

# CHAIN MIGRATION AND RESIDENTIAL SEGREGATION OF INTERNAL MIGRANTS IN THE METROPOLITAN AREA OF SÃO PAULO, BRAZIL<sup>1</sup>

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*Abstract:* This paper focuses on the geography of internal migration to and settlement within the metropolitan area of São Paulo. Specifically, the research objectives are to: (1) document the major flows of internal migration into the São Paulo metropolitan area; (2) map both short- and long-term migrant patterns of settlement within the São Paulo metropolitan area; and (3) approximate to what extent particular migrants from specific sending areas spatially concentrate in certain neighborhoods within the metropolitan area using both non-spatial and spatial measures of segregation. The key feature of our theoretical argument is that migrant networks evolve, accumulate, and generate higher than expected levels of internal migration to particular neighborhoods. As internal migrants become increasingly concentrated and a dynamic feedback process emerges between origin and destination, the metropolis becomes both segmented and segregated. [Key words: internal migration, social networks, São Paulo, Brazil.]

## INTRODUCTION

During the last 50 years, the process of urbanization in Brazil has been remarkable. Post-war government policies stimulating economic growth, along with private industrial and commercial expansion, has prompted dramatic flows of migration from the countryside to Brazil's large and intermediate-sized cities. From the early 1950s onward, deteriorating economic, social, and environmental conditions in many parts of rural Brazil triggered growth in urban places. Large numbers of rural migrants from all parts of the country (but particularly from the most poverty stricken states in the Northeast) used improved roads and expanding transportation networks to enter Brazil's cities. By the

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1970s, a fully integrated sociospatial system ensured the process of rural-to-urban and urban-to-urban migration in Brazil. Even as the country started to experience serious economic difficulties and the pace of urbanization declined between 1975 and 2000, internal migration continued to be an important, dynamic phenomenon. While in 1950, less than 40% of Brazil's population lived in urban locales, today more than 81% of Brazilians reside in a metropolitan area.

This powerful process of internal migration has guaranteed the constant transformation of urban Brazil's social, political, cultural, and economic landscapes. Still, there is little empirical research examining the sociospatial impacts of internal migrants *within* various metropolitan settings. To bridge this empirical gap in the literature, this paper provides the first metropolitan area-wide examination of internal migration settlement patterns using detailed sample data released from the 2000 Brazilian Census. Utilizing geographic information systems (GIS) techniques, the paper focuses on the geography of internal migration to and settlement within the metropolitan area of São Paulo.<sup>3</sup> Specifically, the research objectives are to: (1) document the major flows of internal migration into the São Paulo metropolitan area; (2) map both long- and short-term migrant patterns of settlement within the São Paulo metropolitan area; and (3) approximate to what extent particular migrants from specific sending areas spatially concentrate in certain neighborhoods using both non-spatial and spatial measures of segregation.

The key feature of our theoretical argument is that migrant networks can evolve, accumulate, and generate higher than expected levels of internal migration to particular neighborhoods within the city. As internal migrants become increasingly concentrated and a dynamic feedback process emerges between origin and destination, the metropolis becomes segmented and segregated.

### THE SEGMENTED METROPOLIS

The literature is rich with evidence of the significant role of migrant networks and chain migration in creating segmented cities where local neighborhoods can be defined along various parochial, state, and national lines. The process begins with migrant networks, which are sets of interpersonal ties that connect movers, former movers, and non-movers in origin and destination through social ties, be they relations of kinship, friendship, or remote acquaintances. These migrant networks serve important functions in both international and domestic migration, as early migrants reduce costs and risks for later arrivals by providing information, informal aid, and various other resources. As knowledge and experience accumulates with each trip, more potential migrants are induced to move, further expanding the network and creating increasingly developed paths of migration between particular origins and destinations. The process of migration becomes self-perpetuating, as chain migration connects migrants to non-migrants, thereby increasing movement along specific routes. Massey and Zenteno (1999) call this self-perpetuating process cumulative causation, and their research suggests that each

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<sup>3</sup>Throughout the paper, we will use the terms metropolitan area of São Paulo and São Paulo interchangeably to mean the metropolitan area designated by the Brazilian Census that includes 44 different municipalities and a total population of nearly 20 million.

additional migrant within a stream increases the propensity for others to migrate in that same channel, thus creating high levels of migration to specific destinations.

Eventually, this web of social connections leads to chain migration, in which numerous persons leave one well-defined area of origin for another well-defined location. A pattern of chain migration ensues as new arrivals, with connections to migrants already living in the area, search out specific neighborhoods upon entry. As more linkages connect individual migrants, the greater the spatial density within particular urban communities. Indeed, chain migration plays a significant role in shaping exactly *where* migrants put down roots within a city and often becomes an important facilitator in the process of residential concentration and segregation. The continued infusion of new migrants eventually results in the creation of multiple communities, known as migrant enclaves, established along origin lines.

These delineated spaces serve a variety of both positive and negative functions for newcomers and long-term migrants alike, as residents become continuously concentrated within a particular neighborhood or area of the city. As Korinek et al. (2004) have suggested, enclaves can yield access to social capital and access to valuable economic opportunities, and thereby encourage social embeddedness and socioeconomic mobility. But as Waldinger (1993) has contended, these origin-specific enclaves can isolate some individuals from opportunities outside the enclave and can be self-exploitative of fellow migrants, especially women migrants.

Whether these ideas can be translated to patterns of internal migration in the São Paulo case is a critical question. Some work explicates the functions of chain migration in patterns of internal migration in the developing world context, particularly from rural-to-urban settings (see Champion and Hugo, 2005, for an overview). But this research tends to focus primarily on patterns of internal migration at the state- and metropolitan area-level, leaving questions as to what happens to the migrants once they reach urban centers. With the exception of a few early studies of Mexico City (Browning, 1971; Cornelius, 1975), and Rio de Janeiro (Perlman, 1976) a gap remains in understanding how the process of internal migration creates highly dynamic and concentrated patterns of residential segregation *within* metropolitan areas. Yet, it is clear from both detailed ethnographies and community studies (including Woortmann, 1990; Menezes, 2004), along with accounts in the popular press, that internal migrants from particular sending areas are not only funneled to certain metropolises, but that they are even further channeled to specific neighborhoods within the urban area.

## RESEARCH OBJECTIVES

Of particular interest in this paper is articulating whether chain migration prompts migrants to settle in particular areas within São Paulo. In other words, what are the residential geographies of Brazilian internal migrants in the metropolitan area? The analysis links individual-level migration data from the 2000 Brazilian census to assess the geographic origin and destinations of Brazilian internal migrants within the São Paulo Metropolitan area. We suggest that:

1. Long-term internal migrants (those that have been living in the city for 10 years or longer) are more likely to be living in more centralized neighborhoods, whereas short-term migrants (those that have been living in the city for 9 years or less) are more

likely to be residing on the periphery of the city. This patterning is largely a result of the transformation of the urban environment, and the expansion of cheaper housing, transportation links, and job prospects in outlying areas, which creates more opportunities for recent migrants.

2. Internal migrants from areas with well-known, long-established links between origin and destination are likely to be more dispersed in the metropolitan area, because they are likely to have multiple migrant networks to utilize. These migrants have more knowledge of, and experience within, the metropolitan area. As a result, they are more likely to be aware of the costs and benefits of living in particular neighborhoods, and have a level of choice unavailable to those migrants with less-established histories of migration to the metropolitan area. Migrants from Bahia and Minas Gerais, states with long and sizeable records of migration to São Paulo, will be more dispersed than migrants from Piauí, another Northeast state with much smaller flows and a shorter history of migration to the metro area.

3. Internal migrants to São Paulo demonstrate low levels of segregation in the metropolitan area, according to standard measures. This is not because the migrants do not cluster in particular neighborhoods; rather it is a function of vulnerability of the geographical unit of analysis and sampling variation in the dataset, which limits the degree to which traditional indices of dissimilarity are able to capture any amount of unevenness and/or concentration. Still, patterns of clustering do appear, and these patterns indicate that chain migration may be operating to concentrate particular groups in particular areas.

## DATA AND MEASUREMENT

### *Data*

The paper uses newly released micro-data from the 2000 Brazilian census to examine the degree to which individual migrants from specific states and municipalities within Brazil tend to live together in particular neighborhoods in São Paulo. The latest census data has been released in a way that permits the examination of individual records from a long-form questionnaire distributed to 10% of the population. The data includes geocoded, detailed individual sample records with specifics on birthplace, migration, occupation, and many other socioeconomic and demographic characteristics.

