Racial Segregation, Racism, and Violence in Historical Context

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We use a newly developed household-level measure of residential segregation (Logan and Parman 2017) which can distinguish between the effects of increasing racial homogeneity of a location and the tendency to segregate within a location given a particular racial composition to review the evidence of changes in segregation over time. This household-measure of segregation reveals high levels of Southern segregation and rising levels of segregation in not only cities but in rural communities as well over the first half of the twentieth century. We review new evidence that this segregation was highly correlated with interracial violence in the form or lynchings. We conclude with a discussion of the interaction between residential segregation, racial animosity, and violence.

1. Introduction

Despite the extensive literature on contemporary segregation, the historical scholarship on racial segregation is remarkably thin. We still have little quantitative evidence on the historical evolution of segregation patterns over time, particularly for smaller cities and

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rural communities. Cutler et al. (1999), Collins & Margo (2000), and Shertzer and Walsh (2016) consider the changes in urban residential patterns over the twentieth century and find that levels of urban segregation rose dramatically over the twentieth century as blacks migrated to cities and then became more concentrated in city centers as white residents gradually moved to the suburbs. However, the data and segregation measures utilized in these studies are not well-suited to rural areas. Consequently, there is little quantitative evidence of segregation and its effects prior to the Great Migration when the black population was still primarily a rural population. Our ability to tell the story of a national pattern of segregation remains elusive. In this paper, we review new developments in the measurement of historical segregation, its rise in rural communities, and its relationship to interracial violence in the past.

The inability to analyze segregation over time outside of a handful of major cities with traditional segregation measures and data has limited our ability to discuss the historical interaction of racially based policies with outcomes. For example, there are large sociology and criminology literatures on the links between segregation and violence in urban areas. Increases in residential segregation tend to increase levels of violent crimes including homicides in both white and nonwhite neighborhoods, with impacts greater for black and Hispanic neighborhoods (Krivo, Peterson, and Kuhl 2009). The crimes are typically acts of intraracial violence. This literature points to geographical isolation and the concentration of disadvantage as drivers of this relationship between segregation and violence (Peterson and Krivo 1993; Shihadeh and Flynn 1996; Litwack, 1998; Peterson and Krivo 1999). In this respect, these studies build on the large literature tracing the historical development of segregation and the concentration of poverty in American cities (Massey and Denton 1993; Wilson 2011). Yet these focus attention on racial dynamics in dense, urban populations, dynamics that may or may not extend to smaller communities.

Between 1870 and 1940, the share of the black population living in rural areas fell from roughly 90 percent to under 50 percent. Given that the black population was very much a rural population for much of America's history, understanding rural segregation is critical to understanding the evolution of black socioeconomic outcomes. The segregation

patterns in the rural communities that black residents left, and the pre-existing segregation of the communities they migrated to, may be a crucial piece to understanding the causes and consequences of the Great Migration, racial conflict, and public policy in both rural and urban communities. These segregation patterns may also inform us about the persistence of segregation in rural communities to this day (Lichter at al. 2007).

Similarly, the history of the role of segregation in ethnic and racial violence in the American past has been incomplete because of the inability to look at rural segregation. Diversity and ethnic tensions in the United States influences American society through modern political and economic processes in cities as highlighted by Alesina, Baqir, and Easterly (1999) and Alesina and La Ferrara (2005) and through the intraracial violence studied by Krivo, Peterson, and Kuhl (2009) and others. However, there could also be impacts through the lingering effects of interracial violence more directly related to the literature on ethnic fractionalization and ethnic conflict. Historically, interracial violence in the form of lynching was not strictly an urban issue, but one that plagued America's rural communities. These rural areas continue to show complicated links between anti-minority attitudes, political attitudes, and intergroup conflict (Tope, Pickett and Chiricos 2015, Kimmel and Ferber 2000, Archaya et al. 2016). A growing literature is uncovering links between past violence specifically in the South and modern outcomes, with historical lynchings correlated with modern homicide rates, lack of compliance with hate laws, urban segregation patterns, and black political participation (Messner, Baller, and Zevenbergen 2005; King, Messner, and Baller 2009; DeFina and Hannon 2011, Williams 2018). The shadow cast by historical racial violence could be large and understanding it requires answering the open question of how historical violence was related to historical fractionalization in both urban and rural communities.

In this paper, we review and extend a new literature which explores a new measure of segregation and its relationship to historical interracial violence (Logan and Parman 2017, Cook, Logan and Parman forthcoming). The new segregation measure comes from Logan and Parman (2017), who use the availability of the complete (100%) manuscript pages for the 1880 and 1940 federal census to identify the races of next-door neighbors.

They measure segregation by comparing the number of household heads in an area living next to neighbors of a different race to the expected number under complete segregation and under complete integration where residential location is completely independent of race. This new measure has two key advantages over traditional segregation indices when studying historical interracial violence. First, it can be measured for any geographical area as it does not depend on observing geographic subunits such as wards. This makes the measure equally applicable to both urban and rural areas. Second, since it focuses on the races of next-door neighbors, it provides a potentially better proxy for interracial interactions relative to traditional measures. This consistent measure of segregation for rural and urban areas allows us to extend the analysis of lynching to include its relationship to racial segregation.

