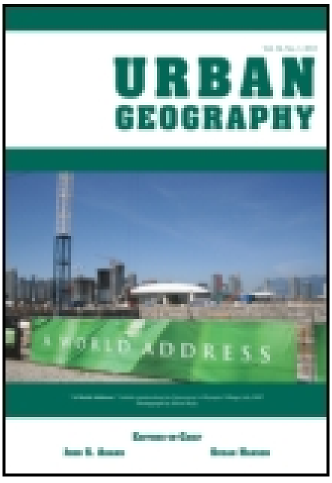

Urban Geography
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rurb20

Neighborhood Racial and Ethnic Change: The Time Dimension in Segregation

Michael Reibel [a] & Moira Regelson [b]
[a] California State Polytechnic University, Pomona
[b] AT&T Interactive
Published online: 16 May 2013.

NEIGHBORHOOD RACIAL AND ETHNIC CHANGE: THE TIME DIMENSION IN SEGREGATION[1]

Michael Reibel[2]
Department of Geography and Anthropology,
California State University, Pomona

Moira Regelson
AT&T Interactive

Abstract: This nationwide study of neighborhood racial and ethnic transitions examines the varieties and dynamics of U.S. neighborhood change between 1990 and 2000. The authors use innovative and robust cluster analysis techniques to classify U.S. census tracts in the 50 largest metropolitan areas. We interpret the resulting clusters according to their central tendencies and explore inter-metropolitan and regional patterns in relative cluster frequencies. Finally, we estimate multilevel logistic regression models of the covariates of cluster membership. We conclude that within cities, trends toward greater and potentially stable diversity in some neighborhoods co-exist with continuing White flight and re-segregation in other local areas. Further, at both the metropolitan and neighborhood levels increasing diversity is associated with the significant presence of multiple minorities, while white flight and re-segregation are associated with the rapid growth of either blacks or Hispanics. This variability in transition outcomes can at least in part be attributed to demographic structure at the metropolitan scale and to the distance from established minority enclaves of the neighborhoods themselves.

INTRODUCTION

Racial and ethnic segregation in cities is a major social problem in the United States and other developed countries, with important consequences for the well-being of minority and majority populations alike (Myrdahl, 1944; Wilson, 1987; Massey and Denton, 1993; Charles, 2003). While a great deal of research continues to be produced documenting the patterns and consequences of segregation, and despite a consensus among segregation theorists that segregation patterns are explained by processes that unfold over time, temporally dynamic neighborhood racial and ethnic transitions have received relatively little direct empirical attention. In this study the authors use an innovative, data-driven classification technique to impose order on the large array of neighborhood transition types in multi-group context, model the covariates of the distinctive neighborhood change types thus identified, and interpret the results in the context of relevant urban theory. In particular we will focus on the implications of key transition findings for segregation outcomes and for the current debates on segregation.

[1]The authors would like to acknowledge the assistance of Nathan Albert for data processing, and of an anonymous reviewer for particularly helpful suggestions.
[2]Correspondence conerning this article should be addressed to Michael Reibel, Department of Geography and Anthropology, California State Polytechnic University, Pomona, CA 91768; telephone: 909-869-3587; fax: 909-869-3586; email: mreibel@csupomona.edu

Urban Geography, 2011, **32**, 3, pp. 360–382. DOI: 10.2747/0272-3638.32.3.360

The study of race and ethnicity as they apply to neighborhoods has a long and rich history. Concern with the subject in the social sciences goes back at least to DuBois (1903) and became established particularly by the early theorists of the Chicago school of human ecology (Park et al., 1925; Park, 1936). The Chicago school applied theories of ecological succession borrowed from biology to explain neighborhood racial and ethnic change (called invasion and succession using the biological terms). The theory of human ecology emphasized processes of change featuring competition between social groups: penetration, invasion, consolidation, and piling up, in the succession model of the Duncans (Duncan and Duncan, 1957). The measurement of temporally static group composition patterns was of comparatively little interest because essentially complete segregation was assumed to be the only normal equilibrium state for neighborhoods. Segregration was noted almost exclusively to the extent it confirmed the stages of invasion and succession: both the theoretical and the empirical action were in the wrenching and relatively sudden process of change to a new stable (and re-segregated) ecology.

By the 1970s, however, the empirical pendulum was swinging away from temporally dynamic studies of transitions and decisively toward the analysis and explanation of static patterns at a moment in time, using segregation statistics. New theories of neighborhood racial and ethnic dynamics have concurrently emerged, including theories of group mobility and assimilation, stratification, and White flight. All these theories emphasize processes of transition over time, but studies testing these theories rarely examine transitions directly. Rather, the related body of empirical work so overwhelmingly uses segregation statistics—which cannot measure transitions directly—that the theories of neighborhood racial and ethnic dynamics themselves are now normally termed theories of segregation. This is perhaps unfortunate, given the (incorrect) implication that studies using temporally cross-sectional segregation statistics will tell us everything we need to know about theories that are primarily focused on processes of change over time. Thus, while segregation patterns in the present moment are indeed a primary, and perhaps *the* primary concern of neighborhood racial and ethnic research, a complete understanding of neighborhood racial and ethnic processes that result in segregation will also require considerably more empirical research using data that captures trends directly. We will now examine contemporary theories of neighborhood racial and ethnic dynamics and discuss the ways both segregation studies *per se* and direct analyses of racial and ethnic mobility and transitions have informed them.

THEORIES OF NEIGHBORHOOD RACIAL AND ETHNIC DYNAMICS

All major contemporary theories of segregation and neighborhood racial and ethnic change resolve to questions of group mobility. The major differences among the theories have to do with the degree to which various majority and minority groups' mobility is constrained, and which social forces are constraining it. At one end of the spectrum is the theory that observed segregation is largely the result of individual mobility choices guided by preferences for particular mixtures of racial and ethnic groups in one's neighborhood, constrained by wealth and income (see Clark and Ledwith, 2007). In this view, racial and ethnic segregation is for the most part either the result of positive preferences or a spurious correlate of class segregation; they are thus seen as relatively benign, at least with respect to civil rights. Clark (1992) presses the birds-of-a-feather argument further, finding that not only whites but all large racial and ethnic groups in his case study of Los Angeles prefer own-race neighborhoods.

At the opposite end of the explanatory spectrum is the theory of place stratification (Massey and Denton, 1993; Yinger, 1995), which holds that durable patterns of racial and ethnic residential segregation both reflect and reinforce the social stratification separating various groups. Place stratification posits that high-status groups (in the U.S., non-Hispanic whites, aka Anglos) will resist attempts at spatial assimilation into their neighborhood by minorities even if those minority persons and families are otherwise high status. As Charles (2003, p. 182) puts it, "Whites use segregation to maintain social distance, and therefore, present-day residential segregation—particularly Blacks' segregation from Whites—is best understood as emanating from structural forces tied to racial prejudice and discrimination that preserve the relative status advantages of Whites."

An intermediate position between preferences and stratification that has gained wide acceptance in recent years is spatial assimilation. Spatial assimilation theory (Massey and Mullen, 1984; Logan and Alba, 1993; Iceland and Nelson, 2008; Iceland and Scopolitti, 2008) suggests that segregation patterns are at least partly due to systematic socio-economic differences among groups. In this explanation, differences in minority groups' abilities to assimilate economically and socially—that is, to narrow the gap between their status and the higher status of the majority—play out spatially in the form of different levels of group segregation. More economically and socially successful minority groups become more geographically mobile and correspondingly less segregated. In this perspective, constraints on the mobility of minority groups are principally economic, and increased assimilation for many groups over time (and for immigrants with time post-immigration) results in declining levels of segregation.

An important variant of spatial assimilation is incomplete or so-called segmented assimilation (Alba and Nee, 1993). This theory suggests that while class mobility tends to translate into spatial assimilation, remaining social barriers result in limited or attenuated assimilation outcomes. South et al. (2005) found significant national-origin group differences in the spatial assimilation trajectories of Hispanics, as well as a race/skin color effect among darker Hispanics that hinders spatial assimilation. Johnston et. al. (2005) found that South Asians in Bradford (Yorkshire, UK) became no more segregated (measured as dissimilarity) but became more isolated during the 1990s. Fischer (2008) found that black suburbanization is not reliably associated with declines in segregation. Conversely, Clark (2006) found greater spatial assimilation as well as greater upward social mobility among Asians and Hispanics who suburbanize, compared with those who remain in metropolitan central cities.

In contrast to the theory of preferences as a benign regulator of racial and ethnic sorting, it has been repeatedly demonstrated by survey research that preferences for levels of racial and ethnic mix differ systematically among groups (Krysan and Bader, 2007; Emerson et al., 2001; Bobo and Zubrinsky 1996; Farley et al., 1978). It follows that even in the absence of discrimination, each individual pursuing their preferred racial mix cannot and will not result in outcomes that are ideal—or even tolerable—for all concerned. This conclusion, which is consistent with the theory of segmented assimilation, suggests that preferences do not lead to equilibrium solutions in the micro-economic sense. Rather they become, among other things, the basis for so-called tipping (transitions leading to re-segregation of a new majority local group) and possibly, in other contexts, for discriminatory practices designed to prevent change beyond the socially dominant group's preferred thresholds.