Importantly, the sample provides a description of geographical mobility and resulting redistribution of sampled individuals across states, counties, and meso-regions. In all, the 2000 Brazilian Census has 13 questions related to migration. For this paper, we utilized several of the available migration questions to perform two different tasks: (1) to classify migrants based on state of origin and length of residence; and (2) to characterize migrants based on municipality of origin.<sup>4</sup> In the first step, information about state of birth and time of uninterrupted residence in the city were utilized to categorize migrants by state of

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<sup>4</sup>The entire matrix of in-migration and out-migration (i.e., net migration) is not outlined in this paper. In effect, we are only describing half of the story—but this is primarily because we are interested in the spatial outcomes of migrants living *within* the São Paulo metropolitan area. For excellent examinations of the recent characteristics of internal migration to/from São Paulo, see Baeninger (2001) and Cunha (2001). These two articles examine the role of São Paulo in both the historical concentration and more recent dispersal of Brazil's population.

origin. Those persons born in the city of São Paulo are non-migrants. All other individuals were divided into two other categories. Short-term migrants are those that were not born in the city of São Paulo and who have lived in the city less than ten years. Long-term migrants were not born in the city of São Paulo but have lived in the city for ten years or more.

Some questions could be raised about our methodological decisions in classifying migrants this way. The utilization of short-term migrants, as those that live in the area less than 10 years, and long-term migrants, as those that live in the metropolitan area for at least 10 years, is not arbitrary, however. Most studies that use census information on previous residence in Brazil apply this classification, because of limitations within the Brazilian census whereby the previous state and/or city of residence is not available for migrants that have lived at least 10 years in the recent residence. Although it does not allow us to fully capture the complexity of internal migration processes to São Paulo, the classification does make this research more comparable with findings released by other researchers, like Schmettmann (1992).

In the second step, we were able to create an even finer definition of short-term migrants using the five-year migration question. This question provides both the municipality and state of residence five years before the census and was used to capture the importance of specific sending municipalities in internal migration flows to particular neighborhoods within São Paulo. Here, we took the 10 most significant municipal flows from each state as a proportion of the sending population rather than the absolute count of migrants. While the numbers of these migrants are not very large, they do shed light on the role of chain migration in prompting migrants from particular municipalities to spatially concentrate in certain neighborhoods within the metropolitan area. We argue that if chain migration were important, we would expect to find migrants from certain source municipalities moving to particular areas where there is already a sizeable proportion of long-term migrants from that same state.

There is a final important note about the geography of our analysis. For the first time, the 2000 Brazilian Census provides information about individuals at a relatively fine scale, what the census documentation calls *areas de ponderação* (translation: deliberately constructed areas). These *areas de ponderação* (or as we will refer to them, “APs”) are the smallest functional units for geographic analysis within the metropolitan area available with the 10% sample. APs were constructed by the Brazilian census, in consultation with community leaders and urban planners, to reflect local place boundaries, while at the same time, protecting individual confidentiality. In all, there are 882 APs within the São Paulo metropolitan area (with a total population of 19,198,273 residents). The average AP contains approximately 800 households—or 22,000 individuals, though the range of weighted individuals within each AP varies considerably, from less than 8,000 to more than 100,000 persons. The spatial boundaries of each AP within the São Paulo metropolitan area are provided by the Brazilian census and are utilized in a geographic information system (GIS) analysis to capture patterns of residential concentration and the spatial clustering of internal migrants.

### *Measurement*

Maps are powerful tools that create visible, descriptive records of migrant settlement and migrant neighborhoods. As a result, the analysis includes maps of: (1) the major flows of internal migration into the São Paulo metropolitan area; (2) the spatial distribution of long-term and short-term migrants by source state; and (3) the spatial patterning of five-year migrants by municipality of origin and AP of destination. Each of these exercises is an attempt to articulate whether there is any significant clustering of groups by AP. The results are mixed and indicate considerable variation by origin group and by time of arrival.

The investigation continues with the most widespread measure of residential segregation—Duncan and Duncan's (1955) index of dissimilarity, commonly known as the *D* index. This index is a summary measure of the total differences of spread of at least two different groups over all enumeration units of the study region. In our case, we analyze the difference between the distributions of migrants from particular source states in Brazil (including Bahia, Alagoas, Minas Gerais, etc.) with the distribution of all other migrants across individual APs within the São Paulo metropolitan area. Because the *D* index does not articulate the spatiality of segregation patterns (indeed, it is an aspatial measure), we then introduce a succession of other spatial indices to approximately measure dimensions of exposure, interaction, centralization, and clustering. And to disaggregate geographic patterns even more, we use the "threshold" technique first introduced by Poulsen et al. (2001). This technique creates an isolation–assimilation continuum that captures the degree to which a group *shares* residential areas with other groups in the metropolitan area.

## MIGRATION PATTERNS TO SÃO PAULO

São Paulo has seen a population explosion, largely a result of the urbanization process, and the movement of Brazilians away from rural areas. As the Southern Hemisphere's largest mega-city, and Brazil's economic capital, São Paulo has been a magnet for internal migration for nearly a century, especially from Brazil's poorer regions. Through time, the movement of people from rural areas to São Paulo has prompted intense growth and rapid change in the metropolitan area.

Ever since the early 20th century, as Lopes' (1976) research documents, movement has been comprised mainly of migrants moving from low-income, underdeveloped states of the North and Northeast to high-income states comprising the industrial and agricultural heartland of South, Southwest, and Southeast Brazil. As Marcus (2004) explains, among other reasons, harsh droughts, desertification, and hunger have pushed the *nordestinos* (translation: northeasterners) from the *sertão* (translation: interior, backlands) to search for employment opportunities in Brazil's industrial hubs. So, while states like Bahia, Pernambuco, Paraíba, and Alagoas have generally recorded the heaviest negative displacement, and Minas Gerais and Espírito Santo have lost the most migrants in absolute terms, states like São Paulo and Guanabara have experienced rapid absolute and relative growth as a result of in-migration.

Today, internal migration from outside the state no longer accounts for the majority of population increase in São Paulo. Instead, research by Cunha and Azevedo (2001)

**TABLE 1.** POPULATION OF THE METROPOLITAN AREA OF SÃO PAULO BY MIGRATION STATUS

Migrant type	Frequency	Percent
Short-term migrant	3,663,317	19.09
Long-term migrant	9,274,114	48.33
Non-migrant	6,252,320	32.58
Total	19,189,751	100.00

*Source:* 2000 Brazilian Census, IBGE.

suggests that natural increase, especially in the urban core, fuels most of the growth in the metropolitan area. Still, the movement of Brazilians to São Paulo has had, and continues to have, a tremendous impact on the composition of the resident population. As Table 1 illustrates, of the almost 20 million residents living in the metropolitan area, nearly 68% were born outside of São Paulo. Just more than 30% were born in the city. This is remarkable and points to the intense and profound role of migration in stimulating growth in the metropolitan area through time. Forty-eight percent of residents in São Paulo were not born in the city and have lived there more than 10 years. Another nearly 20% of migrants have been living in the metropolitan area less than 10 years.

While flows of internal migration have decreased in recent years, and uncertain economic opportunities await newcomers in the metropolitan area, São Paulo continues to prompt the flow of internal migrants from all parts of Brazil. As Baeninger (2001, p. 227) suggests: "... in the migrant imagination, especially for those from less dynamic regions, the area continues to exert a strong attraction." Perhaps they migrate to escape bad conditions in the countryside or because they are in search of sometimes real and sometimes imagined opportunities for socioeconomic mobility in the city. Either way, even though São Paulo is no longer the magnet it once was, migrants still make their way to the metropolitan area.

This "pull" toward São Paulo is readily apparent in the migratory behavior of short-term migrants to the metropolitan area in 2000, especially from Brazil's Northeast region. Table 2 reports the absolute numbers and percentages of short-term migration flows to São Paulo.<sup>5</sup> Movement from two Northeast states—Bahia and Pernambuco—to São Paulo is conspicuous. These two source states account for 44% of the short-term migration streams to São Paulo (if internal migration within the state of São Paulo is excluded). This makes sense given that both of these northeastern states have been net-exporters to São Paulo for decades (Cunha, 2001), and both states have long-established and sizeable flows of migration to the metropolitan area. Indeed, our data indicates that more than half

<sup>5</sup>More than 55,000 short-term migrants arrived from overseas in 2000. These foreign-born migrants are an interesting case. As Table 3 indicates, they are the most highly segregated group of migrants. When mapped out, these migrants are highly clustered in the core of the city and demonstrate a residential patterning dramatically different from Brazilian-born migrants. Skop and Zell (2007) provide an interesting discussion about international migration to/from São Paulo.

