Accumulated disadvantage or moving out of disadvantage? The impact of moving on completion of secondary education for children born in disadvantaged neighbourhoods

Joeke Kuyvenhoven
Netherlands Interdisciplinary Demographic Institute (NIDI)-KNAW/University of Groningen
Department of Human Geography, Stockholm University

Introduction

Education is crucial in shaping life chances, and a child's social environment of peers, the school and neighbourhood is increasingly recognized in influencing educational opportunities. Moving during childhood is an important life event that is not only disruptive and stressful in itself but also likely to alter a child's developmental context which may have long-term consequences on educational attainment (Coley & Kull, 2016). On the one hand, mobility is argued to be an element of instability in a child's life which could have a negative impact especially when experienced repeatedly (Mollborn et al., 2018). Moving during childhood can be an added stressor to accumulated instability when co-occurring with other disruptive life events such as parental union dissolution and parental unemployment or when triggered by instability in income or housing (Clark, 2016). On the other hand, moving may be a strategic decision of parents to improve their family's living conditions. When children move to a better environment – i.e. better housing, neighbourhood, schools – this might be beneficial (Hango, 2006).

The current study builds on the life-course perspective recognizing the complex and dynamic interplay between individuals and the environment as well as acknowledging that (dis)advantages might accumulate over time and life domains (Elder & Shanahan, 2007). The life-course perspective is increasingly applied to studies examining the impact of *neighbourhood context* as well as studies on the impact of *residential mobility*. Neighbourhood effects research suggests that especially long-term exposure to neighbourhood poverty has a negative impact (Nieuwenhuis et al., 2021). Similarly, there is increasing evidence that moving frequently is negatively associated with educational outcomes (Haugan & Myhr, 2019; Hutchings et al., 2013; Tonnessen et al., 2016). Both point to an accumulation of disadvantage over a child's life course, but there is a lack of empirical studies analysing the impact of moving and neighbourhood change for educational outcomes simultaneously.

This study focuses on children born in disadvantaged neighbourhoods and aims to understand not only whether moving from disadvantaged neighbourhoods is detrimental or beneficial for educational attainment, but also under which circumstances and for which children. I study residential mobility and neighbourhood context for each year during childhood until the age of 16 for all children born in 1995 in disadvantaged neighbourhoods in Amsterdam (N=2,276) or Stockholm (N=3,908) and analyse their completion of secondary education at age 21. I distinguish between moving frequency as well as upward or lateral moves in terms of socioeconomic status of individualised neighbourhoods. To minimize selection bias, propensity score weights are estimated for non-mobile children and children with low lateral, low upward, frequent lateral and frequent upward mobility patterns predicted by migrant background, household income, parental socioeconomic status, parental union and tenure at birth. Weighted logistic regression models are used to analyse the association between different moving patterns to completion of secondary education at age 21. Heterogeneity in mobility-effects is analysed by stratifying the models for two groups of children who are found to be especially mobile: children of migrants and children in instable families.

Data and measures

This study uses longitudinal individual-level population data of administrative registers of Statistics Netherlands and Statistics Sweden. The study population consists of children born in 1995 in the metropolitan area of Amsterdam or Stockholm in the most disadvantaged neighbourhoods, defined as the 20% neighbourhoods with the lowest socioeconomic composition (see operationalisation of neighbourhood SES). The final study population consists of N=3,908 children in Stockholm and N=2,276 children in Amsterdam metropolitan area.

All children were linked to their annual place of residence. In the Dutch data place of residence is measured as coordinates of the building, in the Swedish data as coordinates of grid cells. *Residential mobility* is defined as a change in residential address between two years. Frequency of mobility is measured as the sum of moves between ages 0-16 and categorised as: (0) no move; (1) low mobility (one or two moves) and (2) high mobility (three or more moves). To measure a child's *neighbourhood socioeconomic status* (SES), first, individualised neighbourhoods were constructed for each year in childhood based on the 200 nearest neighbouring households. Individual-level socioeconomic data was aggregated and Principal Component Analysis was performed using five socioeconomic neighbourhood variables. This resulted in one factor of neighbourhood socioeconomic status which is categorized into neighbourhood quintiles ranging from (1) very low to (5) very high SES. *Neighbourhood mobility* is measured as a change in neighbourhood SES quintile that coincides with a move. In this definition downward moves are not possible for children born in the most disadvantaged neighbourhoods. Neighbourhood mobility is thus categorized as (0) lateral move and (1) upward move. For children experiencing both lateral and upward moves, neighbourhood change is categorized as lateral if the majority of years is spend in a low SES neighbourhood and upward if the majority of years is spend in a higher SES neighbourhood. The combined measure of *mobility* consists of 5 categories: no move, low mobility lateral, low mobility upward, high mobility lateral and high mobility upward.

Based on previous research, a set of covariates measured at birth were included that are found to be related to residential moves in childhood: parental migrant background (none or at least one foreign-born parent); standardized household income quintiles; parental highest obtained educational level (low, medium, high); parental employment status (none or at least one parent employed); parental union (single parent, both parents); housing tenure (rental, home-owner). Additionally gender is included in all regression models. The outcome of interest is *completion of secondary education*, which is measured as having completed at least upper-secondary education at age 21. This is a slightly different measure for both countries, given the differences in the educational systems. For both countries, it is indicative for access to the labour market or post-secondary education.