Among those studies that probe the mobility of non-Hispanic Whites, the emphasis remains on Whites' distaste for, avoidance of, and so-called White flight to escape close residential contact with minorities beyond preferred levels. There are several layers to this phenomenon: the aforementioned preferences, as explored through survey research; revealed preferences, as inferred by aggregate composition patterns; and actual mobility behavior, as revealed by analysis of microdata for individuals. Only the last of these types of studies investigates neighborhood change processes directly through the examination of trend data. Of these, Pais et al. (2009) found white out-mobility increases with neighborhood percent black; Crowder (2000) found that white out-mobility increases steadily as the concentration of minorities increases, and that the effect is amplified by the significant presence of multiple minority groups. Ellen (2000) affirmed the temporally dynamic nature of neighborhood change considerations by concluding it is not existing minority concentrations but high expected future concentrations that Whites avoid. Crowder and South (2008) examined the influence of nearby (i.e., not immediate) neighborhoods' racial and ethnic dynamics and found that these effects explain much white out-mobility that was previously attributed to conditions in the mover's immediate neighborhood. This is another confirmation of the importance of temporally dynamic effects, as it clearly indicates concern about potential enclave expansion in the future.

Many studies show evidence supporting two or all three of the major mobility theories of segregation, albeit to varying degrees and in different forms depending on context. In other words, these studies suggest that in each city changes toward greater diversity are observed in some local areas while many people and neighborhoods remain stubbornly segregated. Moreover, some of the increases in diversity appear more stable, while others show signs of a rapid trajectory toward complete transitions, i.e., re-segregation. We may refer to this perspective as the fragmented diversity hypothesis. Johnston et al. (2007) found "discrimination, disadvantage, and self-segregation" in their study of segregation in five countries, as did the same authors in an analysis of four American cities (Johnston et al., 2003). South et al. (2008) found evidence that supports both spatial assimilation and place stratification. Holloway et al. (2011; see also Wright et al., 2011) found generally increasing diversity co-existing in cities alongside durable segregated enclaves.

A corollary to the fragmented diversity hypothesis is multigroup stability. This is the notion that, relative to the mid-20th century dynamic of whites and blacks only, the current multi-ethnic condition of U.S. cities creates opportunities for slower local transitions and for more stable integration in those neighborhoods that do become diverse. Frey and Farley (1996; also see Farley and Frey, 1994) speculated that post-immigrant generations of Asians and Hispanics would assimilate spatially into previously all White neighborhoods, creating a buffer between whites and blacks that would ease the eventual integration of blacks into the local mix. This conjecture has recently been confirmed by Logan and Zhang (2010), who found that what they call "global" neighborhoods (neighborhoods with a significant presence of whites as well as multiple minorities) tend to subsequently lose whites more slowly than neighborhoods primarily composed of whites plus a single minority group. Moreover, they found that it is easier for blacks to enter white neighborhoods in significant numbers if these neighborhoods are first pioneered by Asians and/or Hispanics.

CAPTURING THE TIME DIMENSION

Transitions are quite different from the temporally static racial and ethnic composition patterns that are measured by segregation methods. A given proportional transition can be a change toward integration or toward segregation, depending on the group composition of the area at the beginning of the transition interval. Conversely, changes in segregation indices measure neither particular local transitions nor the magnitude of transitions in the aggregate, because opposite transition types locally cancel each other out in terms of aggregate segregation measures. Given that all major theories of neighborhood racial and ethnic dynamics are theories of mobility, it follows that the most direct way of confirming or discrediting these theories is to analyze mobility and neighborhood trends themselves. The individual mobility approach was taken by South, Crowder and their colleagues (South et al., 2005, 2008; Crowder and South, 2008; Pais et al., 2009). This research project used a special census tract–coded version of the Panel Study of Income Dynamics (PSID) merged with data for the tract-level racial and ethnic context of individual panel subjects. The series of studies showed that both place stratification and spatial assimilation were present, but that which explanation proved stronger depended on the subject's racial, ethnic, and even national origin group.

While South, Crowder, and others have thus performed some of the most powerful tests of the mobility theories that currently guide neighborhood racial and ethnic research, their use of a small-panel data set does not permit them to describe or model the general patterns of neighborhood transitions *per se*. That approach has been re-invigorated in recent years by the release of the Neighborhood Change Database or NCDB (Tatian, 2003), a high-quality data set with census tract counts for four decades (1970–2000) standardized to the 2000 tract geography. Prior to the availability of the NCDB, systematic studies of neighborhood transitions were rare and often limited in scope due to the considerable difficulty of reconciling counts pertaining to tract territories that change over time. In two older national studies, Denton and Massey (1991) documented the steep decline of Anglo-only tracts during the 1970s, while Lee and Wood (1992) documented considerable variation at both the metropolitan and regional scales in the degree to which white-to-black succession occurred. Transition case studies of major metropolitan areas were undertaken in New York (Alba et al., 1995), Los Angeles (Clark, 1993) and Toronto, Montreal and Vancouver (Fong and Gulia, 2000; Hou and Milan, 2003). Wood and Lee (1991) examined neighborhood racial and ethnic change over four decades in a case study of five cities. Massey (1983) examined Hispanic succession in seven cities.

Since the NCDB became available, several newer systematic transition studies have appeared making use of the dataset. Reibel and Regelson (2007) documented black-to-Hispanic transitions in a case study of Los Angeles. Friedman (2008) showed that over two decades, tracts that initially transitioned from predominantly white to mixed had a tendency to continue the transition until no significant white population remained. This finding is telling because it shows how commonly declines in segregation at a moment in time can describe a stage in a process that eventually leads to re-segregation—a key thesis of the fragmented diversity hypothesis discussed above, and a pattern that is confirmed only by the direct analysis of transition data. Logan and Zhang (2010), discussed above, point to their profile of global neighborhoods as holding out the promise of stable integration, at least in some subset of U.S. urban neighborhoods.

CLASSIFICATION TECHNIQUES IN NEIGHBORHOOD SOCIAL DEMOGRAPHY

Classification in this context refers to methods for dividing a set of neighborhoods into subsets for analysis. In practice, this requires either the theoretically justified *a priori* specification of class or interval boundaries separating neighborhood types, or a data-driven approach to classification such as cluster analysis. Classification, which groups observations into subsets, should not be confused with factor analysis, which groups the joint effects of various sets of attributes across an entire set of observations. For a more detailed discussion of classification approaches as they apply to urban neighborhood research, see Reibel (2011, in this issue).

Many studies have operationalized theoretical considerations into classifications or typologies of urban neighborhoods with the number of classes and the boundary thresholds between classes specified *a priori*. A number of these works identify distressed or impoverished neighborhoods (cf. Stegman, 1979; O'Laughlin, 1983; Telles, 1995). Others use empirical criteria to create functional definitions of inner-city, inner-suburban, and outer-suburban neighborhoods (Lee and Leigh, 2005; Cooke and Marchant, 2006; Hanlon and Vicino, 2007). A third group, more immediately relevant to the subject of this study, classifies neighborhoods according to racial and ethnic composition and transition (Denton and Massey, 1991; Clark, 1993; Alba et al., 1995; Fasenfest et al., 2006; Friedman, 2008; Johnston et al., 2009, 2003; Logan and Zhang, 2010; Holloway et al., 2011). However, and by definition, none of these studies using *a priori* class-boundary thresholds employed formal data reduction or data mining techniques to determine either the proper number of groups to analyze or the proper class boundaries for classification.

In recent years, urban scholars have begun applying cluster analysis techniques to the sorts of urban questions that previously were addressed with classification schemes specified *a priori*. Studies analyzing suburbs using cluster techniques include Baum et al. (2006), Logan and Zhang (2004), Mikelbank, (2004) and Vicino (2008). Using Los Angeles as his study region, Modarres (2004) used cluster analysis to examine segregation levels between large groups and a great variety of smaller national-origin and ethnic groups. While innovative, his application of cluster analysis did not yield a data-driven taxonomy of neighborhood composition types. Reibel and Regelson (2007) used a clustering approach to create such a data-driven taxonomy of racial and ethnic neighborhood transition types in a case study of Los Angeles. In this special issue of *Urban Geography*, neighborhood classification techniques are also applied in studies by Logan et al. (spatial data mining to determine the extent of enclaves), Mikelbank (of change over time in suburban neighborhoods), and Vicino et al. (to create a data-driven taxonomy of urban immigrant neighborhoods).