**TABLE 2. SHORT-TERM MIGRANTS BY STATE OF BIRTH, 2000**

Migrant state of birth	Total	Percent
São Paulo	912,510	24.91
Bahia	755,591	20.63
Pernambuco	453,796	12.39
Minas Gerais	322,276	8.80
Ceará	207,105	5.65
Paráíba	164,184	4.48
Alagoas	156,461	4.27
Paraná	151,498	4.14
Piauí	136,307	3.72
Maranhão	61,130	1.67
Sergipe	59,558	1.63
Rio Grande do Norte	59,323	1.62
Rio de Janeiro	55,836	1.52
Other countries	54,445	1.49
Rio Grande do Sul	23,170	0.63
Santa Catarina	15,487	0.42
Espírito Santo	14,991	0.41
Pará	14,164	0.39
Goiás	13,322	0.36
Mato Grosso do Sul	12,758	0.35
Mato Grosso	7,533	0.21
Distrito Federal	4,781	0.13
Amazonas	2,704	0.07
Tocantins	1,577	0.04
Rondônia	1,406	0.04
Acre	702	0.02
Amapá	587	0.02
Roraima	115	0.00
Total	3,663,317	100.00

*Source:* 2000 Brazilian Census, IBGE.

(52%) of migrants living in the metropolitan area for more than 10 years come from Bahia and Pernambuco.

Minas Gerais, a state directly along the northeast border of the state of São Paulo, continues to be a major supplier of migrants, accounting for nearly 12% of the total flow of short-term migrants into the metropolitan area of São Paulo (excluding internal migrants within the state). The proximity of this state to São Paulo means that the economic and human costs of migration are much lower than for more distant states in the North and Northeast. For these reasons, Minas Gerais has always been a major source region of internal migrants to São Paulo, as research by Schmertmann (1992) has

demonstrated. These in-flows have occurred even as Martine and Diniz (1997) and Cunha (2001) observed that emigration from Minas Gerais to São Paulo since the 1990s has experienced a continued and overall reduction as the state begins to retain more of its population.

Other Northeast states provide smaller numbers of recent migrants to the metropolitan area and include Ceará, Paraíba, Alagoas, and Piauí. The relatively high levels of emigration to São Paulo (with more than 660,000 short-term migrants from these states living in the metropolitan area in 2000) suggest that the metropolitan area continues to be an important magnet for *nordestinos*, despite a real reduction in both the absolute numbers and rates of in-migration. Thus might have been influenced by an increase in the ability of the Northeast's largest cities to retain their populations along with the potential intensification of return migration, a phenomenon Perillo and Aranha (1992) noted with interstate migration data to the State of São Paulo from the 1990 census. Menezes (2004) also suggests that short-term, temporary, and circular migration are all becoming increasingly significant phenomena in the early 21st century. Even so, it appears that despite an overall decline in the so-called "rural exodus" along with the emergence of more temporary moves, São Paulo continues to attract many permanent migrants from the Northeast, and that this flow is likely to continue into the future.

Figure 1 provides a visual representation of major internal migration flows to the metropolitan area by mapping the absolute numbers and state of origin of all migrants (i.e., both short-term and long-term migrants) living within São Paulo. There were nearly 13 million migrants residing in the city in 2000 and several major streams of internal migration are evident. The largest flow comes from within the State of São Paulo itself, with more than 3.5 million residents moving within the state at some point since they arrived. This movement makes sense given the enormous magnitude of spatial redistribution that typically occurs in a metropolitan area of this size and scale, as research by Souza (2001) illustrates.

The migration patterns generally reflect the states that have been historical suppliers of migrants in the past. The state of Bahia stands out as the most prominent source of migrants outside the state of São Paulo. But migration from Minas Gerais and Pernambuco is also significant: more than 3 million migrants from these two states lived in the metropolitan area of São Paulo in the 2000 census. More medium-sized flows, ranging from approximately 400,000–600,000 migrants, begin in the states of Paraná, Ceará, Paraíba, and Alagoas, and even smaller streams, from 120,000–320,000 migrants, embark from states like Piauí, Sergipe, Rio de Janeiro, Rio Grande do Norte, and Maranhão. The remaining Brazilian states send insignificant trickles of migrants to the metropolitan area.

It is apparent that migration to São Paulo constitutes a complicated system that involves many different players and diverse types of movement. Recent urbanization processes and the spatial redistribution of population in São Paulo indicate that the metropolitan area remains attractive for migratory flows, despite the evident decrease in absolute volumes and rates of in-migrants. Historic suppliers of migrants, like Bahia and Pernambuco, continue to see high levels of emigration to São Paulo, and demonstrate the effects of cumulative causation in the formation of specific and direct channels between particular sending and receiving areas.

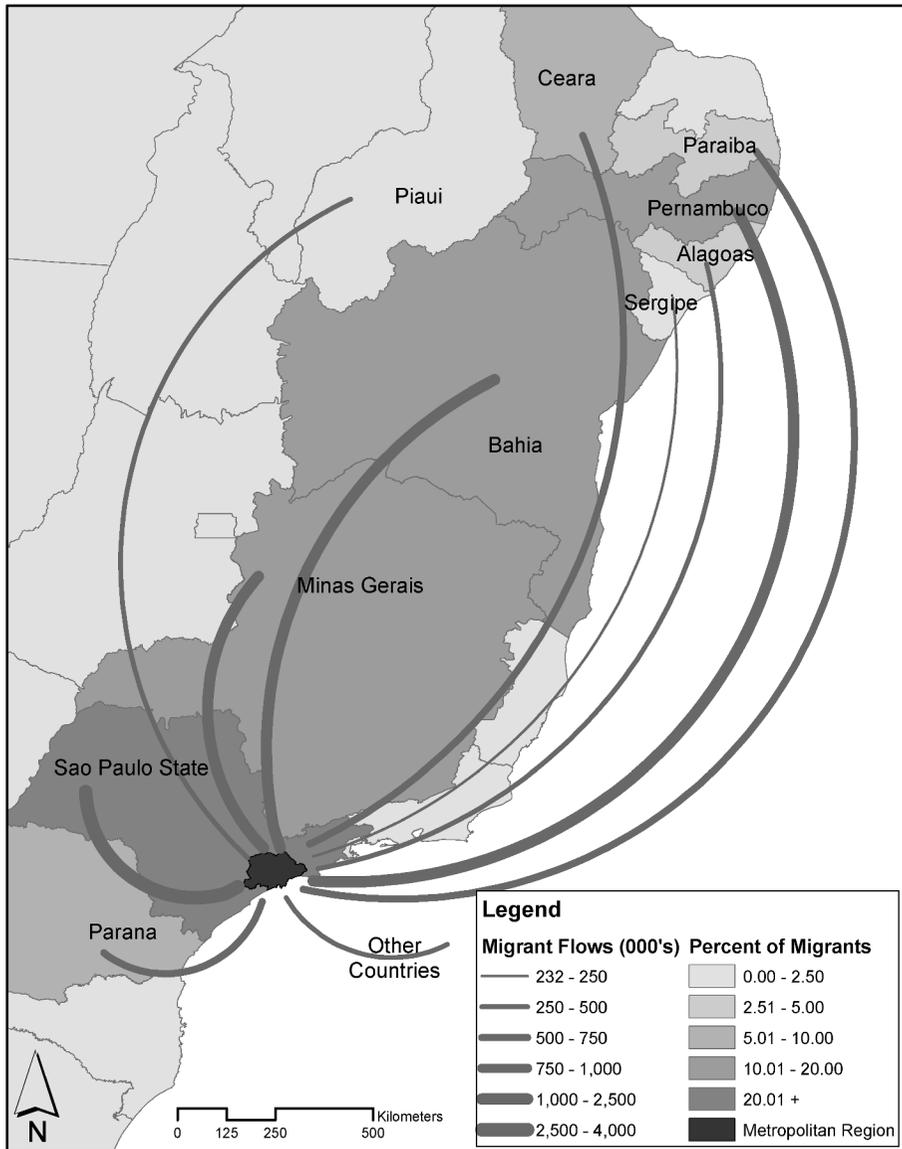


Fig. 1. Flow of migrants to São Paulo from selected states in Brazil, 2000.