In section 2, we review the methodology of Logan and Parman (2017) and extend their analysis to include segregation estimates for 1900, 1910, 1920 and 1930. These additional years of segregation estimates confirm the key stylized facts established in Logan and Parman using the 1880 and 1940 censuses. First, segregation doubled nationally from 1880 to 1940. This increase was not confined to any one particular decade but was instead a fairly steady rise over the entire time span. Second, neighbor-based segregation levels were particularly high for the South throughout the sixty-year time span. Third, segregation was not confined to cities: rural areas experienced similarly large increases in segregation over time and, as with urban segregation, rural segregation was more pronounced in the South than in the Northeast and the Midwest. Finally, despite black households moving to urban areas with large white population shares, the share of black households with a white neighbor was steadily declining over time.

These findings of significant and rising levels of rural segregation, particularly in the South, are not easily explained by traditional explanations of residential segregation such as blacks clustering in small areas abutting white communities (Kellogg, 1977), the use of restrictive covenants (Gotham, 2000), or white flight and suburbanization (Boustan, 2010) as these explanations focus on largely urban phenomena. This suggests that more nuanced theories of residential sorting need to be developed. The presence of significant

levels of rural segregation, even after controlling for black population shares also suggests that historical work on rural racial dynamics can benefit from incorporating empirical measures of residential segregation. For example, Chay & Munshi (2013) were limited to using black population shares to study the causal effect black social networks in rural areas on outcomes. These neighbor-based segregation estimates offer much more information about the spatial distribution of the black population for these types of studies going forward.

To demonstrate the value of incorporating these new segregation estimates into studies of historical outcomes for the black community, we review recent work by Cook, Logan and Parman (2017) examining the relationship between rural segregation and interracial violence. Cook, Logan and Parman use the neighbor-based segregation estimates to show a strong positive correlation between levels of segregation in 1880 and the incidence of lynching. In section 3, we provide an overview of their findings and extend their analysis with newly available complete count data from the 1930 census. Counties with high levels of segregation in 1880 were far more likely to have experience a lynching between 1882 and 1930 and, conditional on having at least one lynching, were more likely to experience additional lynching relative to counties with low levels of segregation. This relationship disappears when looking at lynchings with white victims, suggesting that the relationship between segregation and lynching in the historical United States is not about violence generally but rather specifically about *interracial* violence. When looking at residential patterns after lynchings occurred, we find that past lynching activity predicts the outflow of the black migrants from a county but not the segregation of the remaining black households. In the final section, we discuss the implications of these results and the new evidence on rural segregation more generally for the future direction of research on the history of African American communities.

2. The Historical Rise of American Segregation

2.1 Ward-based Measures of Residential Segregation

A broad range of segregation measures exist, each measuring different dimensions of residential segregation patterns. Massey and Denton (1988) provide a useful overview of these dimensions. Below, we summarize the main dimensions as they apply to black-white residential patterns in urban areas:

1. Evenness – the extent to which black and white residents are similarly distributed across the wards or census blocks of a city
2. Exposure – the degree of potential interaction between white and black residents within the wards of a city
3. Concentration – the proportion of the physical space of a city occupied by black residents
4. Centralization – the extent to which black residents are located near the physical center of the city
5. Clustering – the degree to which the wards or neighborhoods containing black residents are located near one another

While all of these dimensions shape the social and economic outcomes of black residents, the dimensions of evenness and exposure have received the most attention in the economics literature. In particular, historical estimates of urban segregation patterns have typically relied on the dissimilarity index to measure evenness and the isolation index to measure exposure.

The dissimilarity index compares the fraction of the black population living in each ward of a city to the fraction of the white population living in those wards. Formally, the index is calculated as

$$Dissimilarity = \frac{1}{2} \sum_{i=1}^{n} \left| \frac{B_i}{B_{total}} - \frac{W_i}{W_{total}} \right|$$

Where B_i is the number of black residents in ward i, W_i is the number of white residents in the ward, B_{total} is the total black population for the city across all n wards and W_{total}

is the total white population for the city. If black and white residents are spread evenly throughout the wards of the city, this index will equal zero. It increases as more wards become disproportionately white or black.

The isolation index measures the extent to which black residents are only exposed to other black residents. Using the same notation as above, the index is calculated as

$$Isolation = \sum_{i=1}^{n} \frac{B_i}{B_{total}} \frac{B_i}{B_i + W_i}$$

The isolation index can be thought of as the black population share in the ward of the typical black resident. In the case of no segregation, this share will equal the black population share of the city as a whole. As black residents become more segregated, the index will increase approaching one when the entire black population becomes concentrated in a single ward.

2.2 Isolation, Dissimilarity and Rise of Urban Segregation

These two measures, dissimilarity and isolation, have formed the basis for much of the academic research on historical segregation in urban areas. Cutler, Glaeser and Vigdor's (1999) seminal study on the rise and decline of urban ghettos uses these measures to document steadily rising residential segregation in America's largest cities from 1890 through the 1940s.[5] After the 1940s, segregation levels tend to level off through the 1970s and then decline after the 1970s.