DATA AND METHODS

The data for this study conform to the 2000 census-tract areas defined by the U.S. Census Bureau for the 50 most populous U.S. metropolitan statistical areas (including primary metropolitan statistical areas within consolidated metropolitan statistical areas). The counts used are the 1990 to 2000 racial and ethnic subpopulation trends, all standardized to the 2000 tract geography. Data were extracted from the neighborhood change database (NCDB) produced by Geolytics Inc. In order to produce a series of counts for a consistent set of enumeration districts over time, thus making trend analysis possible,

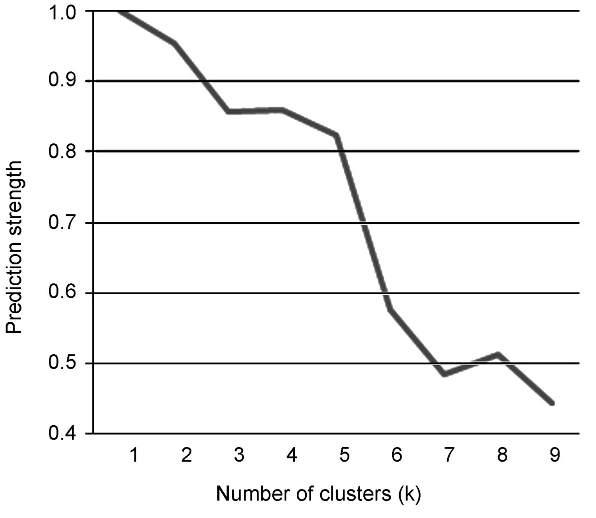

Fig. 1. Prediction strength at selected levels of k.

the NCDB uses a combination of block-count aggregation for whole blocks and street-weighted areal interpolation for split blocks. Mutually exclusive groups, to which multi-race counts are fractionally assigned, are defined as all Hispanics and non-Hispanic whites, blacks and Asians. For details of the NCDB data protocol see Tatian (2003). Metropolitan-level summary 1990 data conforming to the same 50 MSA/PMSAs from which the tracts were selected were downloaded from the U.S. Census Bureau website via the American FactFinder interactive data utility for use as model covariates.

In this study we follow Reibel and Regelson (2007) in using the prediction-strength technique as part of our cluster analysis. The prediction-strength technique is not a clustering algorithm; rather, it is a cross-validation technique designed to empirically identify the proper number of clusters into which a set of observations is best divided (Tibshirani et al., 2005). Once the proper number of clusters has been determined, a clustering algorithm can be applied and cluster labels assigned to the full set of observations in the usual manner. The clustering algorithm we use throughout, both to determine prediction strength and to create clusters for the full sample once the proper number of clusters k has been determined, is partitioning around medoid (PAM) clustering (Kaufman & Rousseeuw, 2005).

Because the prediction-strength technique is relatively new, there are no familiar thresholds of prediction strength that are reinforced by decades of customary usage, as is the case for the .10, .05, and .01 significance levels used for regression parameters. But Tibshirani suggests .80 as a conservative (strong) threshold of prediction strength for determining the correct number of clusters that fit a data set. Prediction strength declines slowly as a higher number of clusters are added, until at six clusters it drops precipitously from greater than .80 to less than .60 (Fig. 1). At this point (between five and six clusters), the .80 normative strong threshold of prediction is crossed at the same time that we encounter a sudden and steep decline in prediction strength. We therefore conclude that five clusters best fit the data and proceed to classify the data accordingly.

Table 1. Cluster Transition Summaries

Cluster number	1	2	3	4	5
Cluster name	Stable	Slow Integration	White-to-Hispanic	Moderate Integration	White-to-Black
Pct. of total tracts	38.7	28.3	8.8	18.3	5.8
Magnitude of transition	Very low	Low	High	Moderate	High
Groups decreasing in proportion	None	NH white	NH white	NH white	NH white

RESULTS

Five clusters of tracts emerged from the analysis (Table 1). The clusters are summarized in terms of their relative magnitudes of transition, the groups significantly gaining and declining in terms of proportional composition, and the size of each cluster as a percentage of all tracts in the sample. Based on these summaries, the clusters are given names. The group transition medoid values for each cluster upon which the summary is based are found in Table 2. While the medoids of multi-group proportional changes alone define the clusters, Table 2 also shows central values of initial group composition levels for each cluster. This places group proportional changes in the context of their impact on the stages of growth or decline for the various groups. Taken together, the two sets of values permit a classification of neighborhood types by interpreting transition clusters in terms of their particular integrating or segregating consequences in multigroup context.

Table 2 shows the dynamics of racial and ethnic group change across the five resulting clusters in terms of initial composition (the within-cluster means for each group's proportional tract composition in 1990) as well as each cluster's medoid tract proportional change values for the racial or ethnic groups. Means are used rather than medians for baseline composition because they sum to nearly 100% across groups in a given cluster (slightly less due to the omission of non-Hispanic American Indian/Alaska Natives and non-Hispanic other-race individuals from the analysis).

Cluster 1 is essentially a stable cluster of tracts experiencing little proportional change for any group (Table 2). Cluster 1 (hereafter the *Stable Cluster*) was the only cluster with zero perceptible black growth in the medoid tract; the very small (0.6%) white decline was nearly evenly divided between even smaller gains for Asians and Hispanics. Notably, the *Stable Cluster* is the largest in terms of the number of tracts with 38.7% of the total (Table 1). This finding indicates that neighborhood racial and ethnic change in the U.S. is common but far from ubiquitous.

Cluster 2 is a *Slow Integration Cluster* in which all three minority groups are making modest gains, and declines in Non-Hispanic white proportions are relatively small. The size of the slow integration cluster is significant: a substantial proportion (28.3%) of census tracts in the largest U.S. metropolitan areas are not only experiencing slow racial and ethnic transitions, but the gradual gains that characterize these transitions tend to be relatively evenly divided between all three major minority groups (Table 1). Moreover, for most of the tracts in this cluster these slow and evenly distributed transitions are taking

Table 2. Cluster Means of Group Proportion of Tract Population in 1990 and 1990–2000 Change in Group Proportions of Cluster Medoid Tracts

Group	Total (all tracts)	Clusters 1 Stable	2 Slow Int.	3 W-to-H	4 Mod. Int.	5 W-to-B
Non-Hispanic white						
1990 mean pct.	68.3	69.0	68.9	64.6	66.4	70.9
1990–2000 change, pct.	Mean = –7.8	–0.6	–5.8	–22.9	–13.8	–26.0
Non-Hispanic black						
1990 mean pct.	15.0	15.8	14.9	12.7	14.1	16.8
1990–2000 change, pct.	Mean = +2.0	0.0	1.5	0.9	3.5	21.6
Non-Hispanic Asian						
1990 mean pct.	3.8	3.3	4.0	4.8	4.8	2.4
1990–2000 change, pct.	Mean = +2.0	0.4	2.0	1.0	3.9	1.7
All Hispanics						
1990 mean pct.	11.3	10.0	10.9	15.7	13.4	8.4
1990–2000 change, pct.	Mean = +4.1	0.3	2.1	21.0	6.6	2.7

place in an atmosphere where non-Hispanic whites predominate throughout the transition interval, indicating a willingness among whites in certain types of metropolitan neighborhoods to tolerate incremental change that reduces but does not eliminate their majority. This finding of multigroup stability associated with gradual change is strikingly similar to that found by Logan and Zhang (2010).

Cluster 3 tracts underwent very rapid white-to-Hispanic succession during the interval. Tracts in the *White-to-Hispanic Cluster* were noteworthy for their initially somewhat higher proportions Hispanic in 1990 (mean = 15.7%), suggesting that in general these tracts were in various stages of transition from a white majority to tracts approximately evenly divided between whites and Hispanics, and in some cases eventually to majority Hispanic enclaves. It cannot be determined from this evidence how complete the eventual white-to-Hispanic transition will be in these tracts. The *White-to-Hispanic Cluster* is relatively small (8.8% of the total), which is perhaps not surprising given the regional concentrations of Hispanics in the U.S.

Cluster 4 tracts are integrating moderately fast, with moderate gains for all three minority groups and moderate declines for non-Hispanic Whites. This *Moderate Integration Cluster* is similar to the *Slow Integration Cluster* in most respects except for the higher pace of White decline (–13.8% versus –5.8% in the respective medoid tracts) and correspondingly faster pace of gains distributed relatively evenly across the three minority groups. Other differences from the *Slow Integration Cluster* are a slightly higher initial proportion of Hispanics and substantially greater Asian gains. These Asian gains are particularly noteworthy when one considers the relatively small size of the Asian population and consequent low initial Asian composition share. The 3.9% Asian gain in the medoid tract of the *Moderate Integration Cluster* nearly doubled Asians' proportional share in this tract from 4.8% to 8.7%.