### MAPPING SHORT-TERM VERSUS LONG-TERM INTERNAL MIGRANTS WITHIN THE METROPOLITAN AREA

While historical and contemporary patterns of internal migration to São Paulo are relatively well-known, the internal migrants' geography of settlement *within* São Paulo has been a mystery up until this point. It is only with the release of the 2000 Brazilian Census, along with advancements in geographic information system (GIS) tools, that

analyses at the metropolitan area-scale are even possible (see Ramos, 2002, for another usage of GIS in mapping the urban structure of São Paulo). The ability to map the residential behavior of internal migrants within the metropolitan area provides a clearer picture of how the newcomers organize themselves in urban social space. This spatial project also offers an alternative method (even though it is only approximate) for capturing the role of chain migration in channeling migrants to certain parts of the city.

Importantly, our analysis indicates that internal migrants to São Paulo *are* concentrated in different parts of the metropolitan area depending on their time of arrival. Figure 2 displays the total number of short-term migrants within each AP as a percent of the total population within each AP, whereas Figure 3 presents the total number of long-term migrants within each AP as a percent of the total population within each AP. Striking differences in the residential behavior of short-term versus long-term migrants are immediately apparent.

The periphery is especially prominent as a magnet for short-term internal migrants. Few APs in the core municipality of São Paulo boast populations of short-term migrants that exceed 20% of the total population in the AP. In contrast, many outer AP's in São Paulo, especially in the northwest and northeast sectors, could be labeled "short-term migrant concentrations," as the vast majority of residents (between 40% and 80%) in these AP's have been living in the city for less than 10 years. In effect, a ring of short-term migrants appears to emerge on the outskirts of the metropolitan area in 2000.

This sociospatial pattern is largely the result of pronounced income inequality in the metropolitan area—a characteristic of São Paulo that is accompanied by accentuated spatial differentiation (Pasternak and Baltrusis, 2001; Schor et al., 2003). São Paulo has been called a "city of rings," whereby a plush, expanded center is surrounded by progressively poorer circles. As a result, poor neighborhoods are mainly located in the peripheral regions of the city, with lower per capita incomes and quality of life that contrasts with some central areas that boast excellent urban facilities, more developed infrastructure, and higher per capita incomes. There are highly contrasting socioeconomic situations between core and periphery, where the general urban configuration creates a pronounced decline in land values, economic activities, and living conditions from the center toward the outskirts of the metropolitan area. Thus, as Leme's (2003) research suggests, wealth and inequality is reflected in the physical reality of the core versus the periphery.

Interestingly, recent trends suggest that this pattern of core-periphery segregation has begun to transform and become more complicated as decelerated economic growth, the emergence of strong social movements, the disappearance of decent housing in the city center, and other factors combine to create a more fragmented metropolis (Caldeira, 2000). The emergence of *buzios* (wealthy gated enclaves) on the outskirts of the metropolitan area and the rise in *periferias* (translation: semi-legal, large housing developments created by private developers) on the fringe, as well as the increasing concentration of *favelas* (translation: illegally constructed, "substandard" squatter settlements) in both the central city and toward the edges of the metropolis, along with the expansion and densification of high-rise *cortiços* (translation: for-rent tenement housing) in the city core are all recently emerging patterns that are re-arranging the urban geography of São Paulo (Fix et al., 2003). Although there is no disaggregated census data on different housing types in the metropolis (a report using data from the 2000 Brazilian census, which includes geographical referencing of slums in the metropolitan area, has yet to be

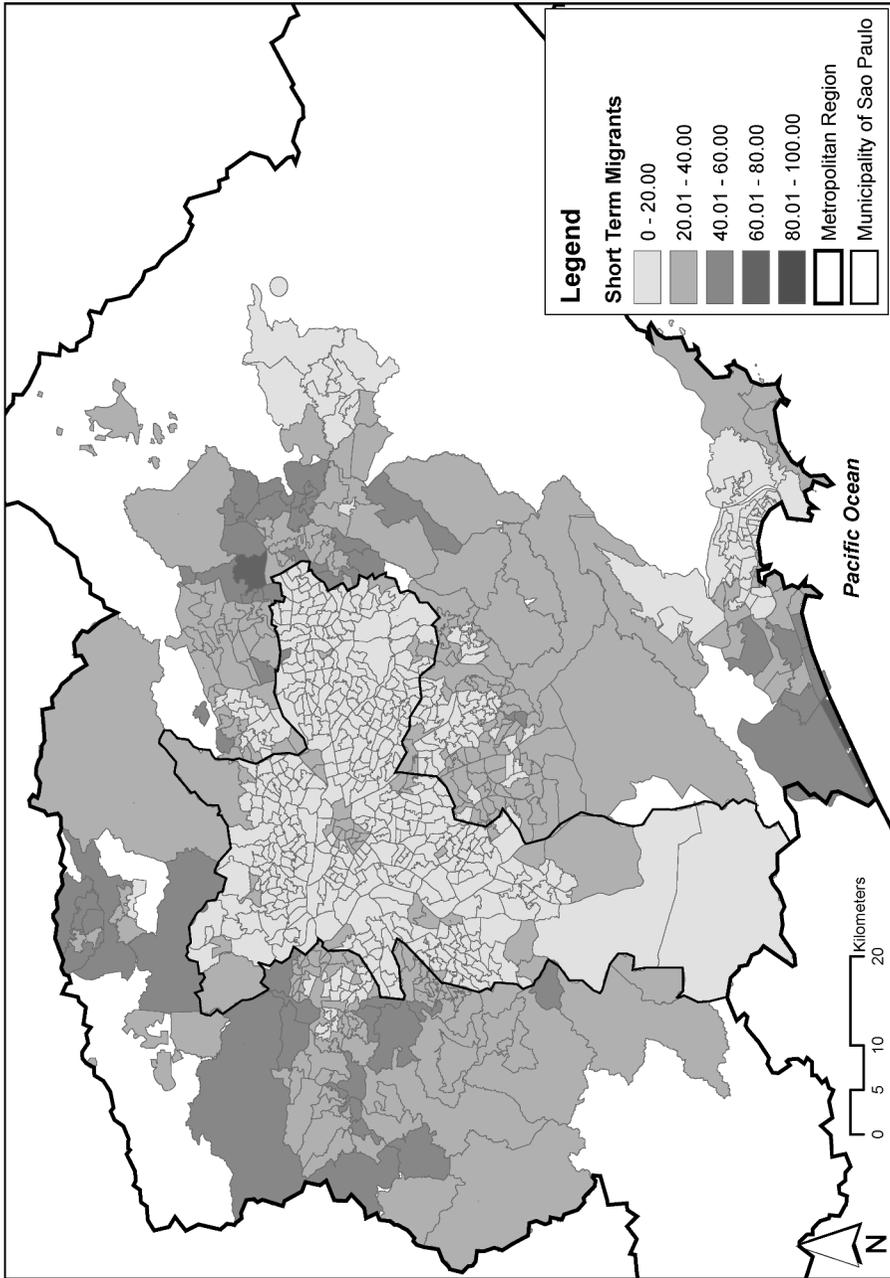


Fig. 2. Short-term migrants as a percentage of total population within each AP, 2000.

