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SEGREGATION IN THE TWENTY FIRST CENTURY: PROCESSES, COMPLEXITIES AND FUTURE DIRECTIONS

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ABSTRACT

Economic inequality, international migration and urban transformation have generated fresh interest in segregation and given new social significance to questions of socio-spatial separation and interaction. At the same time, advances in data, methods and theory are opening up new avenues of inquiry that push the focus beyond simple measures of unevenness of residential patterns towards more nuanced analysis of spatial asymmetry, structure and scale. There is also a drive towards considering spaces and activities outside the neighbourhood, bringing new richness to our understanding of how various social groups interact in the various aspects of their lives. These processes and complexities form the backdrop for our special issue and we reflect on the implications for future priorities in research on segregation in the twenty first century.

Key words: Segregation; measurement; methods; inequality; migration; spatial analysis

INTRODUCTION

Segregation between populations of different ages, ethnicities and social class has been a prominent theme in quantitative geography for at least half a century. At the time of writing, a Google Scholar search for the 'index of dissimilarity', one of the most popular empirical measures of segregation, reveals 176,000 scholarly articles, 24,000 of which have been published since 2014. The index of dissimilarity rose to prominence in the segregation literature following the work of Duncan and Duncan (1955) which demonstrated the power of the index relative to alternative measures available at the time (Massey & Denton 1988). Following Cortese *et al.*'s (1976) critique of the index, 'a torrent of papers' ensued offering alternative methods for measuring the separateness and spatial patterns of population groups (Massey & Denton 1988, p. 282). Since then, understanding and measuring segregation has continued to be important for at least two reasons.

First, the continued globalisation of migration, at least from a destination country perspective, and the growing diversification of immigrant populations in terms of their origins due to 'decreasing emigration restrictions, the shifts toward skill-selective immigration policies, the waning of post-colonial effects, and development-driven migration transitions' (Czaika & De Haas 2014, pp. 315–316). Internal and international migration continue to be the main drivers of population change, especially in regions which send or receive large numbers of migrants (UN 2017, 2018). There has also been growing concern regarding the potential for climate change

to induce large scale increases in global migration (e.g. Reuveny 2007, Piguet *et al.* 2011) which may lead to new patterns of migration flows and new pressures on both origin and destination countries. Growing inequalities in wealth and income within societies along ethnic/racial lines (Bruch 2014), and more skewed international and inter-regional migration, that is, more diverse non-European migration to a smaller pool of destination countries (Czaika & De Haas 2014), have continued to spark concerns about the long-term effects of migration in terms of integration and segregation.

Second, these changing and complex patterns of migration have been accompanied by increasing spatial concentration of migrant destinations as the world's population has become increasingly urbanised. World Bank figures (https://data.worldbank.org/topic/urban-development) suggest that the proportion of the world's population living in urban areas has risen from about a third to more than a half between 1960 and 2015. For many countries, this has resulted in populations from ever more diverse social, racial, ethnic, linguistic and cultural backgrounds being brought into ever greater proximity. Whether these new waves of migrants will be well-received into convivial and richly diverse communities, or exacerbate existing patterns of spatial separation, and whether the impact will be benign or divisive, will have profound effects on inter-group relations and patterns of inequality for generations to come.

At the same time, advances in methods and new forms of data, continue to open up ever richer ways to measure segregation and its impacts. The corollary is that there will likely be both greater imperative and greater opportunity to measure segregation and understand its nature and implications.

In this introduction to the special issue, we seek to paint the backdrop for the papers that follow. Our goal is to guide the reader in understanding why segregation is important and where future research should turn its gaze. We first highlight the recent trends in segregation in Europe and North America. We then reflect on why they are important, before unpacking some of the complexities of defining and measuring segregation.

What seems at face value to be a relatively simple concept – the degree of separation between different groups – emerges as an immensely nuanced, dynamic and multifaceted phenomenon. Finally, we look ahead to how the future landscape of segregation research might evolve. Given that segregation is likely to grow in importance in the twenty first century, how can we take advantage of the new opportunities afforded by statistical and data innovation? We show how the six papers that make up the special issue highlight important directions for research. Using these papers as a springboard, we reflect on what the priorities should be for segregation research.

