

# Chapter 17

## Final Comments

In this study I have shown that popular measures of residential segregation – the dissimilarity index (D), the gini index (G), the separation index (S), Theil’s index (H), and Hutchens’ index (R), a measure closely related to Atkinson’s index (A) – can be cast as group differences of means on residential outcomes ( $y$ ) scored from area group proportions ( $p$ ). This approach yields identical results as previous approaches to calculating index scores, so nothing is lost when adopting this formulation – all past research findings can be reproduced and replicated. Importantly, however, many benefits accrue from adopting the new approach to assessing segregation.

One is that the approach serves to “demystify” aggregate segregation by revealing its direct connections to residential outcomes for individuals. Segregation studies generally have focused on describing aggregate distributions at the city level and have given little attention to the implications index scores have for the residential outcomes of the individuals in the groups being compared. This is very different from the approach that guides studies of group disparities in education, occupation, income, wealth, and other socioeconomic attainments. In these analyses, both the relevant attainment outcome and the attainment process that shapes its distribution are usually clearly in focus. Obviously, the literature on residential segregation rests on an implicit presumption that aggregate segregation arises from micro-level attainment dynamics that have consequences for the residential attainments of the individuals and households in the groups being compared. But, as Duncan and Duncan (1955) noted half a century ago, methodological approaches to measuring aggregate segregation have not pursued index formulations that can facilitate exploring these issues. The formulations I present here address this need by establishing that segregation indices reflect group differences on residential outcomes relating to group contact with differences between indices arising from differences in how they scale group contact.

Another benefit of the approach I have outlined here is that it creates the possibility of seamlessly joining the study of aggregate segregation with the study of

residential attainments. Previously, the two were necessarily separate. Now it is possible to directly investigate how residential attainment dynamics give rise to uneven distribution by framing aggregate segregation as the effect of race on individual-level residential attainments that additively determine the city-level segregation score. This directly addresses the concern Duncan and Duncan (1955) raised that segregation indices serve to describe aggregate-level distributions but do not lend themselves to studying the underlying social processes that create these distributions. In addition, it creates new opportunities for refining segregation analysis by including non-racial characteristics in residential attainment models. This makes it possible to perform standardization and components analyses to investigate the extent to which segregation arises out of group differences in resources relevant for residential attainment and group differences in rates of converting their resources into residential attainments. It also makes it possible to use restricted access census micro files and non-census surveys to explore questions about aggregate segregation that previously could not be explored.

Joining the study of aggregate segregation with the study of micro-level residential attainments also creates new options for investigating variation in segregation over time and across different metropolitan areas. If desired, city-level segregation can now be assessed by estimating the effect of race in city-specific individual-level models of residential attainment. Then the effect of race can itself be modeled as varying over time or with the ecological characteristics of metropolitan areas using multi-level models. The city-specific micro models can optionally include other social characteristics which may also influence residential outcomes. If not included, the effect of race in the model registers how aggregate segregation at the city-level varies with time and urban context. If included, the effect of race registers the level of and variation in racial segregation assessed net of controls for other characteristics.

The approach to assessing segregation I have outlined here establishes a new basis for discussing, comparing, and evaluating segregation indices – namely, the substantive and theoretical relevance of the residential outcomes ( $y$ ) the index registers and responds to. When evaluating indices in terms of their qualities for summarizing and describing group differences in residential outcomes, one may consider whether the residential outcomes they register are substantively compelling for individuals and households or for particular policy goals. When evaluating indices in terms of their relevance for investigating segregation dynamics, one may consider whether the residential outcomes they register are salient in residential attainment dynamics. Do indices register outcomes that individuals and groups seek and potentially compete for? That is, do individuals and groups strive for the outcomes because they value them for their own sake and/or because they are correlated with other valued residential outcomes? Are the outcomes consequential for important aspects of life chances? Are the outcomes relevant to theories of residential attainment and stratification?