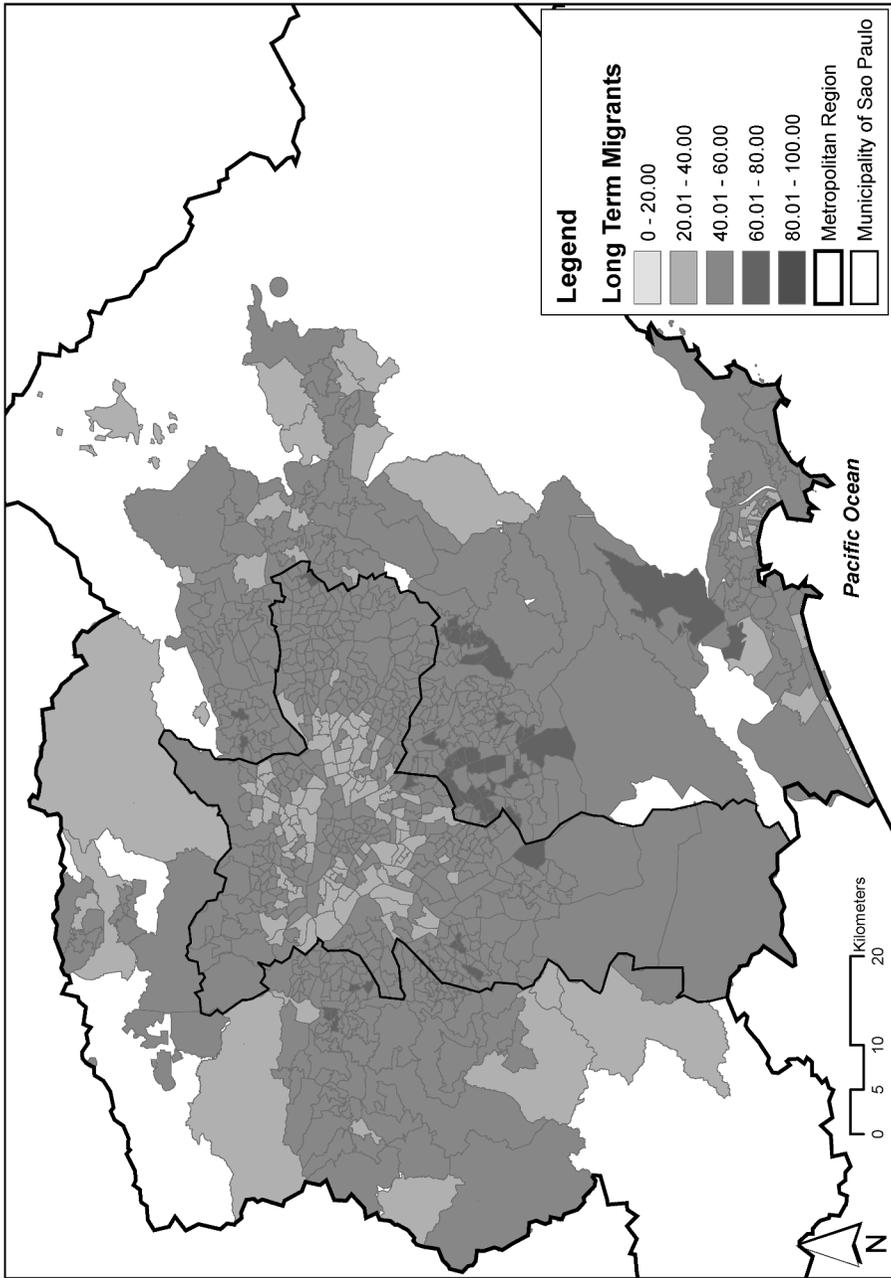


Fig. 3. Long-term migrants as a percentage of total population within each AP, 2000.

released), recent estimates from other sources, including UN-Habitat, indicate that the majority of São Paulo's population live in *cortiços* or *periferias*. At the same time, the number of *favelas* has exploded, and it is estimated that today more than 20% of the metropolitan area's population live in this housing type (Fix et al., 2003).

As migrants who generally arrive in São Paulo with lesser amounts of social and economic capital, most short-term migrants concentrate in the urban fringe, where they are more likely to find cheaper and more affordable housing. The inner-city *cortiços* are simply not places where recent migrants come—probably because there is little space available, low turnover, higher rents, and much crowding. Instead, recent migrants seek out the neighborhoods in the *periferias*—spaces located on the fringe of the city that are predominantly produced by private developers with large landholdings who do not fulfill the necessary requirements for the approval of the settlement in the municipality of governance. Sometimes, in these communities, established residents build other rooms on their lot to rent out and increase their monthly income; the renters are oftentimes recent migrants linked by social networks to a particular sending community (Torres et al., 2002). Other migrants, especially those with the fewest resources, make their homes, at least their first homes, in outlying, illegal *favelas*, which tend to contain the poorest quality and most marginal housing, oftentimes formed in municipal and private areas near gullies, floodplains, and on riverbanks. These illegal settlements are particularly appealing to recent migrants because there are no monthly rental or mortgage payments to be made. This is a process that has been prevalent in the metropolitan area since early in its history, when newcomers were expected to fend for themselves in the vast periphery.

As Figure 3 illustrates, long-term migrants are much more dispersed throughout the entire metropolitan area. They represent the majority of residents in the core, with most centralized APs containing long-term migrant populations of 40% to 80% of the total population within each AP. At the same time, many outer sectors of São Paulo also contain a majority long-term resident population. Unlike the map for short-term migrants, the long-term migrant map does not point to high levels of concentration in any one sector of the metropolitan area, though some APs in the southeastern sectors of the city contain higher than expected long-term migrant populations (where 80% or higher of the population has been living in the metropolitan area for more than 10 years). This pattern suggests that migrant networks have evolved to such a point that long-term residents no longer rely solely on origin-communities for social support. These migrants most likely have more resources and information to draw upon when making residential choices than they did when they first arrived in the metropolitan area. Thus, they reside in a variety of urban living conditions, whether in inner-city tenements, upgraded and consolidated squatter settlements, legal plots in the periphery, and/or government-sponsored public housing.

It is readily apparent from the data that São Paulo is saturated with migrants who have resided in the metropolitan area for at least 10 years. This patterning has as much to do with the fact that migrants, as stated previously, represent nearly 70% of the overall population in São Paulo, as it does with the apparent process of intra-urban mobility that facilitates dispersion and redistribution in the metropolitan area. Both processes have guaranteed that São Paulo continues to be characterized as a migrant city.

### THE ROLE OF CHAIN MIGRATION IN CREATING RESIDENTIAL CLUSTERINGS

#### *Mapping Chain Migration*

The affects of channelization from certain source states to particular neighborhoods within the metropolitan area of São Paulo can only be explored indirectly with this dataset as we have no way to determine whether connections between different individuals and households residing in separate living units exist. Still, our idea is that there will be significant clustering of migrants by municipality of origin and AP of destination, as individual migrants are more likely to settle in areas where they know that there are other migrants from their state of origin.

In this step, we change our reference data from classifying migrants based on state of origin and length of residence to characterizing incoming migrants based on the five-year migration question. This census question specifies the migrant's municipality of origin, and enhances our ability to capture the ways in which specific channels of internal migration from various municipalities tend to settle in particular APs within São Paulo. In a sense, we are bringing the "scale" of the analysis downward—from the state to the municipality—and provide a more detailed geography of settlement.

To further enhance our analysis, we have disaggregated the top 10 proportional flows of migration from various municipalities in three states: Bahia, Minas Gerais, and Piauí. These three states are ideal for comparison because the absolute size of migration flows from each varies considerably. Each state, as previously demonstrated, also has a different history of internal migration to, and contemporary linkage with, the São Paulo metropolitan area. As a result, it is likely that current patterns of settlement will vary considerably between all three states.

Finally, we estimate the spatial relationship between municipality of origin and AP of destination by mapping out the residential geographies of individual migrants in the metropolitan area. These dot density maps demonstrate whether migrants from certain municipalities settle in the same APs as long-term migrants from the same state. This exercise allows us to perform analyses that at least gauge the likelihood that recent migrants are finding their way into the APs where long-term migrants are also residing, and thus tell us something about the role of chain migration in facilitating the process of settlement in a complicated urban setting.

Figures 4, 5, and 6 reveal some interesting patterns about where migrants from municipalities in the three selected states settle in general. First, there are obvious differences in the spatial distributions of each group. Migrants from Bahia are considerably more concentrated in the APs located on the outskirts of São Paulo, whereas those from Minas Gerais and Piauí tend to concentrate in both the core and periphery of the city. Second, while the spatial distribution of each migrant group differs, all tend to concentrate within small groupings of spatially contiguous APs. Migrants from Piauí appear to be more randomly scattered throughout the metropolitan area, with the exception of the large clustering of these migrants in the Northwest quadrant of São Paulo. Third, the maps create a general picture regarding the ways in which new migrants become channeled to certain neighborhoods within the metropolitan area. Many of these areas are those places in São Paulo that have seen the greatest population increases in the past 10 years, as Souza

(2001) demonstrates. So, as the metropolitan area has expanded along particular transportation and economic corridors, new migrant concentrations also emerge in these places at the same time.

### *Measuring Residential Segregation*

While the above exercise is an effective method that allows for the visual representation of basic residential patterns of concentration and/or dispersion, mapping gives little indication of the amount and/or nature of mixing taking place within São Paulo. Table 3 includes several indices of segregation for select migrant groups in the metropolitan area. Given the complex nature of urban settlement patterns, the use of multiple indices provides a deeper understanding of the multiple dimensions of segregation. The measures chosen here are the dissimilarity, exposure, isolation,  $D(s)$ , and  $S$  indices (Wong, 2003).<sup>6</sup>

Perhaps the most notable result shown in the table is the tendency for each index to increase as the size of the migration flow diminishes. This result is, we suspect, largely due to the effect of sampling variation—the noise to signal ratio increases as the number of migrants shrink and the number of APs with either very small numbers of migrants from a given state or no migrants from that state increases. The fact is that these indices are highly vulnerable to sampling variation, so that when a group's population is small, its indices may be high even if the group's members are evenly distributed throughout the area.

