The Spatial Articulation of Urban Political Cleavages

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Abstract

Synthesizing and extending multiple literatures, this article develops a new approach for exploring the spatial articulation of urban political cleavages. We pursue three questions: (1) To what extent does electoral conflict materialize between rather than within neighborhoods? (2) How salient are group, place, and location in defining urban cleavages? (3) How do these sources inflect one another? To answer these questions, the article analyzes a novel longitudinal database of neighborhood-scale mayoral voting in Chicago, Toronto, and London. We find strong evidence of spatially articulated cleavages: in each city, voting patterns are equally or more geographically concentrated than the non-White population, income, and poverty. While group-based interests define Chicago's cleavage structure, place and location are paramount in Toronto and London. We conclude by proposing a research agenda for investigating the spatiality of urban politics and advancing a preliminary typology of urban political cleavages and the conditions under which they may arise.

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Introduction

This article examines political cleavages and their spatial articulation in urban contexts. Political cleavages abound in classic studies of urban politics, such as the works of Dahl (1961), Stone (1989), and Castells (1983), but their spatial rootedness often remains incidental in these analyses. Nevertheless, it is clear that, for instance, it was a set of neighborhood coalitions rather than an aspatial group of activists and voters who produced the rise and fall of San Francisco's progressive coalition under George Moscone and Harvey Milk (that Castells described). In fact, many important urban political cleavages do not even make sense without discussing their anchoring in space. Especially in the American context, racial conflict is spatially organized by residential segregation and thus entails conflict not only between racial groups but also between different parts of the city. Conflicts about transportation and environmentalism, such as the recent Yellow Vest protests in France, reveal spatially rooted interests that pit well-off downtown elites against working-class residents of the urban periphery who depend on their cars and therefore also on cheap gas. Without studying their connection to space, the nature and consequences of cleavages that structure urban politics remain incomprehensible.

Scholars have certainly acknowledged this spatial component of urban political conflict, but very rarely have they examined its manifestations and implications head-on. Political scientists and geographers have explored how voting patterns vary across national space (e.g., Gainsborough 2001; Gelman 2008; Johnston and Pattie 2006; Sauerzopf and Swanstrom 1999; Sellers et al. 2013) and how this shapes representation in legislatures (Ogorzalek 2018; Rodden 2019) but have rarely descended to the level of the city and its neighborhoods (but see Enos 2017; Trounstine 2018; Walker 2013). On the contrary, sociologists have studied how space and place shape identities (for an overview, see Brown-Saracino 2015), but they have done so largely without incorporating political orientations (but see Doering 2020; Miller and Silver 2015; Sampson 2012). Overall, a full appreciation of space and politics as fundamentally linked phenomena is missing from the urban studies literature.

The core contribution of this article is a new framework for conceptualizing the links between urban space, political orientations, and concomitant divisions. We define spatially articulated cleavages as salient political divides that materialize primarily between rather than within neighborhoods. Reviewing and extending the existing literature, we identify three sources of spatially articulated cleavages: group-based, place-based, and location-based interests. These interests include material but also non-material aspects such

as respect and recognition. Group-based interests emerge from similar people clustering in space according to their socio-demographic characteristics such as race, ethnicity, and class. Place-based interests emerge from endogenous neighborhood characteristics, including the housing stock, the presence of particular businesses and organizations, green space availability, and the like. Finally, location-based interests emerge from a neighborhood's relative spatial position in the metropolitan area. As Weberian ideal types, these three sources of spatially articulated cleavages can be distinguished for analytic purposes. Nonetheless, we argue that, empirically, cleavage sources often overlap, mesh, and inflect one another such that important information can be lost if one reduces a cleavage to only one type of interest. While scholars have discussed each of these sources of spatial divisions separately, joining them allows us to formulate a novel and coherent research program around their relative salience, interactions, and causes.

In the present article, we use this framework to pursue three questions: (1) To what extent do voting patterns occur between as opposed to within neighborhoods? (2) For a given city, how salient are group, place, and location-based interests in defining its cleavages? (3) To what extent do these different cleavage sources inflect one another? To address these questions, we built a longitudinal database of neighborhood-scale mayoral voting in Chicago, Toronto, and London. The database itself is a central contribution of the paper, as it is the first of its kind of which we are aware.

Our main findings are as follows. First, we find that candidates in all three cities typically win neighborhoods by large margins even during closely contested elections, which means that these cities indeed feature spatially articulated cleavages. Second, we use principal component analysis (PCA) as a data reduction technique to uncover the cleavages that underlie neighborhoods' mayoral vote shares across multiple elections. Within each city, we find that three cleavages account for the bulk of between-neighborhood variation in mayoral voting. We describe the nature of these cleavages by examining the neighborhood characteristics that correlate with a cleavage's local presence or absence. In agreement with the existing literature (Benjamin 2017; Hajnal and Trounstine 2014; Trounstine 2018), we find that two out of each city's three main cleavages are characterized primarily by the spatial clustering of racial, ethnic, or class groups. In addition, however, we also find in each city a cleavage revolving mainly around place- and location-based interests, which divides neighborhoods into competing political camps we name "core" and "periphery." In London and Toronto, this cleavage explains a far larger share of neighborhood variation in voting than race- or class-based cleavages. In Chicago, as informed observers of American urban politics would expect, race dominates politics, but even here the core–periphery

cleavage matters to some degree. Third, we present regression models with interaction terms to examine how cleavage sources overlap and inflect one another. Focusing on the core versus periphery cleavage, we show that place- and location-based interests cannot be reduced to race or class but that these cleavage sources sometimes interact with one another. Specifically, we find that, in Chicago, White neighborhoods vote differently depending on their housing stock, while in Toronto, White neighborhoods vote differently depending on their distance from downtown.

In the discussion section, we summarize our findings, discuss their implications, and call on researchers to expand our framework as a means to synthesize and extend existing streams of research. We suggest that researchers examine features of place and location beyond the ones we incorporated in this article and also explore how politicians and other actors may activate and mobilize the attendant interests for political purposes. Furthermore, we propose a comparative program of studying urban political cleavages across cities, making initial predictions as to where and when we might expect to find certain cleavages in cities with particular economic, socio-demographic, and spatial features.

Urban Politics, Cleavages, and Space

A cleavage is a durable division that separates groups on the basis of a social category, an identity and awareness that members of this category share, and attendant forms of organized behavior such as collective rituals or political parties (Bartolini and Mair 1990). Early Columbia School election researchers conceptualized cleavages as "latent predispositions" through which voters filter proximate political information (Lazarsfeld, Berelson, and Gaudet 1944, p. 74, chap. 8). The Columbia School understood these predispositions to be rooted in group memberships such as race, class, and religion.

We retain such group-based interests as potential sources of cleavage formation, but we also look beyond traditional origins of cleavage formation in order to incorporate more fluid and emergent interests that contemporary urban life may generate (Castells 1977; Inglehart 1990; Offe 1987). In particular, we synthesize multiple literatures to elaborate the potential sources of spatially articulated cleavages. Spatial articulation refers to the fact that political conflict in cities plays out not only within but also between neighborhoods, though the specific degree varies by time and place. We identify three key yet variable sources of spatially articulated cleavages: (1) group-based interests, where socio-demographically similar people, who tend to vote alike, inhabit the same neighborhoods; (2) place-based interests, where

neighborhoods generate characteristic lifestyles and identities that inform political orientations; and (3) location-based interests, where a neighborhood's location produces distinctive needs and priorities. After describing these three potential sources of spatially articulated cleavages, we discuss how they may mesh and inflect one another. In the analysis section, we then use this framework to examine political divisions in Chicago, Toronto, and London.

Group-Based Interests

While urban scholars rarely use the concept of cleavages explicitly, the phenomenon it describes is prevalent in the literature, especially in its traditional, group-based form. First and foremost, American scholars have paid great attention to race (for summaries, see Browning, Marshall, and Tabb 2003; Trounstine 2018). Many studies in this field demonstrate deep political divisions between Black, White, and Latino neighborhoods, which are both fueled by and reinforce racial segregation (Bobo and Hutchings 1996; Enos 2017; Katznelson 1981; Mollenkopf 1992; Oliver 2010; Stone 1989; Sugrue 2005; Trounstine 2018). Analyzing exit polls for multiple large American cities across time, Hajnal and Trounstine (2014) found that race was the strongest cleavage by far and that racial groups frequently formed rather cohesive voting blocs. Elections in which the major candidates belonged to different racial groups were found to be especially polarized. While partisanship was also a significant division, class, age, and religion were much weaker. Hajnal and Trounstine conclude that, in the American context, big-city elections are primarily racial contests in which such groups compete and sometimes ally (see also Sonenshein and Pinkus 2005).

Given the centrality of race in American cities, class as a driver of urban politics is often subsumed within race, while research on urban contexts outside of the United States traditionally features class more prominently (Dunleavy 1979; Walks 2010). Even in the United States, however, scholars show that the issue of growth can elicit class conflict (Logan and Molotch 2007; Swanstrom 1985). Furthermore, class and race intersect so that urban constituencies may align and split in various ways (Stone 1989). This suggests that class as a source of cleavage formation must always be considered. Furthermore, increasing levels of socioeconomic segregation in American cities (Bischoff and Reardon 2014) and global cities more generally (Sassen 1991) point to the growing potency of class as a dividing line in urban politics. In addition to class and race, the urban politics literature identifies additional group-based cleavages such as religion (Boal 2008), sexuality (Castells 1983), and language (Levine 1991).

Depending on their degree of socio-demographic sorting or segregation, cities may exhibit spatially articulated cleavages that revolve around race, class, and other categories. Enabling the uneven distribution of public goods (Trounstine 2018), spatial separation encourages zero-sum thinking—the resources "their" neighborhood gets, "our" neighborhood loses (Katznelson 1981). As Enos (2017, p. 35) argues, segregation increases a category's cognitive accessibility and salience, which makes it a "demagogue" that "whispers in our ear, playing on our most fundamental psychological tendencies and profoundly affecting the way we think and behave." Accordingly, it is important to recognize that conflict between "us" and "them" unfolds differently if the "we" also corresponds to "East Side" and the "they" to "West Side." In the analysis, we therefore ask: how much do group-based interests divide neighborhoods in Chicago, Toronto, and London?

