

Inequality

The IFS Deaton Review

Geographies of socio-economic inequality

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An IFS initiative funded by the Nuffield Foundation

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Introduction

Over many decades, academics, policymakers and governments have been concerned with both the presence of inequalities and the impacts these can have on people when concentrated spatially in urban areas. This concern is especially related to the influence of spatial inequalities on individual outcomes in terms of health, education, work and income, and general well-being amongst other outcomes. Research into the geographies of inequality can broadly be split into two categories. The first includes studies focusing on understanding the spatial patterns of inequality in cities and regions, including how these patterns emerge and change (or do not change) over time. This category includes studies on residential sorting, the changing intensity and geographies of socio-economic segregation, and the relationship between spatial segregation and income inequality. A lot of work on segregation is inspired by the segregation models of Thomas Schelling (1971), which show that small individual preferences can lead to high levels of segregation in cities.

The second category of research includes studies that consider the effects of spatial inequalities on individual outcomes – often termed neighbourhood effects or spatial context effects (Petrović, Manley and van Ham, 2020). Underpinning this work is the idea that living in deprived neighbourhoods has a detrimental effect on individual outcomes, above and beyond the effect of individual characteristics, such as level of education. In recent years, studies of spatial context effects have shown that the residential context in which people live, and grow up, can have a meaningful effect on a variety of outcomes later in life.

In this commentary, we provide an overview of the contribution that both types of studies make for our better understanding of the impacts and processes behind the (re)production of inequalities in modern cities. We also address some of the main challenges in modelling contextual effects and, crucially, provide evidence that no single study can definitively provide the answer to the question whether – and how much – spatial context effects are relevant for understanding individual outcomes. There is a wide plethora of studies that use different types of data, drawn from different countries and cities, use different outcome variables, and different conceptualisations of the spatial context in which individuals (inter)act. It is only when taken together that this rich body of research on spatial context effects gives a sufficiently nuanced view on the potential influence of spatial context, but increasingly shows convincingly that spatial context effects are relevant.

This commentary ends with the presentation of the vicious circle of the segregation model (van Ham, Tammaru and Janssen, 2018b; Tammaru et al., 2021). The model focuses on the spatial selection of people to residential neighbourhoods, schools, workplaces and leisure time activity sites, and the contextual effects people gain from them that stem from various mechanisms, including interactions with other people. The model further suggests how spatial inequalities are reproduced over the life course of individuals and over generations. Finally, we suggest some ways in which this vicious circle of spatial inequality and segregation can be broken.

¹ We are grateful for the financial support of the Understanding Inequalities (UI) grant, funded by the Economic and Social Research Council (ESRC; Grant Reference ES/P009301/1) between 2017 and 2021. We are also very grateful to the Estonian Research Agency, which has provided financial support to the five-year PRG306 project 'Understanding the Vicious Circles of Segregation: A Geographic Perspective' (for more see <https://segregationcircles.eu/>), to the Estonian Academy of Science, for support through the research professorship of Tiit Tammaru, and to the EU Horizon project 'UpLift' (<https://www.uplift-youth.eu/>).

Residential sorting and geographies of inequality

Worldwide, levels of socio-economic segregation in cities are increasing and, as a result, the rich and the poor are increasingly living in different parts of urban regions. In their book *Socio-Economic Segregation in European Capital Cities: East meets West*, Tammaru et al. (2016) analysed segregation data for 12 European cities. Across these capitals, it was clear that although in Europe levels of socio-economic segregation were still relatively low compared with many other countries, levels of segregation are increasing. This was potentially as a response to increased globalisation, the restructuring of the economy and the labour market, neo-liberal politics and – in some cities – declining investments in the social rental housing sector.