On the other hand, we believe that if one compares the indices for several states with a similar number of migrants, then the indices are informative. Thus, there appears to be a more uneven distribution of migrants from the rest of the state of São Paulo than there is for migrants from Bahia. Similarly, and more directly in line with our hypothesis regarding the influence of chain migration in clustering, there is greater segregation among migrants from the Northeast state of Pernambuco than there is from the Southeast state of Minas Gerais. Lastly, looking at some of the “medium”-sized migration flows, the greatest clustering is to be found among migrants from “Other Countries,” and the least among migrants from the southern state of Paraná. We suspect that the former is due to the concentration of international migrants in a relatively small number of higher income or ethnic neighborhoods (Skop and Zell, 2007), while the latter is due to the difference between the process of migration from the South and that which prevails for migration from the Northeast. Although we do not disaggregate the socioeconomic status of different migrants in this paper, other research suggests that migrants from the South tend to include more middle-class individuals and families, who likely have more housing options when compared with migrants from the North, who tend to include more low-income individuals and families with fewer resources (Baeninger, 2001).

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<sup>6</sup>For a complete explanation of the indices used in this article, along with how to interpret them, see Wong (2003). The  $D(s)$  and  $S$  indices were calculated using an ArcView 3.x extension provided courtesy of David W. S. Wong. The development of the ArcView extension was partially supported by the National Institute of Health/Child Health and Human Development (NICHD) under the National Institute of Health (NIH) grant number 1 R03 HD38292-01 awarded to David W. S. Wong.

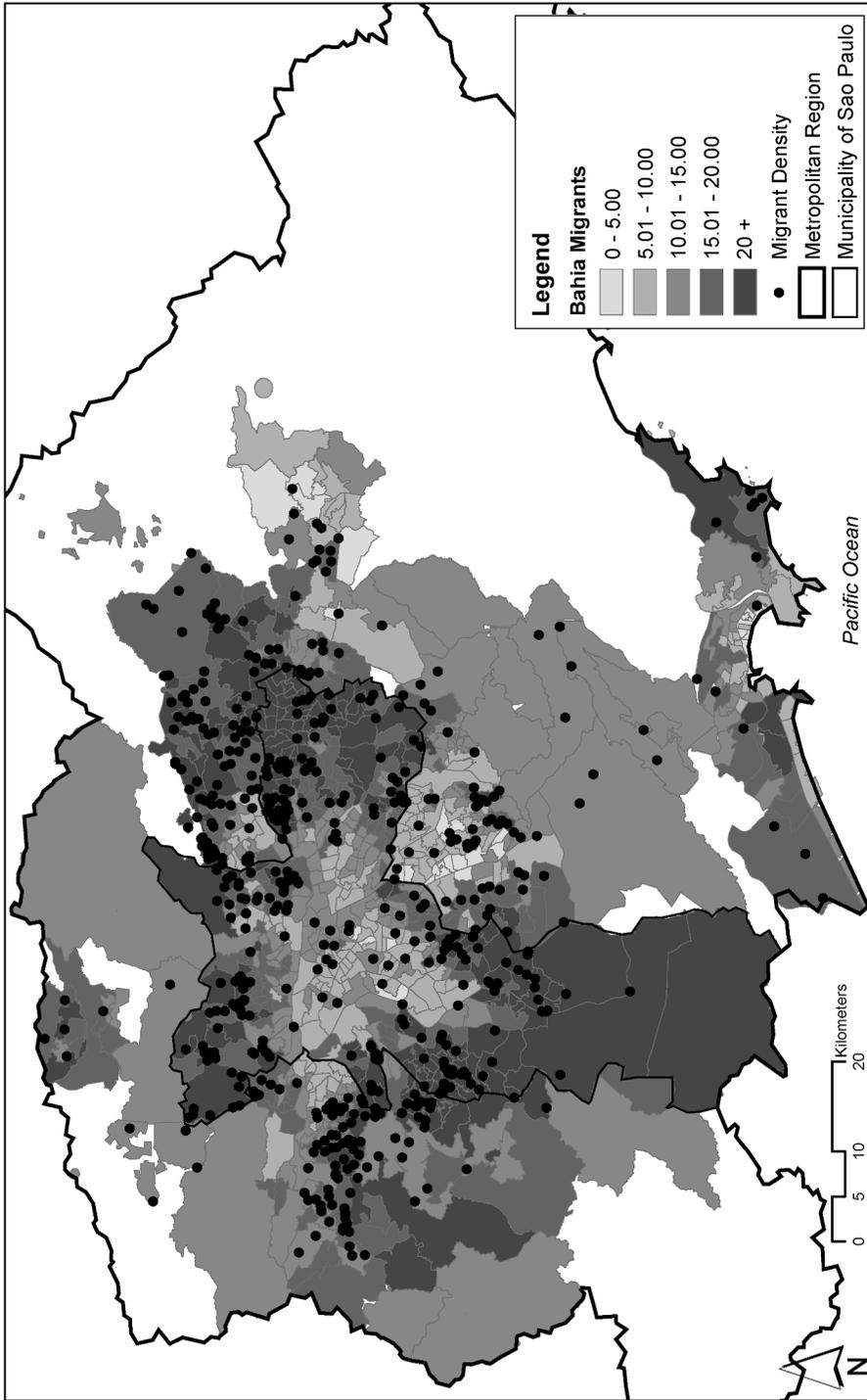


Fig. 4. Distribution of migrants from the 10 most significant sending municipalities in Bahia.

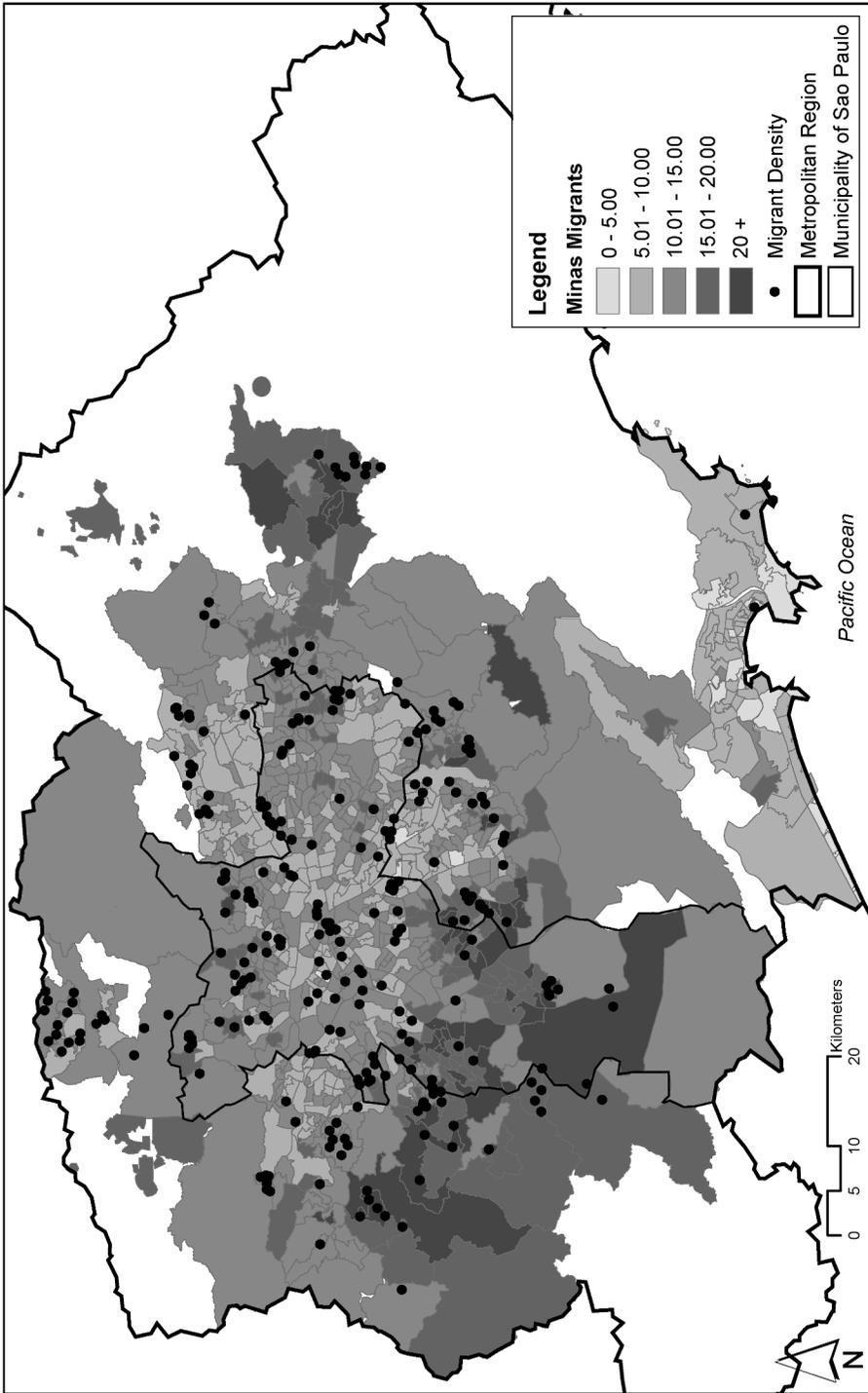


Fig. 5. Distribution of migrants from the 10 most significant sending municipalities in Minas Gerais.