NEW PATTERNS OF URBAN SEGREGATION

Recent studies show that social segregation levels are generally on the rise in North American and European cities (Bischoff & Reardon 2014; Tammaru *et al.* 2016; Monkkonen *et al.* 2018). The growing separation between social groups is arguably linked to broader processes of urban (and suburban) transformation. Since the 1980s, after a period of decline, more and more cities have been witnessing an expansion of knowledge-based economic activities and urban (re)development. This 'urban resurgence' has been driven by demographic transitions, new (middle) class dynamics, and capital investments, and has led to population growth and neighbourhood change (Lees 2008). The growth of middle class professionals in the city has meant that low-income neighbourhoods have been undergoing a process of gentrification. This process can lead to more social mix and a decrease in urban segregation, yet as the process matures, gentrification may lead to social homogenisation and drive segregation through displacement (Walks & Maaranen 2008; Freeman 2009; van Gent & Hochstenbach forthcoming).

The displacement of low-income households from urban neighbourhoods is typically tied to rising house prices as result of gentrification (Guerrieri *et al.* 2013). Yet, displacement is also tied to more structural changes in housing and employment that have curtailed access to urban housing

markets. Following the global financial crisis of 2008, home ownership and, in some cases, private rented housing are becoming less accessible to a younger generation and those who lack wealth and job security (Martin *et al.* 2018). Adding to housing issues in Europe, there has been a long trend of diminishing or less accessible social housing (Scanlon *et al.* 2014). Lastly, the manner in which segregation patterns are made and remade is dependent on local housing (re)development and planning (Tammaru *et al.* 2016; Monkkonen *et al.* 2018). In some cases local governments may use their powers to safeguard a level of social mix in new developments and redevelopments (Andersson *et al.* 2010). Yet, local planning and land use regulation can also lead to the construction of exclusive middle class neighbourhoods and to resources being steered away from low-income housing (Deng 2017).

As urban housing has become less affordable and accessible in increasingly prosperous inner city neighbourhoods, the share of low-income households has gradually diminished, leading to the decentralisation (or 'suburbanisation') of poverty, with poor newcomers in particular more likely to move to the suburbs (Hulchanski 2010; Kavanagh *et al.* 2016; Hochstenbach & Musterd 2018), with potentially deleterious effects on access to employment and amenities for low-income households. Meanwhile, low-income households remaining in the city may become more isolated in pockets of older social housing (Musterd & van Gent 2016) and more concentrated in 'extreme-poverty' neighbourhoods in both inner cities and suburbs (Kneebone & Nadeau 2015).

WHY SEGREGATION MATTERS: INEQUALITY AND DEMOCRATIC POLITICS

Segregation is often discussed in terms of social inequality, yet the two are not synonymous. The degree to which spatial separation amounts to social inequality depends on the social, institutional and historical context. As a population is more socially equal in terms of income and ethnicity, the separation of subgroups becomes less problematic, yet never

meaningless (Maloutas & Fujita 2012). Pierre Bourdieu (2018) theorises segregation as the inscription of social hierarchies on physical space. Driven by the social struggles over the 'profits of space', the lived experiences and patterns of segregation are dependent on various social fields and heavily mediated by the state (Bourdieu 2018). The link between spatial separation and social inequality is contingent on the tendency of the housing market to sort high income residents into neighbourhoods with the best access to education, employment and amenities and the lowest levels of pollution, and crime (Kuminoff *et al.* 2013; Depro *et al.* 2015) and the distribution of public services and goods. For this reason, the link between separation and inequality is strongest in more liberal contexts – notably the US and UK. Conversely, it is weakest in cities in strong (developmental) welfare contexts, where the state would ensure a level of redistribution and direct intervention (Musterd & Ostendorf 1998; Maloutas & Fujita 2012).

