Racial Gerrymandering in Plain Sight? Racial exclusion in Selective Annexations Across Fourteen States, 2000-2010

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Abstract

An understudied aspect of what explains the geographic patterns of urban development in the U.S. is how municipal boundaries are drawn. Each decade, at least 30% of all municipalities conduct annexations (expanding the boundaries of a city), yet there has not yet been a systematic study on whether these annexations exhibit racially exclusionary patterns. Case studies suggests that majority-white municipalities refuse to annex territory containing majority-Black residents, or strategically add white communities to dilute Black political representation. Clearly, how municipal boundaries are drawn is a deliberate process that takes into account more than administrative efficiency, but existing research has not found consensus on the extent to which minority communities may be excluded and disadvantaged via boundary manipulations. Additionally, the few existing studies on the practice of racially selective annexations have not examined the 2000-2010 period, during which the U.S. saw dramatic demographic shifts due to immigration patterns. Using the Census Bureau's Boundary and Annexation Survey from 2000-2010, and Census block- and place-level demographic data for fourteen states, I find mixed evidence that municipalities have continued to engage in racial gerrymandering, especially in adaptation to the changing color line. This research contributes to literature on immigration, racial discrimination, and political geography.

Keywords: municipal annexation, racial exclusion, urban geography, spatial demography, immigration, political geography

Introduction

Economic considerations like increasing the tax base and raising property values are often advanced as the primary explanations for cities' geographic growth patterns, as if the spatial pattern of urban growth is driven mostly by utilitarian constraints of financial viability (see e.g. Edwards 2004). However, from redlining to restrictive covenants, the story of urban expansion in the U.S. has always been inseparable from racial exclusion (Charles 2003). Drawing on theories of political geography, race, and immigration, I argue that geographical boundaries of municipalities reveal more than just a mundane bureaucratic process about administrative conveniences; instead, they can expose the racial and political considerations behind how communities are created.

In this paper, I examine whether and how municipalities use annexations to exclude minority communities, and whether selective annexations constitute a form of racial gerrymandering. In particular, I incorporate literature on new immigrant destinations to investigate the sensitivity of municipal racial gerrymandering practices to the changing color line. Evidence from lawsuits successfully challenging annexations on the basis of racial discrimination suggest that racially motivated annexations do occur, but there is no consensus within the social science evidence. While Aiken (1987; 1990) argues that white-controlled municipal governments perpetuate racial segregation by concentrating Black residents in the under-resourced fringes of their cities, Lichter et al. (2007) found only weak evidence of racial exclusion in Southern, rural towns between 1990 to 2000 and contend that claims of exclusionary boundary-drawing in the South prior to the 2000s may be overblown. Reexamining this question for a wider set of geographies, and in a different time period may give some clarity to this debate.

Between 2000 and 2010, the Hispanic population grew from 35.3 to 50.5 million, or by 43%, and Hispanic population growth accounted for most of the entire nation's population growth rate. The Hispanic voting age population grew by 45%. The prior 1990-2000 decade saw an even sharper Hispanic population growth rate of 58% (Pew Research Center). Additionally, the spatial distribution of growth has also shifted since the 2000s, where the states with the largest percent growth in Hispanic populations are in the Southern states (Pew Research Center). Within those Southern states, Hispanic population growth is most dramatic in nonmetropolitan places. Nonmetropolitan places have been experiencing depopulation since the 1940s, with only 14% of the U.S. population located in nonmetropolitan places in 2016 as compared to 57% in 1940 (Johnson and Lichter 2019). And yet, by 2010, Hispanic population growth accounted for most of the population growth in nonmetropolitan places, with more than 100 rural counties having avoided net population loss only due to Hispanic growth (Carr, Lichter, and Kefalas 2012; Lichter and Johnson 2006).

Immigration and race scholars argue that the arrival of new immigrants has not signaled the end of the Black-white racial structure, but rather has contributed to the reconfiguration of a Black/non-Black hierarchy, where those who are racialized as Black often find themselves at the bottom of the overall racial hierarchy (Lee and Bean 2004; Alba and Nee 2003; Portes and Zhou 1993). Therefore, we would expect that the degree to which selective annexation occurs in response to the newly prominent Hispanic and immigrant populations in the old South to be smaller than that for Black residents, but nevertheless present.

I seek to update prior research on selective annexation by considering how recent demographic pressures predict annexation outcomes at the turn of the century. I reference

heavily Lichter and colleagues (2007) for their methodological approach to identifying annexations. However, Lichter and colleagues (2007) examined trends up to 2000, and for rural Black and white residents only. I make hypotheses at both place and block-levels, for both metropolitan and non-metropolitan areas, for trends after 2000, for all racial groups and use a multi-level model better suited to the nested structure of the data. In this study, I test the following hypotheses:

1. The probability of a block to be annexed is positively associated with the block-level percent white population, but it is negatively associated with the block-level percent Black, Hispanic, and minority population. Moreover, any observed relationship varies depending on the annexing place's recent immigration trends.
2. Whether a place annexed territory between 2000 and 2010 is a significant predictor of racial composition changes in the period.

Similar to Lichter and colleagues (2007), I find no convincing evidence that annexation outcomes are negatively affected by block-level Black composition, whether using their original models or with my modifications. In striking contrast to expectations, probabilities of annexation are positively affected by block-level Black, Hispanic, and minority composition but negatively by block-level white composition. These findings seem to indicate an optimistic picture of preference for diverse neighbors, but higher rates of recent immigrant population growth at the place-level are consistently negatively associated with annexations and moderate the relationships between block-level racial composition and annexation probabilities. Furthermore, annexation is negatively associated with the place's population percentage that is non-Hispanic Black and minority in 2010, but positively associated with the place's population percentage that is non-Hispanic white and Hispanic in 2010. These findings complicate our understanding of how place boundaries are formed in relation to demographic trends.

Annexations as a form of boundary manipulation

Municipalities change their boundaries in many ways, but annexations are the predominant form for doing so. Between the 2000 and 2010 Census, 7,783 places, or 30.7% of all U.S. places conducted annexations. Annexations occur when territory is added to an existing municipality, thus changing the municipal boundaries. In contrast, within the same time period, there were only 176 incorporations, 52 mergers, and 62 dis-incorporations, which all describe a type of boundary change that completely changes the administrative properties of the geography (Census Bureau). Annexations are a form of boundary change where the municipality remains the same as an administrative entity after—that is, New York City is still New York City after conducting an annexation, allowing a comparison of racial composition before and after annexation in the same geographic unit. For this reason, and to have enough observations, annexations are chosen for analysis. In addition, within this decade, the demographic trends in many municipalities changed dramatically since when previous scholars studied them.