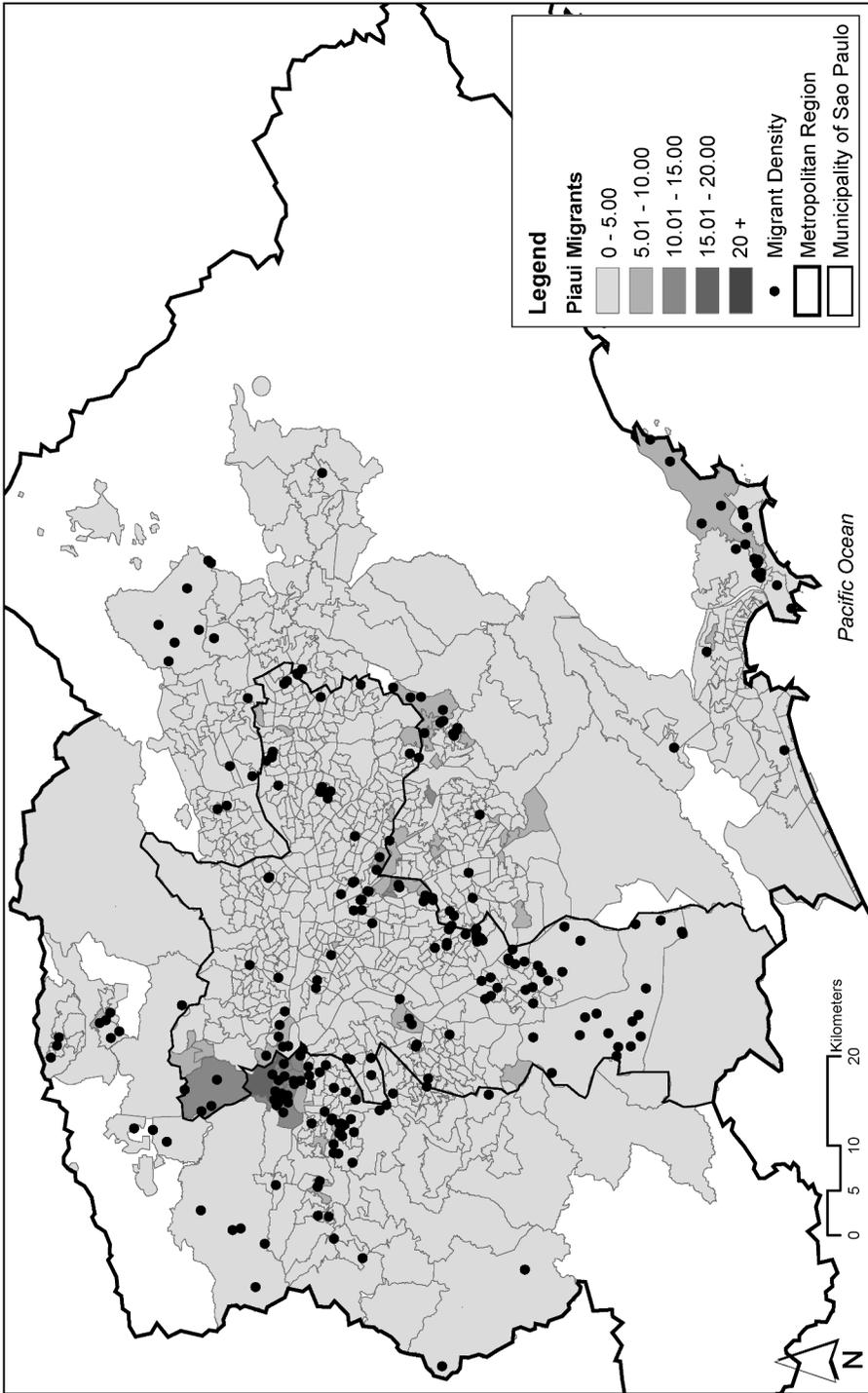


Fig. 6. Distribution of migrants from the 10 most significant sending municipalities in Piau.

**TABLE 3. SEGREGATION MEASURES**

Migrant state of origin	Dissimilarity	Exposure	Isolation	$D(s)$	$S$
<b>Migrant group vs. remaining population</b>					
BA–Bahia	0.24	0.11	0.89	0.22	0.24
MG–Minas Gerais	0.19	0.08	0.92	0.18	0.18
PE–Pernambuco	0.23	0.08	0.92	0.22	0.09
CE–Ceará	0.24	0.03	0.97	0.24	0.13
PR–Paraná	0.18	0.03	0.97	0.18	0.15
PI–Piauí	0.34	0.02	0.98	0.33	0.27
SE–Sergipe	0.35	0.01	0.99	0.34	0.60
OC–Other countries	0.45	0.02	0.98	0.45	0.31
PB–Paraíba	0.23	0.03	0.97	0.23	0.13
AL–Alagoas	0.23	0.02	0.98	0.23	0.14
<b>Migrant group vs. other migrants</b>					
BA–Bahia	0.21	0.16	0.84	0.19	0.13
MG–Minas Gerais	0.16	0.12	0.88	0.15	0.19
PE–Pernambuco	0.19	0.11	0.89	0.18	0.13
CE–Ceará	0.21	0.05	0.95	0.20	0.16
PR–Paraná	0.15	0.05	0.95	0.15	0.15
PI–Piauí	0.30	0.02	0.98	0.30	0.28
SE–Sergipe	0.34	0.02	0.98	0.34	0.59
OC–Other countries	0.52	0.03	0.97	0.51	0.36
PB–Paraíba	0.20	0.04	0.96	0.19	0.09
AL–Alagoas	0.20	0.04	0.96	0.20	0.11
<b>Short-term migrants vs. long-term migrants</b>					
BA–Bahia	0.24	0.31	0.69	0.20	0.17
MG–Minas Gerais	0.28	0.18	0.82	0.25	0.22
PE–Pernambuco	0.26	0.28	0.72	0.22	0.20
CE–Ceará	0.27	0.28	0.72	0.22	0.18
PR–Paraná	0.32	0.20	0.80	0.27	0.28
PI–Piauí	0.30	0.37	0.63	0.21	0.16
SE–Sergipe	0.38	0.21	0.79	0.29	0.20
OC–Other countries	0.39	0.12	0.88	0.33	0.28
PB–Paraíba	0.29	0.29	0.71	0.23	0.19
AL–Alagoas	0.32	0.29	0.71	0.25	0.19
<b>Summary measures</b>					
Migrants vs. non-migrants	0.27	0.62	0.38	0.24	0.20
Short-term vs. long-term migrants	0.24	0.26	0.74	0.21	0.22

Source: 2000 Brazilian Census, IBGE.