These findings, along with those of other studies, have led to a focus on increasing segregation in urban areas being the product of the Great Migration of black individuals from the South to urban centers in the North and subsequent white flight from those cities. There is a solid empirical evidence of this phenomenon. Boustan (2010) provides compelling evidence of white flight in response to black migration to cities in the decades after World War II, estimating that each black arrival led to 2.7 white departures from a

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[5] Cutler, Glaeser and Vigdor are able to exam 54 cities in 1900. Their sample expands to 313 metropolitan statistical areas by 1990.

city. Given these results, much of the literature on the impacts of segregation on black outcomes has focused on the role of suburbanization of the white population and its impact on the access of urban black populations to job opportunities, healthcare, and other resources (Wilson 1987, 1996).

While these are important issues, particularly for recent decades, they do not necessarily address the historical impact of segregation on black outcomes. Collins and Margo (2000) demonstrate that many of the negative consequences of urban residential segregation on black labor market and social outcomes are recent phenomena, arising in the 1970s and 1980s. This impact was not present in a significant way between 1940 and 1970. Furthermore, they focus on urban segregation. Yet, for much of African American history, it may actually be the impact of rural segregation that matters most. To address these patterns, it is first necessary to address the limitations of traditional segregation indices.

2.3 Household-based Measures of Residential Segregation

The traditional measures of segregation capture important dimensions of the black experience in American cities historically. In particular, measures focused on the distribution of the black population across wards may reveal important aspects of how the black population was or was not excluded from the provision of public goods or how ward boundaries may have influenced the power of the black vote in cities. However, there are certain aspects of residential segregation that these traditional measures fail to capture. Specifically, there are two distinct shortcomings of measures like dissimilarity or isolation: (1) they can be highly sensitive to the way boundaries are drawn, and (2) they can be hard to estimate or interpret in rural areas lacking wards.
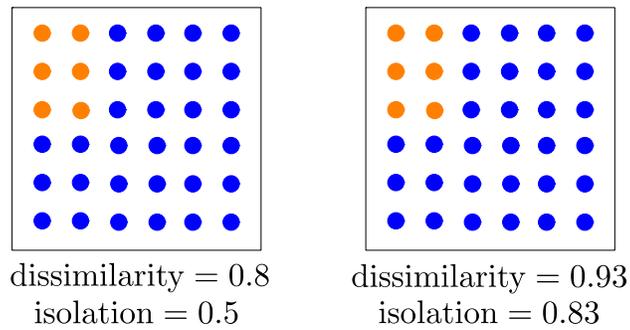
dissimilarity = 0.8   dissimilarity = 0.93
isolation = 0.5   isolation = 0.83

Figure 1: The impact of ward size on dissimilarity and isolation.

The sensitivity to borders includes both sensitivity to the size of wards or any other geographic subunit used to calculate segregation and to the ways in which the boundaries of those subunits are drawn. Figures 1 and 2 demonstrate these issues. Figure 1 provides a simple demonstration of the impact of ward size. In both panels, the minority population of the city is completely segregated in the northwest corner of the city. If ward boundaries are drawn to create three vertical wards, as on the left, we get large estimates for both dissimilarity and isolation (although note that neither reaches the maximum value of one). If we divide each of these wards into three new wards, making a total of nine equally sized wards, both dissimilarity and isolation increase significantly suggesting a more segregated city, despite the underlying distribution of individuals remaining the same. In general, using smaller wards will lead to larger estimates of segregation. This is problematic if we want to compare segregation levels across cities or over time if ward sizes are not uniform, which they most certainly are not.

Figure 2 highlights an even bigger problem for applying dissimilarity and isolation to historical segregation patterns. The panel on the left is identical to the left panel in Figure 1, showing a minority population completely segregated in the northwest corner of the city and the city divided into three vertical wards. If we instead make the wards horizontal, as on the right, the values for dissimilarity and isolation are cut in half despite the underlying distribution of the population remaining the same.
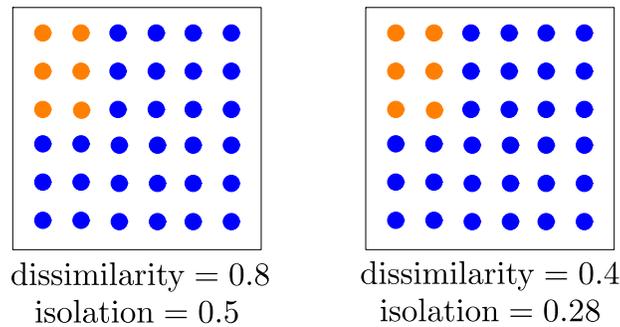
dissimilarity $= 0.8$
isolation $= 0.5$

dissimilarity $= 0.4$
isolation $= 0.28$

Figure 2: The impact of ward boundaries on dissimilarity and isolation.