Place-Based Interests

In addition to group-based sources of cleavage formation, the literature also suggests that place can engender urban political cleavages. Gieryn (2000) defined places as named, demarcated spaces that are suffused with meanings and values. Neighborhoods are prototypical places and urban scholars increasingly recognize that neighborhoods as places facilitate the emergence of distinct place-based identities and lifestyles (Brown-Saracino 2015; Castells 1983; Molotch, Freudenburg, and Paulsen 2000). After all, most cities offer very different types of urban experiences, because neighborhoods vary in terms of their built environments, density, amenity composition, and so on.

Place-based bundles of identities can manifest in aggregate terms as incompatible—and often actively oppositional—policy preferences and electoral behavior (Miller and Silver 2015) and different levels of political activity and engagement (Cho, Gimpel, and Dyck 2006; Hopkins and Williamson 2012). For example, neighborhoods that showcase local arts establishments, crafts shops, and distinctive boutiques may oppose chain restaurants and businesses that other neighborhoods would welcome with open arms (Lloyd 2006). Similarly, dense neighborhoods inspire a culture of walking and cycling, while low-density residential neighborhoods are organized around car use and typically defend car-centric urban policies (Urry 2004; Walks 2015). Furthermore, household ownership of single-detached housing incentivizes privatistic lifestyles and elevated attention to property taxes and the services they fund (Fischel 2001). In this way, places generate interests that may pit neighborhoods against one another. Thus, in the analysis, we ask: how much do place-based interests divide neighborhoods in Chicago, Toronto, and London?

Location-Based Interests

If place-based cleavages emerge from lifestyles and identities associated with the endogenous features of particular locales, location-based interests derive from the fact that areas have distinct needs and priorities depending on their relative spatial position within the city. Urban scholars have primarily paid attention to location in the form of conflict and collaboration between separate municipalities, principally between central cities and separately incorporated suburbs, rather than within municipalities (Feiock 2009; Rusk 2013). However, we believe that there is also much potential in engaging location as a force within single municipalities.

It is reasonable to assume that views on important policy areas like transportation or the siting of infrastructure and facilities may vary by urban location. France's Yellow Vest protests, for example, were triggered by a proposed increase in the gasoline tax that aimed to discourage driving and mitigate climate change. But this increase disproportionally affected low-income residents living on the periphery of France's thriving and expensive metropolitan areas, where cuts to regional public transportation made residents dependent on their cars (Kimmelman 2018). The Yellow Vest movement thus developed not *only* as a type of class conflict but also as a conflict between metropolitan locations. Furthermore, climate change is making cities increasingly vulnerable to threats like wildfires and flooding (Rosenzweig et al. 2018), but these hazards do not evenly affect neighborhoods across metropolitan areas and may thus generate new political divisions. For instance, Arceneaux and Stein (2006) reported that Houston residents residing in neighborhoods that were heavily affected by Tropical Storm Allison in 2001 were significantly more likely to vote against the incumbent mayor than those residing in less affected neighborhoods. Accordingly, we ask: how much do location-based interests divide neighborhoods in Chicago, Toronto, and London?

Cleavage Inflection

In contrasting different sources of cleavage formation—group membership, place, and location, or even two group-based sources, such as race and class—it is important to recognize that these factors can interlock and that, in doing so, they generate political compounds that are not reducible to just one source. For race and class, this point is well known (e.g., Dawson 1994), but the same applies to the relationship between the three potential sources of spatially articulated cleavages. Consider the contingent relationship between poverty and transportation access, which represent potential sources of group- and location-based interests, respectively. Until the decline of the

industrial city, most of the urban poor found themselves crowded into dense neighborhoods close to the urban core (Engels 2010; Park and Burgess 1925). They certainly suffered from congestion and pollution but not from a lack of spatial access and mobility. By contrast, in the postindustrial city, the poor tend to be priced out of the urban core. They thereby come to inhabit less dense and less polluted neighborhoods but instead suffer from limited access to public services, including public transportation (Murphy and Wallace 2010), as in the case of the Yellow Vest protests we have already discussed. The experience and expression of class in urban politics can therefore remain incomprehensible without considering location.

We can also imagine other kinds of interactions between cleavage sources. Conflict between Black and White neighborhoods—a group-based cleavage—dominates politics in many American cities (Hajnal and Trounstine 2014), but it may well matter whether the Black population inhabits depopulated neighborhoods with high vacancy rates (as in Baltimore and Detroit) or high-density neighborhoods (like East Harlem and the South Bronx in New York) that offer comparably better public services (Small 2007), because those neighborhoods instill different place-based interests.

All of this means that, in order to understand a cleavage, it may not suffice to examine groups, place, or location in isolation (see also Enos 2017), because these cleavage sources may overlap and inflect one another. This implies that, rather than assuming each spatially articulated cleavage to have one invariant root, we should examine whether specific cleavages entail bundles of interests that derive from a combination of sources. For instance, a cleavage might be rooted in combinations of group- and place-based interests if it divides poor and densely populated neighborhoods from rich, low-density neighborhoods. In other words, groups, place, and location interact in the social and political life of cities (Galster 2019). Methodologically, our approach thus stands in the tradition of ecometrics (Sampson and Raudenbush 1999) and draws on insights from geodemographic analysis (Webber and Burrows 2018). Accordingly, we study meso-level phenomena, highlighting ordered relationships among neighborhood rates—in this case mayoral vote shares and their correlates—rather than the attributes of individuals or households. No single variable is likely to capture a given cleavage source and most exist on a continuum that spans all three sources to varying degrees. We therefore take a holistic approach that examines many variables at once to uncover broad patterns of relative salience.

In sum, our synthesis and extension of the literature suggests that studying the spatial articulation of political cleavages involves a series of interrelated empirical questions:

1. To what extent do voting patterns occur between as opposed to within neighborhoods?
2. For a given city, how salient are group-, place-, and location-based interests in defining its cleavages?
3. To what extent do these different cleavage sources inflect one another?

Chicago, Toronto, and London: A Brief Overview

In the following sections, we compare and contrast findings from Chicago, Toronto, and London. Our case selection is informed by several reasons. Admittedly, one reason is the ready availability of precinct level voting data for these cities, but there are also good substantive reasons for choosing them. Since we are seeking to establish a new research agenda that examines the spatial articulation of urban politics and uncovers its roots, we are looking primarily for contrast against a background of basic comparability (see Table 1). In terms of factors that establish basic comparability, we are dealing with anglophone cities in the developed world. They are large, populous, socially heterogeneous, and feature a range of neighborhood place distinctions. All three have made the transition to postindustrial service economies and have attracted substantial numbers of immigrants. London and Toronto have recently undergone major institutional changes, while Chicago changed its electoral system. Furthermore, in terms of contrast, the cities have different traditions of ethno-racial and class politics, which raises our chances of observing a broader set of cleavage sources than, for instance, a comparison of Chicago and Philadelphia might yield. Indeed, identifying variation in cleavages and their sources across cities is the main agenda of the present article, rather than an expectation of finding a similar underlying political order. We return to this theme in the conclusion.

As background for our analyses, we provide a brief comparative overview of the cities' governmental and political contexts. Local elections in Chicago, London, and Toronto occur separately from those held for other levels of government. In all three cities, the mayor is a highly visible figure with significant political influence at other levels of government.

Chicago has held nonpartisan elections without primaries since 1999. If no candidate receives an absolute majority in the general election, the city holds a runoff between the top 2 finishers. Such runoffs occurred in 2015 and 2019. The city has had three mayors during the 1999–2019 period analyzed. While the ballot is nonpartisan, the city leans heavily Democratic in national elections and all major candidates are recognized as associated with the Democratic Party. Richard M. Daley (six terms, 1989–2011), the son of longtime "machine" mayor Richard J. Daley, succeeded a left-leaning administration under the

Table 1. City Characteristics.

	City of Chicago	Greater London	City of Toronto
Demographics			
Population	2,695,598	8,173,900	2,615,060
Largest ethno-racial groups	33% Black	60% White	50% White
	32% White (non-Hispanic)	12% South Asian	12% South Asian
	29% Hispanic	13% Black	11% Chinese
			9% Black
			5% Filipino
% foreign-born	21%	37%	49%
Built environment			
Land area	590 km²	1,569 km²	630 km²
% apartment housing	74%	53%	57%
Government and politics			
Government structure	Single-tier	Two-tier (Greater London Authority shares authority with 33 local authorities)	Single-tier
Partisan mayoral elections	No	Yes	No

Note. Data pertain to 2010 in Chicago, 2011 in Toronto and London.

city's first Black mayor to pursue an agenda of downtown development, attracting business, and fighting crime (Glastris 1993). Adapting to the city's demographic change, Daley built a coalition of White and Latino voters while trying to avoid antagonizing Blacks (Rudin 2007). Nevertheless, Daley mainly faced Black opponents in the six elections he contested between 1989 and 2007, with two-way races being the norm. Daley's successor Rahm Emanuel (two terms, 2011–2019) largely continued Daley's policies but also made aggressive efforts to counteract the city's escalating budget deficit. In 2011, Emanuel received support from White as well as Black voters, who rewarded his prior role as President Obama's chief of staff. But the Emanuel administration alienated Black and Latino voters by closing schools, cutting services, and raising fees and fines (Nuamah 2018). Becoming increasingly embattled especially during his second term, Emanuel did not seek re-election in 2019. Chicago's current mayor Lori Lightfoot won the 2019 runoff election in a landslide against another Black candidate, Toni Preckwinkle. Both ran as progressives, but Lightfoot positioned herself as an insurgent against Preckwinkle, who is a more established figure in the local Democratic Party organization (McGhee 2020).