In recent decades, however, the slow but steady restructuring of the redistributive welfare state and the increasing accumulation of capital by fewer individuals have led to growing social inequalities across different contexts (Alvaredo *et al.* 2017). So, as social inequalities are growing in many countries, the question of segregation is becoming more relevant as spatial unevenness reproduces and aggravates social inequalities (Galster & Sharkey 2017). The literature on neighbourhood effects has highlighted the various ways in which social isolation, and the concentration of poverty, stigma, and poor access to employment and commercial opportunities, may be detrimental to life chances of both adults and children (see review by Galster & Sharkey 2017). The tendency for housing market sorting processes to be more potent as the distribution of income is more unequal (Depro *et al.* 2015), combined with negative effects of concentrated poverty on social mobility and life outcomes (Galster & Sharkey 2017), means that inequality and segregation can become mutually reinforcing.

Segregation may also have political significance, problematised as the spatial expression of class divisions. Yet, here, the importance of race, religion, and ethnicity also come to the fore. A notable example

is the US, where the issue of segregation is strongly tied to a history of racial discrimination, dating back to the end of slavery (Massey & Denton 1993). In addition, recent waves of migration have led to new contestations. Since the millennium, Europe and the US have been confronted by a resurgence of right-wing nationalism. The electoral success of radical right-wing populists like the Austrian and Dutch Freedom Parties, France's Front National, the UK Independence Party, and Donald Trump have meant that nationalist and exclusionary discourses have bled into mainstream politics and policies. To understand the rejection of immigrant groups, religious communities (notably Muslims) and racial minorities, multiple authors have pointed to separation as being conducive to misunderstanding, political alienation and discontent among minorities and majorities (e.g. Pattie & Johnston 2008; Sharp & Joslyn 2008; van Gent *et al.* 2014).[1] Conversely, contact between groups through physical proximity may breed tolerance and even understanding, depending on local norms, values and practices (Schnell *et al.* 2015; Piekut & Valentine 2017).

Segregation may not only produce and reproduce social inequalities, but may also have relevance for the functioning of pluralistic democratic societies. For that reason, there is an imperative to understand the conditions, boundaries, dimensions, spaces, levels and scale of separation and proximity of social groups.

UNPACKING THE COMPLEXITIES OF SEGREGATION

The narrative of 'segregation as crisis' has come to permeate much of the policy debate, particularly in the UK and US where the emphasis has been on the negative consequences of residential and institutional (e.g. in schools) concentration of particular ethnic minority populations (Neal *et al.* 2013). Yet, the term – despite being politicised and perceived through a negative prism – has a neutral meaning. It is 'the degree to which two or more groups live separately from one another,

in different parts of the urban environment' (Massey & Denton 1988, p. 282). It is possible that spatial segregation has positive role for a community and for residents of a city as a whole. The concentration of people similar to each other might provide more emotional and social support. Such areas might be also seen as places of comfort, and a source of local know-how, or even be preferred residential locations by some residents due to the concentration of specialised services and offering unique life styles (Cheshire 2007).

Research on the impact of *residential* ethnic and racial segregation suggests that it may well have negative impacts interpersonal trust, social cohesion or attitudes towards minority ethnic groups (Sturgis *et al.* 2014). Indeed, residential areas are important 'socialisation spaces' for their inhabitants and through social control mechanisms they might shape individual attitudes, behaviours and expectations (Galster & Sharkey 2017). Due to physical proximity people living in the same local community are more likely to interact and cooperate with each other and form various groups of interest (Forrest & Kearns 2001). By doing so, attitudes, preferences and behaviours are exchanged, transmitted, and renegotiated. Yet, while some negative phenomena might correlate with the concentration of minority ethnic or racial groups, the latter does not necessarily cause 'hunkering down' of social life. Studies in the UK suggest that it is economic disadvantage – coexisting with segregation – which brings a deteriorating effect on inter-neighbourly social relations. In such communities residents are less well-off (so they are less likely to go out and socialise) and because of less infrastructure supporting social togetherness (Piekut & Valentine 2016).