Methods

To minimize selection bias, the different mobility groups are balanced on the described covariates at birth using propensity score weights. Given that this study compares multiple groups of movers, propensity score weights are estimated using Generalized Boosted Models for multiple treatments (McCaffrey et al., 2013). Covariate balance was assessed and indicated that the mobility groups were well balanced on all included covariates. The estimated weights are included in a logistic regression model in which completion of secondary education is predicted by the mobility types. The models are conducted separately for both cities (Amsterdam and Stockholm) for all children in our study population as well as stratified by migrant background and family stability.

Preliminary results and next steps

First results indicate similar selective mobility patterns for children born in Stockholm and Amsterdam, although frequent moving is more common in Stockholm. Figure 1 shows the background characteristics of the study population for Stockholm (left panel) and Amsterdam (right panel) for the covariates included. It shows that children born in disadvantaged neighbourhoods (coloured bars) are generally in a more precarious situation at birth compared to the total population born in the metropolitan areas (striped bar). Furthermore, it shows differences between the mobility groups. Generally, children who do not move (grey bar) or move to similar neighbourhoods (dark blue, dark yellow) more often have a migrant background and are born in a family with a lower socioeconomic position, while those moving upward (light blue, light yellow) are more often non-migrants and born in higher socioeconomic status families. Frequent movers (yellow bars) are more often born in single-parent families.

Figure 1. Background characteristics of children born in a disadvantaged neighbourhood by mobility pattern for Stockholm (N=3,908) and Amsterdam (N=2,276)
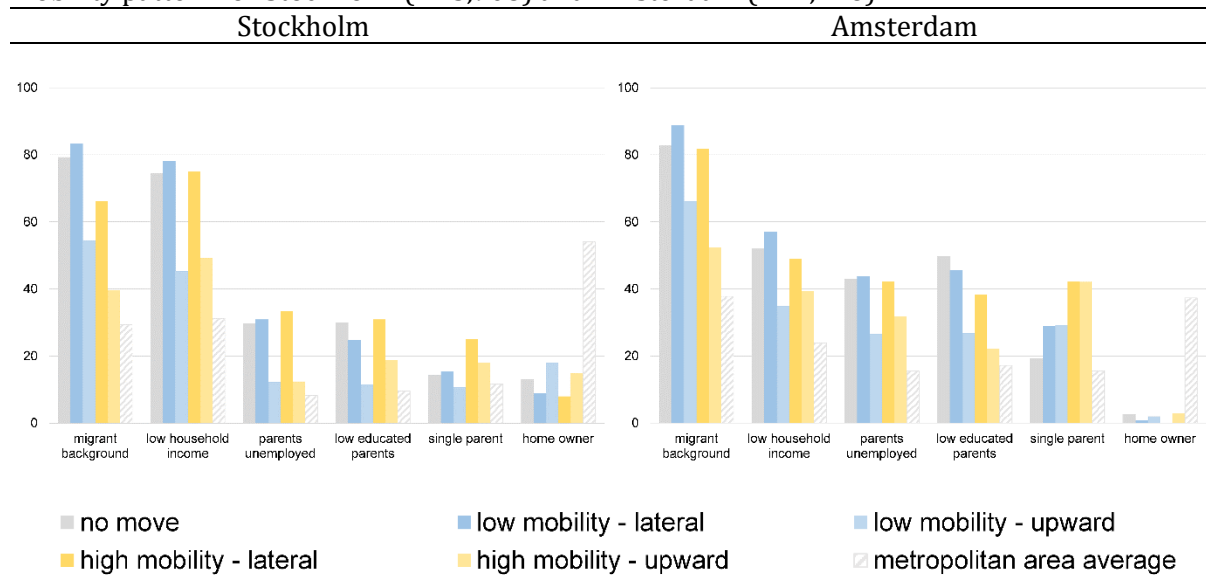

Figure 2 shows the results of the weighted logistic regression models and displays the odds ratios of completing secondary education for the different mobility patterns for Stockholm (left panel) and Amsterdam (right panel). For Stockholm, it shows that children experiencing low mobility and high upward mobility do not differ significantly in their completion of secondary education compared to children who do not move. The direction shows a slightly higher odds to complete secondary education for children moving to a better neighbourhood. In an unweighted model, low upward mobility is significantly associated with a higher likelihood to complete secondary education, indicating that this beneficial mobility effect is explained by a selective group of more affluent children moving to better neighbourhoods. Children moving frequently lateral have significantly lower odds to complete secondary education, even after accounting for background characteristics. This indicates that while frequent movers are indeed a group of children in a more precarious situation, there is an additional effect of moving frequently on the likelihood to complete secondary education. For Amsterdam, none of the mobility patterns are significantly associated to differences in the completion of secondary education, compared to non-movers. The direction of the associations is the same as for children born in Stockholm for all mobility patterns, except for those moving upward frequently. In Amsterdam, children moving frequently have lower odds to complete secondary education regardless of the neighbourhood of

destination, although this is not significant for either group of frequent movers. The large confidence intervals for frequent movers in Amsterdam are partially due to the relatively small proportion of children moving frequently (7% frequent lateral; 6% frequent upward).