This sensitivity to boundaries is particularly problematic when considering historical segregation patterns if ward boundaries were drawn to impact the influence of the black vote. Ward boundaries drawn to dilute black votes across several wards would give the false impression of lower segregation levels when calculating dissimilarity or isolation. On the other hand, ward boundaries drawn to concentrate the black vote in a single ward would lead to overestimates of residential segregation. The potential for ward boundaries to be the product of a racist process presents a fundamental problem when interpreting segregation indices based on those boundaries.

A solution to this sensitivity to the borders of geographic subunits is to do away with the need for geographic subunits altogether, switching to a household- rather than ward-based segregation index. This is the approach of Logan and Parman (2017). The Logan-Parman measure is an intuitive approach to residential segregation. They assert that the location of households in adjacent units can be used to measure the degree of integration or segregation in a community, similar to Schelling's (1971) classic model of household alignment. Areas that are well integrated will have a greater likelihood of opposite race neighbors that corresponds to the underlying racial proportion of households in the area. The opposite is also true— segregated areas will have a lower likelihood of opposite race neighbors than the racial proportions would predict. The measure relies on the individual-level data available in federal census records. With the 100% sample of the 1880 federal census available through the Minnesota Population Center's Integrated Public Use Microdata Series (IPUMS) and the 100% samples of the 1900 through 1940 censuses hosted by the National Bureau of Economic Research (NBER), it is possible to identify

the races of next-door neighbors. Census enumerators went door to door to record households, meaning that next-door neighbors are adjacent to one another on the census manuscript page. The number of black households with white neighbors in a county can, therefore, be calculated by looking at the order and races of all household heads on the census manuscript pages.

The measure is based on comparing this actual number of black households in a community with white neighbors to the number expected under complete integration and under complete segregation. Formally, the measure is calculated as

$$\eta = \frac{E(\overline{x_{b,w}}) - x_{b,w}}{E(\overline{x_{b,w}}) - E(\underline{x_{b,w}})}$$

where $x_{b,w}$ is the actual number of black households with a white next-door neighbor, $E(\overline{x_{b,w}})$ is the expected number of black households with white neighbors under complete integration (household location is independent of race), and $E(\underline{x_{b,w}})$ is the expected number of black households with white neighbors under complete segregation (only the black households on either end of the black neighborhood have white neighbors).[6] This index equals zero for a fully integrated community, increases as black households become more segregated, and equals one in the case of a completely segregated community.

2.4 The Logan-Parman Index and the Rise of Urban and Rural Segregation

Complete census returns from 1880 through 1940 allow for estimates of the Logan-Parman measure of segregation for an incredibly important period in African American history.[7] The 1880 census comes after the Civil War and before the nation moved systematically to Jim Crow. For example, at the time of the 1880 census the Civil Rights Act of 1875, which guaranteed equal protection in public accommodation, was still in

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[6]See the appendix of Logan and Parman (2017) for complete details about the derivation and estimation of the measure.

[7] The 1940 census is the most recent publicly available census. Each federal census becomes publically available 72 years after it was administered.

place. The 1940 census, however, depicts residential patterns after the rise of Jim Crow, the Great Migration, and the influx of European immigrants. Importantly, the 1940 census comes largely before the rise of significant suburbanization seen in the post-war years. It is this period from the late-nineteenth century to 1940 that Cutler, Glaeser and Vigdor (1999) cite as the rise of the American ghetto. While urban segregation as measured by isolation and dissimilarity was generally rising, the segregation patterns across cities tended to persist over time, with the most segregated cities at the turn of the century also being the most segregated cities at the end of the century. The complete census returns for 1880 and 1940 and the Logan-Parman measure provide an opportunity to test whether a comparable change in segregation occurred in rural areas.
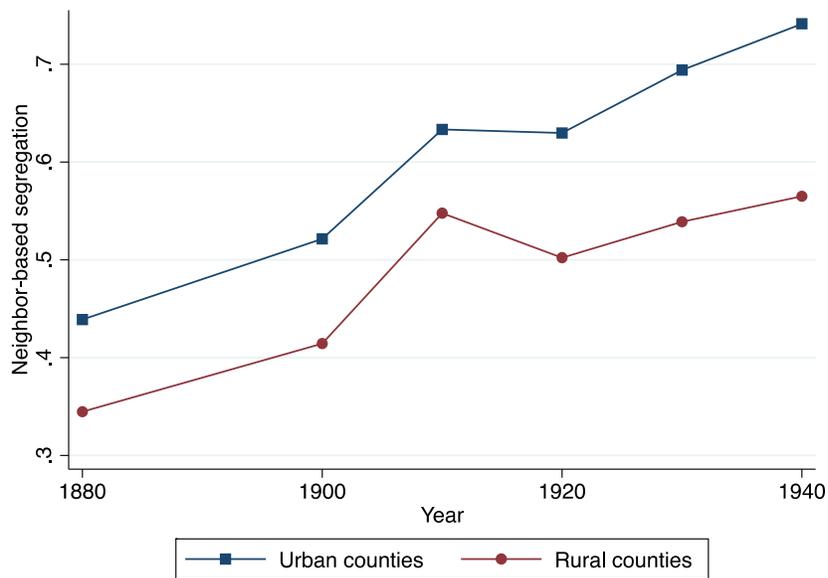

Figure 3: Increases in segregation in urban and rural counties, 1880 to 1940. Segregation is calculated using the Logan-Parman index and the complete count data from the 1880, 1900, 1910, 1920, 1930 and 1940 federal censuses.

