

Outline: How is poverty transmitted across generations, and what role do neighborhoods play? To answer these questions, I have identified a natural experiment and relevant data: the Danish Dispersal Policy (1986-1998) (DDP). This policy quasi-randomly assigned refugees to various locations, creating a unique opportunity to investigate how neighborhood assignment influences long-term outcomes, such as the educational attainment and adult earnings of refugee children [1]. Using modern mediation analysis techniques without stringent assumptions [2], I aim to shed light on refining policies that address major barriers to mobility by *testing for the existence of specific mechanisms driving neighborhood effects*.

Intellectual Merit: The literature has shown that neighborhood effects impact intergenerational mobility, but failed at disaggregating the importance of the various social influences encapsulated in this term. What are the first-order mechanisms driving lower mobility? Does school quality account for a significant portion of this broad term? My objective is to understand how neighborhood effects shape individual outcomes. Simply acknowledging their aggregated existence, as much of the current literature does, is insufficient. Moreover, the methodology I propose will address the longstanding gap in integrating well understood theoretical models with empirical findings to assess the relative importance of different mechanisms. Lastly, my data provides a unique opportunity to study an important yet underexplored group: immigrants and refugees.

Most U.S. studies on neighborhood effects rely on Moving to Opportunity (MTO), which randomly provided voucher subsidies to help disadvantaged families move to better neighborhoods. Nearly half of the families did not use them, leading to noncompliance and selection bias, making it difficult to identify neighborhood effects by simply comparing outcomes across different neighborhoods. Instead, the program measures the causal impact of offering vouchers by evaluating the difference in mean outcomes between families who received a voucher and those who did not (ITT) [3]. In contrast, DDP avoids self-selection *into treatment*, though noncompliance arose over time as individuals left neighborhoods. This allows for the identification of a more relevant policy parameter: the ITT of assigning families to better neighborhoods on later life outcomes [4]. DDP functions as an RCT, enabling the state-of-the-art mediation analysis in [2].

My hypothesis is that, aside from the portion of the effect mediated through parents, school quality will be crucial even if in Denmark school funding is equalized, unlike in the US. This benefit might be undermined by the sorting of households and teachers across neighborhoods, which creates public goods through association [5]. This sorting, often reflected in housing prices, can lead to segregation. If the evidence supports this, it suggests that equalizing school funding alone is insufficient, and complementary policies like neighborhood integration through affordable housing and eliminating exclusionary zoning may be necessary. Another mechanism, though of second-order interest and understudied, is social attitudes. If certain neighborhood characteristics foster trust and reciprocity, they may facilitate the transfer of information about job opportunities. A proxy for social attitude is the number of refugees from the same country of origin. Average education levels in a neighborhood can expose individuals to people who have attended universities. Regularly observing this can shift one's worldview, making higher education seem attainable.

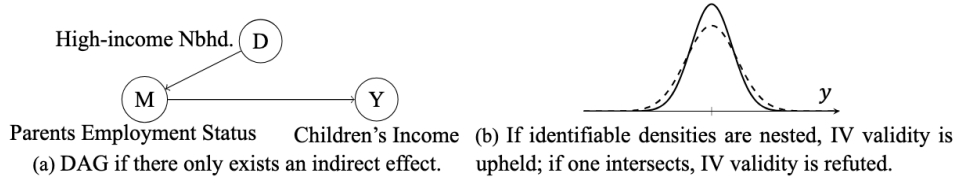
Research Plan: The problem suggests the following initial econometric specification:

$$y_{ikt} = \alpha + \beta d_{ikt-1} + \gamma' x_{it-1} + \varepsilon_{ikt} \quad (1)$$

where y_{ikt} represents later life outcomes for individual i in municipality k and year t . Neighborhood quality, d_{ikt-1} , is measured at the time of assignment, $t - 1$. The vector x_{it-1} includes variables known to the council at the time of assignment, such as parents' age, country of origin, household size, and marital status. Due to the quasi-random allocation of refugees, neighborhood quality at assignment is uncorrelated with ε_{ikt} , given x_{it-1} . β can be seen as the ITT estimate. To study mechanisms, assume $(Y, M, D) = (Y(D, M(D)), M(D), D)$, where D is the treatment (high-income nbhd.) and M the mediator (parental employment status). For simplicity, assume M and D are binary. The analysis in [1] requires:

- Conditional Random assignment : $D \perp X \perp Y(\cdot, \cdot), M(\cdot)$ and $0 < \mathbb{P}(D = 1) < 1$
- Monotonicity in D : $M(1) \geq M(0)$ almost surely

Random assignment is achieved by construction through the Danish Dispersal Policy. Monotonicity implies that being assigned to a high-income neighborhood increases the likelihood of parents being employed.