Our interpretation of the *Moderate Integration Cluster* is similar to that for the *Slow Integration Cluster*, namely that under certain types of local metropolitan conditions that are by no means rare, racial and ethnic change that reduces white majorities (to mere parity with the combined minority groups in this case) will be tolerated by many whites. Specifically, in such neighborhoods the rapid destabilizing transition known as white flight will not generally ensue within the 10-year interval. The association of Asian gains with such areas suggests that the significant (and increasing) presence of Asians might possibly play some sort of stabilizing role during moderate transitions where multiple groups are gaining amid white declines.

Cluster 5 tracts experienced rapid white-to-black succession. These *White-to-Black Cluster* tracts exhibit characteristics and dynamics that would be familiar to a mid-20th century urban demographer: rapid white-to-black transition amid steep white declines that may be characterized as white flight. As a group, *White-to-Black Cluster* tracts tended to have both the highest initial white proportions and the largest white declines over the 10-year interval (Table 2). In addition to their other defining characteristic, namely rapid black gains, these tracts also had the highest initial black proportions and the lowest initial Asian and Hispanic proportions of any cluster. This is further confirmation of the multi-group stability hypothesis, namely that white flight from blacks tends to accelerate in the absence of so-called buffer minorities.

Inter-Metropolitan and Regional Variation

Tracts in Cluster 1, the *Stable Cluster*, are concentrated in the older, slower-growing cities of the Northeast and Midwest (Fig. 2). Within these regions, the proportion of tracts that fall in this cluster is highest in those cities with lower net internal migration and lower immigration rates. In other words, and not surprisingly, metropolitan areas with the highest proportions of stable, low-transition tracts tend to be stable and low transition, as well as low growth, at the metro scale.

Cluster 2 tracts experiencing gradual integration are most highly concentrated in Northern Tier, Mountain West, and Northwestern cities, most of which historically have had low minority populations (Fig. 3). It is less clear whether gradual integration accurately describes such tracts in some other cities with high proportions of their tracts falling in this cluster. For example, cities like Milwaukee and Detroit, with their large, long-established histories of African-American settlement and persistently high segregation, also have a high prevalence of tracts in the *Slow Integration* cluster.[3] Because these cities also have high proportions of tracts experiencing rapid white-to-black transition, we may speculate that nationwide this cluster may be composed of two different types of tracts, which are

[3]Boston, which also has a history of high segregation and white (especially white-ethnic) animosity toward blacks, also has a relatively high proportion of its tracts in the *Slow Integration Cluster*. Unlike Milwaukee and Detroit, however, Boston has a relatively low proportion of blacks at the metropolitan level, which generally facilitates integration. The slow-integration interpretation for metro Boston also appears to be confirmed by the small proportion of that city's tracts in the white-to-black succession cluster, in contrast to Milwaukee and Detroit.

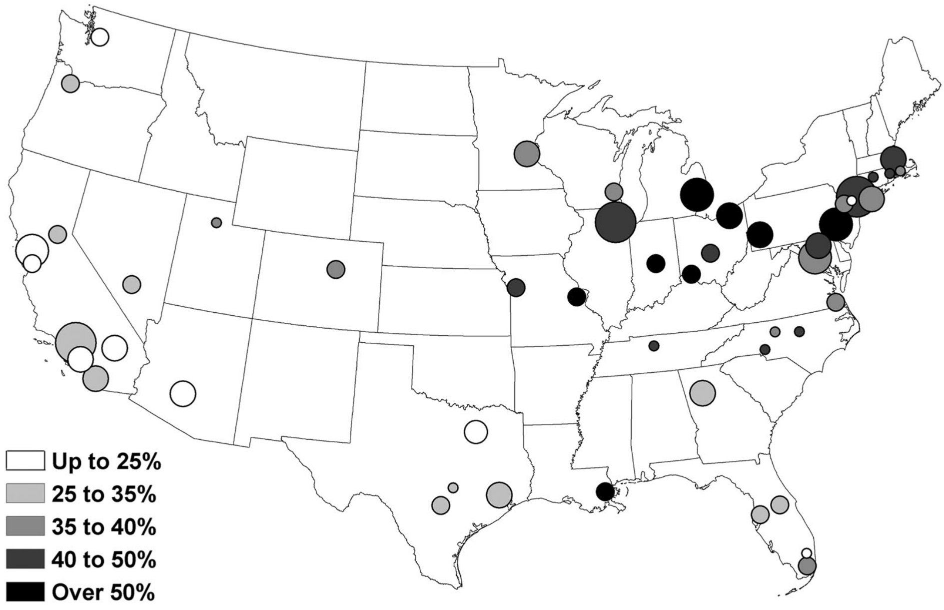

Fig. 2. Percentage of MSA tracts in *Stable Cluster*.

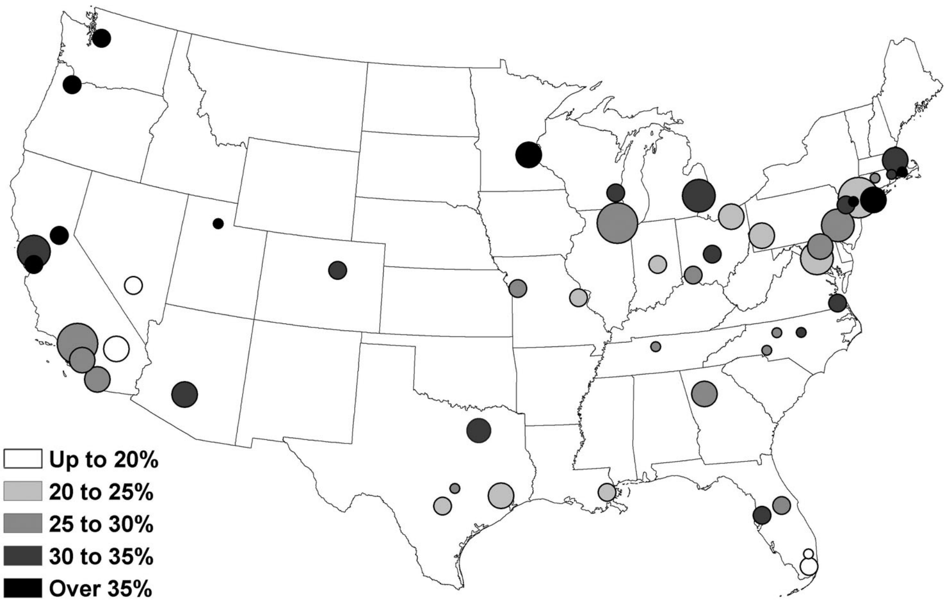

Fig. 3. Percentage of MSA tracts in *Slow Integration Cluster.*

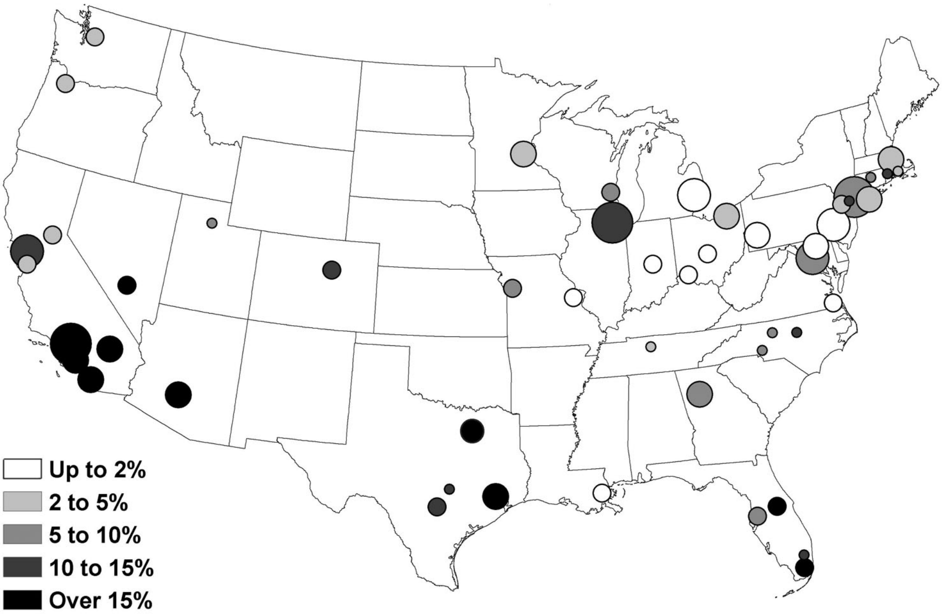

Fig. 4. Percentage of MSA tracts in *White-to-Hispanic Cluster.*

nonetheless similar in terms of proportional transitions. One type would be majority-white tracts that are in fact experiencing slow integration, predominantly in metro areas with low minority proportions and low minority growth. The other type, found mostly in the most segregated cities, would be very high minority tracts in which further minority growth is limited by the already small proportion of the tracts' populations that was white at the beginning of the time interval. Such a pattern is consistent with the traditional human ecology notion of late-stage succession (Duncan and Duncan, 1955).