Today's City of Toronto was formed in 1997 when the former two-tier Metro Toronto government and its six constituent boroughs were amalgamated into a single-tier government with a directly elected mayor and council.

As in Chicago, Toronto's municipal elections are officially nonpartisan. Although mayoral candidates' party affiliations are generally well known and acknowledged in the media, it is common for major candidates to assemble campaign organizations whose personnel cross provincial and federal party lines. Toronto has had four mayors since the 1997 amalgamation: longtime center-right mayor of the dissolved suburban North York borough Mel Lastman (two terms, 1997–2003), center-left lawyer and environmentalist David Miller (two terms, 2003–2010), the right-populist Rob Ford (one term, 2010–2014), and establishment conservative John Tory (two terms, 2014–present). Each transition featured an open race; Lastman and Miller declined to run again in 2003 and 2010, respectively, while Ford withdrew from the 2014 race after being diagnosed with cancer. (His brother Doug Ford ran in his stead but lost to Tory.)

Lastman's tenure was primarily focused on maintaining low residential property taxes despite deteriorating services. Having campaigned on city beautification, Miller presided over a residential housing boom, promoted waterfront redevelopment and social investment in marginalized neighborhoods, and secured a new city charter with greater taxing powers. His plan for an expanded light-rail network in the city's postwar suburban areas was canceled by Ford, who campaigned against "the war on the car" and "downtown elites" and for a residential property tax freeze. In 2014 and 2018, Tory has sought a business-friendly middle ground between Miller's and Ford's agendas by championing new rapid transit and cycling facilities as well as car access to downtown, restraining property tax increases through austerity measures, and promising the creation of new affordable housing.

Like Toronto, London has undergone a major institutional change. The Greater London Authority (GLA), governed by a directly elected mayor and assembly, was established only in 2000 (Travers 2015). Unlike Chicago and Toronto, the GLA shares its authority with 32 borough councils and the City of London Corporation. The GLA is responsible primarily for transportation, housing, protective services, economic development, and land-use planning, while the boroughs manage local services, including schools, waste management, and libraries. Mayoral candidates in London run on party tickets with established identities and policy platforms. Accordingly, party identification likely has a stabilizing effect on individual political behavior, even as specific candidates come and go.[1] The mayoralty has alternated between candidates of the left, Ken Livingstone (two terms, 2000–2008) and Sadiq Khan (one term, 2016–present), and right, Boris Johnson (two terms, 2008–2016).[2]

Known as "Red Ken" while serving as the Labour leader of the Greater London Council from 1981 until its abolition in 1986 by Conservative Prime Minister Margaret Thatcher, Livingstone came from the left wing of the

Labour party. Rejected as Labour's candidate in the first GLA election in 2000, he ran successfully as an independent, campaigning on transit modernization and a congestion charge on car commuters into downtown. Livingstone won the 2004 election on the Labour ticket, championing London's 2012 Olympic bid, but was defeated in 2008 and 2012 by Eurosceptic journalist, MP, and future Prime Minister Boris Johnson. Johnson campaigned on expanding outer London bus and express rail transit and cracking down on crime. Khan, the son of a bus driver and a former lawyer, inner London borough councilor, and Labour cabinet minister, is London's first non-White and Muslim mayor. The dominant issue in the 2016 election was housing affordability, with Khan promising rapid expansion of new housing supply with affordability targets.

Method

Political behavior is most often analyzed at the individual level using representative sample surveys. However, these samples are rarely large enough to permit analysis of neighborhood-scale variation within cities and surveys are seldom repeated across multiple elections. To capture the spatial articulation of voting patterns across both urban space and time, we analyze aggregate neighborhood-scale vote shares in mayoral elections in relation to social and other data over two decades in each city. This allows us to investigate the presence and character of spatially articulated cleavages within the three cities through examination of spatial patterns of aggregate voting data across all elections in each city.

Our analysis is geared toward the three research questions outlined above. To address our first research question—to what extent do voting patterns occur between as opposed to within neighborhoods?—we begin by simply describing margins of victory across elections within the smallest geographical units available in the three cities. We then pursue this question further with the help of PCAs of neighborhood vote shares across all years in order to group candidates from different elections. Commonly used in geodemographic analysis (Webber and Burrows 2018) and for exploration of clustered data (Van Gunten, Martin, and Teplitskiy 2016) and indicator construction (Anselin, Sridharan, and Gholston 2007; Somarriba and Pena 2009), PCA is a data reduction technique similar to factor analysis that identifies a number of uncorrelated variables—"components"—that account for all variation in the original set of variables while maximizing variance (Demšar et al. 2013; Dunteman 1989).[3] In our case, we pool observations of mayoral vote shares per neighborhood and election year within each city, and then use PCA to identify the underlying components that

account for variations in neighborhood vote shares. This enables us to overcome the methodological challenge of identifying consistency in neighborhood political orientations across election events when elections are nonpartisan (there are no party labels on the ballot) and the identities and number of candidates vary from one election to the next. The PCA in itself is not a spatial analysis, but we can uncover the spatial distribution of the underlying components. To do so, we map neighborhoods' principal component scores, which reveals clusters of politically similar and dissimilar neighborhoods. We also formally assess the degree of spatial clustering by computing the spatial autocorrelation (Moran's *I*) of neighborhood component scores and comparing the results to the spatial autocorrelation of income, poverty, and the non-White share of the population.

For our second question—how salient are group-, place-, and location-based interests in defining a city's political cleavages?—we analyze the correlation of neighborhoods' principal component loadings with neighborhood-scale social and physical environment variables. Correlation rather than a regression framework is used in order to reveal the bundling of neighborhoods' characteristics in relation to their electoral orientations. Finally, we take up our third question: To what extent do different cleavage sources inflect one another? To answer this question, we present a series of regression models that examine, at the neighborhood scale, the influence of place and space characteristics on voting patterns independent of and in interaction with group composition. We provide more details about specific methods in the course of the analysis.

Data

One problem inhibiting the quantitative analysis of aggregate political behavior within cities is that electoral and census boundaries change over time and often do not align with one other. In order to link electoral and social data to identify intra-urban political cleavages, we used a population-weighted methodology[4] to apportion precinct-level mayoral voting results for all election years to harmonized neighborhood-scale census geographical units: census tracts in Toronto and Chicago (2001 and 2010 boundaries, respectively) and wards in London (2016 boundaries). The assembly of these data sets is itself an important contribution. We are aware of no other study that uses mayoral voting data at such a fine-grained level of spatial resolution over a period this long.

In the Chicago case, we collected precinct-level results for six mayoral elections, including 28 major candidates, held between 1999 and 2019.[5] In 2015 and 2019, Chicago held runoff elections because no contender secured

an outright majority during the general elections. For these cases, we include only the general elections in order to keep findings comparable across the six elections. For 1999, precinct-level election results were assembled from the archives of the Chicago Democracy Project and precinct boundaries were reconstructed from paper maps held by the University of Chicago library. Geolocated election results for 2003–2019 were drawn from the Chicago Elections portal. In their raw form, these data have high spatial resolution: Chicago was divided into 2,069 precincts for the 2019 election containing an average of 765 registered voters. Voting data for all years were apportioned to 2010 census tract boundaries. Chicago contains 795 census tracts with an average population of 3,390. With data for six elections, this yields 4,770 tract-level observations.

For the Toronto case, our data set comprises results for the six elections held between 1997 and 2018, which included 19 major candidates. For the years 1997 and 2000, a spatial data set was constructed from paper records retrieved from the Toronto Reference Library and Toronto Elections. Digital voting records after 2000 come from the City of Toronto Open Data Catalogue. In 2018, there were 1,181 precincts in Toronto, each containing an average of 1,592 eligible electors. As in Chicago, precinct-level votes for candidates were apportioned to 2001 census tract boundaries. There are 527 census tracts in Toronto, each containing an average of about 4,800 residents, thus yielding 3,689 observations across the seven elections.

We collected GLA mayoral election returns for the four elections held between 2004 and 2016, including 27 major candidates, from the London Datastore. The data are available for wards, which are roughly similar in size to U.S. and Canadian census tracts. Although the GLA's first election was held in 2000, no ward-level data were published for that year. Ward boundaries are identical across years with the exception of those in three boroughs (Hackney, Kensington and Chelsea, and Tower Hamlets), which differ in the 2016 election. The 2004–2012 votes in these boroughs were apportioned to the new 2016 ward boundaries. The City of London (the small local authority containing mostly office space) is treated as a single ward. There are 630 wards, each containing an average of about 13,000 residents in 2011. With data for four elections, this yields 2,520 observations.

In order to assess the relative salience of the multiple bases of spatially articulated cleavages, we rely primarily on census data. Seeking to describe the nature of the cleavages indicated by the PCAs and in line with the holistic approach outlined above, we correlate a large set of potentially relevant variables—between 44 and 54 per city (see Supplemental Appendix B for a summary)—with the main PCA components in each city. Given that we draw these variables from three different national censuses, each of which collects

slightly different data, we selected variables that are available in similar form for all three cities. Variables pertaining to group-based interests include age, marital status, income, education, race and ethnicity, immigration and employment status, occupation, and religious affiliation. Variables pertaining to place-based interests include the age of the housing stock, population density, and housing type, while location-based interests are represented by distance from the city center and commuting mode. For Chicago, we assembled census tract profiles from the 2010 Census and the 2008–2012 American Community Survey five-year estimate file as contained in the Longitudinal Tract Database (Logan, Xu, and Stults 2014) and the NHGIS (National Historical Geographic Information System) (Manson et al. 2018), which apportion data to 2010 boundaries. For Toronto, we constructed census tract profiles by averaging data from the 1996, 2001, 2006, 2011, and 2016 mandatory Census and the 2011 National Household Survey. Data were apportioned to 2001 census tract boundaries using the Canadian Longitudinal Tract Database (Allen and Taylor 2018). For the London analysis, we assembled ward-level profiles from the 2011 UK Census. Since the electoral and census boundaries are identical in London, no apportioning was required beyond that for the three boroughs listed above.