One of the objects of study will be the sharp null of full mediation (i.e. Can the effect of D on Y be explained fully by a candidate mechanism or set of mechanisms M ?). If we reject the sharp null, then there is evidence that mechanisms other than M are having an effect. If the sharp null is satisfied, then M is the only mechanism that matters. Which is satisfied if and only if, $Y(d, m) = Y(m)$ (a.s.) $\forall d, m$ [2]. If the sharp null of full mediation is satisfied, then D is a valid instrument for the LATE of M on Y . See figure (a) for a visual argument. We can see that the instrument only affects Y through M . In case the null is not satisfied, there would be a direct arrow from D to Y , invalidating the instrument. Using the fact that under the sharp null of full mediation $Y(1, 1) = Y(0, 1)$ one can show that the following identifiable densities have to hold:

$$\mathbb{P}(y \in Y, M = 0 | D = \text{Low Income}) \geq \mathbb{P}(y \in Y, M = 0 | D = \text{High Income}) \quad (2)$$

$$\mathbb{P}(y \in Y, M = 1 | D = \text{High Income}) \geq \mathbb{P}(y \in Y, M = 1 | D = \text{Low Income}) \quad (3)$$

In essence, testing for the sharp null of full mediation is equivalent to testing for the exclusion restriction for the validity of an instrumental variable. The results in [6] imply that these testable implications are sharp. See figure (b) for a visual representation of this test. Due to imperfect compliance in the Dispersal Policy, it is uncertain whether the property will hold. Addressing this issue will also be a part of the study. Nonetheless, the methodology in [2] follows through by setting $D = Z$, based on the assumption that if Z is a valid instrument for the effect of D on Y , and if the sharp null hypothesis holds, then Z affects Y only through M .

Extensions can be implemented by considering cases where a non-binary mechanism or multiple mechanisms are tested jointly [2, 7]. The general idea behind the extension is that the testable implications of the sharp null can be written as a system of moment inequalities with linear nuisance parameters (i.e. as a linear program). Lower bounds can then be provided for the size of alternative mechanisms when the sharp null is rejected [2, 8]. This lower bound represents the residual neighborhood effect not captured by the mechanisms. This aggregation approach allows for a multidimensional analysis of mobility, integrating insights from both economic and sociological perspectives. I can observe mediators such as parents' income and employment status, and construct neighborhood-level mediators including crime rates, average education levels, school quality, and the number of refugees from the same country of origin.

Broader Impacts: Neighborhood effects act as bottlenecks, allowing only a selected few to advance. Understanding the mechanisms that shape children's life outcomes is essential for developing policies that expand opportunities. There is a risk of misallocating resources to programs that do not target the primary drivers of low intergenerational mobility. For instance, immigrants now comprise 13.8% of the U.S. population, and those aged 25 and older are nearly three times more likely than U.S.-born individuals to have not completed high school. Educational attainment, along with neighborhood composition, influences criminal behavior and English language acquisition, both of which affect labor market outcomes and social integration. Segregated neighborhoods disproportionately impact Black communities, where crime can significantly disrupt children's life trajectories. This issue is further exacerbated by a non-monetary sorting mechanism, where high-quality teachers gravitate toward schools with high-achieving students and engaged parents, seeking non-pecuniary benefits from more favorable working environments [9]. At its core, this paper aims to update our understanding of where policy and future research efforts should be concentrated.

References: [1] Damm and Dustmann, Does growing up in a high crime neighborhood affect youth criminal behavior? [2] Kwon and Roth (2024), Testing mechanisms. [3] Pinto (2022), Beyond intention to treat. [4] Eshaghnia and Razavi (2024), Neighborhood effects and children's outcomes. [5] Durlauf (1996), Associational Redistribution [6] Kitagawa (2015), A test for instrument validity. [7] Fang et al. (2023), Inference for large-scale linear systems. [8] Flores et al. (2010) Nonparametric partial identification of mechanism ATE. [9] Billings et al. (2014). School segregation, educational attainment, and crime