Reasons to annex

Access to resources
Urban planners and regional scientists state broadly two motivations for annexing. First, it is purely resource-driven: a place may simply be in need of more land or water resources and

annex territory accordingly (Jonas 1991), used heavily in the late 19th and early 20th centuries by such rapidly growing cities as New York, Philadelphia and Chicago (Edwards 2008). In recent decades, the number of annexations has begun to slow down, but are still frequently pursued in order to gain better or more streamlined access to resources, and to offset the tax revenue lost from the outmigration of city habitants to the suburbs (Austin 1999; Jonas 1991). Even though many of these cities are now experiencing a robust back-to-city movement, populations in cities are nevertheless shrinking on the whole. Particularly for the 2000-2010 period in this paper, suburban growth rates far outpaced those in cities (Frey 2014).

Since the peak of annexation activity in the 70s and 80s, many places are instead facing long-term population shrinkage, which is an undesirable economic outcome (Macagnone 2019; Morello and Lazo 2012; Kelsey 1993). Population figures are directly tied to the amount of federal funding received for hundreds of financial assistance programs like Medicaid and the Children's Health Insurance Program (Reamer 2018). Estimates of the amount of federal funding lost per person lost range from $533 to $1,091 in 2010, varying by state (Reamer 2018). In these cases, annexation may be pursued as a strategy to maintain population counts and to secure federal funding.

Certain communities wish to *be annexed* if it leads to greater and improved access to resources. Lichter and colleagues (2007) emphasize that this is particularly true for Black residents in rural areas who often live at the peripheries of small towns where they lack access to public services like sewer and water services. For example, the majority-Black community of Walnut Tree has been lobbying since the 1990s to be annexed into the adjacent majority-white Walnut Cove Town, North Carolina. Living at the peripheries of Walnut Cove Town as an unincorporated community, Walnut Tree's residents are wholly reliant on the Town for public services like sewer and water but have no right to participate in city council discussions directly affecting their lives. In the same time period, the Town has instead annexed multiple neighboring majority-white territory and have made plans for fracking projects in Walnut Tree (UNC Law Center for Civil Rights).

Racial Exclusion

But annexations or lack thereof by places should not be attributed *solely* to socioeconomic concerns. Annexations could also be pursued as a political strategy, since population numbers affect apportionment in voting (Macagnone 2019; Frey 2020). Racial discrimination could also motivate decisions on whether to annex. Aiken (1987) examined the selective drawing of boundaries to exclude Black residents, coining this practice "municipal underbounding." Morgan and Mareschal (1999) argue that municipal boundaries play a big role in shaping the financial and racial disparities within metropolitan areas. Citing Massey and Denton (1993), Smith and Walder (2018) argue that the processes producing "American Apartheid" may be ossified by processes of boundary changes that make it impossible to integrate racial minorities within place boundaries.

Richmond v. Virginia is one of the more well-known cases of resistance to conducting annexations due to concerns of minority vote dilution. The case was brought to the Supreme Court by a group of Black residents of Richmond City, Virginia in 1970 and decided in 1975. The group contested a proposed annexation in 1970 that would add fifty thousand residents to the city, 97% of whom were white, thus effectively reducing the Black population from 53% to 42%. The U.S. Supreme Court voted unanimously that the annexation would lead to a dilution of the Black vote and that the annexation plan had a racially discriminatory purpose (City of

Richmond v. United States 1975). However, Lichter et al. (2007) found weak evidence for racial exclusion.

In cases where places are experiencing rapid immigrant growth and rapid minority growth, annexing predominantly white territory could be a means of diluting the minority vote share, which is more pronounced in municipalities where elections are held at-large instead of by ward or district (see e.g. Davison and Korbel 1981; Trounstine and Valdini 2008; Abott and Magazinnik 2020). There has not yet been a study of annexations between 2000-2010, despite the rapid diversification of those very same places that selectively annexed to avoid Black communities.

As of the 2010 Census, almost two-thirds of all immigrants are concentrated in just six states (Waters and Pineau 2015 citing Grieco et al. 2012). More than half of all immigrants currently live in suburbs and they are increasingly diversifying traditionally all-white, rural communities (Waters and Pineau 2015 citing Lichter 2012; Marrow 2011; Smith and Furuseth 2006; Marrow 2011; Hernández-Léon and Zúñiga 2005). Recent arrivals tend to be concentrated in established co-ethnic neighborhoods, which often bolsters and reinforces existing patterns of segregation (Crowder, Hall, and Tolnay 2011 citing Iceland et al. 2008).

In these new immigrant destinations, particularly in the South, there is strong evidence that receiving communities tend to respond negatively to immigrants (Armenta 2017; García 2019). Especially in small towns, the presence of newly arrived immigrants of color can be especially stark, triggering white responses to a sense of perceived threat to their whiteness or masculinity (McDermott, Knowles, and Richeson 2019; Ribas 2016). Despite the diversification of many previously homogenous places, new immigrant arrivals have not led to greater residential integration (Lichter et al. 2010). In fact, for the majority of new immigrant groups arriving from places like Mexico, Korea and Vietnam, Hall (2013) found that immigrant dissimilarity from native white residents tends to be even higher than that in established destinations. White preference for all-white neighborhoods is well-documented, even as neighborhoods continue to diversify. Krysan et al. (2009) found that white respondents to their survey experiment had a strong resistance towards all-Black or mixed-race neighborhoods, ranking all-white neighborhoods instead as the most desirable. Whites rarely enter all-minority neighborhoods, and as neighborhoods become more diverse, whites are still the first to leave them (Logan 2013 citing Logan and Zhang 2011).

Prior social science research on municipal boundary-making is due for an update that takes into account recent demographic trends. Would we see similar trends in boundary formation when analyzing other minority racial groups, such as the rapidly growing foreign-born and/or Hispanic population? Do places view these growing populations as a "minority" or "immigrant" threat and thus attempt to dilute the minority population by adding predominantly white territory? Additionally, the contrast in the Richmond and Walnut Tree cases reveal a tension in how race motivates annexation strategies. In the Richmond case, annexation could be pursued in order to dilute existing minority population; in the Walnut Tree case, annexation was resisted by the place in order to preserve existing white population. The different models I present in this study allow us to assess which strategy municipalities pursue.

Data

Identifying Annexations

To investigate whether annexation patterns in our new demographic context differs from those in the past, I look at annexations in fourteen states between 2000 to 2010 using the Census Bureau's Boundary and Annexation Survey ("BAS"). These are the eight southern states studied by Lichter et al. (2007), where they find weak evidence of selective annexation along a Black/white color line in rural towns. Southern states are chosen firstly because geographers like Aiken (1987) and Johnson et al. (2004) have argued strongly that racially exclusionary annexation patterns in rural Southern towns are the final bastion of the "Old Plantation South." Johnson and colleagues (2004) even go as far as to conclude that these practices are a concerted effort by white elites to enact "local apartheid." And yet, Lichter and colleagues (2007) suggest that these strong claims are overblown. I examine these states in order to situate myself within the conversation about whether or how geography continues to be a force of racial exclusion in the old South.