Findings

To What Extent Do Political Divisions Occur Between Versus Within Neighborhoods?

Initial examination suggests that voting patterns are strongly articulated as spatial divisions. Table 2 summarizes the proportion of precincts won by different margins of victory. At the local level, landslide victories are the norm in all three cities. Across all elections, 78% of precincts were won by *more* than a 10-percentage-point margin in Chicago, 83% in Toronto, and 80% in London. In Chicago and London, around 60% were won by more than 20 percentage points; in Toronto, two-thirds were. The high frequency of local landslides suggests that, in each of the three cities, political divisions are articulated in space—that is, neighborhoods tend to strongly align with specific candidates.

PCAs of neighborhood vote shares for major mayoral candidates across all elections in each city reveal enduring spatial patterns of political orientations. In our analysis, the PCA reduces neighborhood vote shares in multiple election years to three highly predictive components per city. Within each city, these three components account for the bulk of the variation in neighborhood vote shares across all elections analyzed (81% of total variation in

Table 2. Margins of Victory Across All Elections.

% of Precinct Contests	Chicago	Toronto	London
Margin of victory <10%	22.5	17.6	20.6
Margin of victory 10%–20%	16.8	15.9	19.6
Margin of victory >20%	60.7	66.5	59.8
Total	100.0	100.0	100.0
No. of elections	6	7	4
No. of total precinct observations	14,509	11,486	2,509

Note. Chicago data exclude 2015 and 2019 runoff elections.

Chicago and London, and 84% in Toronto).[6] In fact, in Chicago and Toronto, the first component alone accounts for the majority of variation—61% and 56%, respectively. London's politics are only slightly less rigidly divided by neighborhood with the first component accounting for 41% and the second component accounting for 27% of the variation. Taken together, these results suggest that individual candidates draw support from neighborhoods that consistently support similar types of mayoral candidates.

Theoretically, neighborhoods with high loadings on the same component could be randomly distributed across the city. The extent to which neighborhoods with similar loadings are geographically clustered therefore indicates the degree to which each city's political cleavages are spatially articulated. We assessed spatial clustering in two ways: by mapping neighborhood component loadings and by computing the Global Moran's I statistic, a measure of spatial autocorrelation (Moran 1950).

Visual inspection of the maps in Figures 1–3 indicates that aggregate, neighborhood-scale voting patterns are indeed strongly spatially clustered in all three cities. This is reinforced by Table 3, which presents Moran's I spatial autocorrelation values for each component. To go beyond the mere proposition that political orientations are not randomly distributed in space, we compare the spatial concentration of vote shares to that of income, poverty, and the non-White share of the population. In all three cities, the spatial clustering of the component loadings is very high.[7] Remarkably, voting patterns are equally or even more clustered in Chicago, Toronto, and London than the non-White population, income, and poverty. In very few areas of each city are neighborhoods adjacent to their strong political opposites; most residents would have to walk rather far to encounter concentrations of people with different political orientations. Political differences in Toronto and London thus constitute their most fundamental spatial divisions; in Chicago, politics cleave the city as deeply as does race.
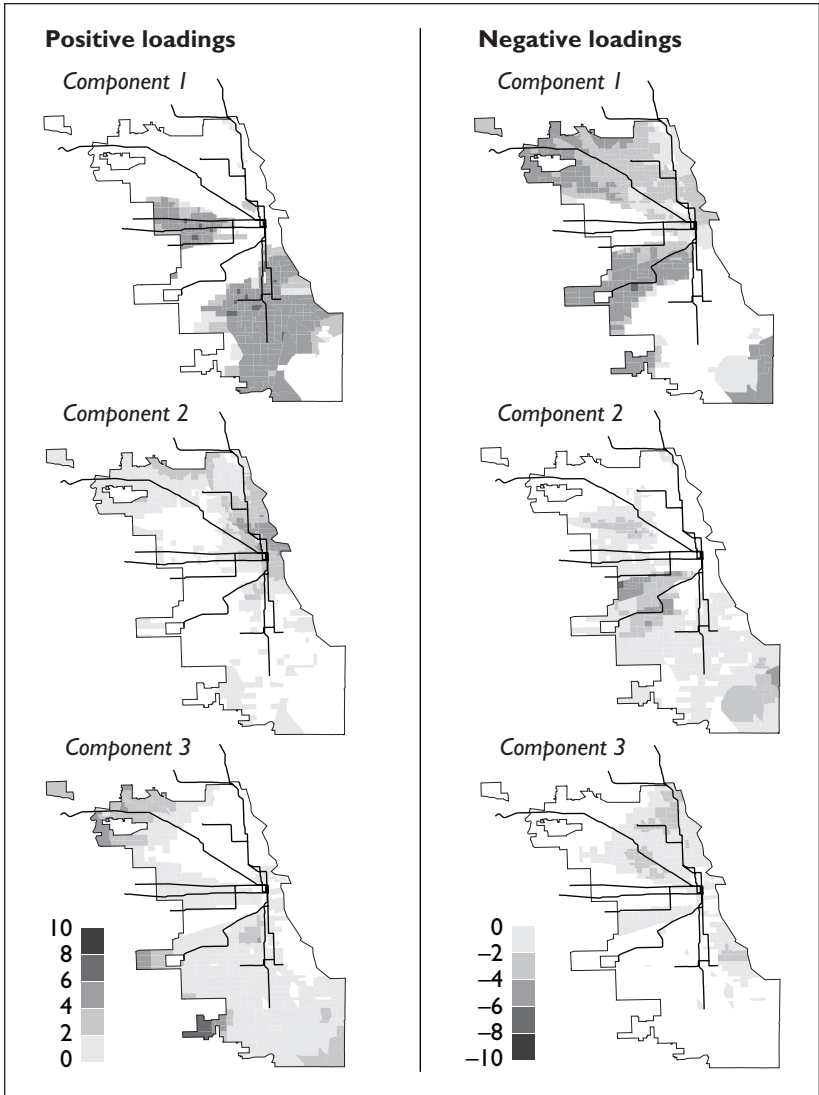
Figure 1. Map of neighborhood component loadings in Chicago.
Note. Neighborhoods' positive and negative loadings on the three components are mapped separately for ease of interpretation. The black lines indicate CTA rail lines, which converge in the downtown Loop.

Several general points emerge from the analyses so far. We have evidence that political divisions largely unfold between rather than within
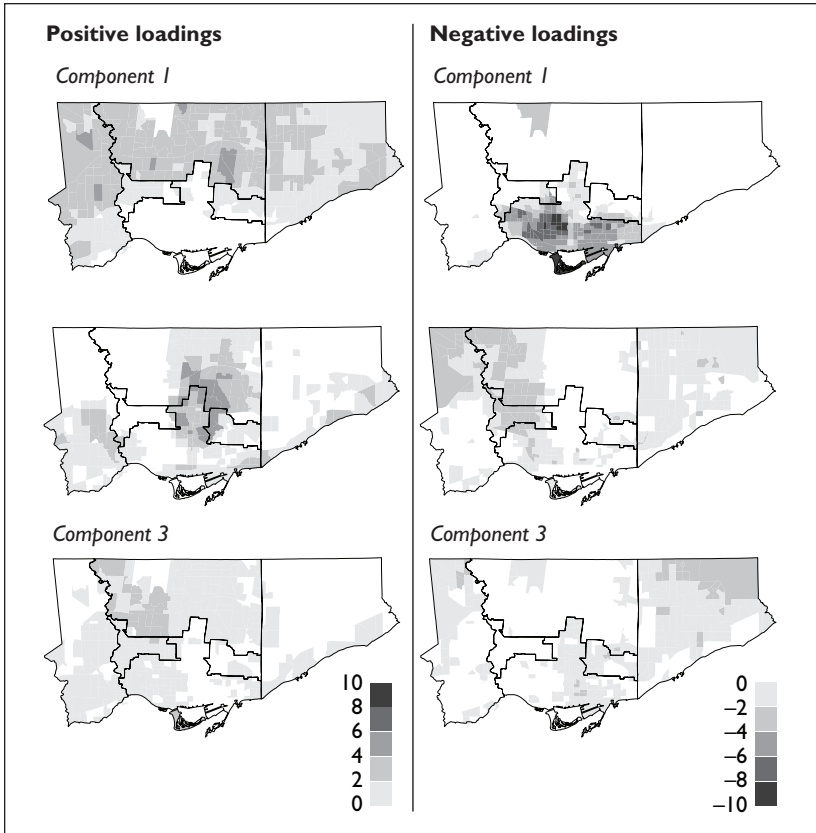
Figure 2. Map of neighborhood component loadings in Toronto.
Note. Neighborhoods' positive and negative loadings on the three components are mapped separately for ease of interpretation. The black lines indicate the borders of the six municipalities that existed prior to the 1997 municipal amalgamation.

