is associated with the likelihood of ever marrying, though the relationship is complex. It interacts with gender norms and economic opportunities, revealing tensions between work and marriage for women, while becoming more influential for men as economic conditions improve. Paper III demonstrates that neighbourhood status also relates to partner selection: individuals from higher-status neighbourhoods are more likely to marry white-collar partners and less likely to marry blue-collar ones, with similar macro-level interactions as observed in Paper II.

Paper IV demonstrates that, in contemporary Sweden, advantageous neighbourhood conditions in childhood are associated with delayed fertility in adulthood among cohorts who grow up in Landskrona between 1939 and 1967. These delays are likely influenced by collective socialisation processes and increased educational attainment. However, neighbourhood context does not affect the number of children individuals have, suggesting that local contexts are unrelated to fertility quantum in this context.

Finally, Paper V shows that, from the 1990s to the present, neighbourhood context in adolescence affects the likelihood of having a university-educated partner in adulthood. This association is observed for both men and women in native-born unions across Sweden. Interactions with educational attainment, family background and city size reveal that neighbourhood exposure has a marginal but consistent effect on educational assortative mating, with implications for patterns of social stratification.

This dissertation explores the relationship between socioeconomic segregation and life-course transitions, with a particular focus on how childhood conditions influence partnering, marriage, and fertility. Given that individuals experience a range of socio-spatial contexts during childhood, these environments are expected to influence both subjective perceptions and objective opportunities, becoming determinants of life chances. From another perspective, when examining SES differences in family and fertility transitions, it becomes evident that individual achievement and family background alone do not fully account for observed

patterns; broader social contexts, such as neighbourhoods, also play a significant role.

This is precisely what the findings demonstrate. Differences in marriage probability, fertility timing and partner selection cannot be explained solely by individual-level factors such as income, educational attainment or occupational achievement, or macro-level factors such as period changes and partner availability. This thesis contributes to a growing body of research that links childhood and early adulthood neighbourhoods to family formation across the life course, through the use of novel data sources, advanced spatial methods and the study of previously underexplored outcomes.

A further contribution is the quantitative assessment of socioeconomic segregation in Sweden prior to the 1970s. Income segregation was considerably lower in the 1970s than it is today (Mutgan & Mijs, 2023), and Swedish urban areas resembled other European and North American cities in being densely populated and socially mixed (Molinder & Söderhäll, 2020; Glaeser & Kahn, 2001). In Landskrona, urban sprawl accelerates around the mid-1950s, leading to the development of more isolated suburban areas. This shift has been driven by rising living standards, the Million Homes Programme (Hall & Vidén, 2005), and has likely been facilitated by improved infrastructure and transportation.

In comparative terms, Sweden may be considered a least-likely case for strong neighbourhood effects, given its reputation for low inequality and comprehensive welfare policies (although see Mutgan & Mijs, 2023). A more favourable opportunity structure, lower gender inequality and policies supporting families and workers suggest that the Swedish context should mitigate the negative consequences of concentrated poverty and segregation, especially when compared to the U. S. (Friedrichs et al., 2003). However, Sweden is not an outlier within Europe. Other European countries also implement welfare policies aimed at reducing segregation and disadvantage (Tammaru et al., 2016), making it plausible that the associations between neighbourhood status and life chances observed here are similar to those found in other Northern European contexts with comparable economic and cultural conditions.

Although methodological differences across neighbourhood effects studies limit direct comparisons of estimates, the general direction of the findings in this thesis aligns with comparable research in Sweden and Northern Europe (e.g. Berrington & Stone, 2014; Malmberg & Andersson, 2019 on fertility; Kalmijn & Flap, 2001 on assortative mating). Comparisons with U. S.-based research are more complex, given that social stratification in the U. S. is closely tied to race and ethnicity, dimensions not explored in-depth here. This makes it difficult to directly compare with studies such as South and Crowder's (1999, 2000) work on race and marriage timing. Nonetheless, one can reasonably infer that neighbourhood status in Sweden

was likely associated with marriage as a normative and desirable transition into adulthood, rather than an out-of-sequence or stigmatised one.

In summary, Sweden's status as a least-likely case strengthens the argument for neighbourhood effects as determinants of demographic behaviour and life chances. The external validity of the results observed here, particularly those related to SES and class through social interaction mechanisms, is therefore likely to hold.