Second, since the study by Lichter and colleagues (2007), these Southern states have been transforming into new immigrant destinations. If racial exclusion is in fact still operating within the South in the form of boundary manipulations, based on the evidence about slow rates of immigrant integration discussed above, we should expect a similarly racially exclusive reaction to new immigrants via boundary manipulations. To get a more precise understanding of whether these racially exclusive tendencies are race sensitive, I additionally select the ten states with the fastest growing Hispanic populations, four of which overlap with the above southern states (Pew Research Center). In total, these fourteen states are: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, and Virginia. Due to the computationally demanding nature of this process, these states are chosen for exploratory purposes.

All data in this paper are drawn from the Census, which defines the geographic units used in this analysis and produces data for those geographic units over time. A Census place is defined as a city, town, or a village. As long as the place is assigned a unique place FIPS code, it is included in the sample. Therefore, Census Designated Places ("CDPs"), which are not administratively a full municipality but nevertheless are defined communities, are still included in the analysis. A Census block is the smallest geographic unit of analysis available, and Census block boundaries aggregate up to place boundaries. For this reason, blocks are considered to be nested within the boundaries of and are most commonly used as the unit for studying annexations (see e.g. Lichter et al. 2007; Marsh et al. 2010). That is, a place is typically composed of a set of blocks, and the boundaries of those blocks in aggregate are aligned with the boundaries of places. "Fringe", "annexable", and "at-risk" territory are used interchangeably in the literature to refer to Census blocks that are contiguous (sharing any boundary) to a Census place. These are the blocks that form the universe of all possible territory a place could annex, as it is most common to annex territory that shares a boundary.

Whether noncontiguous blocks are eligible for annexation varies by state or municipality laws, but growth management experts and city planning officials generally prefer to grow contiguously (Kelly 2004). Because expanding a city often involves extending particular municipal services such as sewer lines and electric cables, it would be inefficient to skip over a contiguous block in preference for a non-contiguous block (Kelly 2004). Taking into account the rarity of annexing a non-contiguous block without first annexing the contiguous block in between, I define annexable blocks as only those blocks that are contiguous to a place in 2000 to the first degree. Future research may extend contiguity to the second degree or more, where

contiguity may be defined by being contiguous to another block that is directly contiguous to the place boundary and so on.

The 2000-2010 Boundary and Annexation Survey provides all annexing places in that decade. All blocks that fall in those places are obtained from the IPUMS block-level Census files for 2000 and 2010 respectively, where each block is assigned a place FIPS code. Using block shapefiles for 2000 from IPUMS, place boundaries are manually generated in order to reduce noise from inconsistently drawn boundaries across the place and block shapefiles. Then, all blocks that are contiguous to place are identified from the same shapefile, as defined by any touching boundaries. Two illustrative maps are provided in Figures 1 and 2, showing the 2000 place boundaries for Charlotte, North Carolina and Jackson, Mississippi. All annexable blocks are those that are contiguous to the place boundaries, defined as any touching boundary. Additionally, they are only considered annexable if they did not already belong to a Census place—except for CDPs. As Figure 1 shows, this approach sometimes fails to capture blocks that are contiguous to a second degree (contiguous to a block that is contiguous to the place) which nevertheless is annexed along with the directly contiguous block.

Annexed blocks were obtained by comparing block files from IPUMS for 2000 and 2010. For each unique place, blocks that were in that place in 2010 but not in 2000 are considered annexed if: 1) the population was greater than 0 in 2010 and 2) the block existed in 2000. In total, I identified 1,619 places conducting annexations, 31,515 annexed blocks and 34,268 annexable but not annexed blocks.

Figure 1. Annexations to Charlotte, North Carolina, between 2000 and 2010.
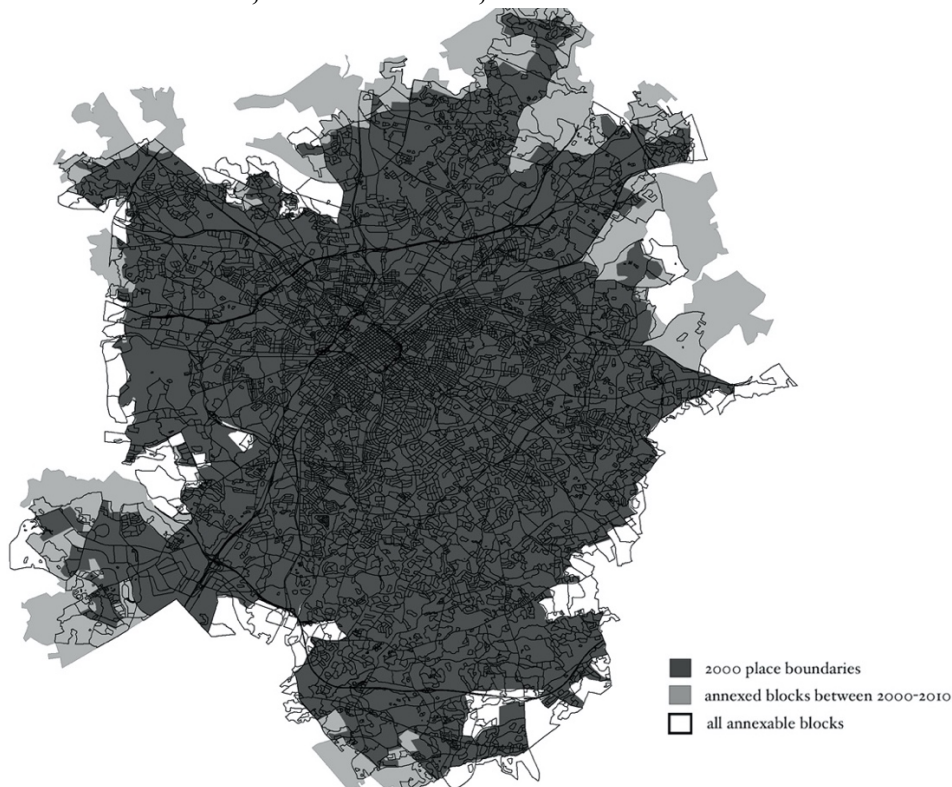
Source: IPUMS 2000 block shapefile for North Carolina and analysis of IPUMS 2000 and 2010 Decennial Census block-level data

Figure 2. Annexations to Jackson, Mississippi, between 2000 and 2010.