Cluster 3 tracts—those that experienced rapid non-Hispanic white-to-Hispanic transition—are concentrated in metro areas with large established Latino populations and (in most cases) ongoing rapid growth of the Latino population (Fig. 4). Metro areas with higher proportions of white-to-Hispanic tracts are found in Southwestern areas with high Mexican-origin populations; in Chicago, with its large, predominantly Mexican-Hispanic population; and in Florida, where the Hispanic population is diverse in terms of national origin. *White-to-Hispanic Cluster* tracts are relatively less frequently found in the Northeast, where Latinos are still primarily Caribbean Islanders despite increasing Hispanic-origin diversity.

Cluster 4, characterized by moderately rapid integration involving all three major minority groups, is mostly a Sunbelt/West Coast phenomenon (Fig. 5). This is consistent with findings that integration is most easily achieved in neighborhoods built since the Housing Rights Act of 1968, and thus occurs mainly in newer metropolitan areas that have many such neighborhoods due to the high proportions of neighborhoods built since 1968. The major exceptions to this characterization are the older cosmopolitan magnets, New York and Washington D.C., which also had high proportions of tracts in the *Moderate Integration Cluster*.

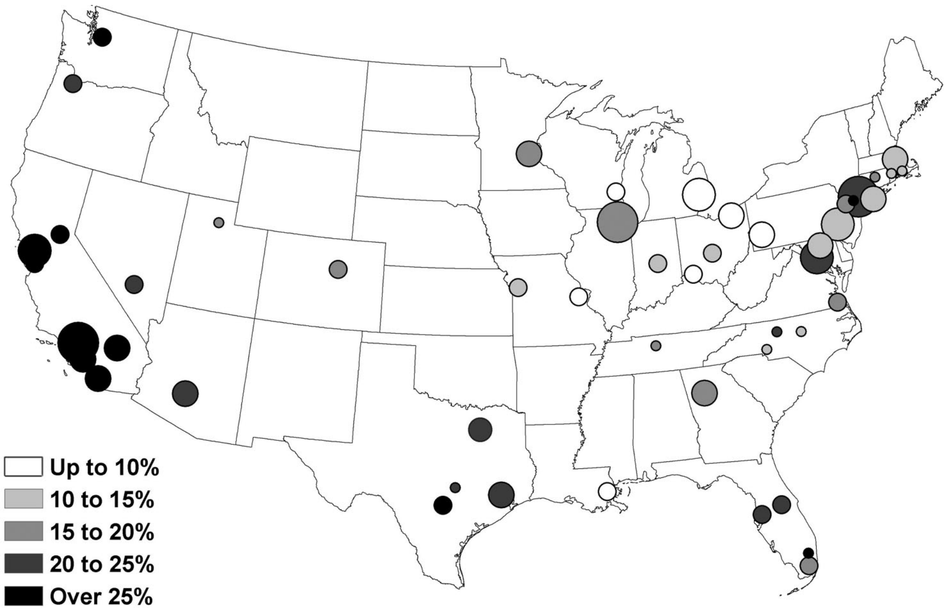

Fig. 5. Percentage of MSA tracts in *Moderate Integration Cluster.*

Cluster 5 tracts are undergoing rapid white-to-black succession (Fig. 6). The regional pattern here shows a distinctive east–west divide, with the highest relative frequencies of white-to-black tracts occurring in Eastern cities. At a more detailed regional scale we see that higher concentrations of these tracts within the eastern half of the country are found in the South (including East Texas, Baltimore, and Washington, DC), the Midwest (Milwaukee, St. Louis, and Columbus are in the top quintile; Chicago is an exception[4]), and to a lesser extent in the Mid-Atlantic metro areas. The steady South-to-North decline in metro proportion of white-to-black tracts in the Washington to Boston Megalopolis corridor is particularly striking. This pattern mainly reflects metropolitan percentage black in 1990.

Another level of synthesis this investigation makes possible is the identification and interpretation of joint distributions of neighborhood cluster frequencies at the metropolitan scale. An initial observation is that few cities have high proportions of their tracts either in both rapid-transition clusters or in both integration clusters. The exceptions to the former seem to be Houston and Dallas in Texas and Miami and Orlando in Florida—all Southern cities. The only metro areas with high proportions of their tracts in both integration clusters are San Jose and Sacramento in California, Seattle, and Portland—all West Coast cities.

This points at the outset to something of a cultural split between Southern and Western Sunbelt subregions but upon closer inspection the differences appear to be at least partly structural. Many medium-sized Western cities from the Bay Area to the north have the requisite significant Asian populations and small-to-moderate sized, moderately growing

[4]It is quite possible that Chicago has relatively fewer white-to-black transition tracts only because in most tracts at risk for such transitions consolidation as black enclaves was already largely complete by 1990.

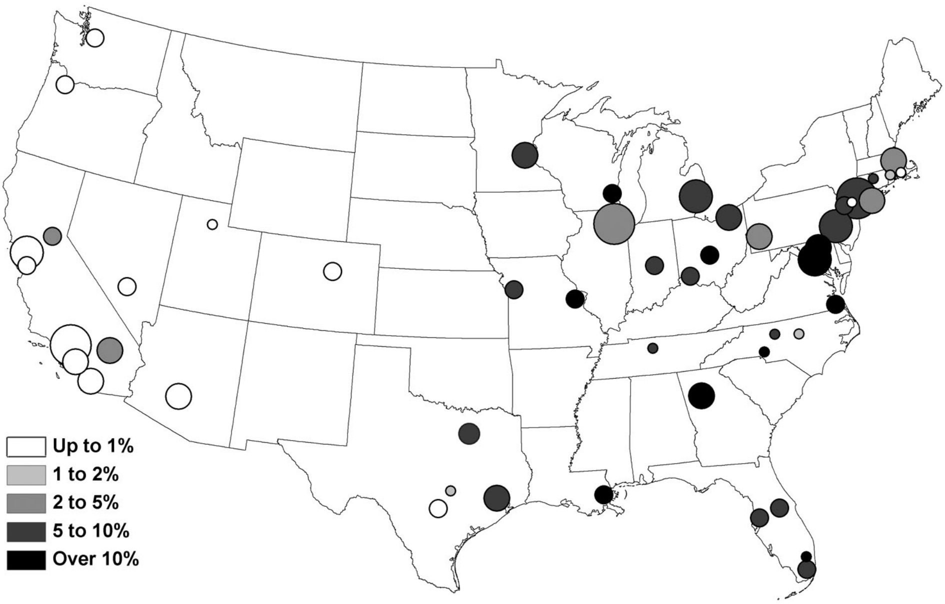

Fig. 6. Percentage of MSA tracts in *White-to-Black Cluster.*

black and Hispanic populations that foster gradual, potentially stable transitions involving multiple groups. Some large, fast-growing Southern cities have sizable and growing black and Hispanic populations combined with white suburbanization and mobility reminiscent of Northern cities in the 1960s and 1970s (also at least partly a structural phenomenon, due to the typically later growth and development of Southern cities). Moreover, Texas and Florida are outliers within the southern region in terms of their large Hispanic populations.

Also of particular interest are metro areas with high proportions of their tracts in both an integration cluster and a rapid transition cluster. These comparisons show indications that, consistent with the fragmented diversity hypothesis, integration might co-exist with continuing segregating behaviors within the same metropolis. The Southern California MSA/PMSAs that were large enough to be included in this study (Los Angeles, San Diego, Orange, and San Bernardino/Riverside counties) are all in the top quintile of both the *White-to-Hispanic Transition Cluster* and the *Moderate Integration Cluster*. Again, this does not necessarily reflect any local bifurcation of cultural attitudes toward integration; the pattern can be explained by structural factors. Specifically, this sprawling megalopolis combines huge populations of all four groups and a surge of Hispanic growth with, on the one hand, vast tracts of newer suburban housing (hence moderate integration) and on the other hand with aging neighborhoods in metropolitan central cities and blue collar factory suburbs (hence white-to-Hispanic succession).

A different apparent metro-scale mix of integration and succession involving high frequencies of tracts in both the *Slow Integration Cluster* and the *White-to-Black Transition Cluster* is found in some metros in the Midwest. Detroit, Milwaukee, and Columbus all exhibit this pattern. As explained above, in these metros there is reason to suspect that what appears to be slow integration may in some local areas actually be late-stage minority consolidation (of blacks in this case). When combined with these metropolitan areas' high incidences of rapid white-to-black transition tracts, we may speculate that the general trend in such cities is toward greater segregation.

The Covariates of Cluster Membership

In their seminal paper on systematic neighborhood racial and ethnic transitions, Denton and Massey (1991) estimated OLS models of the pace of tract-level change for the four major groups, and logit models of the probability of a loss or gain for each group. Both sets of models used the same set of predictor variables for local (tract-level) racial and ethnic composition and structure, distance from established minority enclaves and central city versus suburban location, plus metropolitan-level variables for group composition, group growth, and economic conditions, and dummy variables for the four regions of the U.S.