Another persistent issue in the neighbourhood effects literature is endogeneity, particularly the sorting of families into neighbourhoods by their SES and background. To address this, researchers have used randomised relocation experiments (e.g. Kling et al., 2007) and quasi-experimental designs with causal inference methods (Chetty & Hendren, 2018). Others, like Sampson (2012), have argued that selection is not a nuisance but a mechanism through which neighbourhoods exert influence, influencing individual choices and outcomes.

I align with this latter view. Although this thesis does not aim to empirically determine causal effects in a strict sense, it is important to acknowledge previous research on this issue. Early studies have relied on cross-sectional data, raising concerns about spurious correlations. However, longitudinal studies have confirmed that exposure to concentrated poverty is linked to worse outcomes in union formation and fertility (Malmberg & Andersson, 2019; South & Crowder, 1999; 2000). Other scholars have highlighted that it is not straightforward to disentangle neighbourhood effects from the sorting of families into neighbourhoods (Ellen & Turner, 1997).

The Moving to Opportunity (MTO) experiment seems to support this scepticism: relocated families have seen limited gains in employment or education, and boys fared worse in their destination neighbourhoods compared to their origin ones (Clampet-Lundquist et al., 2011). Yet, the picture is more nuanced. MTO participants report improved well-being and safety (Kling et al., 2007), and later analyses reveal that families moved to only slightly better areas (Sampson, 2012). The experimental and quasi-experimental literatures have built a strong case for selection-free neighbourhood effects on economic outcomes both as developmental effects of long-term exposure in childhood (Chetty et al., 2016; Chetty & Hendren, 2018), and in adulthood (Galster et al., 2015), though findings are context-dependent. These findings have contributed to a relative consensus on neighbourhood effects as a determinant of life chances (Chyn & Katz, 2021).

However, this consensus is contested. Experimental and observational studies often yield conflicting results, with selection effects, such as residential sorting, frequently outweighing the impact of neighbourhood exposure. Some evidence from the U. S. shows that background characteristics, not neighbourhoods themselves, drive adult economic outcomes (Harding et al., 2021). While Harding and colleagues do not challenge earlier findings of large developmental effects of

long-term exposure to neighbourhoods in childhood, their findings do cast doubt on observational findings for other outcomes.

Heckman & Landersø (2022) also sharply critique the "power of place" narrative, arguing that neighbourhood effects persist across vastly different welfare regimes, suggesting that family strategies and parenting resources play a larger role than previously acknowledged. In a yet unpublished manuscript, Eshaghnia (2023) questions the validity of quasi-experimental designs, showing that they may capture the mobility patterns of high-SES families rather than genuine exposure effects.

Despite these challenges, this thesis joins a growing body of literature that confirms the link between neighbourhood context and life chances using a variety of observational, quasi-experimental and statistical methods to account for selection, and I believe the current state of this literature generally supports this link. As I have alluded to in Theory and previous research, some of the criticism of the neighbourhood effects literature conflates composition with consequence. Composition reflects residential choices, and is therefore likely to be driven by selection, but the consequences of those choices can still be independently influential to individual's lives. If anything, they are the rational basis for the decision of parents (and adults) to strategically relocate to better places for themselves and their children.

Naturally, this does not mean that the neighbourhood can be considered a determinant on par with other aspects of individual and family conditions, such as parental SES. It is a fact that the impacts of neighbourhood context are often modest in comparison, but not always. In Paper III, for example, neighbourhood context is shown to have significant impacts on the likelihood of blue-collar marriage and outmigration, on par with social class origin. In summary, while it is difficult for neighbourhood effects research to establish definitive causal claims, the results of this thesis contribute to a growing body of research that casts doubt on the extent of selection effects, at least when it comes to developmental neighbourhood effects.

Schools are important meso-level contexts where individuals spend a significant portion of their childhood and adolescence, and where many formative relationships are established. As such, schools are often considered important determinants of life course transitions, either in relation to neighbourhood effects or as competing explanations. However, in the historical period examined here, schools did not appear to play a significant role. School districts have been explicitly tested in Paper IV, as well as in other studies using the same data on other outcomes (Hedefalk & Dribe, 2020; Hedefalk et al., 2023; 2025), and have been found not to influence the observed neighbourhood associations.

This may be a context-specific finding for Landskrona, with limited external validity. However, it could suggest that the social-interactive effects captured by the neighbourhood context measure do not vary meaningfully at the school level. This might occur if there is internal segregation within schools based on parental

background and neighbourhood origin, meaning that schools do not introduce additional variation beyond what is already present in the neighbourhood context. However, it might also reflect that the collective socialisation mechanism put forth in this thesis is more significant than previously thought. While further investigation into the effects of schooling in the contemporary period would be valuable, earlier findings led us to prioritise other pressing issues, such as refining segregation measures, examining marriage markets, and considering the timing of educational attainment measurement.