Figure 3 shows the variation in our segregation index from 1880 through 1940. All statistics are weighted by the number of black households in the county and should therefore be interpreted as representing the level of segregation experienced by the average black household. Counties are divided between rural and urban to distinguish between the segregation patterns described by Cutler, Glaeser and Vigdor specific to cities and more general patterns affecting the rest of the population. We follow Logan

and Parman (2017) and define a county as urban if more than one quarter of the households from that county live in an urban area and rural if less than one quarter of the households live in an urban area.

The figure shows stark time trends for both rural and urban counties. The Logan-Parman index of segregation nearly doubles over this 60-year time period in both rural and urban counties. No single decade seems to be responsible for the majority of this increase. The rise is segregation is fairly steady and rapid throughout the entire period. The rise for urban counties is consistent with the patterns identified by Cutler, Glaeser and Vigdor. However, the similar rise in rural segregation suggests that increasing segregation is by no means strictly an urban story. While rural counties were always less segregated than urban counties, they experienced the same growth in segregation over time.

Table 1: Neighbor-based segregation over time by region, 1880 to 1940.

Year	South		Northeast		Midwest	
	Rural	Urban	Rural	Urban	Rural	Urban
1880	0.351	0.470	0.219	0.388	0.241	0.322
	[0.110]	[0.106]	[0.027]	[0.021]	[0.071]	[0.071]
1900	0.419	0.575	0.206	0.421	0.295	0.371
	[0.112]	[0.105]	[0.018]	[0.024]	[0.088]	[0.059]
1910	0.553	0.693	0.37	0.513	0.369	0.477
	[0.150]	[0.128]	[0.031]	[0.026]	[0.053]	[0.072]
1920	0.506	0.676	0.248	0.561	0.323	0.506
	[0.108]	[0.121]	[0.019]	[0.030]	[0.053]	[0.056]
1930	0.543	0.721	0.354	0.625	0.369	0.685
	[0.111]	[0.128]	[0.022]	[0.041]	[0.125]	[0.040]
1940	0.568	0.740	0.389	0.731	0.44	0.781
	[0.130]	[0.131]	[0.018]	[0.049]	[0.117]	[0.043]

Mean by year and region across counties are given with standard deviations in brackets. All statistics are weighted by the number of black households in each county. Segregation is calculated using the Logan-Parman index.

Table 1, providing mean neighbor-based segregation by region over time, reveals another striking feature of segregation patterns obscured by traditional measures. While the segregation appears greater in the North when measured by dissimilarity or isolation, the Logan-Parman measure reveals higher segregation levels in the South. While Southern

black and white households may have been more likely to live in the same wards compared to their Northern counterparts, they were less like to live adjacent to each other along the same streets.
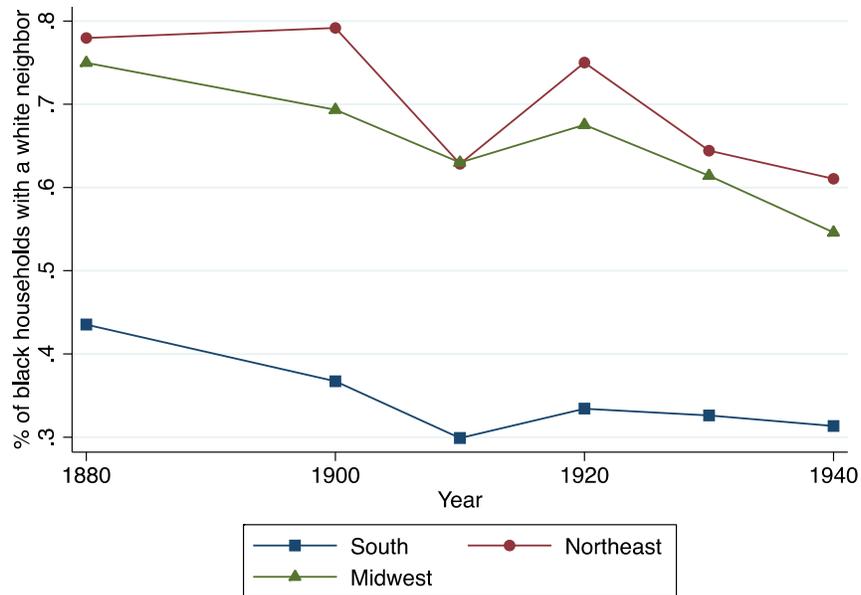

Figure 4: Exposure of black households to white neighbors by region, 1880 to 1940

This neighbor-based approach to measuring segregation also provides insight into an important aspect of opposite-race interactions: the likelihood of having a next-door neighbor of a different race. Figure 4 shows the change over time by region in this particular dimension of opposite-race interactions, giving the percentage of black households that have a white neighbor. Given the small share of black households relative to white households in the Northeast and Midwest relative to the South, it is unsurprising to find that far more black households had white neighbors in the North compared to the South. However, a striking feature of the graph is the general decline in the percentage of black households with white neighbors (a decline that is also mirrored by a fall in the number of white households with a black neighbor). Between 1880 and 1940, black and white households became dramatically less likely to live next to one another and therefore less likely to engage in daily social interactions.

