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PLACES FOR PUBLIC DISCOURSE: THE IMPACT OF WALKABILITY ON PROTEST IN THE UNITED STATES

A Thesis in

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Abstract

Social movement scholarship on the emergence of protest in its current theoretical paradigms has limited engagement with built environment scholarship. However, urban scholars dating back to Lefebvre have theorized that the physical environment produces social reactions, and recent work (e.g. Nejad 2013, Deaton 2015) has examined how spatial characteristics related to urban form determine where people gather to protest and how often. This study examines walkability as a design feature which may impact protest frequency. Prior studies linking walkability to protest have had very small sample sizes (Németh and Carver 2017) or have not measured protest frequency directly (Knudsen and Clark 2013), likely because comparing protests between cities is difficult without cities sharing a causal and temporal commonality from which protests can be analyzed. The recent George Floyd protests, which occurred repeatedly in all major US cities throughout the summer of 2020, offer such an opportunity for a more thorough between-city case study in the United States. I find that cities with higher overall levels of walkability saw more population-adjusted protests during the 2020 George Floyd movement, and that this association is mostly supported when using specific locations, including courthouses, police headquarters, city halls, public parks, and state capitols as the unit of analysis instead. This study finds evidence that, when using a expanded sample size of cities, the nature of the walkable built environment maintains a role in facilitating acts of collective action, suggesting implications for movement scholars who are interested in predicting protest as well as for urban scholars, planners, and other stakeholders who are interested in evidence on the various impacts of walkable spaces on cities.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1 - Introduction

The freedom of assembly is an important cornerstone in any democratic civil society. In the United States, it is enshrined in the Constitution and has been a key contributor to many of the country's most important social and political reforms. In recent years, for example, American demonstrations about racialized police violence have prompted public discourse about systemic racial inequality both domestically and across the globe. Protests, even those that don't result in institutional change, play a crucial role in introducing claims to a larger audience. Social movement scholars have long been interested in examining what factors account for the frequency and location of protest events (Schussman and Soule 2005). However, within this framework, movement scholars have mainly focused on how political opportunity structures (Kitschelt 1986; McAdam [1982] 1999; Moss 2016; Williams 2023), resource availability (Breuer, Landman, and Farquhar 2015; Walsh 1981), or both (Soule et al. 2006) shape demonstrations. With a few exceptions (McCarthy and McPhail 2006), the role that the built environment plays in protest has been mostly explored from other academic perspectives, including geography, anthropology, architecture, and political science (Gül, Dee, and Nur Cünük 2014; Jansen 2001; McGahern 2017; Nejad 2013; Salmenkari 2009). More work needs to be done to incorporate this interdisciplinary focus on space into social movement theoretical paradigms. Sociologists, particularly urban sociologists, have long taken inspiration from how scholars such as Henri Lefebvre (Lefebvre [1974] 1991) have conceptualized how social relations are reproduced in physical space, and how such spaces facilitate interaction and nurture social ties, factors crucial to the building of social movements and the demonstrations they hold.

This is where the concept of a walkable city, long championed by urban scholars and activists, comes in. Walkability, within the context of urban planning, is typically characterized

by a built environment distinguished by short distances between housing, employment, and amenities, as well as dense and well connected pedestrian paths protected from vehicular traffic (Jacobs 1961; Price 2018). Theoretically and empirically, walkable cities have been connected to beneficial impacts on health, safety, community building, the economy, and the environment (Charron 2017; Freemark and Jenkins 2022), and they have become a major topic of conversation in urban planning circles and in the media (Chamberlain 2022). The current study, by examining the relationship between walkable locations and the frequency of protests, aims to understand their role in facilitating democratic behavior as well. In the sections that follow, I explore how walkable environments may facilitate social movement ties as well as provide locational benefits to demonstrators, thus providing multiple plausible, and testable, links between walkability and protest.

Chapter 2 - Literature Review

I. Overview of the two Mechanisms

In this study, I narrow my measurement of protests to just their frequency (as opposed to other components of protest, such as crowd size or success rate), and use theoretical and empirical literature to expand upon two distinct mechanisms through which a walkable urban environment may increase it. Firstly, walkable urban design may have a passive impact on the formation of social ties that are necessary in order for protest to happen. I call this the *social mechanism.* Secondly, it may play a role in the strategic considerations of protestors, who have many reasons to be attracted to places where urban design is more hospitable to foot traffic. This will be termed the *strategic mechanism.* These two mechanisms present two fundamentally different ways on which walkability may operate on protest. The social mechanism posits that a city's built environment facilitates the network connections necessary for protests, yet is agnostic on the exact locations from which a protest may take place. The strategic mechanism, on the other hand, suggests a location-specific process that draws protestors to areas with high walkability. The theoretical origins of these ideas are explored in turn.