Another recurring question in the literature concerns the direction of neighbourhood status trajectories for individuals from different SES backgrounds. The evidence consistently points to a positive relationship between neighbourhood advantage and improved life chances. While it is challenging to determine whether outcomes in family formation, such as delayed fertility, marriage or assortative mating, are inherently beneficial or detrimental, these transitions cannot be evaluated in the same way as outcomes like income or health. Nevertheless, the findings underscore a clear link between neighbourhood status and investments in education and human capital, which likely contribute to better living conditions and more stable family and fertility trajectories.

For instance, consider the relationship between neighbourhood status, the likelihood of ever marrying, and the probability of marrying a partner of higher SES. These associations suggest that growing up in a higher-status neighbourhood contributes to better conditions in adulthood, which in turn provides advantages in the family formation process. The link between neighbourhood status and delayed fertility is more nuanced. On one hand, delayed partnership and childbearing could reflect economic constraints. On the other hand, it may indicate that individuals from higher-status neighbourhoods have greater opportunities to pursue education, invest in career development, and spend additional time and resources searching for partners and timing parenthood. Given the historical context of the fertility study, covering cohorts who entered adulthood between the late 1940s and the 1980s, the overall pattern of delayed fertility appears to reflect prolonged education and increased opportunities, rather than disadvantage.

The findings in this thesis suggest that relative deprivation was not a substantial mechanism. Across all family formation outcomes, neighbourhood advantage was beneficial regardless of class origin. In the fertility study (Paper IV), high-status neighbourhoods are associated with greater delays in fertility among those from white-collar families, but the overall effect was similar for individuals from blue-collar backgrounds. These results support theories of collective socialisation, peer influence, and social control, linking neighbourhood status to improved life chances.

Another question is the persistence of childhood neighbourhood context throughout the life course, even after individuals move away from their childhood neighbourhood. While register-based research cannot fully capture these

mechanisms, this thesis does offer some clarity. Studies from both the U. S. and Sweden show that neighbourhood context tends to persist over time, as people often relocate to areas similar to those they grew up in (Sampson & Sharkey, 2008; Sharkey, 2012; Van Ham et al., 2014). This pattern is also observed in Paper II, where most individuals followed in adulthood are likely to remain in similar SES environments to the ones in which they grew up. Another important mechanism is education. Previous research has shown that neighbourhood context strongly affects educational attainment (e.g. Hedefalk & Dribe, 2020), and this thesis finds consistent links between childhood neighbourhoods and family formation outcomes, suggesting that educational attainment, and its influence on earnings and partner selection, is a pathway through which early neighbourhood conditions affect adult life.

While education plays a role in linking childhood neighbourhoods to adult outcomes, it does not fully explain associations. In Papers IV and V, neighbourhood status remains significantly associated with family formation outcomes even after controlling for educational attainment. Notably, in Paper V, individuals without university education who have grown up in highly educated neighbourhoods were more likely to have university-educated partners than their educated counterparts from similar areas. These findings support theories of collective socialisation and peer influence, suggesting that socially mixed neighbourhoods foster familiarity across social groups, influencing partner choice beyond individual education. Overall, the thesis identifies three main pathways through which neighbourhoods influence life chances: social-interaction effects, persistence of context, and educational attainment.

The 20th century brought major shifts in family and fertility behaviours, driven by two fertility transitions. An important question is whether neighbourhoods contributed to the diffusion of these changes. This thesis offers two clues. First, developmental effects of childhood neighbourhoods remained relatively stable over time, with limited variation in their association with fertility and assortative mating, suggesting that neighbourhoods were not the main drivers of behavioural change, compared to education and social class. However, Papers II, III and IV show that individuals from white-collar origins often have stronger neighbourhood associations. Additionally, Papers II and III reveal that neighbourhood context in adulthood varies by period and gender, likely reflecting broader changes in marriage accessibility, economic conditions and gender norms. Overall, while neighbourhoods are unlikely to be major drivers of demographic transitions, they have probably amplified broader societal changes through local norms and an increasing acceptance of new behaviours. In summary, it is difficult to provide a definitive answer, and further research is needed.