3. Segregation and Southern Lynching

The previous section identifies two distinct features of the Logan-Parman measure relative to traditional segregation indices. First, it can be estimated and interpreted for rural communities. When doing so, we find that the increases in segregation during the first half of the twentieth century were not strictly an urban phenomenon. Rural counties saw large increases in segregation including the rural counties of the South being left by black individuals during the Great Migration. Second, the Logan-Parman measure captures a very direct dimension of black-white interactions: the interactions between neighbors. Traditional segregation measures, which consider population shares at the ward level, can say very little about the extent of interracial interactions. Directly observing the races of next-door neighbors offers a potentially far stronger proxy for these interactions.

These two features make the Logan-Parman index a natural measure to consider the relationship between segregation and lynchings. Lynching was not restricted to cities and was in fact often considered a rural phenomenon. The prominent social and political theories of lynching often hinge on white perceptions of the black community. These perceptions will depend fundamentally on the level of interaction between white and black individuals. Therefore, a segregation measure that can be applied to rural areas and captures a very local level of social interactions between races, the two key advantages of the Logan-Parman measure, is essential to studying segregation's impact on lynching activity.

In what follows, we describe the key findings from Cook, Logan and Parman (forthcoming), examining the relationship between segregation and lynching activity in the South between 1882 and 1930, a period of rising segregation in both the urban and rural counties of the South. The basic empirical question is whether pre-existing patterns of residential segregation increased or decreased the likelihood of lynchings. As Cook, Logan and Parman describe in detail, there are a range of theories of lynching including economic theories concerned with labor control and competition for jobs, social theories centered on status competition, and political theories such as the power-threat hypothesis.

These various theories provide very mixed predictions about the impact of segregation on racial violence. Establishing the empirical relationship between segregation and lynchings offers an important step forward in refining these theories.
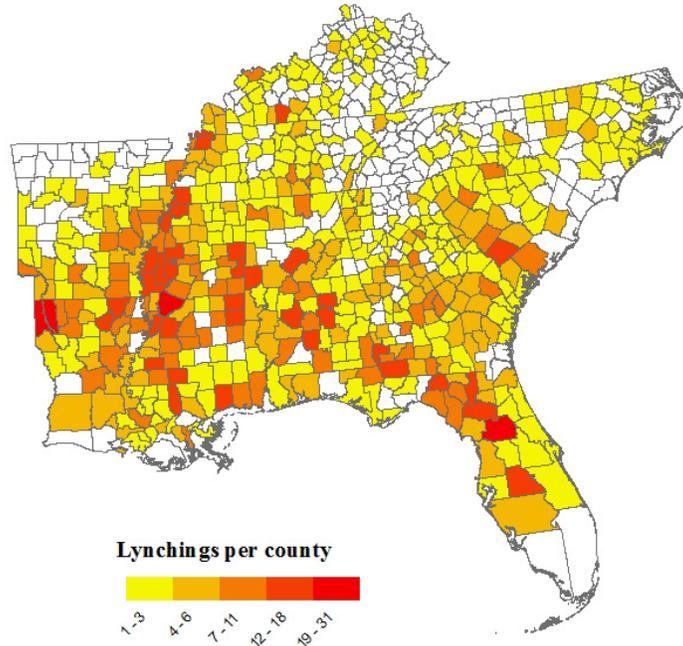

Figure 5: Lynchings per county in Southern states, 1882-1930.

To establish this relationship, we merge the 1880 county-level segregation estimates from Logan and Parman (2017) with the comprehensive data on lynchings from the Historical American Lynching (HAL) project. These data contain detailed information on lynchings occurring in the South (excluding Virginia) between 1882 and 1930. Figure 5 gives the distribution of lynchings across southern counties.

With these data, we estimate the following reduced form relationship:

$$\lambda_{i,s} = \alpha + \beta_1 \eta_{i,s} + \beta_2 \eta_{i,s}^2 + \beta_3 \text{PctBlack}_{i,s} + \beta_4 \text{PctBlack}_{i,s}^2 + \Gamma X_{i,s} + \theta_s + \epsilon_{i,s}$$

where λ is the number of lynchings in a county i in state s or the presence of lynching in that county over the entire 1882 to 1930 period, η is the Logan-Parman measure of segregation for 1880, and PctBlack is the proportion black in the county, also measured in 1880, $X_{i,s}$ is a vector including county characteristics, and θ_s is a state fixed effect. This reduced form relationship is quite similar to the models estimated in the prior empirical literature on lynchings. Since at least Raper (1933), the relationship between

the percent black of a county and lynching has been known to be non-linear, hence the need to control for black population share and its square. The studies of Tolnay and Beck (1990), Corizine, Creech and Corzine (1983) and many others have identified a rich set of correlates related to lynching including agricultural variables, black and white literacy rates, migration rates, and several others. These confounding factors established by previous studies are captured in the vector of county characteristics. Consequently, our specification incorporates the controls of the previous literature but includes segregation.