Taking a more global perspective, van Ham et al. (2021) have presented an analysis of 24 large urban regions in Africa, Asia, Australia, Europe, North America and South America. Their book specifically focuses on analysing spatial segregation and income inequality trends and they have investigated changes in the occupational structure of the case study cities. The book shows similar patterns all over the world. Overall, the more unequal societies are, the more separate the neighbourhoods of rich and poor. In higher-income countries, the affluent part of the urban population is moving to city centres, while those with lower levels of (financial) resources are being pushed to the peripheries, with the suburbanisation of poverty (see Bailey and Minton, 2018; Zhang and Pryce, 2020). This is a reversal of the suburbanisation trends of the 1970s when many of the higher-income groups moved to a house with a garden in the suburbs, and it is in line with the urban revanchism of Smith (1996). In lower-income countries, we see similar patterns emerge, often with the rich concentrating in enclaves. An important factor that explains the changing social geography of cities is the professionalisation of the urban workforce. Through the process of professionalisation, the share of high-income and high-status jobs is increasing at the expense of the other groups, including those in lower-income and lower-status groups. This is important for the understanding of spatial patterns as high-income workers exercise their ability to realise their preferences to live in centrally located and attractive areas, displacing residents with more limited means.

The relationship between income inequality and spatial segregation appears almost universal. Rising levels of inequality lead to rising levels of socio-economic segregation almost everywhere in the world. Levels of inequality and segregation are higher in cities in lower-income countries, but the growth in inequality and segregation over the last few decades has been faster in cities in high-income countries. If this trend continues, cities in higher-income countries will move closer to the high levels of inequality currently seen in lower-income countries. Given that, over the last decades, levels of income and wealth inequality have been rising across the globe (Piketty, 2014; Alvaredo et al., 2018), we would expect levels of socio-economic segregation also to continue to rise. These rising levels of inequality and the associated potential spatial segregation pose huge challenges for the future social sustainability of cities, because the places where a diverse range of people live have a direct effect on individuals' socio-spatial mobility and well-being. The more unequal the cities get, the more restricted socio-spatial mobility becomes (Nieuwenhuis et al., 2020).

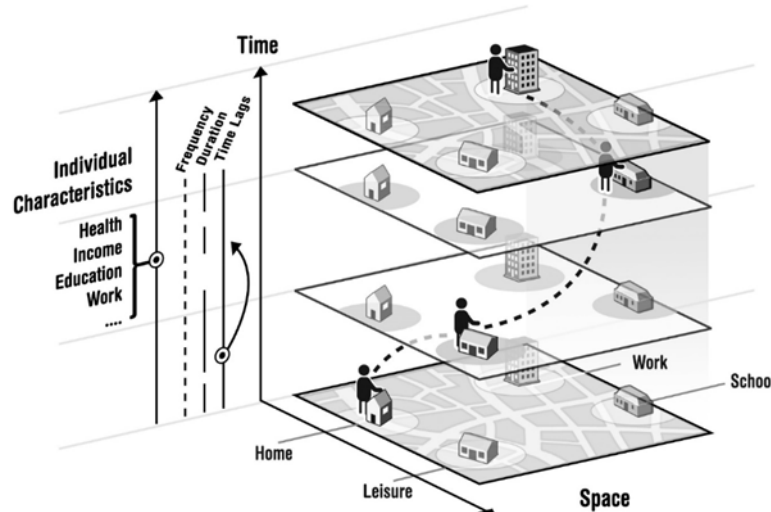
Spatial context effects

Rising levels of inequality and socio-economic segregation in cities lead to more uneven urban spatial landscapes of opportunity. As levels of segregation grow, the poor and the rich live increasingly separate lives. The concentration of poverty in specific neighbourhoods can lead to negative neighbourhood effects on individual outcomes. There is a long tradition of studying these so-called neighbourhood effects, but more recently it has been acknowledged that the effects of geographies of inequality extend beyond the residential neighbourhood, with the interaction of residential segregation of parents and school segregation of children being central to understanding intergenerational transmission of inequality (Nieuwenhuis, Kleinepiers and van Ham, 2021; Tammaru et al., 2021).