II. The Social Mechanism

i. Walkability and Social Capital

The idea that walking in an urban environment helps build social cohesion has prevalent theoretical roots. Jane Jacobs, in her urban planning treatise *The Death and Life of Great American Cities*, argued that cities facilitate high levels of pedestrian activity through an abundance of densely populated, mixed-use neighborhoods with well-placed public spaces and wide sidewalks (Jacobs 1961). These walkable places, according to Jacobs, facilitate social

connection in the form of regular interactions with both familiar and new people, an abundance of easy opportunities to congregate with groups of similar interests, and common ties neighbors develop with high profile community members. In urban sociology, her work has impacted how scholars perceive social impacts of the built environment. Subsequent sociological analysis of urban design has cited Jacobs, observing that spaces like parks and plazas most effectively produce social ties when they are surrounded by a diversity of jobs and amenities that bring different types of people in contact with the square by foot (Yancy 1983). Manuel Castells later developed similar thoughts about the social value of urban form, arguing that interchanges where walkers pass through and public spaces with social activity were vital in creating a sense of shared city life amongst the public, a phenomenon he termed "the sociability of public spaces in the individualized metropolis," (Castells [2003] 2018:152). For Castells, simply being in the public presence of others creates a valuable urban interaction network.

Network ties have also long been studied by sociologists through the conceptualization of social capital (Coleman 1988). In relation to the built environment and collective action, Robert Putnam's civic perspective on social capital is particularly noteworthy. In his seminal book *Bowling Alone* (2001), Putnam argued that Americans' social capital had declined precipitously from the 1960s onward. He conceptualized civic engagement, social group participation, and trust in fellow citizens as some of the key components of the overall concept of social capital. He found declines in all these metrics among Americans and explored a variety of phenomena which he argued brought about this decline, among them suburbanization (Putnam 2001:204). American suburbs are widely regarded as unwalkable spaces (Muller 2004; Price 2018), with amenities and neighborhoods significantly distanced from one another, necessitating vehicle travel as the most safe and convenient option for engaging in public life. Putnam argued that this

rise in automobile use meant that travel had become a private activity, done within confined spaces where engagement with passersby was irrelevant to commuting networks. Therefore, Putnam had a Jacobsian idea of how the shared occupation of public space built social ties. More recently, qualitative scholars have further developed the idea that individuals' walking experiences create interaction environments that facilitate a unique sense of community and place (Kanellopoulou 2017), while quantitative work has found correlations that Jacobs' built environment walkability features are in fact correlated with increased physical activity, with more consistent evidence supporting walking for transportation as opposed to walking for leisure (Frank et al. 2005; Frank and Engelke 2001; Owen et al. 2004; Saelens and Handy 2008).

In the last few decades, the relationship between walkability and social capital has also become the focus of many empirical studies. A seminal study of this type was conducted by Leyden (2003), who observed that measures of self-rated social capital, including political participation, were higher among residents in more walkable neighborhoods when compared to car-dependent neighborhoods in the same Irish city (Leyden 2003). Around the same time, Lund conducted two survey studies in Portland, Oregon measuring similar concepts. The first (2002) found that residents' sense of community was higher in an objectively and subjectively pedestrian-oriented neighborhood than in an automobile-oriented neighborhood (Lund 2002). In the second (2003), she found that residents in neighborhoods with easy walking access to parks and retail had more unplanned interactions with their neighbors than those without, supporting Jacobs' idea about how walking fosters interaction (Lund 2003). Subsequent studies have been synthesized by a literature review conducted by Mazumdar et al. (2018), who found consistent positive associations between social capital and four common (Cervero and Kockelman 1997) built environment operationalizations of walkability: destinations, density, diversity, and design

(Mazumdar et al. 2018). More recent studies connecting walkability with higher levels of social capital were conducted by Kwon et al. (2017) and Lee et al. (2018) (Kwon, Lee, and Xiao 2017; Lee et al. 2018).

The literature review conducted by Mazumdar et al. (2018), despite its findings of a largely positive relationship, also captured counterintuitive findings, part of a growing body of recent empirical research that has cast doubt on the link between walkability and social capital (Jun and Hur 2015; Koohsari et al. 2021; Mouratidis and Poortinga 2020; Wood, Giles-Corti, and Bulsara 2012). Koohsari et al. posited that walkable areas tend to be in dense, crowded, commercial areas that might serve to create an environment of anonymity rather than community. Jun and Hur (2015) made some of the same observations about anonymity in highly crowded spaces while also pointing out that walkability metrics are generally higher in high poverty, high crime areas in the United States. While it may be scientifically more advantageous to walk in these areas, residents may not always feel safe when doing so, discouraging interaction. A similar conclusion was reached by Wood et al. (2012) who found that negative perceptions of the built environment, such as perceived safety, upkeep, and the presence of housing, may have contributed to a more walkable street grid being outscored in social capital measures than a less walkable grid. Therefore, despite theoretical and early empirical support for a connection between walkability and social capital, recent research has called this connection into question.

ii. Social Capital and Protests

I propose that social capital could mediate a positive relationship between walkability and protest frequency, with communities of higher social capital having greater means to engage in

forms of collective action such as protest. Jacobs contended that network ties in neighborhoods made them more robust in their ability to defend their interests in the political sphere. As an example, she recounts her own experiences in New York's Greenwich Village, where the neighborhood's collective action against highway bisection was facilitated by strong social ties between high visibility community figures, such as petitioners and store owners, who spread information through their network ties with pedestrians and customers (Jacobs 1961:70).