To investigate the local and metropolitan predictors of the identified clusters of local racial and ethnic change, the authors of this study estimated multilevel logit models (also known as hierarchical linear or mixed-effects models) of the probabilities of a given tract falling into each of the five clusters as predicted by their geographic context. In the intervening 20 years since Denton and Massey's study, multilevel models have become recognized as the most appropriate for problems of this sort, parsing as they do the component of local effects that are conditioned upon higher-scale context. With the exception of this innovation, and the specification of linear distance from established minority enclaves rather than dummy variables for a series of distance intervals, we replicate Denton and Massey's specification in our models of the probability of cluster membership.

In these mixed models, the tract-level variables as a group show few significant effects (Table 3). In particular, the ethnic structure category dummy variables (in which the presence of each group is defined as exceeding the data suppression threshold of thirty individuals) individually indicate no significant effects. Likewise, the interval variables for tract proportion that is minority show only scattered significant effects, and none in three of the five models. The major exception is the set of three tract-location variables, which are highly significant about half the time and which have one or more significant effects in each of the five models. In sum, when random effects are accounted for, the remaining influence of local racial and ethnic structure and minority composition is typically weak, but that of local geographic variables (suburban location and proximity to minority enclaves) often remains significant.

The model for the *Stable Cluster* (Cluster 1) provides an opportunity to further explain the model variables and the interpretation of the estimated model parameters. We see that percentage black at the metropolitan scale is negative and significant, with a coefficient of –2.00. This means a unit difference in percentage black divides (reduces) the odds of membership in the stable tract by 1.353 (e^{-2}=1.353). The black/white growth differential is also negative; taken together these effects tell us that *Stable Cluster* tracts are much more likely to occur in metropolitan areas with fewer blacks and slower black growth relative to whites. The large negative effect of the Asian/White differential in this model appears to be an artifact of the relative scarcity of *Stable Cluster* tracts in the Western region. This interpretation is supported by the positive coefficients for the three included regional

Table 3. Multilevel Logit Models of the Covariates of Cluster Membership[a]

Variable	Cluster 1: Stable	Cluster 2: Slow Integration	Cluster 3 White-to-Hispanic	Cluster 4: Moderate Integration	Cluster 5: White to Black
Intercept	–0.87	–1.23**	2.04	–1.22**	–5.85**
Log likelihood	–10,866	–10,153	–5,317	–8,324	–2,825
MSA/PMSA composition, 1990					
Pct. black	–2.00**	–1.85**	–3.14	–0.56	7.11***
Pct. Hispanic	–1.19	–0.38	1.57	1.41	–2.62*
Pct. Asian	0.18	6.40*	7.51	14.71***	–23.06***
MSA/PMSA group growth differentials					
Black/white	–1.53**	–0.55	2.44*	–0.15	2.38*
Hispanic/white	0.23	0.16	–2.94*	–0.12	–0.13
Asian/white	–2.24***	–0.19	0.92	0.74	0.66
MA/PMSA employment and housing					
Employment growth	–0.26	–0.09	–0.48	0.61***	0.52
Change, median housing value	0.28	0.26	1.02	0.66***	–1.92**
Median age of housing units	0.68	0.42	–5.53***	–2.32***	4.38***
Region					
Northeast	1.24**	0.35	0.81	1.18**	–0.33
Midwest	0.71	–0.23	1.23	0.43	0.70
South	1.43***	0.15	–1.52**	–0.09	1.36**
Tract ethnic structure in 1990					
No significant minority groups present	0.10	–0.07	–0.10	–0.13	0.04
Hispanics present	0.06	0.01	0.26	0.01	–0.27
Asians present	0.05	0.16	–0.07	–0.26	–0.04
Blacks present	0.08	–0.08	0.08	0.16	–0.09
Hispanics and Asians present	0.08	0.01	0.08	–0.11	0.14
Blacks and Asians present	0.03	–0.09	0.20	–0.10	0.00
Blacks, Hispanics, and Asians present	0.05	0.00	0.05	0.02	–0.19
Tract combined minority concentration intervals					
5–10%	0.05	–0.06	0.00	–0.02	–0.03
10–20%	–0.06	–0.17**	0.02	0.21**	0.21
20–30%	0.05	–0.08	–0.01	0.04	0.07
30–40%	0.09	–0.20*	–0.12	0.06	0.01
40–50%	0.04	–0.07	–0.18	0.01	0.08
Tract location variables					
Located in central city of MSA/PMSA	0.43**	–0.32***	0.04	–0.38*	–0.30
Distance to nearest majority-black tract	1.61**	0.41	0.11	–0.43	–9.29***
Distance to nearest majority-Hispanic tract	–0.10	–0.22	–5.92***	–1.19**	3.13**

[a]Significance levels: * = .05, ** = .01, *** = .001.

dummy variables as compared to the omitted Western reference region. Also not surprisingly, *Stable Cluster* tracts tend to be located farther from established black enclaves. They also are slightly more likely to be found in metropolitan central cities. This latter effect is probably due less to preference differences among central city residents than to the general lack of mobility in, and particularly in-migration to, many central city neighborhoods.

Cluster 2, the *Slow Integration Cluster*, is also negatively associated with metropolitan percent black, despite the typical modest growth of blacks as a proportion of tract population in this cluster. This is consistent with the descriptive analysis of the metropolitan concentration pattern for this cluster as illustrated in Figure 3: *Slow Integration Cluster* tracts are most common in Northern Tier, Mountain West, and Northwestern cities with fewer metropolitan Blacks. Unlike the *Stable Cluster*, the *Slow Integration Cluster* is very strongly and positively associated with metropolitan percentage Asian. Again, this might reflect the greater frequency of such tracts in the Western region, as well as other cities such as Boston and Minneapolis–St. Paul with relatively large Asian populations but relatively few blacks and Hispanics. In terms of tract-level minority concentration, two of the included intervals have significant negative coefficients, as does the central city dummy variable.

The covariate model of the *White-to-Hispanic Transition Cluster* (Cluster 3) shows some superficially counterintuitive results that are easily resolved with reference to underlying metropolitan demographics. Specifically, the model shows that these tracts, which are undergoing dramatic white-to-Hispanic transitions, tend to be *less* common in metropolitan areas with high 1990–2000 relative Hispanic growth rates. The reason is that this Hispanic-white growth differential measure is strongly negatively correlated with metro-level percentage Hispanic in 1990.[5] All 50 metropolitan areas in the study had Hispanic growth rates higher than white growth rates. The median differential was 0.745, indicating a 74.5% greater increase in Hispanic population during the interval. But the biggest differentials were in cities like Atlanta (342%), Indianapolis (247%), Portand, Oregon (189%), and Minneapolis–St. Paul (153%), all of which had relatively few Hispanics—hence less pressure for the formation of Hispanic enclaves—at any time during the interval. Clearly, even without large absolute growth numbers, the very low initial (1990) Hispanic populations in such places tended to inflate the percentage Hispanic change, which drove the large differential. Conversely, Los Angeles County, which had 15% of the nation's Hispanics in 1990 (and a correspondingly higher proportion of Hispanics in the 50 cities of the study area), had only a 47.3% Hispanic-white growth differential despite adding *890,971 Hispanics* during the interval. Given the pressure such large numbers of a minority group represent for enclave development, it is not surprising that over 10% of the *White-to-Hispanic* (Cluster 3) tracts in the 50 cities are found in Los Angeles County.

The explanation why tracts with relatively higher metropolitan black-white growth differentials should be more likely to experience white to Hispanic transitions is the same, although less immediately apparent from the data because black growth patterns were far less dramatic during the interval than those of Hispanics. The median black-white growth differential was 10.7%; several large cities with large Hispanic populations and high proportions of their tracts in this cluster also had black-white growth differentials that were larger than the median (46% for Riverside–San Bernardino, CA; 34.8% for Miami; 16.7%

[5]Pearson Correlation Coefficient= –0.48, sig. at .01

for Houston; 15% for New York; 13.1% for Los Angeles). Conversely, several other large metropolitan areas (notably in New England and the Ohio Valley) actually had negative (Pittsburgh, Cleveland) or low black-white growth differentials (Cincinnati, Indianapolis, Boston, Providence, New Bedford–Fall River) combined with very low Hispanic populations, hence little pressure for Hispanic enclave formation. Overall, black-white growth differentials tend to be larger in cities with large absolute numbers of Hispanics and smaller in cities with comparatively few Hispanics—hence the observed effect. Likewise, the negative effect of location in the Southern region reflects smaller absolute Hispanic numbers in Southern metropolitan areas, while the negative effect of median age of housing units at the metropolitan level picks up the effects of larger absolute Hispanic populations in the newer cities of the Southwest.