A counter narrative to the crisis lens on segregation is the narrative of conviviality and everyday multiculturalism developed within human geography and the sociology of race/ethnicity, which points to the importance of small-scale zones for spatial integration outcomes and to the limitations of developing standardised measures of segregation (Neal *et al.* 2013). Despite Cortese *et al.*'s (1976) critique of the index of dissimilarity, it likely remains the most commonly-used measure of segregation. The index compares distributions of two

groups across spatial units and specifies what portion of one group would have to move to different units, so the distribution would be uniform across all units. The a-spatial nature of this measure is its major drawback (see Yao *et al.* this issue) – it does not, for example, take into account the spatial contiguity, proximity or asymmetry of the group distributions. These are important omissions. In reality, residential segregation is often characterised by asymmetry in the spatial patterns of different groups, and different levels of separateness at different scales, with some residents clustering at the street level, despite the neighbourhood having a mixed population profile overall, and particular patterns may reveal underlying tensions or positive connections. As a result, a high dissimilarity index might conceal the fact that ethnic groups living within this area actually share everyday lives and interact with each other in other types of spaces, and a low index that ignores local asymmetries may hide the existence of inter-group antipathy manifested in 'social frontiers' (see Dean *et al.* this issue).

Despite the majority of social segregation research concentrating on residential areas, segregation processes occur across various spaces, such as workplaces, schools or leisure spaces. In order to move research attention away from the residential space, Wong and Shaw (2011) suggest renewed focus on activity spaces instead, that is, all urban locations where people engage in social interaction (see also Kwan 2013). Understanding the nature of segregation requires taking into account how much time is spent in spaces considered to be dominated by different populations (Schnell *et al.* 2015). For example, existing research on the night-time (residential) and day-time (working) spaces examines whether people living in ethnically segregated neighbourhoods also work in segregated workplaces. Studies in the US, Sweden and the Netherlands have revealed that although workplace segregation is lower than residential segregation, there is a strong positive and linear effect of residential segregation on work-tract segregation, indicating that segregations between spaces and activities are interlinked (Ellis *et al.* 2004; Marcińczak *et al.* 2015; Boterman & Musterd 2016). These perspectives imply that residential areas are not the only spaces that

structure social interactions, attitudes and life outcomes, a theme taken forward by Kukk *et al.* this issue who look at the segregation dynamics in leisure activities, for example.

Another strand of underdeveloped research is conceptualising spatial segregation as multi-dimensional (Kukk *et al.* this issue). Is ethnic segregation in a given city higher than segregation along the socio-economic lines? How do they interact with each other? Managerial studies exploring the workplace segregation have developed the concept of 'faultlines'. A faultline is present if two employee groups fall into two distinct categories, in terms of ethnicity, social status, age, etc., for instance, when all ethnic minority workers hold lower, non-managerial positions within a company. A study on ethnicity and gender demonstrated that work satisfaction is lower if such faultlines occur (Lau & Murnighan 2005). A US-based study exploring the dynamics between income and race segregation showed that spatial separation of white and black residents is greater when within-group income inequality is low (Bruch, 2014). So segregation in two dimensions might overlap with a minority group members being of a distinct ethnicity and status; and any negative consequences of this intersection might be amplified. It is possible that segregation along the lines of ethnic subjectivities (or along *a priori* identity categorisation) might result in a variety of outcomes across and within ethnic groups depending on gender, age, ability and status. Such *intersectionality* of segregation outcomes remains under researched in the wider segregation literature, however, and awaits further investigation.

NEW CONTRIBUTIONS

The foregoing discussion highlights both the growing importance of segregation as a phenomenon worthy of study, and our growing awareness of its complexity. Against this backdrop, we anticipate directions in the future study of segregation will fall broadly into three broad categories:

1. The *nature of segregation* – how do we define and measure separateness in its many varied forms?

2. the *causes of segregation* – what are the processes that lead to different degrees and types of separation?
3. The *impact of segregation* – what are the effects of separation, and the extent to which these effects vary depending on segregation type?