These findings have clear policy relevance, as neighbourhood context, unlike family background, is considered amenable to intervention. Numerous programmes targeting neighbourhoods have been implemented in both the U. S. and Europe

(Galster et al., 2015). Broadly, these interventions fall into two categories: relocation and area improvement.

Relocation programmes have been carried out in the U. S. with positive outcomes for treated individuals (Chetty et al., 2016; Kling et al., 2007). However, their general equilibrium effects remain poorly understood (Chyn & Katz, 2021). The core issue is that housing is both scarce and highly desirable, but increasingly inaccessible. This means that when individuals are relocated, the vacated housing is likely to be occupied by newcomers who may face similar disadvantages. Alternatively, the older housing may be demolished, which constrains the supply of housing and pushes disadvantaged residents into other deprived areas. To mitigate the potentially negative effects of relocations, area improvement programmes have been proposed as an alternative, aiming to enhance neighbourhood conditions and reduce their negative impact on residents' lives.

Even so, these programmes are not without challenges. If successful, they may lead to gentrification, whereby the original target population is displaced due to rising rents and property prices. Nevertheless, area improvement initiatives offer a constructive approach to the general equilibrium problem by "levelling up" neighbourhoods. When implemented at scale, they have the potential to address structural issues in urban environments, even if they do not directly reduce inequality between residents, a goal that relocation programmes cannot reliably achieve.

While the results presented here do not directly evaluate the effectiveness of existing programmes, they align with findings from relocation studies in suggesting that improving neighbourhood status enhances life chances. Papers III and V indicate that more socially mixed neighbourhoods can reduce family-level inequality by fostering unions between individuals from diverse backgrounds, a novel finding.

Additionally, the findings contribute to the debate on whether neighbourhood effects are linear or non-linear. If the impact of neighbourhood context on life chances is linear, then relocation programmes may have a net-zero effect. This is because the improvement in one individual's circumstances is offset by a corresponding decline in the destination neighbourhood's marginal quality. In contrast, non-linear effects would imply that relocating someone to a better neighbourhood yields disproportionately positive outcomes, exceeding any effects of reordering.

Historical data from Landskrona suggest threshold effects, with only the highest-status neighbourhoods showing a consistent impact. However, results from Papers IV and V, based on contemporary Swedish data, reveal linear associations. These findings support the notion of net-zero relocation effects and contradict findings of strong threshold effects in neighbourhood poverty and labour market outcomes (Galster et al., 2015). They may be reconciled by the studies' focus on developmental effects of long-term exposure on union formation and fertility, while

Galster et al. (2015) have studied current neighbourhood effects on labour market outcomes. More research is needed on the policy implications of neighbourhoods on family demographic outcomes.

A final point of discussion concerns the challenge of encoding and decoding neighbourhoods in research. The neighbourhood effects literature has long relied on residential location as a proxy for both social interaction spaces and SES. While this approach has limitations, it remains useful, especially when residential location aligns with activity space segregation (Hedman et al., 2021). However, as geocoded data becomes more detailed and diverse, research designs and theoretical frameworks must evolve accordingly. This is already underway in the segregation and mobility literatures (Hedman et al., 2021; Kwan, 2013; Müürisepp et al., 2025; Hu et al., 2022), although the decoding problem remains unresolved.

Consider, for example, a gig worker who circulates in affluent areas while living in a deprived neighbourhood, and a physician residing in an exclusive area but working in a disadvantaged one. Is the gig-worker accessing better opportunities throughout his working life *because of where he* works than the doctor is *because of where he lives*? Their activity spaces reflect both residential and workplace contexts, raising questions about how social interactions and opportunities are created. If workplace segregation levels are substantially different from residential segregation (Hu et al., 2022), then the nature and substance of interactions, along with time-use patterns across urban space, become critical to interpreting segregation. Some research has found that workplace segregation is less severe than residential (Hu et al., 2022), but others have highlighted continuity between residential and activity space segregation (Hedman et al., 2021). Like in the above example, the substance of the social-interactions in these spaces is crucial in the interpretation of segregation patterns, as is the time-use component of how residents of different areas of a city use available spatial resources (Müürisepp et al., 2025). As such, decoding neighbourhood effects requires both sophisticated data and context-aware research designs.

Conclusion

This dissertation has used high-quality geocoded data to study meso-level contextual effects on family demography in unprecedented detail and in previously understudied contexts and outcomes (Research Objective 1). The high temporal resolution and consistency over a long period of time allowed for the construction of precise sociospatial context measures throughout the life course for multiple cohorts over the 20th century. Furthermore, they have been used to demonstrate that socioeconomically segregated neighbourhoods were not a permanent feature of

Swedish cities, but an emergent phenomenon of the mid-1950s onwards (Research Objective 2).