neighborhoods in all three cities, despite their different geographies, political systems, and histories. Not only are voting patterns spatially clustered, they are opposed. As noted, landslides at the neighborhood level are common even in closely contested elections. Furthermore, we see strong spatial clustering. Most neighborhoods are surrounded by other neighborhoods with similar voting patterns. Politics in all three cities therefore appear to revolve around strongly pronounced, spatially articulated cleavages.
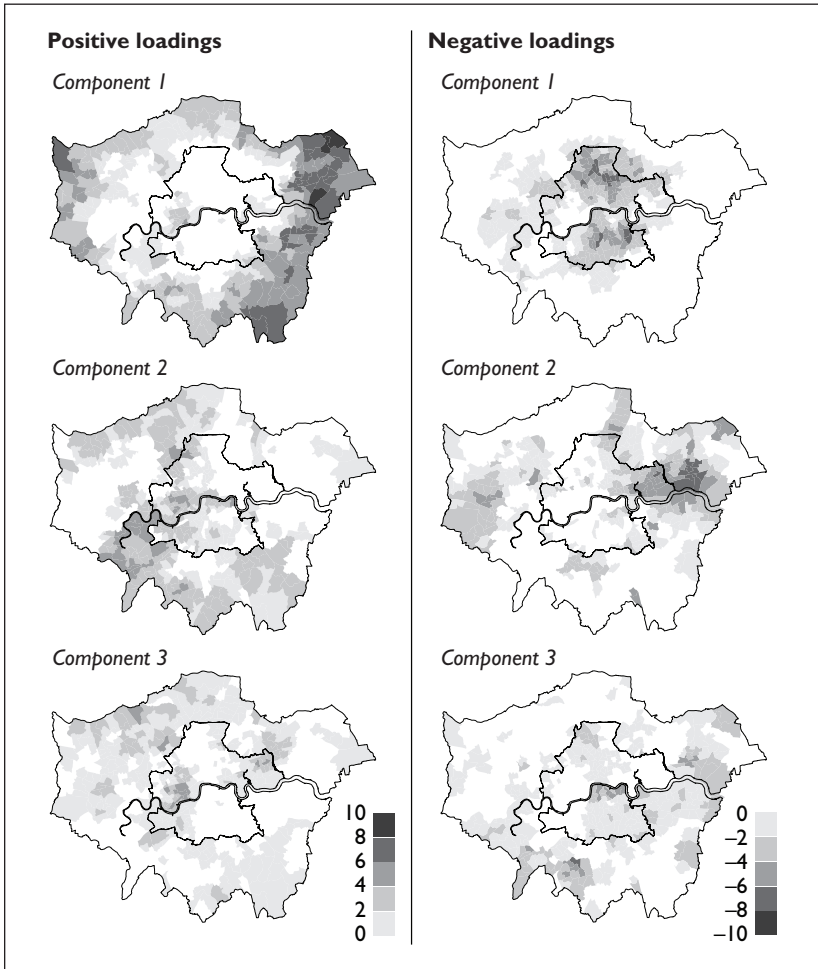
Figure 3. Map of neighborhood component loadings in London.
Note. Neighborhoods' positive and negative loadings on the three components are mapped separately for ease of interpretation. The inner black outline indicates the border between boroughs designated by the Office of National Statistics as Inner and Outer London.

How Salient Are Group-, Place-, and Location-Based Interests in Defining a City's Political Cleavages?

While the analysis so far suggests that cleavages are spatially organized, it is silent on their nature. This section clarifies the substance of the cities'

Table 3. Measures of Spatial Autocorrelation.

	Chicago	Toronto	London
Component 1	.66	.87	.81
Component 2	.54	.67	.66
Component 3	.69	.62	.55
% non-White	.68	.62	.71
% individuals in low income/poverty	.42	.19	.54
Average household income	.50	.38	.44

Note. Global Moran's *I* values were calculated using GeoDA. Chicago data are derived from the 2010 census, Toronto from an average of the 1996-2006-2016 censuses, and London from the 2011 census. For London, % individuals in low income/poverty are measured as DE ("unemployed and lowest grade occupations") on the British Social Grade scale.

cleavages. To do so, we first unpack the results of the PCA further and then correlate neighborhood principal component loadings with theoretically relevant variables drawn from national censuses.

Setting aside each city's third component for now, Figure 4 visualizes the results of the PCA as biplots (see Gabriel 1971) of the first two components. (For reference, the component loadings are presented in tabular form in Supplemental Appendix A.) Each arrow represents one candidate. The angles between the arrows and the component axes represent the strength of the association between the candidate's vote share and the two components. A longer arrow indicates that the components explain more of the candidate's vote share. In Chicago and Toronto's nonpartisan elections, the clustering of candidates in different quadrants of the biplots indicates that, even without parties, a limited number of cleavages structure politics across elections. For instance, in Chicago, neighborhoods where Rush received high vote shares in 1999 also supported Preckwinkle in 2019; in Toronto, areas where Hall won higher vote shares in 1997 also tended to support Keesmaat in 2018. Chicago's candidates are clustered by race. Black and non-Black candidates primarily divide on component 1, while White and Latino candidates primarily divide on component 2. Building on the component loadings' cartographic representation in Figures 1–3, Toronto's component 1 divides candidates with support from the urban core from those who mainly received votes from neighborhoods outside the urban core. Component 2 indicates a division that unfolds primarily outside of the urban core. In London's partisan contests, we see that parties occupy enduring political positions. Component 1 divides the left (Labour and the Greens) from the right (Conservatives and UKIP, the United Kingdom Independence Party). Component 2 distinguishes the Liberal Democrats and the Conservatives
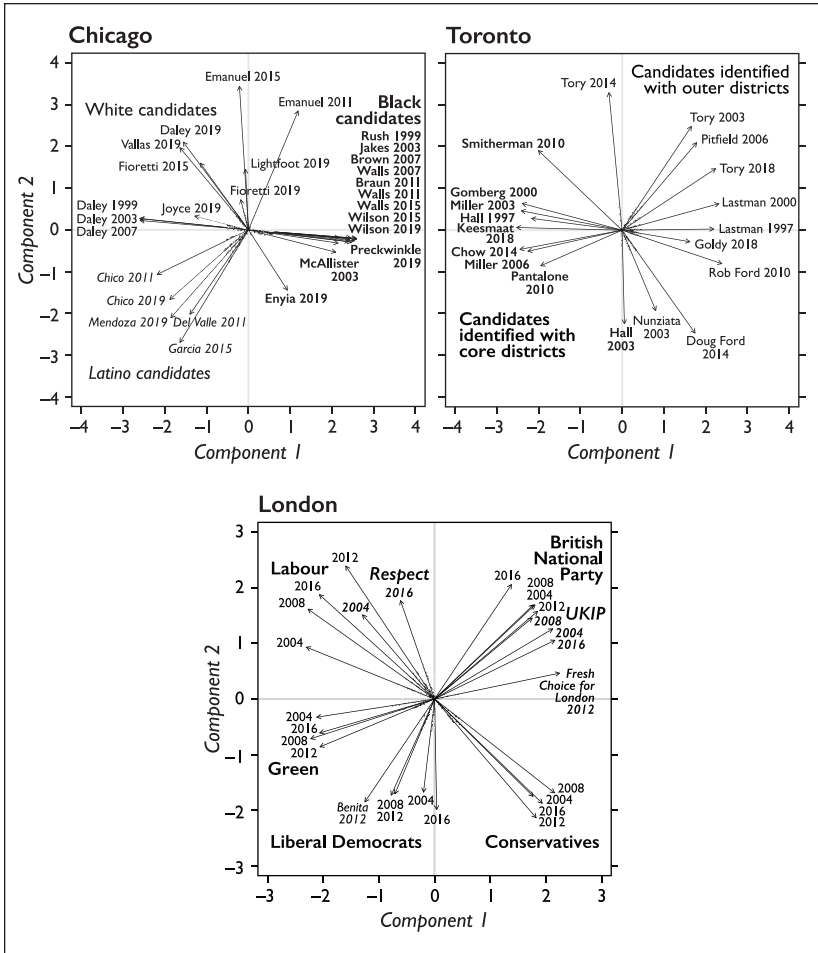
Figure 4. Biplots of candidate loadings on the first two principal components. *Note.* These are row-preserving biplots of standardized component loadings. Plotting of neighborhood points is suppressed for ease of interpretation. See Supplemental Appendix A for unstandardized candidate loading values. Explanations for the London biplot, which is grouped by party: Respect is a splinter of the Labour Party. UKIP = United Kingdom Independence Party; Fresh Choice for London is the banner under which UKIP contested the 2012 election. Siobhan Benita is an independent 2012 candidate with close ties to the Liberal Democrats.

from Labour and the British National Party (BNP). This second component explains a relatively higher share of the total variance than does the second component in Toronto and Chicago.

To interpret the substantive meaning of the PCA results, we correlate neighborhoods' component loadings (which are derived purely from mayoral vote shares) with a set of social, economic, and environmental variables drawn from national censuses. With the exception of income, dwelling value, and rent cost, which are standardized, the variables are percentages of neighborhood totals, for example, the percentage of the neighborhood population that belongs to a particular racial or occupational group. We also calculated the population density and the distance from the center of each neighborhood to the city core.[8] The ten strongest positive and negative census variable correlates for each city's three components are shown in Tables 4–6. For ease of presentation we only show statistically significant ($p < .001$) correlations over .4 (complete correlation tables are available on request).

Chicago's dominant spatial cleavages are grounded in group-based interests, but place- and location-based interests are also present

African-American versus White and Latino. Explaining 56% of variation in neighborhood candidate support across the six general elections held between 1999 and 2019, Chicago's main cleavage is clearly grounded in group-based interests revolving around race. More specifically, this cleavage pits African-American neighborhoods against those with high proportions of Latinos and Whites of European ancestry. Reflecting Chicago's high degree of racial segregation and the close (but not complete) entanglement of race and socio-economic deprivation, the first component correlates very highly with the proportion of Black residents ($r = +.96$); unemployment ($+.65$); those who are divorced, separated, or widowed ($+.58$); poverty ($+.57$); and the proportion of dwellings that are vacant ($+.51$). Neighborhoods that load negatively on component 1 correlate most strongly with married households ($-.77$), residents who do not speak English at home ($-.74$), the proportion of residents who are foreign-born ($-.73$), Hispanics ($-.63$), non-Hispanic Whites ($-.59$), and residents of European ancestry: Poles ($-.55$), Italians ($-.49$), Germans ($-.46$), and Irish ($-.44$).

White versus Latino. Chicago's second cleavage, which explains 14% of neighborhood vote share variation, is also rooted in group-based interests. It revolves around race and, again, class, which in Chicago are strongly associated with one another. The second component positively correlates with the proportion of European-descended, but not foreign-born, Whites ($+.64$). These privileged neighborhoods have elevated property values ($+.50$) and rents ($+.56$). Their residents tend to work in professional, business, and financial services occupations ($+.65$) that are well-paid ($+.53$) and require advanced education ($+.64$). Residents aged

Table 4. Census Correlations with Principal Components, Chicago.