**TABLE 4.** CONCENTRATION OF MIGRANT GROUPS IN SÃO PAULO BY AP, 2000

Migrant state of origin	Threshold bands								Totals
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
Percent of total population									
BA-Bahia	4.35	19.10	29.03	30.64	12.44	3.82	0.63	0.00	100.00
MG-Minas Gerais	7.47	48.52	31.78	10.85	1.38	0.00	0.00	0.00	100.00
PE-Pernambuco	11.08	44.38	34.77	8.50	0.25	1.02	0.00	0.00	100.00
PR-Paraná	73.13	26.60	0.27	0.00	0.00	0.00	0.00	0.00	100.00
CE-Ceará	60.32	36.86	2.82	0.00	0.00	0.00	0.00	0.00	100.00
PB-Paraíba	84.74	12.93	1.15	0.52	0.67	0.00	0.00	0.00	100.00
AL-Alagoas	90.34	9.66	0.00	0.00	0.00	0.00	0.00	0.00	100.00
PI-Piauí	94.21	3.57	2.22	0.00	0.00	0.00	0.00	0.00	100.00
SE-Sergipe	93.40	5.23	1.16	0.21	0.00	0.00	0.00	0.00	100.00
OC-Other countries	52.41	39.85	5.53	1.40	0.00	0.81	0.00	0.00	100.00
Percent of migrant population									
BA-Bahia	0.58	6.85	17.58	25.89	22.98	16.17	8.15	1.80	100.00
MG-Minas Gerais	0.68	25.02	46.28	18.68	8.26	1.09	0.00	0.00	100.00
PE-Pernambuco	3.29	26.67	39.87	25.76	3.73	0.50	0.17	0.00	100.00
PR-Paraná	34.10	64.04	1.86	0.00	0.00	0.00	0.00	0.00	100.00
CE-Ceará	29.81	65.25	4.60	0.34	0.00	0.00	0.00	0.00	100.00
PB-Paraíba	62.65	35.89	1.17	0.19	0.10	0.00	0.00	0.00	100.00
AL-Alagoas	65.97	33.71	0.32	0.00	0.00	0.00	0.00	0.00	100.00
PI-Piauí	90.45	7.13	2.25	0.17	0.00	0.00	0.00	0.00	100.00
SE-Sergipe	92.06	6.15	1.27	0.37	0.15	0.00	0.00	0.00	100.00
OC-Other countries	32.68	62.33	3.41	1.20	0.18	0.14	0.05	0.00	100.00

Source: 2000 Brazilian Census, IBGE.

One of the primary advantages of the above indices is that they are simple to calculate and interpret, but they have long been criticized because they have a limited capacity to address other concentration and clustering dimensions of segregation (Wong, 2003). In an effort to more fully measure the spatial patterning of internal migrants in São Paulo, we use the “threshold” analysis developed by Poulsen et al. (2001). This analysis provides a general profile for individual groups to establish whether they form a majority in any particular areas of a city and create exclusive residential districts. The technique creates an isolation–assimilation continuum that captures the degree to which a group *shares* residential areas with other migrant groups and the overall host community.

In Table 4, we have adapted the threshold procedure to our study groups and calculated results for the various types of potential residential patterning. This is primarily to answer the call by Ward (1993), who argued that theory and methods need to be derived specifically from the Latin American experience, rather than simply using North American or European conceptual models. So, there are three critical differences between the original threshold analysis and our own. First, in our case, internal migrants are the “unit”

of analysis, whereas Poulsen et al. (2001) used racial/ethnic groups (which are largely composed of various international migration groups but also include “native” groups like African Americans and Aborigines). Second, our thresholds are disaggregated at the AP level, whereas other analyses are able to use a much smaller geographic unit of comparison—the census tract—to calculate thresholds. Our third adaptation takes care of this aggregation to a larger geographic unit by lowering threshold levels, because no migrant group represents more than 40% of any one AP, whereas in the other threshold analyses, census tracts can contain upward of 80% of any one racial/ethnic group, not only because spatial clustering is prevalent, but also perhaps because the population within that geographic unit of analysis is smaller.

The isolation–assimilation continuum originally proposed in threshold analysis does not exactly “fit” this new cultural/geographic context. The original continuum begins with the polarized enclave with one racial/ethnic group substantially isolated and the mixed minority enclave with two or more racial/ethnic groups sharing the same space. The multiethnic neighborhood is the most assorted community type with relatively equal numbers of both racial/ethnic group members and the majority racial/ethnic group. The continuum ends with the assimilated community where the majority racial/ethnic group forms the majority with the racial/ethnic group forming a significant minority and the citadel where the racial/ethnic group is mostly absent in a majority racial/ethnic group area.

Because none of the internal migrant groups fit into the extreme “ghetto” or “polarized” categories (i.e., internal migrants do not live in significantly isolated communities in São Paulo—at least at this scale of analysis), we have reconfigured the continuum to more closely relate to the São Paulo situation. This rearrangement means that new thresholds were created and the most “isolated” thresholds include those APs where migrants form at least 35% to 40% of all the migrants living within an individual AP. Only one group, migrants from Bahia, forms any significant clusters at this level of concentration.

The vast majority of migrants tend to form much smaller minorities of individual APs. As is confirmed by the data, there are many similarities among most of the migrant groups in São Paulo. The majority of migrants from all of the major states of in-migration live in APs where they represent fewer than 15% of the total population. The migrant groups are in no way isolated from one another and/or the non-migrant population, at least at this scale of analysis.

Still, the majority of migrants from many states (excluding Bahia, Parana, Ceará, Alagoas, and Piauí) live in APs where they represent more than their population totals for the entire city. These numbers suggest some clustering along origin-state lines, especially in the case of Minas Gerais and Paraíba. This resonates with the maps presented above and field evidence presented in other research. While Little Minas and Paraíba towns have yet to become conspicuously manifest in São Paulo, individuals from the same states in Brazil do tend to form communities, at least temporarily, within the metropolitan area.

## CONCLUSION

The Latin American city presents a monumental challenge to contemporary social scientists. For one thing, the pace of urbanization in Latin America has outstripped other regions of the world. For another, the scope and scale of social changes connected to the

larger urbanization process are unprecedented. Given our concern with internal migration as a geographical phenomenon, we argue for the use of a variety of mapping techniques and descriptive, spatial statistics as an alternative means for understanding how the fragmented metropolis is related to the process of chain migration—particularly with the ways in which internal migrants from particular sending areas create particular neighborhoods in their destination.

The geography of internal migration has important implications for the migrants' sociocultural and socioeconomic success. It has long been argued that the social and economic structures surrounding migrants can shape and/or constrain adjustment experiences. As a result, questions focusing on geographic distribution and geographical mobility provide a window to other important adjustment processes. The geography of internal migration to São Paulo is by no means a homogenous or identical experience for all migrants. Our research suggests that some of the newest migrants to São Paulo are arriving in areas where they live with families and friends, however temporary, in a setting that likely promotes social adaptation and incorporation. But our research also illustrates that some short-term migrants are isolated from, and unconnected to, other long-term migrants from their origin—which suggests less social support and fewer community structures to rely upon in the urban setting, at least when they first arrive. In this giant agglomeration, which consists of 39 municipalities and nearly 20 million residents, the fear is that many of these “lonely” migrants will fall through the cracks, and that local government, already overwhelmed, does not and/or will not be able to provide for them (Ward, 2004). The result could mean an increase in unemployment, overcrowding, poverty, and crime, in an already precarious situation. Yet the fact that much of our data indicates that migrants seek out the neighborhoods of friends, relatives, or both in São Paulo most likely means that forces supporting continuity and community will circumvent much of the anomie that might exist otherwise in this metropolis.

Much research remains to be done before any broad-based conclusions can be made concerning the degree to which chain migration is creating a fragmented metropolis, and/or collective communities. Some of this work can be accomplished with the secondary data provided in the Brazilian census. The individual long-form census records provide a rich resource from which to draw this information, since they contain information on household characteristics, education, housing quality, and a variety of consumer durables (e.g., cars, refrigerators). Clearly, one of our most important tasks is to measure how much socioeconomic status accounts for the concentration in migrant settlement. Initial research by our team indicates that the profile and experiences of middle- and upper-class migrants are vastly different from low-income migrants, and that they create distinctive geographies of settlement as well. This, of course, has significant consequences for the migrants' overall well-being, as well as implications for their second-generation children.

Even though our broad-scale analysis of chain migration and residential segregation provides insight into the phenomenon of urbanization, we recognize our findings as partial and incomplete. Ideally, our results should be paired with observations from more in-depth qualitative research to truly begin to elucidate how the Latin American city is being transformed by the process of internal migration. The outstanding work done by Janice E. Perlman (1976) in the 1970s about migrant communities in Rio de Janeiro would be the ideal model for this kind of qualitative data collection. The combined results would yield a better understanding of how geographic concentration and social support

networks intertwine in adjustment process of migrants in the São Paulo case. Thus, the challenge we face is to continue to create new techniques and mixed methods to capture the changing dynamics and multifaceted geographies of internal migration taking place in urban space.

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