■ 2000 place boundaries
▨ annexed blocks between 2000-2010
□ annexable blocks
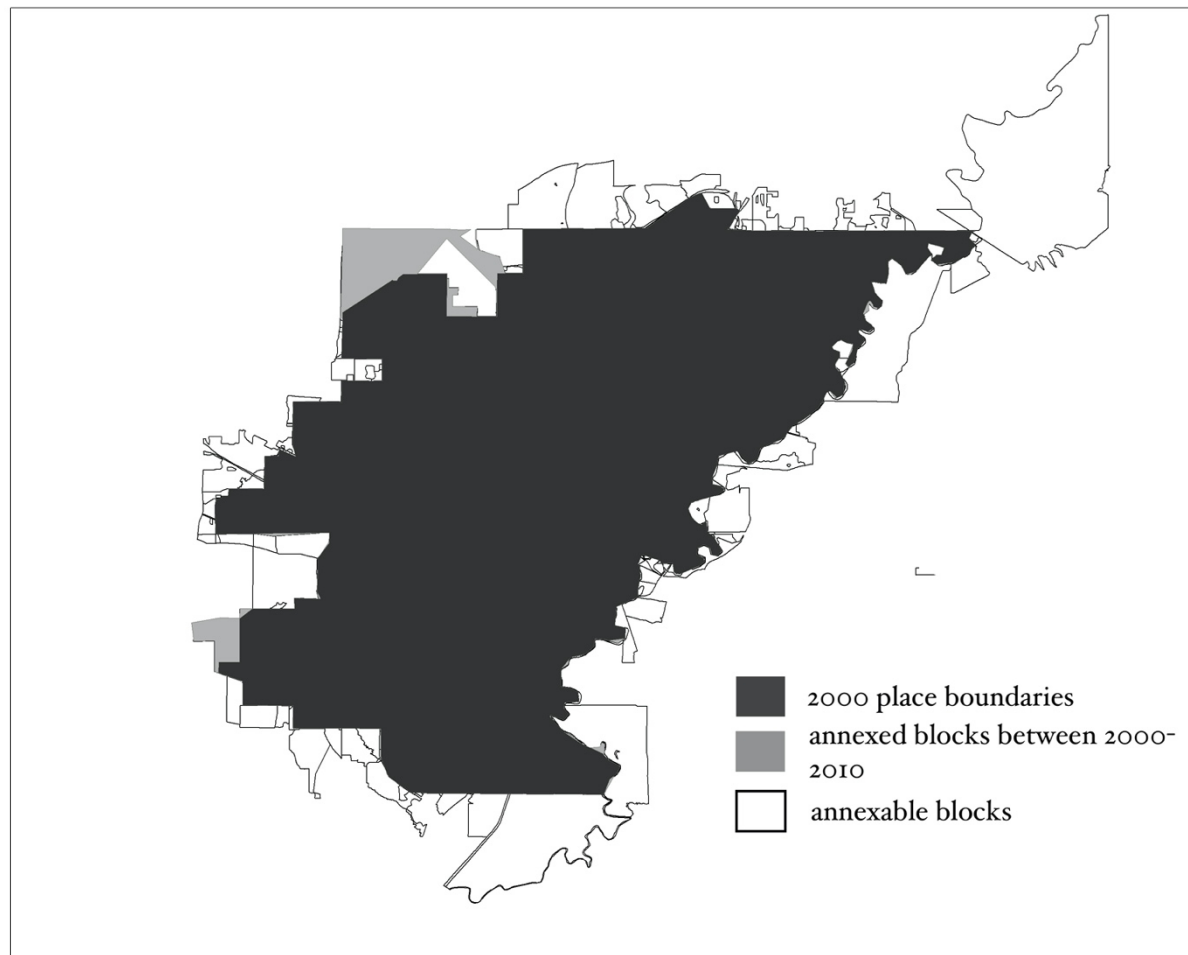
Source: IPUMS 2000 block shapefile for Mississippi and analysis of IPUMS 2000 and 2010 Decennial Census block-level data

Independent variables

My primary independent variable is the block-level racial composition in 2000. Using 2000 Census block-level data, I calculate the percent of the block's population that is non-Hispanic white, non-Hispanic Black, Hispanic, and minority—measured as anyone who is not non-Hispanic white. For every model, I compare outcomes using each of these four block-level race variables as a to examine whether and how annexation patterns differ by the particular non-white racial group.

To account for alternative explanations for annexation patterns, I include the following variables. First, the effect of block-level racial composition is likely to vary depending on the racial composition in the annexing place. For example, predominantly black places may be more likely to annex predominantly black blocks. Since I am primarily interested in the interaction between white and non-white groups, I include an interaction term between the place-level percent white and the respective block-level racial composition to account for the effect of in-group affinity. Second, if communities generally have the tendency to hoard wealth, economically disadvantaged blocks would be less likely to be annexed (Mukhija and Mason 2013; Johnson et al. 2004). Socioeconomic indicators are limited at the block-level, however. Using housing units data, I include the percentage of housing units that are owner-occupied.

Using age composition data, I create a dependency ratio variable, defined as the ratio of dependents to working-age individuals, as an indicator of socioeconomic health at the block-level. The higher the dependency ratio, the more economically burdened the block may be (Santacreu 2016). The place-level median household income in 2000 is included to account of wealth hoarding by annexing places.

Third, places may be more likely to annex in order to gain more space when facing population increases (Watkins and Fleischmann 1980; American Society of Planning Officials 1958). Therefore, the population size (log-transformed), population density, and prior decade population growth rate are included to account for demographic pressures that influence annexation decisions. If racial bias is indeed at play in annexation decisions, Lichter et al. (2007) argue that a higher percentage of Black residents in the annexing place will play a deterring role on annexing blocks with more Black residents due to the stereotyping effect. I include a place-level percent poverty variable for each racial group and test each according to which racial group is the predictor for each model. Additionally, since immigration trends are of primary interest in the present study, I test whether block-level racial composition interacts with the place-level prior decade recent immigrant growth rate. Recent immigrants are those foreign-born residents who entered the country in the past ten years.

Table 1 provides a descriptive overview of blocks that were annexed and not annexed, and of these annexing places. Place characteristics of blocks that were not annexed are for places the blocks are contiguous to but that did not annex the blocks. At the block-level, annexed blocks had smaller population sizes than non-annexed blocks, but the two groups have similar racial compositions, all within about 0.5 a percentage point of each other. Strikingly, across both groups, the median block was almost 100% white, with annexed blocks being slightly more white than non-annexed blocks, so it may be possible that places choose not to annex at all unless annexable blocks are a certain racial composition. Annexed and not-annexed blocks were also very similar on the two socioeconomic indicators.

At the place-level, the places that blocks were annexed to were slightly more diverse than the places blocks were not annexed to. On average, blocks were annexed to places that had about 1.5% more non-Hispanic Black residents and 1% more non-white residents overall, compared to the places blocks were not annexed to. Blocks were also annexed to slightly poorer places, which had on average a $2,000 lower median household income and about 1% more people in poverty across racial groups, compared to the places blocks were not annexed to. Finally, the population trends between places were strikingly different. Blocks were annexed to places that experienced a much slower population growth rate—almost half that of places that blocks were not annexed to. Blocks were also annexed to places with a much slower non-Hispanic white population growth rate, suggesting that they were more likely to be annexed to places that were diversifying more. However, these places also had a slower recent immigrant population growth rate compared to the places blocks were not annexed to, providing reason to investigate potential moderating effects of place immigration trends.