What is particularly important in the above specification is the timing. Segregation is being measured in 1880 with the total number of lynchings being measured between 1882 and 1930. Therefore, the specification is focusing on lynching activity responding to segregation levels, not segregation taking place in response to lynchings. While understanding whether lynchings drove black communities to segregate themselves from white communities is an important question, it is beyond the scope of the current study.

Table 2: The Relationship Between Segregation and Southern Lynchings, 1882 - 1930.

Model:	All lynchings		Lynchings of black victims		Lynchings of white victims	
	Negative binomial	Probit	Negative binomial	Probit	Negative binomial	Probit
Percent Black	3.969***	0.936***	5.645***	2.035***	-1.895	-0.202
	[0.686]	[0.288]	[0.754]	[0.332]	[1.518]	[0.273]
Percent Black^2	-3.067***	-0.875***	-4.609***	-1.898***	1.623	0.113
	[0.737]	[0.332]	[0.801]	[0.379]	[1.655]	[0.303]
Segregation Index	4.637***	1.370***	5.600***	1.800***	2.482	0.554
	[1.256]	[0.423]	[1.449]	[0.538]	[2.462]	[0.433]
Segregation Index^2	-5.116***	-1.725***	-6.368***	-2.418***	-1.488	-0.835
	[1.656]	[0.612]	[1.880]	[0.750]	[3.462]	[0.618]
Constant	-0.419*		-1.024***		-1.322***	
	[0.235]		[0.272]		[0.473]	
Observations	783	783	783	783	783	783

Standard errors in brackets. * significant at 10%, ** significant at 5%, *** significant at 1%. All regressions include state fixed effects. Dependent variable is number of lynchings for the negative binomial regressions and an indicator variable equal to one if a county experienced at least one lynching.

Table 2 presents the key results from Cook, Logan and Parman (forthcoming), providing estimates of a negative binomial model in the spirit of previous studies focused on count models and a probit model where the dependent variable is an indicator variable for whether a county experienced one or more lynchings. The probit model has the advantage of capturing the impact of segregation on the extensive margin of lynching activity.[8] In the first columns, we look at overall lynchings and find that both the black population share and the segregation of that black population have a positive but diminishing impact on the likelihood of lynchings.[9] These effects of segregation are large: in general a one standard deviation increase in segregation is associated with one additional lynching.

The next sets of columns separate lynchings by race of victim. They demonstrate that the results for all lynchings are being driven by the subset of lynchings with black victims. There is no statistically significant relationship between lynching activity and levels of segregation when the victim is white. This is important for the interpretation of the results. It suggests that segregation is not picking up some general tendency toward violence or vigilante justice. Instead, the impact of segregation is specific to *interracial* violence.

As discussed in Cook, Logan and Parman, this positive correlation between segregation and lynching sharpens our understanding of theories of lynching. Economic theories of

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[8] Cook, Logan and Parman also estimate Poisson and Tobit models. All of the models yield qualitatively similar results.

[9] Given the negative coefficient on the segregation squared, one may wonder if increasing segregation actually leads to declines in lynchings at very high levels of segregation. Across nearly every specification, the marginal effect of segregation does not turn negative until segregation is greater than one which is outside of the bounds of the Logan-Parman index.

lynching predict a passive role for segregation and social theories related to status competition predict a negative correlation between segregation and lynching. Both of these prediction are rejected by the results. Instead, the strong positive relationship between lynching and segregation is most consistent with the political theories of lynching in which whites see blacks as a threat to political power and with the recent work of Hagen et al. (2013) arguing that political events were the primary motivation for lynching.

The results above focus on pre-existing patterns of segregation and their influence on subsequent lynchings. It is also natural to ask whether the lynchings then induced further residential sorting. With the release of complete count data for the 1930 census since Cook, Logan and Parman's study, it is now possible to test whether lynching activity up to 1930 is associated with additional residential sorting from 1930 to 1940.