Our residential, social and urban spaces are, of course, continuous and not divided into discrete neighbourhood units, even if the processes we are interested in exploring do have a spatial extent to them. Consequently, spatial context effects can emerge across a wide array of environments and

spatial scales; these could be in the very, local, immediate environment around the home or in larger quarters of the city as places of residence, schools and workplaces start to cluster (Petrović, van Ham and Manley, 2018). Low-income neighbourhoods tend to increasingly overlap with the location of low-skilled workplaces (Delmelle, Nilsson and Adu, 2021) and 'notorious schools' (Bernelius, Huilla and Lobato, 2021). It follows that the residential context is only one of the socio-spatial contexts in which people are exposed to others and environmental factors. Through their daily activities, people go to school or work, go shopping, or participate in leisure activities, and the accumulation (and interactions between) of exposure in all these domains can result in cumulative spatial context effects. So spatial context effects are multi-scale and multi-domain and should be investigated over the life course (Hedman and van Ham, 2021), as is depicted in Figure 1 on the life course approach to understanding spatial context effects.

Figure 1. A life course approach to understanding the role played by spatial context



Source: Taken from de Vuijst, van Ham and Kleinhans (2016).

Challenges in modelling the role of the spatial context

One of the key challenges for the measurement of spatial contextual effects is the identification of genuine and 'pure' causal influences of the spatial context on individual outcomes. It is not controversial to observe that there is strong correlation between living in a poor neighbourhood and being poor: indeed, much of this relationship can be explained by the fact that poorer people move to and live in lower-income neighbourhoods because that is where the more affordable housing tends to be located. Up to a decade ago, most studies of spatial context effects found strong negative significant effects of living in spatial concentrations of poverty on individual outcomes; the reason was that most studies did not take into account selection effects, and basically found correlations. More recently, the use of some sort of correction for selection effects has become standard in the literature, but the majority of studies continue to find evidence for spatial context effects (but the effects are much smaller than before correction for selection).

Over the years, a range of methodological approaches and modelling strategies has been developed to identify 'real' causal effects and most of these approaches are not without problems. Ideally, an experimental set-up is used where people are randomly allocated to neighbourhoods and followed over very long periods of time. But such an approach is not realistic and is morally questionable in the real world; even in the case of the (quasi) experimental settings used in the United States for poverty deconcentration, the results have been far from clear and the evidence of confounding substantial (see Clark, 2008; Manley, van Ham and Doherty, 2012). Because of these difficulties, econometric solutions have been used to try to overcome the lack of experimental designs. The studies show a range of outcomes where some find evidence of spatial context as an influence of individual outcomes, whilst others do not. Overall, it is the case that when studies correct for spatial sorting, the resulting impact of the spatial context on individual outcomes reduces, often substantially but, even then, there remains a meaningful contribution from context. However, for us the problem of sorting remains critical and under-explored: the issue of residential sorting is

integral to residential context and resulting contextual influence, and often studies overlook the fact that the sorting process itself is also (partly) a neighbourhood effect. Consequentially, within the wider critique of specifying the contextual effect more explicitly, association with a catch-all measure, such as low income or deprivation, is not sufficient to elicit a causal mechanism through which the context can influence individuals – so sorting mechanisms should also be taken into account explicitly (van Ham, Boschman and Vogel, 2018a). The simple fact that poor people end up in poor neighbourhoods is part of the (intergenerational) neighbourhood effect, which has major consequences for the chances people get in life.

There is a large literature on how neighbourhood affects individuals, which deals with the question whether or not neighbourhood effects exist, and if so, how important they are. While these questions are important, it is not possible to answer them within a single study. Whether a study that uses some sort of correction for selection effects finds evidence for spatial context effects or not, it is important to remain highly critical with regard to the outcomes of such a study. Besides the major challenges of overcoming selection bias in the sorting process, and other econometric challenges, there are several other issues that need to be understood when evaluating the evidence emerging from the literature on the role played by spatial context. There is a large variation in the definition of neighbourhoods used in studies. Some studies investigate contextual effects using very large spatial units – the size of counties, states or local authorities – while others use units that represent the local environment; whilst both provide contextual information on the mechanisms, processes and meanings behind the contexts, different scales have different meanings. Ultimately, there is no one single spatial unit that can sufficiently represent all residential contexts, and therefore a multi-scale approach should be used (Petrović, van Ham and Manley, 2021). These multi-scale units can be taken from administrative neighbourhoods (at different scales) but, more recently, work has increasingly used 'egohoods' or bespoke neighbourhoods, where an individual is at the centre of their own spatial context at different spatial scales.