Table 1. Characteristics of Blocks (Annexed and not Annexed) and Annexing Places

Variable	Annexed			Not annexed		
	Mean	Median	SD	Mean	Median	SD
Block-level variables						
Population	44.79	21.00	87.98	63.91	23.00	127.49
Non-Hispanic Black	8.37	0.00	33.52	11.08	0.00	43.91
% non-Hispanic Black	16.07	0.00	30.17	15.28	0.00	28.59
Non-Hispanic White	33.85	15.00	65.33	48.54	17.00	96.00
% non-Hispanic White	79.06	96.88	32.12	79.24	95.45	31.00
Hispanic	1.31	0.00	9.27	2.37	0.00	17.28
% Hispanic	2.19	0.00	8.89	2.63	0.00	9.86
Non-White	10.94	1.00	40.89	15.37	2.00	57.57
% non-white	20.94	3.13	32.12	20.76	4.55	31.00
Dependency Ratio	0.67	0.58	0.57	0.67	0.58	0.74
% Owner Occupied	73.68	80.00	27.07	73.32	80.00	26.82
Place-level variables						
Population Density	1,225.37	1,093.99	764.52	1,208.92	1,085.28	720.81
Population	33,923.97	9,853.00	73,306.65	30,240.87	9,853.00	61,497.17
Non-Hispanic Black	13,041.58	1,807.00	40,830.81	10,038.72	1,643.00	26,473.63
% non-Hispanic Black	25.30	21.24	20.24	23.91	19.69	19.08
% Black in Poverty	28.42	28.96	15.69	27.46	28.40	16.87
Non-Hispanic White	18,577.27	6,483.00	31,340.63	17,678.16	6,813.00	32,333.46
% non-Hispanic White	68.76	71.44	20.28	69.32	71.44	19.42
% White in Poverty	11.35	10.29	5.77	10.85	9.90	6.13
Hispanic	1,214.12	220.00	3,021.91	1,406.70	231.00	3,947.93
% Hispanic	3.38	1.78	4.68	4.03	2.04	5.52
% Hispanic in Poverty	25.26	22.73	21.30	24.26	21.18	20.92
Minority	15,346.70	2,406.00	45,116.51	12,562.71	2,384.00	31,750.14
% Minority	31.24	28.56	20.28	30.68	28.56	19.42
% Minority in Poverty	27.85	28.70	11.78	26.69	27.65	12.61
Median Household Income (2000$)	33,201.57	31,445.00	9,735.56	35,404.92	33,140.00	11,673.96
1990-2000 Change						
Population growth rate	19.29	11.07	41.10	31.30	17.26	64.47
Non-Hispanic White population growth rate	9.71	2.30	45.67	22.78	6.67	124.30
Recent Immigrant population growth rate	1.55	0.69	2.73	2.06	0.83	3.31

Analytical Strategy and Models

My analysis proceeds in four steps. First, since I am interested in whether results for the 2000-2010 period differ from those found in Lichter et al. (2007) due to the demographic trends in this period, I first replicate models from Lichter et al. (2007) exactly with 2000-2010 data. This model is a logistic regression of annexation between 2000-2010 on the above set of 2000 block- and place-level characteristics, and 1990-2000 place-level trends with state fixed effects for the eight southern states, excepting the block-place interaction variables (non-Hispanic white population and recent immigrant population growth rate). Since a motivating interest for this study is whether there are differences by racial group—Lichter et al. (2007) only tested effects for Black residents—I also replicate their model using other racial groups. State fixed effects are included to account for unobserved heterogeneity across states that could otherwise explain differences in annexations, the primary one being complex differences in administrative rules and procedures governing annexations.

Second, since I am interested in whether results would differ when including states that have seen the most dramatic demographic shifts since the Lichter et al. (2007) study, I modify the states in the previous states to include the states with the fastest-growing Hispanic populations between 1990-2010 and compare results for models with and without those states.

Third, the geographic structure of annexations makes the hypotheses I test well-suited to a multilevel modeling structure. Census blocks are geographically nested within Census places

and annexation occurs by adding Census blocks to the place. I test my hypotheses as a two-level structure of blocks within places and allow the intercept to vary by-place. Even though Lichter et al. (2007) used state fixed effects and not place fixed effects, results comparing models allowing the intercept to vary at the state only yielded an interclass-correlation of 0.06, while models allowing the intercept to vary at the place yielded an interclass-correlation that ranges between 0.065 to 0.66, suggesting that there is much more variation by place rather than by state. In these two-level models, I add in my cross-level interactions—block racial composition and place non-Hispanic white growth rate, and block racial composition and place recent immigrant growth rate. These three models correspond to my first hypothesis about the relationship between racial composition and annexations. All continuous variables are centered and scaled.

For the second hypothesis testing the extent to which annexation is pursued as a strategy to dilute minority populations or concentrate white populations, I run a OLS model predicting the place population percentages for each racial group in 2010 by whether the place annexed, controlling for that percentage in 2000, and the 1990-2000 growth rate, with place fixed effects to account unobserved place variances. These may include level of hostility towards racial groups, lack of job or housing opportunities for certain groups etcetera [Charles 2003; Zhou 1993]. Note that in this model, the universe is all places that existed in 2000 in the fourteen states, or 5,196 places, 1,902 of which conducted annexations and 3,294 of which did not.

Results

Table 2 presents results by each block-level racial composition for the first analytical step testing a logistic regression model of annexation by block-level racial composition, with the full model including all fourteen states in comparison against the original eight southern states. The Lichter et al. (2007) study found no effect of block-level percent Black residents in 1990, but here I find that annexations are significantly more likely as the block-level percent Black residents increases in both models. Moreover, annexations are also significantly more likely as the block-level percent minority residents increases in both models, and they are actually significantly less likely as the block-level percent non-Hispanic white residents increases. There are no statistically significant effects associated with block-level percent Hispanic residents.

There is strong evidence that socioeconomic factors play a significant role on annexation outcomes. First, the greater proportion of a group in poverty, the less likely the place is to annex, but this is not specific to a particular racial group, which tends to refute the stereotyping theory for selective annexations. This is true for both models, except for in the case of block-level percent Hispanic residents, which is not significant in the Lichter model. Second, in the full models for percent Black and percent minority residents, higher rate of homeownership at the block is associated with a higher likelihood of being annexed. Third, in contrast to Lichter et al. (2007), blocks are significantly less likely to be annexed as the annexing place is wealthier, suggesting wealth-hoarding by communities. Since this also holds across models for all racial groups, there is little evidence to suggest the wealth-hoarding is intended to keep resources out off reach for particular racial groups.