Perhaps the most salient explanatory variable in the model of the white-to-Hispanic transition cluster is the strong negative effect of distance to the nearest majority Hispanic tract. This effect clearly indicates that tracts undergoing this dramatic pattern of transition are experiencing spillover diffusion from majority-Hispanic enclaves that were already established in 1990. Such enclaves, particularly those of substantial size, were heavily concentrated in the Southwest at that time.

The model of Cluster 4, the *Moderate Integration Cluster*, shows that tracts in this cluster were more likely to be found in neighborhoods that were moderately integrated in 1990 (combined minority concentration = 10 to 20%). This is in sharp contrast to the *Slow Integration Cluster* (Cluster 2), for which the marginal effects of existing moderate integration in 1990 were negative as compared to the omitted category of tracts with minority concentrations over 50%. *Moderate Integration* tracts also differ in the relatively small but significant effect of distance to the nearest majority Hispanic tract. On the other hand, *Moderate Integration* tracts resemble tracts in the *Slow Integration Cluster* to the extent that they tend to be suburban and to be associated with large metropolitan Asian populations.

Seen together, these effects suggest a more consistent pattern of the steady integration (as opposed to rapid turnover or late-stage consolidation) in cities with substantial Asian minorities and specifically in more peripheral neighborhoods that may be near Hispanic enclaves. This, of course, is a description of neighborhoods common on the West Coast and in the Southwest, the regions where, as we have seen, *Moderate Integration* tracts are most commonly found. This impression is supported by the positive effects associated with higher employment growth and newer and more expensive housing (the latter being particularly associated with California). In this context the positive and significant model effect of location in the Northeast region, as compared to the omitted Western reference region, is puzzling.

Membership in Cluster 5, the *White-to-Black Cluster*, appears to be determined largely by the dynamics and geography of the black population itself. White to black cluster tracts are strongly and significantly associated with large metropolitan black populations and with small metropolitan Hispanic and Asian populations, with high black/white growth differentials, and with older and less expensive metropolitan housing markets. These are all characteristics of Southern and Midwestern cities; the regional variable for the South has a significant positive effect. As was the case for the *White-to-Hispanic Cluster* (Cluster 3), the *White-to-Black Cluster* shows strong spillover diffusion effects for the group in question in the form of a negative association with distance to the nearest majority-black tract. Interestingly, *White-to-Black* transition tracts are also positively and significantly associated with distance to the nearest majority-Hispanic tract, indicating black avoidance of those areas in their collective spatial processes.

DISCUSSION AND CONCLUSIONS

These examinations of data-driven neighborhood change clusters, inter-metropolitan and regional distribution of cluster frequencies, and models of cluster covariates offer a new perspective on neighborhood racial and ethnic change in the U.S. The analysis provided here establishes that racial and ethnic change is both highly variable in its overall local magnitude and highly diverse in terms of the respective rates of growth or decline for the various groups measured. By its nature, the analysis cannot and is not intended to create an exhaustive breakdown of all noteworthy patterns of neighborhood racial and ethnic change. For example, Asian enclave formation, black-to-Hispanic transitions, and minority-to-white transitions have been noted elsewhere, but do not occur frequently enough in this large nationwide sample to emerge as distinctive clusters in their own right. This should be construed neither as a flaw in the method nor as an indication that such results elsewhere are contradicted by these findings. Rather, it is a function of the scale dependency of classification methods: patterns that are important in a few cities are not necessarily large enough phenomena to emerge in a data-driven nationwide taxonomy. The conclusion is that where data-driven classification approaches are concerned, the tendency among scholars to perceive empirical studies that are larger in scale as more complete, and therefore better, is misplaced; classification studies of individual cities (or at other important scales) are equally necessary and equally valid.

Several patterns emerge from our examination of proportional transitions that have important implications for theory. First, the cluster descriptions reveal a pattern in each city (albeit to varying degrees) of both widespread trends toward greater diversity and rapid transitions pointing to white flight and the re-segregation of neighborhoods thus destabilized. The coexistence within cities of both significant trends is the essence of fragmented diversity, the pattern discussed above that emerges from work by Johnston, Poulsen, and Forrest as well as Holloway, Wright and Ellis. Also important is the fact that both of the integration clusters prominently involve all three minority groups, while both of the rapid transition/white flight clusters feature rapid replacement of whites by a single minority group. This is consistent with the multigroup stability idea expressed as "global neighborhoods" by Logan and Zhang (2010). In particular, the presence of relatively large numbers of Asians both locally and at the metropolitan scale appears to facilitate trends toward multi-group integration. It is noteworthy that both the integration clusters, and particularly the *Moderate Integration Cluster*, were associated with large Asian proportional gains.

Further, the models of cluster covariates provide the beginnings of an explanation as to which geographic structural conditions at both the local and metropolitan levels are associated with the different observed types of neighborhood racial and ethnic change. The likelihood of a given tract experiencing a particular pattern of local racial and ethnic transition is primarily a function of three things: overall growth at the metropolitan scale, group-specific population sizes and growth at the metropolitan scale, and the proximity to potential spillover diffusion from existing black or Hispanic enclaves. Specifically, trends toward greater long-term integration tend to be more common in newer and faster growing metropolitan areas with significant Asian and Hispanic populations. The frequency of trends toward white flight and eventual re-segregation as black or Hispanic enclaves tends strongly to follow the absolute and proportional size of those respective minority populations at the metropolitan level. As Holloway et al. (2011) explain, these two patterns are not mutually exclusive within cities but rather frequently co-cluster. California cities, for example, tend strongly to have high relative frequencies of both integrating clusters as well as of the *White-to-Hispanic* transition cluster. Finally, the particular neighborhoods that experience white flight and rapid transitions are strongly associated with the spatial expansion (spillover diffusion) of previously existing minority enclaves.

When we combine the overall patterns of group dynamics with the geographic structural effects described above, it appears that such a dramatically bifurcated pattern of simultaneously integrating and segregating trends is probably not, or at least not only, the result of a widening range of assimilation success among members of each given minority group. Rather, the pattern appears to be greatly influenced by the pressure brought to bear by rapid minority-group population gains at the regional and metropolitan scales. The particular structural geographic and socio-economic neighborhood conditions that foster stable integration are themselves partly a function of metropolitan demographic structure, but in any case such neighborhoods are always in limited supply at a given moment in time. When a minority group's population is expanding rapidly enough, it exceeds the opportunities for absorption by stable integrating neighborhoods and leads to the formation or expansion of relatively segregated ethnic enclaves in the same cities.

We also cannot discount the importance of cultural factors in the theoretical framework of fragmented diversity and multigroup stability sketched above. Cultural attitudes and non-income status factors will be important going forward in explaining the relative supply and specific characteristics of structurally integration-ready neighborhoods and the attributes of the relatively few minority-group members who successfully integrate under metropolitan conditions of rapid growth for their group. Finally, we cannot summarily dismiss the possibility that the simultaneous, diametrically opposed trends summarized as fragmented diversity partly reflect a widening or even polarizing range of preferences among non-Hispanic whites and perhaps among minorities as well.

REFERENCES

Alba, R., Denton, N., Leung, S. and Logan, J., 1995, Neighborhood change under conditions of mass immigration: The New York City region, 1970–1990. *International Migration Review,* Vol. 29, 625–656.

Alba, R. and Nee, V., 1997, Rethinking assimilation theory for a new era of immigration. *International Migration Review,* Vol. 31, 826–874.

Baum, S., Haynes, M., van Gellecum, Y., and Han, J., 2006, Advantage and disadvantage across Australia's extended metropolitan regions: A typology of socioeconomic outcomes. *Urban Studies*, Vol. 43, 1549–1579.

Bobo, L. and Zubrinsky, C., 1996, Attitudes toward residential integration: Perceived status differences, mere in-group preference, or racial prejudice? *Social Forces*, Vol. 74, 883–909.

Charles, C. Z., 2003, The dynamics of racial residential segregation. *Annual Review of Sociology*, Vol. 29, 167–207.