The six papers that comprise this Special Issue nicely illustrate ways in which each of these three sets of questions could be investigated. Taken together, the papers form a solid foundation for future research.

It is the first of these areas, understanding the *nature of segregation,* that has been the primary focus of the quantitative literature which has bourgeoned into an enormously varied and complex field. In order to identify the limitations of current knowledge, and recognise opportunities for innovation, we need to find a way to synthesise this voluminous body of work. The paper by Yao *et al.* facilitates this task by presenting existing measures of segregation in standardised mathematical notation. They further help us navigate the existing state of knowledge by mapping out key challenges and developments in spatial segregation measurement, particularly with regard to: (i) incorporating different aspects of spatiality and multi-group social contexts into dissimilarity measures; (ii) dealing with continuous variables (such as income); (iii) accounting for spatial clustering; and (iv) developing indices that capture segregation in activity space. They highlight the need to study spatial interactions between people from different groups and the challenges of dealing with issues of spatial scale, statistical inference and connecting individual level experiences with ecological quantification.

The next four papers – by Dean *et al.*, Kramer and Kramer, Manley *et al.*, and Kukk *et al.* – nicely build on the Yao *et al.* review by focusing on particular aspects of segregation measurement that they seek to extend. Dean *et al.* highlight the remarkable lack of research on *spatial asymmetry* in segregation and the potential importance of this aspect. They present a new approach for identifying 'social frontiers', which allows for robust statistical inference in the presence of spatial

autocorrelation. The paper by Kramer and Kramer focuses on the problem of multigroup segregation – increasingly important due to the emergence of highly diverse ethnic populations. A nice solution to the technical challenges posed by this is presented in the form of a localised entropy index which they apply to the multi-ethnic context of Philadelphia. The issue of how address the multi-scale nature of segregation is tackled by Manley and colleagues using multi-level modelling which allows the authors to estimate segregation at different spatial levels within a unified model. Kukk *et al.* grapple with the issue of non-residential segregation and offer a 'domains approach' to the conceptualisation of segregation across different spheres of life and then utilise this framework to consider how interaction between ethnic groups in Tallinn, Estonia, relates to residential segregation. Together these papers greatly enrich the suit of tools available to researchers studying segregation.

This brings us to the *causes of segregation* and the processes that lead to different degrees and types of separation. Clark's paper demonstrates the detail and nuance that can be achieved by combining origin-destination analysis of the sorting process – whether, for example, ethnic groups from segregated neighbourhoods tend to move to less segregated ones – with carefully designed survey questions that attempt to uncover preferences for neighbourhood mix. The richness of Clark's results raises the question of whether the neighbourhood vignette approach used by the Los Angeles Family and Neighborhood Survey should be used more frequently, not just in the US, but in household surveys around the world.

This leaves us with the *impact of segregation*, perhaps the area in most need of development. Given the apparent disconnect in the literature between developing novel ways to measure particular facets of segregation and the robust estimation of the impact of segregation, it is perhaps not surprising that only one of the papers in this issue, Dean *et al.*, attempts to estimate the impact of the new segregation measure they develop. Using both permutations tests and fixed effects Poisson regression estimation, Deal *et al.* attempt to quantify the impact of

social frontiers on various types of crime. Their results provide compelling evidence that the neighbourhoods in Sheffield, England, that are joined by social frontiers tend to have significantly higher levels of crime. Again, this is an approach ripe for application elsewhere. More generally, however, there is a need to consider whether and how different forms of separateness lead to particular outcomes for individuals and communities.

The nuanced insights and innovations offered in these six papers not only provide stimulating contributions in their own right but also offer a springboard for thinking about future directions in segregation research. It is to this task we now turn.

FINAL THOUGHTS – WHICH WAY NOW?

Reflecting on the literature reviews and innovations presented in this special issue, what can we say, if anything, about the priorities for segregation researchers in the twenty first century? What are the most important gaps, and most valuable avenues to pursue, in the next phase of segregation research? Inevitably, any advice we offer here will be somewhat speculative as the existing literature is so vast and the potential permutations of future societies so varied. It is with these caveats in mind that we offer the following tentative suggestions regarding the priorities of future segregation research.