Finally, the coefficients for population-related variables—positive for population density but negative for both 2000 population (log-transformed) and population growth rate—lead to the conclusion that annexation is not primarily driven by a need to have more space in order to accommodate more people, but by a need to reduce population density. This finding fits well in

the context of decades of suburban growth and the documented American preference for low-density urban spaces (Jargowsky 2002; Barrington-Leigh and Millard-Ball 2015).

Table 2. Logistic Regression of Annexation on Place and Block Characteristics Compared for Select and Full States

	Non-Hispanic Black		Hispanic		Minority		Non-Hispanic White	
	Lichter States	Full States	Lichter States	Full States	Lichter States	Full States	Lichter States	Full States
Place Characteristics								
% non-Hispanic White	-0.013	-0.032***	-0.037***	-0.056***	-0.029**	-0.045***	0.027*	0.01
	(0.013)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.014)	(0.013)
Population Density	0.108***	0.125***	0.108***	0.127***	0.105***	0.121***	0.127***	0.139***
	(0.014)	(0.012)	(0.015)	(0.012)	(0.014)	(0.012)	(0.014)	(0.012)
Population, 2000 (log)	-0.017**	-0.036***	-0.022***	-0.043***	-0.017**	-0.035***	-0.019**	-0.036***
	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)
Population Growth Rate, 1990-2000	-0.160***	-0.197***	-0.159***	-0.193***	-0.162***	-0.199***	-0.145***	-0.182***
	(0.013)	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)
Median Household Income, 2000$	-0.172***	-0.122***	-0.132***	-0.092***	-0.184***	-0.141***	-0.261***	-0.222***
	(0.015)	(0.013)	(0.014)	(0.012)	(0.015)	(0.014)	(0.017)	(0.016)
% Population in Poverty of Specified Race	-0.071***	-0.068***	0.00	-0.020**	-0.087***	-0.090***	-0.160***	-0.165***
	(0.011)	(0.010)	(0.010)	(0.009)	(0.013)	(0.011)	(0.013)	(0.012)
Block Characteristics								
% owner occupied	0.005	0.014*	0.00	0.01	0.01	0.015*	0.01	0.01
	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.008)
% Population of Specified Race	0.036***	0.033***	-0.012	-0.009	0.027***	0.027***	-0.027***	-0.028***
	(0.009)	(0.01)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
Dependency Ratio	-0.011	(0.011)	(0.01)	(0.01)	-0.01	-0.01	-0.012	-0.012
	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)
Constant	0.220***	0.406***	0.263***	0.461***	0.216***	0.390***	0.254***	0.416***
	(0.080)	(0.072)	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)
State Fixed Effects (ref = Virginia)								
Alabama	X	X	X	X	X	X	X	X
Arkansas	X	X	X	X	X	X	X	X
Georgia	X	X	X	X	X	X	X	X
Louisiana	X	X	X	X	X	X	X	X
Mississipi	X	X	X	X	X	X	X	X
North Carolina	X	X	X	X	X	X	X	X
South Carolina	X	X	X	X	X	X	X	X
Virginia	X	X	X	X	X	X	X	X
Delaware		X		X		X		X
Kentucky		X		X		X		X
Maryland		X		X		X		X
North Dakota		X		X		X		X
South Dakota		X		X		X		X
Tennessee		X		X		X		X
Observations	53514	65557	51621	62909	53514	65557	53510	65553
Log Likelihood	-35660.06	-41407.97	-34426.25	-39855.39	-35659.86	-41401.28	-35606.37	-41335.64

Note: *p<0.1; **p<0.05; ***p<0.01

Next, using two-level models of blocks nested in places, I test the addition of two cross-level interaction variables, presented in Table 3 by the specific racial composition tested in the model. As noted above, variance between places explains more than 65% of the variation in block-level annexation outcomes, as opposed to 6% when testing models varying by state. That is, much of block-level variation on annexations can be explained by the varying effects of block-level factors across places, and this intra-class correlation does not vary much across models. Like the previous models, I find that annexation increases in likelihood as the diversity of the block-level population increases. Consistent with the OLS models, block-level percent non-Hispanic Black and percent minority residents are significantly positively associated with being annexed, while the opposite is true for block-level percent non-Hispanic white residents. Again, there are no effects for percent Hispanic. Moreover, the cross-level interaction testing the

block-level racial composition against the place-level percent non-Hispanic white residents is not significant. Further, I also tested models separately for subsets of the data where the place percent non-Hispanic white was greater than or equal to 50%, and the results still hold. Taken together, these findings suggest that this surprising positive association between non-white residents and annexations is not owing to in-group affinity.

Like the OLS models, there is strong evidence that socioeconomic considerations drive annexation outcomes. Excepting the model for Hispanic residents, block-level homeownership was significantly associated with an increased likelihood of being annexed, which place-level median household income decreased the probability of being annexed in the non-Hispanic black and minority models. Contrary to the OLS models, this finding may suggest that wealth-hoarding is sensitive to race. Again, population growth is negatively associated with probability to annex but population density is positively associated.

Table 3. Two-Level Logistic Regression of Annexation on Place and Block Characteristics

Predictors	Non-Hispanic Black			Hispanic			Minority			Non-Hispanic White		
Place-level Predictors	Odds Ratios	CI	p	Odds Ratios	CI	p	Odds Ratios	CI	p	Odds Ratios	CI	p
Population Density	1.14	1.00 – 1.30	0.058	1.14	1.00 – 1.30	0.056	1.14	0.99 – 1.30	0.061	1.15	1.01 – 1.31	**0.041**
Population (log)	1.33	1.20 – 1.47	**<0.001**	1.33	1.19 – 1.48	**<0.001**	1.34	1.21 – 1.48	**<0.001**	1.33	1.20 – 1.47	**<0.001**
Population Growth Rate	0.75	0.64 – 0.87	**<0.001**	0.77	0.66 – 0.89	**<0.001**	0.75	0.65 – 0.87	**<0.001**	0.76	0.65 – 0.88	**<0.001**
Median Household Income, 2000$	0.84	0.72 – 0.98	**0.027**	0.89	0.77 – 1.03	0.126	0.8	0.68 – 0.95	**0.008**	0.84	0.70 – 1.01	0.058
Poverty Rate of Specified Race	0.87	0.77 – 0.99	**0.029**	0.96	0.86 – 1.08	0.517	0.83	0.73 – 0.95	**0.009**	0.92	0.79 – 1.08	0.315
Recent Immigrant Population Growth Rate	0.82	0.71 – 0.95	**0.008**	0.84	0.73 – 0.96	**0.014**	0.82	0.71 – 0.95	**0.008**	0.83	0.71 – 0.95	**0.009**
% non-Hispanic White	1.19	1.03 – 1.37	**0.018**	1.16	1.00 – 1.34	0.05	1.16	1.01 – 1.35	**0.04**	1.24	1.07 – 1.43	**0.005**
Block-level Predictors												
% Specified Race	1.05	1.02 – 1.08	**<0.001**	1.01	0.98 – 1.03	0.591	1.04	1.02 – 1.07	**0.001**	0.96	0.94 – 0.98	**<0.001**
% Owner Occupied	1.02	1.00 – 1.04	**0.046**	1.02	1.00 – 1.04	0.105	1.02	1.00 – 1.04	**0.038**	1.02	1.00 – 1.04	**0.039**
Dependency Ratio	0.98	0.97 – 1.00	0.085	0.99	0.97 – 1.01	0.179	0.98	0.97 – 1.00	0.091	0.98	0.97 – 1.00	0.082
Cross-Level Interaction												
Recent Immigrant Population Growth Rate * % Specified Race	0.97	0.95 – 1.00	0.056	0.99	0.98 – 1.00	**0.046**	0.97	0.95 – 0.99	**0.007**	1.03	1.01 – 1.05	**0.008**
% non-Hispanic White * % Specified Race	1	0.98 – 1.03	0.844	1	0.98 – 1.02	0.967	1	0.97 – 1.02	0.682	1	0.98 – 1.03	0.747
Intercept	0.04	0.02 – 0.10	**<0.001**	0.04	0.02 – 0.11	**<0.001**	0.04	0.02 – 0.10	**<0.001**	0.04	0.02 – 0.11	**<0.001**
ICC	0.66			0.65			0.66			0.66		
N (level 2--place)	1619			1479			1619			1618		
Observations	65557			62909			65557			65553		