The idea behind using a multi-scale approach is that different causal mechanisms play at different spatial scales. For example, peer group effects or positive role model effects are likely to play at a very low spatial scale – think streets or blocks of houses – while labour market processes are likely to play at the scale of regional labour markets or supply and demand. So, there is no single relevant geography for understanding spatial context effects, and therefore it is also not possible to identify one geography for policy measures, as different processes play at different spatial scales. Having said that, recent research shows that the most important spatial context effects play at the lower spatial scales – from a few hundred metres up to two kilometres (Petrović et al., 2021) – which suggests that policy measures should focus on resolving high local concentrations of poverty.

The question of the importance of spatial context effects also depends on how the spatial context is measured, as there are many different indicators. Often the contextual influence is based on the neighbourhood income level; but, income is not the only contextual influence that matters, and other measures that characterise places should be considered as well. Spatial contexts are likely to be related to specific places and specific points in time, varying in their intensity for both people and periods. As a result, a study on one city in a single country does not necessarily provide evidence of how the same spatial context would influence people in a different place, or even at a different point in time (even in the same place). Different studies use different outcome variables for different categories of people. Studies of spatial context investigate such effects for young children, teenagers, young adults and adults, for different socio-economic or ethnic groups, amongst others. And studies investigate health outcomes, educational outcomes, crime, employment, income, and so on. It is the combination of this very rich literature that gives us insight into the importance and relevance of the spatial context of individuals. Finally, there is also a rich literature on spatial context effects using qualitative and ethnographic approaches. These studies are not concerned with any of the important challenges related to modelling the importance (or otherwise) of spatial context, but they provide very rich insights into the underlying mechanisms that lead to spatial context effects, by studying people's everyday lives and their practices, beliefs and behaviour (see, for example, Pinkster 2007, 2014; Darrah and De Luca, 2014).

So, to conclude, studies of spatial context effects should preferably explore different modelling approaches, including different strategies to control for selection effects, different geographies, and

preferably also different operationalisations of the outcome variable. All of these choices made by researchers will have an effect on the outcomes of the study.

Empirical studies of the role of spatial context

Spatial context effects have been studied for many decades now using many different datasets from different countries. The majority of studies seem to focus on the US, the UK, the Netherlands and Sweden. The latter two countries are relatively small in population, but very rich in terms of longitudinal and geocoded individual data. When reviewing literature from different countries, it is important to keep in mind that there are large differences between countries and even between cities within countries. These differences relate to levels of segregation, poverty and inequality, but also to the socio-political context, welfare system and urban form. Whilst it is important to compare results from different countries, one has to keep in mind that results from one country might not be applicable in other settings. Having said that, it is quite striking that results for the US and, for example, Sweden can be quite similar despite the huge differences in welfare systems.

Whilst the majority of the neighbourhood effects literature has dealt with adult outcomes (and the effect of spatial contexts during adulthood), there is a growing literature that investigates the impact of context on childhood – either in terms of predicting shorter-term outcomes during childhood or, more recently, using childhood experiences to understand outcomes later in life. It is this second aspect we are particularly interested in here, and the evidence is clear in terms of the potential connections. For instance, it is well known in the wider sociological literature that the socio-economic status of children is linked to that of their parents but Manley, van Ham and Hedman (2020) went further and demonstrated that there is also an intergenerational transmission of neighbourhood contexts. In their paper, Hedman and van Ham (2021) show several examples of recent studies. Based on data in the US, Vartanian, Buck and Gleason (2007) show that childhood neighbourhood disadvantage is associated with neighbourhood quality for those living in the lowest-quality neighbourhoods. This is supported in the conclusions of Chetty and Hendren (2018) who exploit a quasi-randomised mobility programme in conjunction with causal econometric modelling to demonstrate that mobility out of concentrated poverty increased earnings from work in later life. Other authors, such as Sharkey (2008, 2013) and Pais (2017), come to similar conclusions for the US.