Rank	Variable	r, pc1	Variable	r, pc2	Variable	r, pc3
1	% Black	.96	% professional occ.	.65	% dw. single-family	.57
2	% U.S.-born	.73	% bus./finance occ.	.65	% commute by car	.55
3	% unemployed	.65	% age 18–24	.64	% age 0–17	.44
4	% non-White	.60	% with univ. degree	.64	Distance from Loop	.44
5	% div./sep./wid.	.58	% White	.64	% high school or less	.43
6	% ind. in poverty	.57	% German ancestry	.56	% own	.40
7	% single	.51	Avg. rent	.56		
8	% dwellings vacant	.51	% med. hhld. income	.53		
9	% transit comm.	.42	% Italian ancestry	.51		
10			Avg. dwelling value	.50		
10	% Irish ancestry	−.44				
9	% German anc.	−.46			% rent	−.40
8	Med. hhld. income	−.48			Avg. rent	−.41
7	% Italian ancestry	−.49	% dwellings pre-1980	−.42	% age 18–24	−.41
6	% Polish ancestry	−.55	% no English at home	−.50	% transit comm.	−.42
5	% White	−.59	% age 0–17	−.54	% bus./finance occ.	−.42
4	% Hispanic	−.63	% non-White	−.65	avg. dwelling value	−.42
3	% foreign-born	−.73	% blue-collar occ.	−.69	% professional occ.	−.48
2	% no Eng. at home	−.74	% Hispanic	−.70	% with univ. degree	−.51
1	% married	−.77	% high school or less	−.72	% dw. multi-res.	−.57

Note. All variables except distance drawn from the 2010 Census and 2008–2012 American Community Survey. Coefficients > .75 are shaded in gray. Variables with correlation *p* values above .001 have been dropped.

18 to 24 are overrepresented, potentially reflecting youth-led gentrification. Toward the opposite pole of this component, we find neighborhoods dominated by Hispanics (−.70) and those who do not speak English at home (−.50). In terms of class, the strongest negative correlates are the percentage of the working-age population working in blue-collar jobs (−.69) and with a high school diploma or less (−.72).

Core versus periphery lifestyles. The third cleavage, which explains 11% of neighborhood mayoral vote shares, is most strongly related to a mix of place- and location-based factors. The strongest correlates of the third component are single-family housing (+.57), car commuting (+.55), distance from the Loop (+.44), and home ownership (+.40), as against multi-unit dwellings (−.57), transit commuting (−.42), and renting (−.40). This makes sense when inspecting the map in Figure 1, which shows that this cleavage divides lakefront neighborhoods, particularly high-status and gentrified areas north of the Loop, from those located on the urban "periphery." While rent, education, and occupation also correlate with this cleavage, the built

Table 5. Census Correlations with Principal Components, Toronto.

Rank	Variable	r, pc1	Variable	r, pc2	Variable	r, pc3
1	% commute by car	.83	% management occ.	.87	% South Asian	.56
2	Distance from City Hall	.74	% university degree	.84	% speak Tamil	.55
3	% married	.70	% social services occ.	.75	% Hindu religion	.52
4	% detached dwellings	.45	% Anglican religion	.72	% non-White	.50
5	% aged 0–18	.42	Dwelling value	.72		
6			% United Church religion	.71		
7			% English ethnicity	.70		
8			Avg. hhld income	.68		
9			% White	.60		
10			Avg. rent	.52		
10			% Hindu religion	−.44		
9	Population density	−.40	% Pentecostal religion	−.55		
8	% social services occ.	−.47	% in low income	−.58		
7	% commute by transit	−.54	% non-White	−.60		
6	% atheist	−.61	% Black	−.62		
5	% single	−.70	% unemployed	−.62		
4	% walk, bike commute	−.73	% sales/service occ.	−.70		
3	% prewar dwellings	−.74	% foreign-born	−.72	% White	−.50
2	% unmarried couples	−.79	% income from gov.	−.80	% Catholic	−.58
1	% arts/sports occ.	−.84	% blue-collar occ.	−.83	% Italian eth.	−.67

Note. All variables are averages of values from the 1996, 2006, and 2016 census. Coefficients > .75 are shaded in gray. Variables with correlation *p* values above .001 have been dropped.

environment and transportation variables' stronger coefficients suggest that this cleavage hinges on place-based and location-based interests more than socioeconomic status.

The strength of cleavages varies across elections. The salience of these cleavages depends on the configuration of particular electoral races. As visualized in the biplot in Figure 4, and summarized in Supplemental Appendix A, the 1999, 2003, and 2007 contests were essentially two-way races between Mayor Daley (White) and various Black contenders, and it is no surprise that these candidates load strongly on component 1—the African-American versus White/Latino cleavage. With the exception of Lightfoot in 2019, *all* Black candidates for mayor since 1999 load positively on component 1. With the departure of Mayor Daley, electoral races became increasingly crowded and featured a more diverse set of contenders and political appeals. The second and third cleavages emerge for the first time in 2011, with Latino candidates Miguel del Valle and Gery Chico loading negatively on the Latino pole of the second cleavage but diverging on the lifestyle cleavage. With support from traditionally White working-class unions and a tough-on-crime

Table 6. Census Correlations with Principal Components, London.

Rank	Variable	r, pc1	Variable	r, pc2	Variable	r, pc3
1	% commute by car	.75	% managerial/prof. occ.	.83	% foreign-born	.44
2	% age 65+	.69	% med. hhld. income	.76	% South Asian	.44
3	Dist. from center	.69	% with univ. degree	.69	% Muslim	.41
4	% dw. det./semidet.	.66	% self-employed	.66		
5	% own home	.65	% White	.64		
6	% < high school	.64	% atheist	.46		
7	% married	.62				
8	% born in UK	.56				
9	% Christian religion	.55				
10	% semi-skilled occ.	.49				
10	% walk/bike comm.	−.48	% work from home	−.58		
9	% with univ. degree	−.49	% Muslim	−.58		
8	% foreign-born	−.50	% skilled manual occ.	−.62		
7	% same-sex marr.	−.54	% unemp.—disabled	−.63		
6	population density	−.57	% non-White	−.64		
5	% rent	−.62	% age 0–17	−.64		
4	% dw. apartments	−.64	% no education	−.78		
3	% transit comm.	−.66	% unemployed	−.79	% U.K.-born	−.42
2	% no car owned	−.69	% never worked	−.82	% divorced	−.43
1	% single	−.71	% unskilled occ.	−.89	% atheist	−.58

Note: All variables except distance from center drawn from the 2011 census. Coefficients > .75 are shaded in gray. Variables with correlation *p* values above .001 have been dropped.

message, Chico did better than del Valle in periphery neighborhoods. At the same time, Rahm Emanuel (2011, 2015) and Lightfoot (2019) loaded positively on the second component—that is, they received disproportionate support from privileged White neighborhoods. The 2015 and 2019 elections also saw Latino candidates load onto the second component's Latino pole while White establishment figures Paul Vallas, Robert Fioretti, and Richard M. Daley's brother William Daley did best in periphery areas.

Toronto's dominant cleavage is place- and location-based, followed by socioeconomic status and immigrant identity

Core versus periphery lifestyles. The dominant cleavage in Toronto, which explains 56% of variation in neighborhood vote shares in the general elections held between 1997 and 2018, has little to do with race and ethnicity but rather represents the mix of location- and place-based factors that constituted the third component in Chicago. Indeed, we can say that Toronto politics first and foremost pit the downtown bastions of residents emerging out of Richard Florida's *Rise of the Creative Class* against periphery neighborhoods with car-reliant families. Census data (see Table 5) reveal that residents in areas

with negative scores on the first component—namely, "core" areas—tend to be single (−.70) or live as unmarried couples (−.79) and atheist (−.61). They are disproportionally likely to commute by transit (−.54) as well as walking or cycling (−.73). Their areas tend to be dense (−.40) and exhibit a large proportion of dwellings built before the Second World War (−.74). Occupationally, we find in these areas an outsized share of people working in "creative" occupations related to the arts as well as sports and recreation (−.84). By contrast, "periphery" areas with positive scores on the first component are first and foremost characterized by residents commuting by automobile (+.83) and distance from City Hall (+.74). The periphery also contains higher incidence of traditional domestic lifestyles: marriage (+.71) with children (+.43) and living in single-detached housing. If Chicago is a city where politics are organized primarily along racial lines, Toronto shows that substantively different divisions—in this case, place- and location-based lifestyles and interests—can structure city politics just as profoundly.

Establishment versus marginality. Regarding Toronto's second cleavage, which explains 20% of vote share variation, we find a political divide that unfolds primarily within the city's periphery. As seen in Figure 2, negative loadings on component 2 in Toronto are located on a "U"-shaped arc running from the city's core to its northwest and northeast extremities.[9] Positive loadings are found in the city's geographic center and in periphery areas to the southwest and along the eastern lakefront. Areas with positive loadings on the second component contain what we may think of as Toronto's privileged establishment. As shown in Table 5, residents here tend to be university-educated ($r = +.84$), of English ethnicity (+.70), practice Anglican (+.72) and United Church (+.71) religion, White (+.60), high-income (+.72), and work in management (+.87) and social services (+.75) occupations. Neighborhoods with negative scores on the second component exhibit disproportional levels of blue-collar (−.83) and sales and service (−.70) employment, income from government transfers (−.80), and incidence of unemployment (−.62) and low income (−.58)—in short, concentrated disadvantage. Areas with negative loadings also contain disproportionate populations of Blacks (−.62) and immigrants (−.72). (In contrast to Chicago, Toronto's Black population is largely composed of postwar immigrants from the Caribbean and Africa.) Furthermore, these areas are often poorly connected to the urban core by road and high-frequency transit, while the opposite is true for neighborhoods with positive loadings on component 2, indicating some overlap with locational factors. Thus, the second political cleavage in Toronto revolves around class, differential levels of spatial isolation from downtown, and an established-outsider status distinction (Elias

and Scotson 1994)—the strong association with "high church" Protestant denominations suggests that the component encapsulates not just class but also a status dimension.