Across all models, the place-level recent immigrant population growth rate in the prior decade was significantly associated with a decrease in probability for annexation, which complicates an optimistic view from the block-level racial composition results that places are generally open to racial and out-group diversity. Moreover, the cross-level interaction with block-level racial composition is significant for models testing percent Hispanic, percent minority and percent non-Hispanic white population, with a different trend for percent non-Hispanic white. Figure 3 illustrates these differences across the models.

For both the Hispanic and minority models, the effect of block-level racial composition differed based on whether the annexing place had a lower or higher rate of recent immigrant growth. More specifically, in places with higher rates of recent immigrant growth in the past decade, probability to annex decreased as the block-level percent population that is Hispanic increased. In places with lower rates of recent immigrant growth in the past decade, probability to annex increased as the block-level percent population that is Hispanic increased. While the

effect of percent Hispanic was not statistically significant, the differences in probability by the level of recent immigrant growth are.

      The trend for block-level percent population is non-white is exactly the same, with even larger differences depending on whether the place had a low or high level of recent immigrant growth. However, the opposite case is true when looking at the block-level percent population that is non-Hispanic white. For places that had a lower level of recent immigrant growth, probabilities of annexation decreased as percent population that is non-Hispanic white increased, and increased as percent population that is non-Hispanic white increased for places that had a higher level of recent immigrant growth.

Figure 3. Predicted Probabilities of Annexation by Block-Level Racial Composition Interacted with Place-Level Recent Immigrant Growth in the Past Decade for (a) % Hispanic population (b) % minority population and (c) % non-Hispanic white population
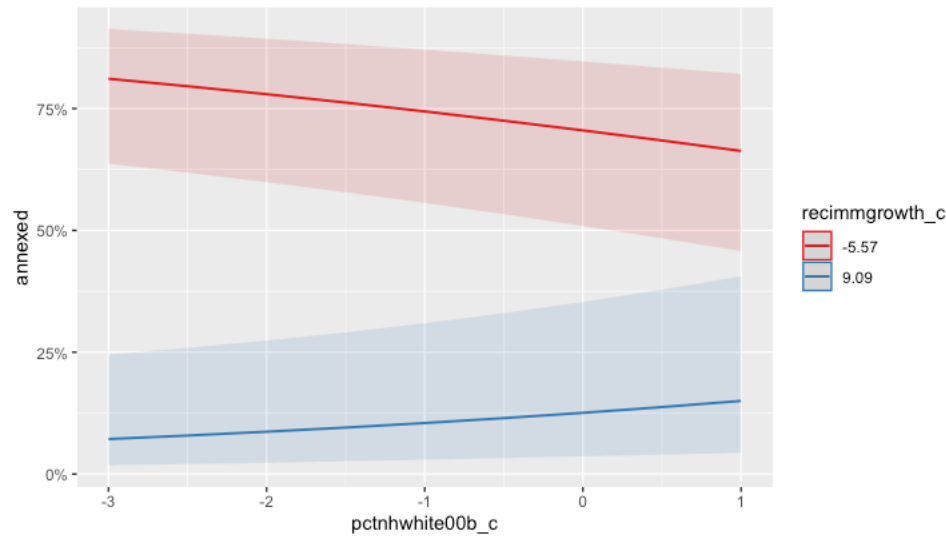
(a) Block-level % Hispanic
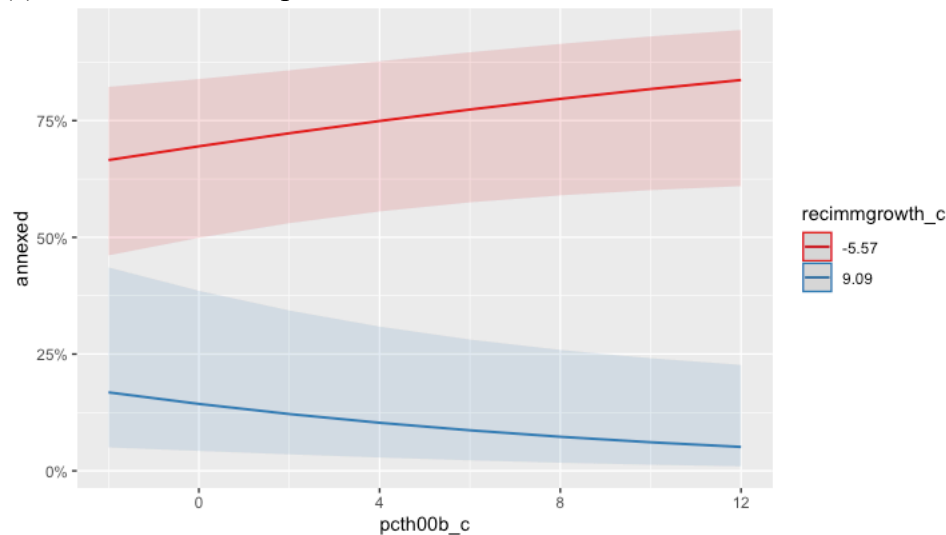
(b) Block-level % minority
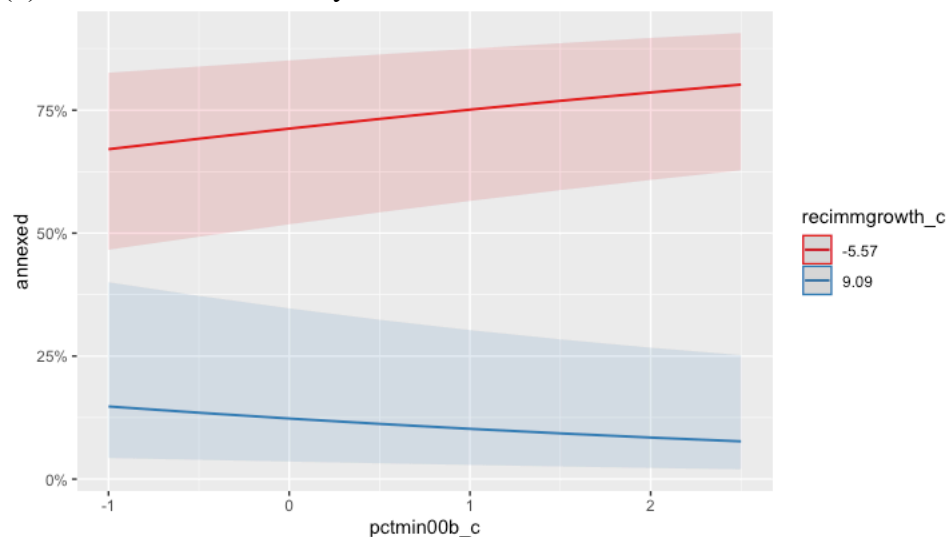
(c) Block-level % non-Hispanic white