Moving away from the economic outcomes, Glass and Bilal (2016) explore the 'stickiness' of neighbourhood characteristics during early childhood and highlight that exposure to disadvantaged environments during the formative years can be causally linked to higher levels of obesity in later adult life. There have been similar findings in European-based research as well. For instance, using data from Sweden, Gustafson, Katz and Österberg (2017) and van Ham et al. (2014) find that the neighbourhood status of children is correlated to that of their parents, and that immigrants are more likely than natives to remain in disadvantaged areas over two generations. Manley et al. (2020) add a family dimension to the analysis: children from the same family live more similar lives than unrelated individuals, but the neighbourhood of origin has an independent effect on future residential careers. Wixe (2020) connects segregation during childhood with later-life employment outcomes and concludes that there are short-term negative effects on self-employment, which appear to alter in later life and demonstrate that 'individuals who grow up in ethnically segregated neighbourhoods are more likely to become self-employed later in life' (p. 2733). Whilst becoming self-employed can be diverse in cause – both positive in terms of entrepreneurship and negative in terms of a demonstration of a lack of connectivity to the wider labour market – it is instructive to see the impact that segregation can have.

Using data from the Netherlands, de Vuijst, van Ham and Kleinhans (2017) add that higher education can reduce intergenerational transmission but that this is less prevalent among the immigrant population. Nordvik and Hedman (2019), however, argue that in the Norwegian setting higher education may function as a means of social mobility for people with an immigrant background in particular, a conclusion supported by Galster and Wessel (2019). Also, in terms of the transmission of maternal neighbourhood status, Hedman and van Ham (2021) demonstrate that there is a strong path dependence. This is relevant because many studies of spatial context effects are concerned with modelling away selection bias in neighbourhood sorting, but the neighbourhood sorting itself is part of the spatial context effect. And we know that residential environments, and other spatial contexts, influence spatial sorting in other domains, such as

education. What matters in all of these studies is that the size and impact of the context varies: there is increasingly little doubt that context matters, but the key questions of to whom, when and in what way remain open.

Many empirical studies have investigated neighbourhood effects on individual income and other individual-level outcomes (for an overview, see Galster and Sharkey, 2017, p. 21). Moving beyond the single study and reviewing the child-based literature, Minh et al. (2017) identify the theoretical mechanisms behind contextual influences and highlight the importance of place (i.e., where the neighbourhood effect occurs) and who (i.e., the specific person being exposed matters in relation to the degree of impact that the neighbourhood context has on them). Generally speaking, this literature suggests that the neighbourhood context is more important during childhood than during adulthood for understanding outcomes later in life. Several causal mechanisms have been identified, which can explain how the concentration of poverty in residential neighbourhoods is related to individual outcomes later in life. These mechanisms include collective socialisation, social control and cohesion, environmental issues (such as air pollution), and access to educational and job opportunities and other amenities (Wilson, 1987, p. 198; Galster, 2012; Sampson, 2012). It is now widely acknowledged that each of these mechanisms operates on a different spatial scale (Sharkey and Faber, 2014; Galster and Sharkey, 2017; Petrović et al., 2018, 2020), which emphasises the importance of using a multi-scale approach in empirical studies.

In recent years, there has been a substantial increase in studies using individual-level, longitudinal and high-resolution geocoded data to model the influence of spatial context. Some of these studies found strong and convincing evidence for spatial context effects whilst others found that the apparent impact of spatial context on individual outcomes was acting as a proxy for other, sometimes omitted, factors. For example, van Ham et al. (2018a) used a two-step strategy in which they first modelled neighbourhood choice to derive a neighbourhood selection correction component, which they used in a second step to model neighbourhood effects in income. Using data from the Netherlands, they show that the observed impact of the neighbourhood on an individual's income weakens after adding the neighbourhood selection controls, but remains significant. In another study, Hedman, Manley and van Ham (2019) used sibling data to explore the impact of neighbourhood histories and childhood family context on income from work. They concluded that there is a neighbourhood effect on income from adult neighbourhood experiences, but that the childhood neighbourhood effect is actually a childhood family context effect. They found that there is a long-lasting effect of the family context on income later in life, and that this effect is strong regardless of the individual neighbourhood pathway later in life.