Table 3: Lynching and subsequent residential sorting

State	Lynchings with black victims per county, 1882 to 1930	Change in black population share, 1930 to 1940	Change in segregation, 1930 to 1940
Alabama	4.015	-0.022	0.013
	[4.128]	[0.025]	[0.043]
Arkansas	2.427	-0.022	0.047
	[2.834]	[0.030]	[0.152]
Florida	2.881	-0.032	0.022
	[4.792]	[0.058]	[0.066]
Georgia	2.547	-0.034	0.041
	[2.835]	[0.028]	[0.098]
Kentucky	1.058	-0.017	0.018
	[2.238]	[0.015]	[0.123]
Louisiana	4.770	-0.034	0.026
	[5.788]	[0.037]	[0.034]
Mississippi	5.915	-0.029	0.004
	[5.127]	[0.023]	[0.048]
North Carolina	0.798	-0.023	0.031
	[1.209]	[0.020]	[0.092]
South Carolina	2.500	-0.030	0.030
	[3.359]	[0.050]	[0.043]

Tennessee	1.839	-0.015	0.031
	[2.960]	[0.014]	[0.151]

All variables are measured at the county level. Means are given with standard deviations in brackets. Segregation is measured using the Logan-Parman index.

Table 3 provides basic summary statistics for lynching activity and subsequent residential sorting for the states in the lynching database. Across all of the states, consistent with the national trends documented earlier, segregation was rising between 1930 to 1940. With the general trend of migration out of the South, we also see large declines in the black population across all of the states in the sample. What stands out in the table is a strong correlation between lynchings and the decline in black population share. There does not appear to be a similar pattern for changes in segregation. This is borne out by basic regression analysis. A simple regression of the change in black population share on the number of lynchings produces a large and statistically significant coefficient on the number of lynchings. The results suggest that an additional lynching was associated with a 0.13 percentage point decline in the black population share. Counties with at least one lynching had a roughly one percentage point greater decline in black population share than counties without any lynchings. We do not find similar effects for segregation. Regressions of the change in segregation from 1930 to 1940 on the presence of lynchings from 1882 to 1930 do not produce any statistically or economically significant coefficients. While lynching activity appears to have driven black individuals to migrate, it does not seem to have subsequent impacts on the residential sorting of the black individuals that remained.

4. Discussion

In this paper we have provided an overview of a new measure of segregation based on the simple criterion of the race of an individual's next-door neighbors, discussing the results of Logan and Parman (2017) and extending them to the years 1900 through 1930. This neighbor-based index of segregation provides a means of quantifying the likelihood of interracial interaction in both urban and rural communities. This feature makes this new measure particularly useful for assessing the impact of segregation on the African American population prior to the Great Migration when a large share of the population

resided in rural communities and for understanding the roots of historical interracial violence that was not restricted to large urban areas.

The patterns revealed by this neighbor-based measure produce several new stylized facts that ought to motivate future work on the evolution of American communities and black-white gaps in outcomes. The United States not only became a more segregated society from 1880 to 1940, consistent with the findings of Cutler et al. (1999), but that this increase in segregation was remarkably general. All regions saw a rise in segregation and that rise occurred in both urban and rural communities. This rise in rural segregation and in the areas black households were leaving during the Great Migration suggests that white flight from Northern cities and suburbanization are only one part of a bigger story about rising segregation levels and suggests that future work on the motivations and mechanisms underlying residential sorting are needed.

The patterns also add greater nuance to stories about regional differences in segregation and its impacts. While urban segregation levels were lower in South relative to other regions during the first half of the twentieth century when measured by the index of dissimilarity, they were actually higher when measured with a household- rather than ward-based index. This suggests that black and white households may have been more likely to occupy the same wards in the South, but were less likely to be next-door neighbors. Moving forward, this ability to identify residential location at the household level will provide valuable insights for differences in the structure of cities and levels of interracial interactions across regions.

The ability of a household-level measure of segregation to shed insight on racial dynamics and the historical roots of modern black outcomes is highlighted by the work we reviewed on Southern lynchings. These past acts of interracial violence had lingering effects on levels of trust and the development of the American South. Modern data suggests that black individuals are 24 per cent less likely to trust others than non-black individuals (Alesina and La Ferrara, 2002). This lack of trust is most pronounced in the states that experienced high levels of lynchings in the early 19th century. Mississippi,

Alabama and Arkansas are all among the five states with the lowest levels of trust today (Alesina and La Ferrara 2002) and experienced the first, fourth and sixth highest levels of lynchings in the data examined in this paper. Beyond low trust levels today, these states also have relatively low income per capita and low levels of public goods provision. The strong correlations between the Logan-Parman measure of segregation and levels of lynching across counties in the South suggest that this interracial violence and its long-run consequences may be rooted in residential segregation in these counties impacting interracial interactions. In particular, the Logan-Parman measure of segregation, being based on the races of next-door neighbors, offers a much stronger proxy for interracial interactions than the racial proportions prior studies were forced to rely on. Finding that lower levels of interracial interactions were correlated with greater incidence of interracial violence opens up new avenues of inquiry into the relationships between intergroup conflict and the history of the American South.

Future work can extend this analysis beyond the South to investigate regional differences in the relationship between segregation, minority population share, and interracial violence. This includes studying lynching victims of other groups including Asian, Hispanic, and Native American men and women. The segregation of all of these groups can be quantified using the techniques reviewed in this article. Further research taking advantage of these new data sources and techniques on the relationship between segregation and local outcomes will help us to understand the dynamics of segregation in both the urban and rural communities of the past that continue to confront complex issues related to race, trust, political participation, and economic performance to this day.

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