In the body of this monograph I reviewed how different indices register residential outcomes ( $y$ ) based on scaling area group proportions ( $p$ ) in different ways. D, G, H, and R score  $y$  in complicated ways. D scores  $y$  as a two-value step function based on  $P$  – the pairwise group proportion for the city in question. G scores  $y$  as an

irregular nonlinear monotone function of  $p$  based on relative rank position (i.e., the percentile transformation).  $H$  and  $R$  score  $y$  as continuous nonlinear functions of  $p$ . For all four indices, the scaling of residential outcomes varies, often quite dramatically, with the racial mix of the city. To be clear, the functional forms of  $y=f(p)$  for  $D$ ,  $G$ ,  $H$ , and  $R$  can, and often will, vary with the groups involved in the comparison, across cities for the same group comparison, or over time for the same group comparison in a given city. In contrast,  $S$  scores  $y$  directly from  $p$  under all conditions. In this regard,  $S$  stands out as the only index for which the scoring of  $y$  based on  $p$  is the same across different group comparisons, over different points in time, and across different cities. Because of this quality, I am drawn to the one-to-one scoring of  $y=p$  that  $S$  registers. It is simple and easy to understand and it is related to an aggregate segregation outcome that can easily be explained to non-technical audiences. In addition, there are good reasons to believe that the area group proportions that  $S$  registers are meaningful to individuals and households and consequentially are salient in residential dynamics. However, I recognize that discussion and debate on this issue is just beginning and I invite others to give attention to questions concerning what substantive concerns about residential dynamics and group differences in residential outcomes should guide the choice to focus on particular specifications of aggregate segregation.

Finally, I note that casting uneven distribution as a difference of group means on residential outcomes ( $y$ ) based on area group proportion scores ( $p$ ), provides a new vantage point for understanding the origins and nature of bias in standard versions of popular indices of uneven distribution. In addition, it opens the door for a surprisingly simple and compelling solution that allows one to eliminate bias from index scores if desired. The scores of the resulting new “unbiased” versions of indices of uneven distribution are near identical to the scores of the conventional versions in situations where the conventional scores are non-problematic and they provide attractive alternatives in situations where conventional scores cannot be used – for example in the study of White-Latino segregation in new destinations (Fossett et al. 2015).

In closing, I note that the approach to investigating segregation I have outlined here complements and extends previous traditional approaches to studying aggregate segregation. It does not put approaches and findings from past research to the curb. To the contrary, the framework I offer here is fully compatible with mainstream traditions of research focusing on aggregate segregation. Casting segregation in terms of group differences in individual residential outcomes and equating index scores with the effect of race in micro-level attainment models does not preclude pursuing traditional analysis of aggregate-level segregation; that remains as an option for those who prefer that approach. In addition, however, there now is a new set of alternatives for computing the indices that are used in such studies. More importantly, the framework I offer provides researchers new options for interpretation and analysis that I believe many will view as potentially useful. These include: new options for extending previous research investigating variation in segregation across cities and over time; new options for taking account of non-racial social characteristics when investigating racial segregation; new alternatives for assessing

the substantive implications of segregation based on the consequences it has for group differences in residential outcomes; and new options for theorizing about and investigating the social attainment processes that give rise to aggregate segregation. I encourage researchers to adopt the refined measures and new options for analysis outlined here because I believe they will enable researchers to move forward in ways that will yield more trustworthy measurement of segregation and better understanding of how group differences in residential distributions arise from group differences in residential attainments resulting from the role of race in residential dynamics.

## References

- Duncan, O. D., & Duncan, B. (1955). A methodological analysis of segregation indices. *American Sociological Review*, 20, 210–217.
- Fossett, M., Crowell, A. F., Saenz, R., & Zhang, W. (2015). *White-Latino residential segregation in new destinations: Trends for metropolitan and nonmetropolitan areas, 1990–2010*. Working paper. (This is an expanded and revised version of a paper by the same title presented at the annual meetings of the Population Association of America, Boston, Massachusetts, 1–3 May, 2014).

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