Figure 2. Odds ratios completion of secondary education by mobility pattern for Stockholm (N=3908) and Amsterdam (N=2,276)
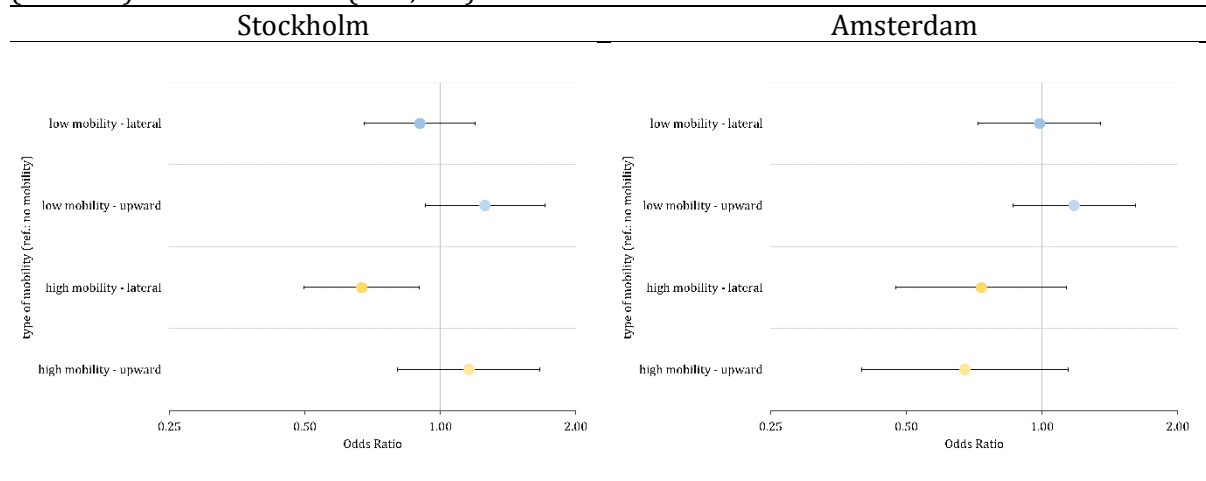
The first results of the stratified models indicate that frequent lateral moves are especially detrimental for children of migrants and children in instable families, while low upward mobility is beneficial for children living with both parents throughout childhood. In the next steps, I will explore this heterogeneity in mobility effects further and examine the differences between the cities more in-depth.

References
Clark, W. A. (2016). Life events and moves under duress: Disruption in the life course and mobility outcomes. *Longitudinal and Life Course Studies, 7*(3), 218-239.
Coley, R. L., & Kull, M. (2016). Cumulative, timing-specific, and interactive models of residential mobility and children's cognitive and psychosocial skills. *Child Development, 87*(4), 1204-1220. https://doi.org/10.1111/cdev.12535
Elder, G. H., Jr, & Shanahan, M. J. (2007). The life course and human development. In R. M. Lerner (Ed.), *Handbook of child psychology* (Vol. 1). New York: Wiley.
Hango, D. W. (2006). The Long-Term Effect of Childhood Residential Mobility on Educational Attainment. *The Sociological Quarterly, 47*(4), 631-664. 10.1111/j.1533-8525.2006.00061.x
Haugan, T., & Myhr, A. (2019). Residential Mobility, Family Structure, and Completion of Upper Secondary Education - A Registry-Based Cohort Study of the Norwegian Adolescent Population. *Frontiers in Psychology, 10*, 2311. 10.3389/fpsyg.2019.02311
Hutchings, H. A., Evans, A., Barnes, P., Demmler, J., Heaven, M., Hyatt, M. A., et al. (2013). Do children who move home and school frequently have poorer educational outcomes in their early years at school? An anonymised cohort study. *PLoS ONE, 8*(8), e70601. https://doi.org/10.1371/journal.pone.0070601
McCaffrey, D. F., Griffin, B. A., Almirall, D., Slaughter, M. E., Ramchand, R., & Burgette, L. F. (2013). A tutorial on propensity score estimation for multiple treatments using generalized boosted models. *Statistics in Medicine, 32*(19), 3388-3414. 10.1002/sim.5753
Mollborn, S., Lawrence, E., & Root, E. D. (2018). Residential mobility across early childhood and children's kindergarten readiness. *Demography, 55*(2), 485-510. 10.1007/s13524-018-0652-0
Nieuwenhuis, J., Kleinepier, T., & van Ham, M. (2021). The role of exposure to neighborhood and school poverty in understanding educational attainment. *Journal of Youth and Adolescence, 50*(5), 872-892.
Tonnessen, M., Telle, K., & Syse, A. (2016). Childhood residential mobility and long-term outcomes. *Acta Sociologica, 59*(2), 113-129. https://doi.org/10.1177/0001699316628614