Connecting spatial asymmetry, proximity, structure and scale – This special issue includes methodological innovations that will help us understand spatial asymmetry (in the form of social frontiers – Dean *et al.*) and the effect of spatial structure and scale (based on multilevel modelling – Manley *et al.*). But these and other spatial features do not existent in isolation. We need to find ways of capturing the asymmetry, proximity, contiguity and structure in a coherent and integrated way, and to link individual level data with ecological measures of segregation (a point raised by Yao *et al.*). Advances in other literatures might help us here. For example, spatial proximity and spatial hierarchy have recently been integrated into a unified modelling framework and applied to individual-level data by Dong *et al.* (2016) using Bayesian multivariate conditional autoregressive models. It may be possible to use this approach to extend the multi-level modelling method presented by Manley *et al.* to decompose different spatial facets of segregation in the context of individual-level longitudinal data.

Connecting spatial and non-spatial segregation – The paper by Kukk *et al.* investigates the relationship between residential segregation and spatial interactions in activity domains (particularly leisure activities). We have said little in this special issue, however, about non-spatial aspects of segregation which have the potential to become increasingly important as social media and technology make trans-spatial communication increasingly easier and more immersive. Social network analysis (SNA) offers a potentially fruitful way to create a more capacious unified conceptual and empirical framework for considering both spatial and non-spatial connections, incorporating also more subtle aspects of segregation such as perceived homophily (Dean & Pryce 2017) and homophily horizons (Bakens & Pryce 2018). The problem with purely spatial approaches to segregation is that they overlook non-spatial connections between neighbourhoods and between individuals; connections that are difficult to analyse using traditional methods. Rapid methodological advances in statistical network analysis, particularly with respect to exponential random graph modelling (permitting multiple covariate analysis of connections) and big data techniques (allowing application of social analysis methods to much larger samples) open up important new opportunities for applying more nuanced social network approaches to segregation research. One of the limiting factors is the dearth of longitudinal surveys that have detailed social network questions. So a priority for future research strategists will be to address this data deficiency.

Connecting segregation types and segregation impacts – Dean *et al.* this issue attempt to estimate the impact of one particular type of

segregation (social frontiers) on crime, but how does this compare to the effects of other forms of segregation, including multi-group, multi-dimensional, multi-domain and intersectional aspects? And what about the impact on health, social mobility, education etc.? In other words, there needs to be much greater integration between neighbourhood effects research and the different strands of segregation research. Indeed, a noticeable feature of these literatures is how disconnected they are methodologically. Innovations in segregation measurement have generally evolved quite separately from the relatively limited number of studies that seek to measure the impacts of segregation. As such, there is a need for a comprehensive and coherent scientific programme of research to understand which types of segregation in which contexts have the most deleterious effects on particular types of outcome.

Connecting processes, outcomes and inequality – Clark's paper highlights the dynamic nature of segregation. A segregation index only gives us a snapshot but some of the crucial features of segregation relate to its underlying drivers and dynamics. Much more work is needed to link migration and sorting along various social dimensions with particular types of segregation and with the concomitant impacts. We also need to understand the implications of and for long term dynamics of migration and segregation. Bakens and Pryce (2018), for example, note how different preferences for homophily (particularly homophily horizons) could have profound impacts on the long-run segregation trajectories of cities. The impacts of these processes on life outcomes have important implications for inequality across different social classes and ethnic groups. While there have been tentative steps towards theorising and measuring the link between segregation and inequality, there is much that we do not now about the intricacies and causal processes of how the two are connected in the long term.

All of these suggestions highlight the pressing need for synthesis, not just conceptually, but methodologically and empirically also. Taken together, we believe these four research

areas comprise a rich and compelling scientific agenda for segregation research in the twenty first century.

Acknowledgement

Note

1. The reverse may also be true; discontent and aversion to specific political opinions and social groups may produce political segregation through selective migration.

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