Clark, W., 1992, Residential preferences and residential choices in multiethnic context. *Demography,* Vol. 29, 452–466.
Clark, W., 1993, Neighborhood transitions in multiethnic racial contexts. *Journal of Urban Affairs,* Vol. 15, 161–172.
Clark, W., 2006, Race, class, and space: Outcomes of suburban access for Asians and Hispanics. *Urban Geography,* Vol. 27, 489–506.
Clark, W. and Ledwith, V., 2007, How much does income matter in neighborhood choice? *Population Research and Policy Review*, Vol. 26, 145–161.
Cooke, T. and Marchant, S., 2005, The changing intrametropolitan location of high-poverty neighbourhoods in the US, 1990–2000. *Urban Studies,* Vol. 43, 1971–1989.
Crowder, K., 2000, The racial context of white mobility: An individual-level assessment of the white flight hypothesis. *Social Science Research*, Vol. 29, 223–257.
Crowder, K. and South, S., 2008, Spatial dynamics of white flight: The effects of local and extralocal racial conditions on neighborhood out-migration. *American Sociological Review,* Vol. 73, 792–812.
Denton, N. and Massey, D., 1991, Patterns of neighborhood transition in a multiethnic world: U.S. metropolitan areas, 1970–1980. *Demography,* Vol. 28, 41–63.
Du Bois, W. 1990 (1903), *The Souls of Black Folk: Essays and Sketches*. New York, NY: Vintage Books.
Duncan, O. and Duncan, B., 1957, *The Negro Population of Chicago*. Chicago, IL: University of Chicago Press.
Ellen, I., 2000, Race-based neighbourhood projection: A proposed framework for understanding new data on racial integration. *Urban Studies*, Vol. 37, 1513–1533.
Emerson, M., Chai, K., and Yancey, G., 2001, Does race matter in residential segregation? Exploring the preferences of white Americans. *American Sociological Review*, Vol. 66, 922–935.
Farley, R. and Frey, W., 1994, Changes in the segregation of whites from blacks during the 1980s: Small steps toward a more integrated society. *American Sociological Review*, Vol. 59, 23–45.
Farley, R., Schuman, H., Bianchi, S., Colasanto, D., and Hatchett, S., 1978, Chocolate city, vanilla suburbs: Will the trend toward racially separate communities continue? *Social Science Research*, Vol. 7, 319–344.
Fasenfest, D., Booza, J., and Metzger, K., 2006, Living together: A new look at racial and ethnic integration in metropolitan neighborhoods, 1990–2000. In A. Berube, B. Katz & R.E. Lang, editors, *Redefining Urban & Suburban America: Evidence from Census 2000, Volume III*. Washington, DC: Brookings Institution Press, 93–117.
Fischer, M., 2008, Shifting geographies: Examining the role of suburbanization in blacks' declining segregation. *Urban Affairs Review,* Vol. 43, 475–496.
Fong, E. and Gulia, M., 2000, Neighborhood change within the Canadian ethnic mosaic, 1986–1991. *Population Research and Policy Review,* Vol. 19, 155–177.
Frey, W. and Farley, R. 1996, Latino, Asian, and black segregation in U.S. metropolitan Areas: Are multi-ethnic metros different? *Demography*, Vol. 33, 35–50.
Friedman, S., 2008, Do declines in residential segregation mean stable neighborhood racial integration in metropolitan America? A research note. *Social Science Research,* Vol. 37, 920–933.

Hanlon, B. and Vicino, T., 2007, The fate of inner suburbs: Evidence from metropolitan Baltimore. *Urban Geography,* Vol. 28, 249–275.

Holloway, S., Wright, R., and Ellis, M., 2011, The racially fragmented city? Neighborhood racial segregation and diversity jointly considered. *The Professional Geographer*, forthcoming.

Hou, F. and Milan, A., 2003, Neighbourhood ethnic transition and its socio-economic connections. *Canadian Journal of Sociology,* Vol. 28, 387–410.

Iceland, J. and Nelson, K., 2008, Hispanic segregation in metropolitan America: Exploring the multiple forms of spatial assimilation. *American Sociological Review,* Vol. 73, 741–765.

Iceland, J. and Scopilliti, M., 2008, Immigrant residential segregation in U.S. metropolitan areas, 1990–2000. *Demography* Vol. 45, 79–94.

Johnston, R., Poulsen, M., and Forrest, J., 2003, And did the walls come tumbling down? Ethnic residential segregation in four U.S. metropolitan areas 1980–2000. *Urban Geography*, Vol. 24, 560–581.

Johnston, R., Poulsen, M., and Forrest, J., 2005, On the measurement and meaning of residential segregation: A response to Simpson. *Urban Studies*, Vol. 42, 1221–1227.

Johnston, R., Poulsen, M., and Forrest, J., 2007, The geography of ethnic residential segregation: A comparative study of five countries. *Annals of the Association of American Geographers*, Vol. 97, 713–738.

Johnston, R., Poulsen, M., and Forrest, J., 2009, Research note—Measuring ethnic residential segregation: Putting some more geography in. *Urban Geography*, Vol. 30, 91–109.

Kaufman, L. and Rousseeuw, P., 2005, *Finding Groups in Data: An Introduction to Cluster Analysis*. Hoboken, NJ: Wiley-Interscience, Wiley Series in Probability and Statistics.

Krysan, M. and Bader, M., 2007, Perceiving the metropolis: Seeing the city through a prism of race. *Social Forces*, Vol. 86, 699–733.

Lee, B. and Wood, P., 1992, Is neighborhood racial succession place-specific? *Demography,* Vol. 28, 21–40.

Lee, S. and Leigh, N., 2005, The role of inner-ring suburbs in metropolitan smart growth strategies. *Journal of Planning Literature,* Vol. 19, 330–346.

Logan, J. and Alba, R., 1993, Locational returns to human capital: Minority access to suburban community resources. *Demography*, Vol. 30, 243–268.

Logan, J. and Zhang, W., 2004, Identifying ethnic neighborhoods with census data: Grouping concentration and spatial clustering. In M. Goodchild and D. Janelle, editors. *Spatially Integrated Social Science*. New York, NY: Oxford University Press, 113–126.

Logan, J. and Zhang, W., 2010, Global neighborhoods: New pathways to diversity and separation. *American Journal of Sociology*, Vol. 115, 1069–1109.

Massey, D., 1983, A research note on residential succession: The Hispanic case. *Social Forces,* Vol. 61, 825–833.

Massey D. and Denton, N., 1993, *American Apartheid: Segregation and the Making of the Underclass.* Cambridge, MA: Harvard University Press.

Massey, D. and Mullen, B., 1984, Processes of Hispanic and black spatial assimilation. *American Journal of Sociology,* Vol. 89, 836–873.

Mikelbank, B., 2004, A typology of US suburban places. *Housing Policy Debate*, Vol. 15, 935–964.

Modarres, A., 2004, Neighborhood integration: Temporality and social fracture. *Journal of Urban Affairs,* Vol. 26, 351–377.

Myrdal, G., 1972 (1944), *An American Dilemma: The Negro Problem and Modern Democracy*. New York, NY: Random House.

O'Laughlin, J., 1983, Spatial inequalities in Western cities—a comparison of North American and German urban areas. *Social Indicators Research,* Vol. 13, 185–212.

Pais, J., South, S., and Crowder, K., 2009, White flight revisited: A multiethnic perspective on neighborhood out-migration. *Population Research and Policy Review*, Vol. 28, 321–346.

Park, R., 1936, Human ecology. *American Journal of Sociology,* Vol. 42, 1–15.

Park, R., Burgess, E., and McKenzie, R., 1925, *The City*. Chicago, IL: University of Chicago Press.

Reibel, M., 2011, Classification approaches in neighborhood research. *Urban Geography*, Vol. 32, 305–316.

Reibel, M. and Regelson, M., 2007, Quantifying neighborhood racial and ethnic transition clusters in multiethnic cities. *Urban Geography,* Vol. 28, 361–376.

South, S., Crowder, K., and Chavez, E., 2005, Migration and spatial assimilation among U.S. Latinos: Classical versus segmented trajectories. *Demography*, Vol. 42, 497–521.

South, S., Crowder, K., and Pais, J., 2008, Inter-neighborhood migration and spatial assimilation in a multi-ethnic world: Comparing Latinos, blacks, and Anglos. *Social Forces*, Vol. 87, 415–443.

Stegman, M., 1979, Neighborhood classification and the role of the planner in seriously distressed communities. *Journal of the American Planning Association*, Vol. 4, 495–505.

Tatian, P., 2003, *Neighborhood Change Database 1970–2000 Tract Data Users' Guide Long Form Release.* Washington, DC: The Urban Institute. Accessed March 2010 from http://www.geolytics.com/pdf/NCDB-LF-Data-Users-Guide.pdf

Telles, E., 1995, Structural sources of socioeconomic segregation in Brazilian metropolitan areas. *American Journal of Sociology,* Vol. 100, 1199–1223.

Tibshirani, R., 2005, Cluster validation by prediction strength. *Journal of Computational and Graphical Statistics,* Vol. 14, 511–528.

Vicino, T., 2008, The spatial transformation of first-tier suburbs, 1970 to 2000: The case of metropolitan Baltimore. *Housing Policy Debate,* Vol. 19, 479–518.

Wilson, W., 1987, *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago, IL: University of Chicago Press.

Wood, P. and Lee, B., 1991, Is neighborhood racial succession inevitable? Forty years of evidence. *Urban Affairs Quarterly*, Vol. 26, 610–620.

Wright, R., Holloway, S., and Ellis, M., 2011, Reconsidering both diversity and segregation: A reply to both Poulsen, Johnston, and Forrest; and Peach. *Journal of Ethnic and Migration Studies*, forthcoming.

Yinger, J., 1995, *Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination.* New York, NY: Russell Sage Foundation.