Southern European versus South Asian. Toronto's third cleavage, which accounts for 7% of the variation in neighborhood vote shares, revolves around group-based interests grounded in ethnicity and immigration. It represents a division between neighborhoods containing concentrations of established, mostly Italian (−.67), Catholic (−.58) immigrants and those that are home to more recently arrived immigrants from South Asia (India, Pakistan, and Sri Lanka) (+.52 to +.56).

The strength of each cleavage varies across elections. As in Chicago, we see a strong relationship between candidates' identities and messages and their spatial support, as well as distinct patterns of cleavage manifestation in relation to the number of candidates in each race. The two-way races in 1997, 2000, 2006, 2010, and 2018 were between candidates strongly identified with the core and periphery zones of the amalgamated city. The first mayor of the new city, Mel Lastman, had been the longtime mayor of the dissolved suburban borough of North York; his opponent in 1997 was a quintessential "core" candidate, the former mayor of the old City of Toronto Barbara Hall. In 2000, Lastman easily trounced environmental activist Tooker Gomberg, who received little support overall but far more in core than periphery neighborhoods. In 2006 and 2010, respectively, Jane Pitfield and Rob Ford did best in the periphery areas they had represented as councilors. Their opponents David Miller and George Smitherman did best in the core, where they had held office as a councilor and provincial legislator, respectively. Similarly, Jennifer Keesmaat, a prominent urbanist and the City's former planning chief, had strong support in the core but lost to John Tory in peripheral areas in 2018.

As in Chicago, multi-candidate races enabled the activation of additional cleavages. In 2003 and 2014, John Tory, scion of a prominent establishment family and sometime lawyer, businessman, philanthropist, and Conservative party insider, loaded positively onto component 2—that is, he drew support disproportionately from privileged neighborhoods—while neighborhood vote shares for his right-populist opponents John Nunziata (2003) and Doug Ford (2014) loaded onto that cleavage's marginality pole. Two candidates load positively on the third component: John Nunziata (2003) and Joe Pantalone (2010). Their ideological orientations are in fact completely different, but their common Italian and Catholic heritage suggests that the third factor points to ethnic affinity voting. (Toronto's population was 28%

Catholic and 7% Italian in 2011.) The only candidate who loads negatively on component 3 is Barbara Hall, who campaigned extensively in more recently arrived South Asian immigrant communities.

London's political cleavage structure resembles Toronto's

Core versus periphery. As in Toronto, the strongest component indicates a political division between core and periphery locations and associated lifestyles. This component explains 41% of variation in neighborhood vote shares in the four mayoral elections held between 2000 and 2016. These neighborhoods differ by indicators of place- and location-based interests, differentiating those who tend to commute by automobile (+.75), are more distant from the core (+.69), live in lower-density freehold housing (+.66), and own their homes outright (+.65) from those who do not own a car (−.69), commute by transit (−.66) or walking and cycling (−.48), reside in apartments (−.64), rent (−.62), and live in high-density urban environments (−.57). The map in Figure 3 suggests that positive scores are concentrated in core areas and negative scores in peripheral areas. Periphery residents are disproportionately older (+.69), married (+.62), U.K.-born (+.56), Christian (+.55), and White (+.44), while in the core we see higher proportions of singles (−.71), same-sex couples (−.54), and foreign-born residents (−.50).

Establishment versus marginality. Again similar to Toronto, London's second component, which explains 27% of variation in vote shares, indicates group-based divisions along the lines of class and social status. This cleavage crosscuts London's core/periphery divide. Positive loadings on component 2 are located on an arc running from the city's southwest to northwest, and also the southeast. Negative loadings are found in periphery areas to the west and northeast. The component correlates positively with the incidence of unskilled (−.89) and skilled manual (−.62) occupations, unemployment (−.79), low educational attainment (−.78), non-Whites (−.64), and adherents of Islam (−.58). The opposite pole consists of neighborhoods with rates of middle- and upper-middle-class people with high-status occupations (+.83) and high incomes (+.76), who are disproportionately White (+.64) and university-educated (+.69).

U.K.-born versus immigrant. London's third cleavage, which explains 13% of variation in vote shares, divides neighborhoods by group-based factors such as concentrations of U.K.-born residents (−.42), who are more likely to be divorced (−.43) and nonreligious (−.58), from those with concentrations of immigrants (+.44), including South Asians (+.44) and Muslims (+.41).

The strength of each cleavage varies across elections. As aforementioned, partisan elections stabilize the terms of competition in London. Institutionalized party organization and leadership, reinforced by connections to national politics, constrain shifts over time in parties' policy positions and ideology. In all years, "core" indicates support for leftist/postmaterialist parties (Labour, the Greens, and the anti-racist Respect), while "periphery" indicates support for the Conservatives and the Eurosceptic, nationalist, and anti-immigrant right: the BNP and UKIP (campaigning as "Fresh Choice for London" in 2012). "Establishment" neighborhoods tend to support the Conservatives and Liberal Democrats, while "marginality" wards often reject "elite" options, although to different degrees in different elections. Unlike in Toronto, where marginality neighborhoods support populist right candidates when they emerge, London's marginality areas support parties of both the left and the right: in addition to Labour, they vote for the leftist Respect (2004 and 2016) but also for the rightist BNP and UKIP. Considering component 3, which captures a division between neighborhoods with higher U.K.-born versus immigrant populations, we see that they give support to both left and right parties. The "U.K.-born" neighborhoods tend to support both the centrist Liberal Democrats and the anti-immigrant BNP and UKIP, while "immigrant" neighborhoods support both the pro-Israel Conservative Party and the leftist anti-Zionist Respect party.

To What Extent Do Cities' Multiple Types of Cleavages Inflect One Another?

The correlation analysis reveals how bundles of neighborhood characteristics are associated with the relative presence of the spatially articulated cleavages revealed by the PCAs. These bundles encompass not only group-based interests rooted in factors such as ethno-racial background, income, occupation, religion, and so on, but also variables associated with location and place: distance from the city center, commuting behavior, and housing types. We have shown that one of each city's components is primarily associated with location- and place-based factors, but we have not yet examined the degree to which the effects of location and place are independent from one another or how they interact with group-based interests.

To address our final research question, we present findings from ordinary least squares (OLS) regression models (shown in Table 7) that include interaction terms, which allow us to examine how different cleavage sources inflect one another. The dependent variable in these models is the neighborhood loading on the place- and location-based cleavage we identified in each city: Toronto and London's component 1 and Chicago's component 3. As our

Table 7. Interaction Models.

	Chicago pc 3	Toronto pc 1	London pc 1
Predictors	Estimates	Estimates	Estimates
% Low-density housing	1.104***	0.491***	0.765***
Distance from city center	−0.121*	2.450***	1.419***
% White	0.033	−0.134	1.122***
Median household income	−0.525***	0.162	−0.261*
% Low-density housing × % White	0.675***	0.162	0.219
Distance × % White	−0.104	0.946***	−0.158
(Intercept)	0.015	0.490***	−0.020
Observations	787	518	630
R^2	0.542	0.658	0.592

Note. All predictors have been z-standardized.
*$p < .05$. **$p < .01$. ***$p < .001$.

independent variables, we include one measure each of place (housing type), location (distance from the city center), group (race), and interaction terms between group and place as well as location. In addition, we control for median household income. While other variables could shed additional light, we present sparse models for clarity and to avoid multi-collinearity, but even these achieve high explanatory power of R^2 values greater than .5.

First, the findings in Table 7 demonstrate that place and location are not epiphenomena of neighborhood composition in the form of group interests. Even after controlling for race and income, the presence of low-density housing and, in Toronto and London, distance from the city center predicts support for periphery candidates. In Chicago, low-density housing matters much more than distance. More importantly, however, we find strong and significant interaction terms for Chicago and Toronto. In Chicago, White neighborhoods are on average no more likely to support periphery candidates than non-White neighborhoods. However, White neighborhoods with large proportions of low-density housing lean strongly toward periphery candidates. Race and place thus inflect one another—White neighborhoods in Chicago vote differently depending on their housing stock. As in Chicago, Toronto's White neighborhoods do not tilt toward periphery candidates on average; however, they do so if they are located far away from the city center. Race and location inflect one another in Toronto—its White neighborhoods vote differently depending on their proximity to the urban core. By contrast, in

London, group concentrations, location, and place do not interact, but including these variables in one regression model reveals a general, positive association between proportion White and voting for periphery candidates—a finding that demands further investigation.

Overall, these results indicate that a neighborhood's location within the city, as well as physical characteristics such as the housing stock, can influence the neighborhood's political orientation, an influence that cannot simply be reduced to composition. Moreover, location- and place-based factors interact with group-based interests that might seem to be independent of location and the built environment. Simply put, the political orientation of concentrated groups differs based on their neighborhoods' location and place characteristics.

Discussion

In this article, we propose a research agenda of identifying the spatial articulation of urban political cleavages. Synthesizing and extending multiple literatures, we argued that the spatial articulation of political cleavages can be specified empirically by pursuing three questions: (1) the extent of between versus within neighborhood voting; (2) the substance of political cleavages in group-, place-, and location-based interests; and (3) the interaction of multiple cleavage sources. We found that across Chicago, Toronto, and London, voting patterns are strongly spatialized. At the neighborhood level, most elections are landslides, and nearby neighborhoods tend to share a common political orientation that endures through time. Furthermore, we specified the substance of these cleavages by examining the neighborhood characteristics that correspond to their presence and absence. Table 8 summarizes these findings. In line with classic research on social groups as a source of cleavage formation, we find that neighborhoods whose populations are more homogeneous in terms of race, ethnicity, or class have shared political leanings that undergird citywide political cleavages. This is the case for Chicago's first and second as well as for Toronto and London's second and third principal components. In addition, however, we find that urban cleavages may also revolve around competing lifestyles associated with different built environments, property tenure, transportation behavior, and urban location. Unlike race, ethnicity, and class, these cleavages emerge directly from different ways of experiencing and relating to urban space.