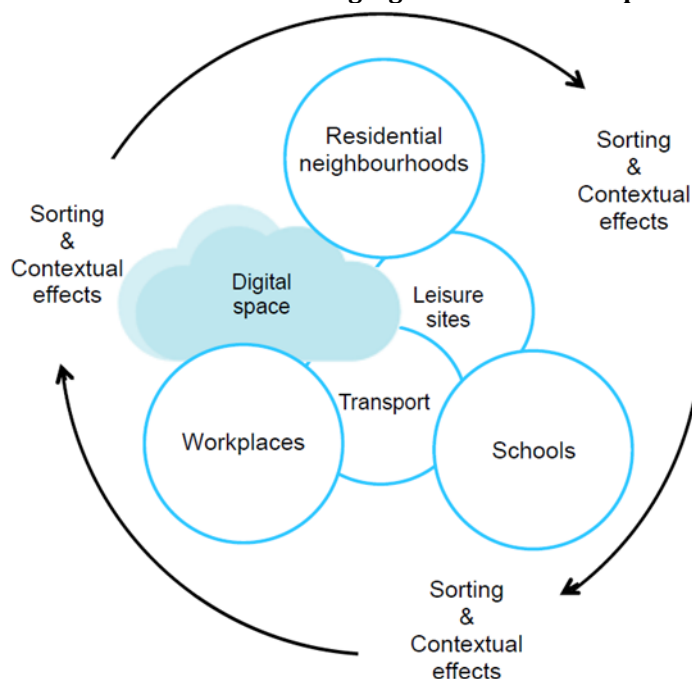
Hedman et al. (2019) provide a useful overview of some of the more recent literature on spatial context effects. Using data from the US, Chetty, Hendren and Katz (2016) demonstrate that moving from a high- to a lower-poverty area before the age of 13 is associated with increased college attendance, and higher earnings and lower risks of single parenthood later in life. Similarly, Galster and Santiago (2017) find that children in the US perform better (measured at age 18) if they are exposed to higher-performing neighbours at a younger age. The results by Chetty et al. and Galster and Santiago suggest that at least part of the neighbourhood effects are temporally lagged and long-lasting (see also Wheaton and Clarke, 2003; Sampson, Sharkey and Raudenbush, 2008). This is confirmed in a study by Hedman et al. (2015), who find for Sweden that the parental neighbourhood affects the incomes of children up to at least 17 years after leaving the parental home. A study by Sharkey and Elwert (2011) using US data suggests that children's cognitive ability is influenced by the neighbourhood of their parents, even though the children have never lived in the area themselves. This transmission is suggested to operate through long-lasting effects on parents, which are then affecting the outcomes of their children. Overall, the literature suggests that spatial context effects are relevant, and that controlling for spatial sorting leads to a smaller, but yet significant effect of the spatial context of individuals on their individual outcomes.

Vicious circle of segregation and inequality

The effects of spatial sorting and spatial context effects come together in the vicious circle of segregation model (van Ham et al., 2018b; Tammaru et al., 2021). The model builds on multiple components of the literature reviewed above and sets out a holistic understanding of how

childhood experiences feed into adult experiences within the framing of intergenerational inheritances. Children are born into the neighbourhood in which their parents live as a result of their sorting processes. This neighbourhood context influences a range of individual outcomes for the children and their parents, including, for example, their attitudes to education and their social network. The neighbourhood where children grow up has consequences for spatial sorting processes across other domains in life including, crucially, schools. For instance, as most children attend a primary school local to their residential location, children of low-income parents growing up in a poor neighbourhood will also go to school with local children who are also likely to have low-income parents. This school context has an influence on the learning outcomes of children, which subsequently affects the rest of their educational career. Children of affluent parents who grow up in an affluent neighbourhood are likely to go to a school where other children also have a higher socio-economic status. Their parental background, combined with the neighbourhood and school context, is likely to give them an advantage over children in low-income neighbourhood contexts. The spatial sorting effect extends to other life domains as well, such as leisure time activities. Children often engage in such activities with children from the same neighbourhood or school.