These findings suggest that immigration trends play a significant role on annexation probabilities. Moreover, immigration trends can moderate the relationship of block-level racial composition on annexation probabilities. Even though the overall trend appears to be that places prefer to annex blocks that are less white, annexation can still depend on how the place responds to immigration growth. To test whether annexations of black, Hispanic or otherwise predominantly minority-populated territory occur as a strategy to dilute the proportion of these groups at the place-level, I move on to the second set of hypotheses.

These hypothesis test whether annexations between 2000 and 2010 are a significant predictor of the place's racial composition in 2010. If places annex in order to dilute the percentage of their population that are non-white, as in the Richmond, Virginia case, annexations should have a negative relationship to 2010 place percent population that is non-Hispanic Black, Hispanic, or minority, but have a positive relationship to 2010 place percent population that is non-Hispanic white.

Table 4 presents results for each racial group of interest. After controlling for the place percent of that racial group in 2000, the prior decade growth rate of that racial group, and place fixed effects, annexations are a significant predictor of 2010 racial composition. Indeed, annexations between 2000 and 2010 were positively associated with proportion of population that is non-Hispanic white in 2010, but negatively associated for non-Hispanic Black and minority residents. Surprisingly, annexations were positively associated for Hispanic residents. These findings, taken with the moderating effect of recent immigrant growth, provide strong reason to be suspicious of the earlier finding that more diverse blocks are preferred in annexation.

Table 4. OLS Regression of 2010 Place Racial Composition on Annexations (simplified)

	Non-Hispanic Black	Hispanic	Minority	Non-Hispanic White
Annexed	-*	+*	-*	+*
% Specified Race in 2000	+*	+*	-*	-*
Population Growth Rate for Specified Race Between 1990-2000	-	-	-	-
Constant	*	*	*	*
Place Fixed Effects	*	*	*	*

Summary

In this paper, I investigate whether municipality deliberately exclude certain racial groups selectively annexing predominantly white blocks in 2000-2010. This time period is particularly relevant because of the rapid demographic changes occurring in the old South as a result of immigration of non-white groups. Prior research finds some evidence that white communities excluded Black communities in the old South in the 80s and 90s, under a framework of perceived "Black threat" (Aiken 1987; Miller 1981; Lichter et al. 2007). As I argued in the paper, one should predict a similar outcome of white communities deliberately excluding Hispanic and non-white populations when considering recent waves of immigration and settlement patterns. Furthermore, one would expect the motivation to "defend" against a rapid growth in minority population to be more pronounced in places that face a decline in white population or increase in recent immigratnt population. In these cases, annexation may be used to pursue growth in a manner that still allows separation from minority populations.

I found no evidence that blocks are selectively annexed to exclude non-white racial groups. To the contrary, the larger the proportion of the population in the annexable block that was non-Hispanic Black, Hispanic, or minority, the more likely the block was to be annexed, and vice versa for the non-Hispanic white population. However, this alone is not enough reason to take an optimistic view about racial dynamics between annexing places and their neighbors. Further analysis shows that this trend does vary significantly depending on the annexing place's recent immigrant population growth rate. As the recent immigrant population growth rate is higher, predominantly non-white blocks are less likely to be annexed, while the reverse is true for whiter blocks. Moreover, annexations between 2000 and 2010 are negatively correlated to the place's percent population that is non-Hispanic Black and minority in 2010, but positively correlated to the place's percent population that is non-Hispanic white and Hispanic. This provides avenue to further investigate whether annexations are pursued as a strategy to dilute minority population.

Finally, socioeconomic factors also play a larger role in shaping annexation outcomes than previously discussed, and more than 65% of variation in annexation outcomes are driven by variations between places. A few directions stand out as fruitful future avenues of research. First, the data collected for this project may reveal a weakness in conceptualizing how these racially exclusionary dynamics may be actually playing out on the ground. While prior research on boundary changes has mostly centered the decision-making power of white communities, boundary changes have changed significantly since. At the same time as municipal incorporation rates are dropping to new lows compared to the 1950s when a new city formed every three days,

the proportion of newly formed cities that are majority-minority is increasing (Rice et al. 2014; Smith, Waldner, and Richardson 2016; Smith and Waldner 2018). It may be that minority populations do not move to the annexable vicinity of majority-white places to begin with. It may be that along with minority population growth, minority communities are more self-determinative than prior decades and exercising their rights not to be annexed more frequently through incorporating into their own municipality (Smith et al. 2016; Smith and Waldner 2018).

If annexations are indeed used as a racially exclusionary strategy, the evidence in this paper so far tends to lend support the theory that racially exclusionary places may not annex at all. Even though more than 30% of places conducted annexations between 2000 and 2010, the remaining 70% of places could be not annexing due to pernicious reasons. To continue assessing whether preserving voting power were a motivation for selective annexations, data should be collected for municipalities that conduct local elections at-large or by ward (Davidson 1981). A productive line of further research is to investigate more carefully the annexation activities and outcomes of municipalities in the 70s and 80s during the height of annexation-related voting rights litigation. Additionally, by considering a broader range of boundary changes like incorporations and de-annexations, and the demographic pressures that may motivate them, we can better understand the institutional practices of racial exclusion that continue today. Further research will also bring in literature on the rise of exurbs and suburban sprawl (Stahura and Marshall 1982). It will be important to continue comparing 2000-2010 results with results from prior decades for the same set of places to assess differences over time.

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