Nevertheless, neighbourhood context has played a significant role in life-course transitions throughout the 20th century (Research Objective 3), even in a setting like Sweden, often considered a least-likely case for neighbourhood effects due to its low inequality and strong welfare institutions. Across five studies, the findings consistently demonstrate that neighbourhood status, net of social class origin and adult SES, influenced outcomes such as the likelihood of marriage, marrying higher-status partners, delayed childbearing, and increased chances of having university-educated partners.

While the magnitude of these effects was generally smaller than that of individual and family-level determinants, they were nonetheless meaningful, persistent and statistically significant. Importantly, the results suggest that neighbourhoods matter not only through structural pathways like education, but also via mechanisms of collective socialisation, peer influence and social interaction. Education was an important mediator, but did not fully account for the observed associations, indicating that neighbourhoods shape values, behaviours and opportunities beyond formal schooling (Research Objective 4).

Moreover, the thesis has found no evidence supporting relative deprivation theories, since individuals from disadvantaged backgrounds did not fare worse in high-status neighbourhoods. Instead, high-SES environments appear to promote upward mobility and broader partner pools, particularly for those without university education. These findings reinforce the importance of neighbourhoods as spaces of social interaction and norm formation, which persist even after individuals have left their childhood neighbourhoods (Research Objective 4).

However, the role of neighbourhoods in driving broader demographic transitions appears limited. While they may not have initiated behavioural change, they likely amplified or permitted shifts in family formation patterns by creating local contexts more receptive to new attitudes and behaviours. The absence of nonlinear effects, and some evidence of threshold effects in very high-status areas, suggests that policy efforts should focus less on relocation and more on improving conditions in disadvantaged neighbourhoods.

Finally, the increasing availability of detailed geocoded data brings new challenges for decoding neighbourhood effects. As data becomes more detailed, new considerations about the relationship between residential location and activity spaces as proxies for social interaction. Activity space data, which captures where individuals live, work and spend time, offers new opportunities but also demands more nuanced research designs. Understanding how individuals relate to their environments based on their own SES will be essential for future studies aiming to capture the complexities of neighbourhood effects and other meso-level contexts.

In summary, even in contexts with relatively low levels of socioeconomic segregation, neighbourhood environments can have clear and lasting impacts on individuals' life chances. This raises concerns for future generations growing up in increasingly unequal settings, especially given the ongoing rise in income and wealth inequality in Sweden. At the same time, the findings offer a hopeful outlook: socially integrated neighbourhoods appear capable of breaking cycles of disadvantage. This provides strong motivation for policy interventions aimed at improving neighbourhood conditions, for children and adults alike.

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Familiar territory

Our relationships with others structure many aspects of our lives, especially during important moments such as choosing an education, entering the workforce, forming partnerships or starting a family. While the influence of family and parenting has been widely studied, less is known about the role of non-family connections, such as neighbours. One reason is that the data needed to study these relationships is often difficult to obtain.

This dissertation contributes to this field by expanding existing high-quality longitudinal databases with detailed geographic information, allowing for a richer understanding of people's neighbourhood environments across their lives. Using advanced spatial methods, I construct measures that reflect the social settings in which children grew up and young adults lived, following them to union formation and fertility later in life.

The thesis links historical and contemporary Sweden. It studies early 20th-century demographic patterns in Landskrona, a mid-sized industrial city in southern Sweden. It then follows individuals who spent their childhoods in Landskrona during the mid-century and tracks their lives into adulthood. Finally, the study turns to contemporary Sweden, examining national trends in union formation.

The findings show that neighbourhoods in the past were less socioeconomically segregated than they are today. Nevertheless, living among high-status neighbours was associated with a greater likelihood of marrying, marrying someone with higher education or social status, and postponing parenthood. These patterns were generally observed across social backgrounds, though some effects were context and outcome dependent.

In summary, the findings highlight the role of collective socialisation processes within neighbourhoods, that is, the ways in which individuals are influenced by those around them, both directly and indirectly. The evidence indicates that social interactions in neighbourhood settings are linked to demographic behaviours in adulthood, even in contexts where socioeconomic segregation is relatively low. In light of increasing segregation trends in Sweden and other parts of Europe, this dissertation contributes to ongoing research and policy discussions concerning neighbourhood environments and the influence of non-family social networks on individual life trajectories.

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