Figure 2. The vicious circle of segregation across multiple domains



Source: Adapted from van Ham, Tammaru and Janssen (2018b).

The educational outcomes of children affect their transition to work as adults and the unequal starting point of children growing up in poor and affluent neighbourhoods creates an unequal playing field. The spatial sorting and spatial context effects in early age influence the earning capacity of children as adults, which in turn has an effect on their sorting into residential neighbourhoods as adults. Children who grew up in low-income neighbourhoods often end up living in similar neighbourhoods as their parents when they start their independent housing career. This is especially the case for children from minority families. As a result, we observe that there is a strong intergenerational effect of neighbourhood on both individual outcomes and place of residence. When the next generation of children are born, the circle of segregation continues, with the new parents living in a low-income neighbourhood, and their children attending their local school. This circle runs throughout an individual's life and over multiple generations. Of course, the vicious circle is not deterministic model; we all know examples of people who grew up in a low-income neighbourhood and ended up doing well in life socio-economically. However, the social and economic structures that surround the model, and processes that shape (spatial) opportunity sets through which people travel as they age, do influence the outcomes of individuals. It is also worth noting that this model focuses specifically on socio-economic outcomes, and not on other indicators

of well-being, such as happiness. Nevertheless, the general picture that emerges from the literature is one of a strong path dependency.

Breaking the vicious circle

It is clear that poverty and inequality are strongly rooted in space, and that spatial context effects play a role at different spatial scales. There are three main intervention strategies that could break the vicious circles of segregation: people-based policies, area-based policies, and policies that connect people to places. People-based policies revolve around investing directly in people, in their education, skills, health and well-being, in order to create more equal opportunities. Given the spatial context effects found for children, and the effects later in life, it is important to focus policies on early life, making sure that all children have access to good schools and education. But people-based policies also need to focus on improving access to education and employment for adults matching the full life cycle. However, people-based policies are unlikely to succeed on their own if the wider spatial opportunity structure is not invested in.

As a result, the second type of interventions – area-based policies – complement the people-based policies and focus on creating more socio-economically mixed residential areas to reduce negative spatial context effects. It is unlikely that in the short term such policies will have much effect on individual-level outcomes, but in the longer-term de-segregation policies are likely to pay off. Policies can focus on the existing city to create more mixed neighbourhoods by building housing for lower-income households in more affluent parts of cities, or by introducing middle-income households in lower-income neighbourhoods. These policies are increasingly controversial as it is often the case that housing for lower-income households is demolished to make place for higher-income households. It is therefore very important that such policies are sensitive to local structures and also provide better living conditions for those who are forced to move. Also, newly developed residential areas should be planned in such a way that a sustainable socio-economic mix emerges. Here it is important that the mixing takes place at a spatial level that is not too low, as people like to be surrounded by others who are similar to them. At the same time, mixing should be done in such a way so that people with different socio-economic backgrounds still meet each other, and that children go to mixed schools. Both people- and area-based policies require very long-term investments from which results are initially likely to be small, but in aggregate can provide larger alternations in outcomes, possibly only after decades and multiple generations.

Finally, connectivity-based policies connect people with places. Growing up in a low-income neighbourhood has negative effects on the educational career of children. Making sure that children from low-income neighbourhoods can go to good schools makes a difference. Also, connecting places of residence with jobs, health-care facilities and places of leisure will reduce spatial inequalities. Connectivity-based policies should focus on providing excellent and affordable public transport solutions to reduce urban inequality in spatial opportunity structures. It is therefore crucial to give priority to providing the lowest-income neighbourhoods access to places of opportunity.

Critically, breaking the vicious circle requires constant attention and active urban policy as global trends show increasing levels of socio-economic segregation driven by increasing levels of economic inequality and the resulting rising house prices in the most desirable parts of cities.

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