The strength of particular cleavages varies across cities. Racial segregation is the dominant form in which political cleavages are articulated spatially in Chicago and probably many American cities. For decades, White and Black neighborhoods have formed relatively distinct voting blocs that vie for political power, especially in Midwestern and Northeastern cities. The growth

Table 8. Cleavage Summary.

PC	Chicago	Toronto	London
1	**Afr. Am. ⟨→⟩ White/ Latino (56%)** African-American neighborhoods support Black candidates. White and Latino neighborhoods support their opponents.	**Core ⟨→⟩ Periphery (56%)** Dense core supports progressive candidates. Low-density, auto-dependent periphery areas support conservative candidates.	**Core ⟨→⟩ Periphery (41%)** Dense core supports progressive parties. Lower density periphery areas support conservative parties.
2	**White ⟨→⟩ Latino (14%)** White, well-off, privileged areas support business-friendly White candidates. Mostly Latino, blue-collar areas support Latino candidates when they run.	**Establishment ⟨→⟩ Marginality (20%)** Privileged areas support establishment conservative candidates. Disadvantaged areas support right-populist candidates when they run.	**Establishment ⟨→⟩ Marginality (27%)** Privileged areas support mainstream parties (Labour, Conservatives, Liberal Democrats). Disadvantaged areas support anti-establishment parties (BNP, UKIP, Respect).
3	**Core ⟨→⟩ Periphery (11%)** Ethnically diverse core areas support more progressive candidates. Auto-dependent periphery areas support more conservative candidates.	**Southern European ⟨→⟩ South Asian (7%)** Established southern European neighborhoods support Italian candidates when they run. Asian immigrant neighborhoods cohere when appealed to.	**U.K.-born ⟨→⟩ Immigrants (13%)** U.K.-born areas support Lib Dems and xenophobic parties. Established, mostly South Asian and Muslim immigrant neighborhoods support Conservatives and Respect.

Note. PC = Principal component; BNP = British National Party; UKIP = United Kingdom Independence Party.

of the Latino population has made these neighborhood-based blocs tripolar (Benjamin 2017), but it has not eliminated race and ethnicity as the dominant ordering principle of urban politics, although place- and location-based interests matter at the margins—Chicago's third component suggests that the city's "core" and "periphery" diverge politically beyond their group-based differences. Toronto and London display a remarkably different primary ordering principle, one that is much more rooted in neighborhoods' place- and location-based differences, but which nevertheless divides the city just as deeply as do race and ethnicity in Chicago. In those cities, core and periphery lifestyles constitute the dominant cleavage, establishment and marginality the second, and ethnicity the third. While we found that race mattered less in

Toronto and London than in Chicago, we also found that place, location, and race can strongly inflect one another. The association of race with these cleavages in some cases becomes visible only after allowing for interactions with place and location. Research on place and location, therefore, does not reduce attention to race, ethnicity, and class as essential urban cleavages. Rather, these categories often operate in combination with sui generis sources of urban cleavages, sometimes even rendering group-based differences visible that would otherwise be obscured.

We encourage scholars to extend and broaden our approach. Taking the spatial articulation of urban politics seriously opens up multiple opportunities to advance urban politics scholarship. One direction involves digging deeper into the spatial roots of politics within cities. We have analyzed population and place variables collected by censuses, but additional factors likely provide place-based anchors for distinct political coalitions. For instance, neighborhood politics may be shaped by community organizations (Sampson et al. 2005), third spaces (Oldenburg 1989), and even the prevalence of porches in the built environment (LeVan 2020). By drawing on business patterns databases, records of physical characteristics (e.g., Google Street View), and local crime and school performance statistics, scholars can deepen our understanding of the place-based roots of urban political cleavages. Scholars should also incorporate additional features of location beyond distance from the urban core. For example, Enos (2017) has shown that political mobilization increases in relation to neighborhoods' proximity to salient outgroups. Other potentially important location-based interests include differential access to rapid transit or highways and differential exposure to natural hazards such as wildfires and flooding.

In addition, scholars could examine the processes by which the various interests underlying spatially articulated cleavages become activated through political campaigning. For example, our background research for this article revealed that "periphery" candidates in Toronto have forcefully opposed bike lanes and public transit ("end the war on the car"), tolls on downtown access highways ("highway robbery"), and city taxes and fees that fund social services ("stop the gravy train") (Church 2014; Gilmour 2010; Lorinc 2004), deploying rhetoric that invokes place- and location-based interests in combination with class. Scholars should investigate in detail the rhetoric and political signals that politicians deploy to tap into political cleavages (see Benjamin 2017) and their various spatial roots. Furthermore, scholars should examine additional local actors that mobilize people around the interests we have identified, including activists, resident and business associations, faith-based groups, and more (Doering 2020; Small 2004).

Building on our framework would enable scholars to aggregate these insights more systematically, for instance, by joining neighborhood voting patterns and characteristics to longitudinal data about building permit applications, protest events, candidate platforms, and neighborhood-based media such as blogs and Facebook groups. Finally, scholars could push our ecological analysis further by examining cross-level interactions between neighborhood conditions and individuals' local political behavior and attitudes toward urban issues, joining urban politics research more directly with the neighborhood effects research tradition. How much do individuals' attitudes toward, for instance, transit policy, taxation, or environmental remediation depend on group, location, or place-based attributes of their neighborhoods, over and above their individual attributes?

In addition to investigating the spatial articulation of politics within cities, scholarship building on our work could look for patterns between cities. To be sure, we make no claim that the particular cleavages we identified in Chicago, Toronto, and London are the only urban cleavages to be found. Nonetheless, we can venture broad-strokes predictions about a city's cleavages on the basis of that city's demographic features, economy, spatial structure, and built environment that could guide further research. For example, we might expect that group-based cleavages dominate in cities that are segregated by race, language (e.g., Montreal, Brussels), or religion (e.g., Belfast) and that where ethno-racial, linguistic, or religious identities correspond spatially to concentrated disadvantage, as in Chicago and the United States overall, ethno-racial cleavages will overlap with the establishment–marginality cleavage. Similarly, the greater the economic inequality and segregation, the more salient the establishment–marginality cleavage, and sometimes also the core–periphery cleavage, are likely to be. For instance, in postindustrial, service-oriented cities like Toronto, London, and Paris, professionals inhabit dense but fashionable downtown districts, the rich seclude themselves in prohibitively expensive, low-density neighborhoods, and the marginalized find themselves pushed into dense rental housing on the fringes of the city. Finally, the core–periphery cleavage will likely be weak or non-existent in small cities and decentralized cities without significant core areas—for example, California's Irvine or Brampton outside of Toronto. Furthermore, we expect the cleavage to be weak in compact cities with relatively undifferentiated built environments and mobility patterns such as San Francisco and Vancouver. Instead, core–periphery conflicts there probably play out at the metropolitan scale, between the central city and its separately incorporated suburbs.

Pursuing these lines of research may yield a more comprehensive theory that incorporates contextual variation, transformation, and mobilization. The present article, however, starts a step back. First and foremost, our goal has

been to systematically demonstrate the spatial roots of urban political divisions, to build up theoretical and analytical infrastructure for understanding and explaining spatially articulated cleavages, and to illustrate the utility of this approach through a comparative analysis of three cities.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. While we did not compare local with proximate national and European Parliament election results, we found that ward-level support for the same parties in elections for London mayor, the Greater London Assembly, and council seats in the 32 boroughs and Greater London Corporation was highly correlated within and across years. Moreover, year-over-year Spearman rank-order correlations of ward-level party vote shares were very high—greater than .87 for Labour and .95 for the Conservatives, and .72 or higher for the Liberal Democrats, the British National Party, and the United Kingdom Independence Party.

2.   Greater London Authority mayoral elections use an instant runoff ballot where voters rank 2 candidates in order of preference. If a candidate receives more than 50% of first-choice votes, he or she is elected. Otherwise, the two leading candidates enter into a second round. The second-choice votes of those ballots whose first choice was eliminated are then counted and added to the first-round totals. The candidate with the highest combined total of first- and second-choice votes wins.

3.   As a data-reducing strategy, our approach is conceptually analogous to Poole and Rosenthal's (2007) widely used technique for analyzing congressional roll-call votes, which locates representatives' relative ideological positions in low-dimensional space.

4.   Electoral precincts and census tracts are both bounded by linear features such as streets and rail lines and therefore share common edges. To apportion precinct-level vote counts to census tract boundaries, we (1) assigned census blocks (for which population counts are available) to their enclosing precincts, (2) calculated the population of each precinct and each block's proportion of the precinct population, (3) multiplied the precinct vote counts by each block's share of the precinct population, and (4) summed the results by census tract.

5.   Given the large number of minor mayoral candidates in some Toronto and Chicago elections, we include in the analysis each candidate (or, in the case of London, party) who received at least 3% of the citywide vote in any given general election in which they ran.

6.   We did not include components beyond the third in the analysis because they individually account for very little variation in neighborhood vote shares. The fourth component accounts for 4.8% of variation in Chicago, 4.7% in Toronto, and 6.6% in London—in each case a substantial drop-off from the third.

7.   To ensure that these results are not artifacts of the principal component analysis (PCA), we also calculated Global Moran's I scores for several candidates' vote shares and found similarly high values. For a similar analysis, see Walker's (2013) spatial analysis of congressional voting in the Minneapolis-St. Paul region.

8.   City cores are defined as follows: in Chicago, the centroid of tract 3204, which encompasses Millennium Park; in Toronto, the location of City Hall; and in London, the centroid of the City of London ward.

9.   These comparisons take on added meaning given recent local discussions around increasing spatial polarization by income, demonstrated by Hulchanski (2010). Even in a city where income (high and low) is growing increasingly spatially concentrated, political differences transcend this division.

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