The idea that political mobilization could spread in this way was further developed by Granovetter in "The Strength of Weak Ties," where he speculated that social insulation in the West End Italian community in Boston caused it to fail to mobilize against the urban renewal that eventually destroyed it (Granovetter 1973) For Granovetter, dissemination of information about a neighborhood political movement only attracts constituents when the information is being distributed through network ties, and the lack of weak ties in this fragmented community prevented these efforts from taking hold. Inspired by this work, Coleman in his foundational piece on social capital noted how radical ideas were passed through networks of Korean activists through appointed inter-network representatives (Coleman 1988). These pieces strengthen Jacobs' assertion that network building within a community helps mobilize it politically and specifically suggest that this process happens through leveraging weak ties.

For his part, Putnam argued that his findings on the decline of US social capital had serious implications for democracy. Along with the other dimensions of social capital that declined over Putnam's period of study, political participation also fell across the board, including voter turnout and the percent of Americans who attended a local government meeting, attended a political rally, or worked for a political party (Putnam 2001:41–43). Putnam argued

that declines in social capital were responsible for this climate of political disillusionment and apathy.

Finally, in the field of social movements research, both resource mobilization and political process literature link social capital with protest (van Stekelenburg and Klandermans 2013; Zhuang, Wang, and Li 2023). Resource mobilization theorists, such as McCarthy and Zald (1977) contend that social movement organizations can successfully recruit by reaching out to non-movement local groups that might be composed of movement sympathizers (McCarthy and Zald 1977:1228), and that the maintenance of friendship and professional ties helps the main body of the organization earn loyalty from its branches and affiliates (McCarthy and Zald 1977:1231). The political process model, though traditionally a competitor with resource mobilization theory, is similar in its position on network ties. In his foundational piece on the political process model, McAdam (1982) argued that "only rarely and with great difficulty do previously isolated individuals emerge, band together, and form movement groups. Rather, it is along established lines of interaction that movement recruitment usually occurs" (McAdam [1982] 1999:128–29). He argued that existing community structures, like Black churches, Black universities, and the NAACP helped mobilize communities of African Americans into a strong base for insurgency during the Civil Rights Movement. According to both theories, abundant networks of both strong and weak ties provide vital lines of communication for information about movements to diffuse through different social circles. Given the literature on walkability and social capital, it is possible that a pedestrian-oriented environment could play a role in facilitating these lines of communication, thus leading to higher numbers of demonstrations.

III. The Strategic Mechanism

i. Location Considerations for Protests

Protests are located in physical space, and the choices that protestors make about which spaces to occupy are the second dimension along which walkability might impact protest frequency. I begin this argument with a more general discussion of how place matters to protest. One of the early theorists of the built environment's role in social reproduction was Henri Lefebvre, who differentiated between representations of space, referring to how space is conceptualized by professionals, and representational space, referring to how such spaces are symbolically reconceptualized through the lived experiences of those who come in contact with the space (Lefebvre [1974] 1991). This concept can be seen in contemporary social movement literature. Endres and Senda-Cook (2011) theorize that locations of protest are often tied symbolically to the rhetoric of protesters (Endres and Senda-Cook 2011). Actors choose to protest in places that are laden with symbolic meaning relevant to their particular cause, often in an effort to challenge or reconstruct the place's social meaning. For example, this can be observed in civil rights protests such as the March on Washington, where protestors occupied the National Mall in a challenge to oppressive institutions perpetuated by the federal government. The Mall was thus reconceptualized as a place of racial progress and has been frequently revisited by subsequent civil rights protestors (Endres and Senda-Cook 2011). McCarthy and McPhail (2006) also consider location and protest, taking the legal concept of the public forum and analyzing it from a social movements perspective (McCarthy and McPhail 2006). The public forum includes locations such as state capitals, municipal courthouses, sidewalks, streets, and municipal parks that are codified in American law as the most appropriate spaces for protest because of their long history in shaping civil action in the United States. Despite a growing

privatization of such spaces coupled with large crowds increasingly congregating in private venues (such as stadiums, malls, and concert halls), McCarthy and McPhail argue that protestors still overwhelmingly cling to the public forum for their activities. Bringing Lefebvre back in, it is clear that protestors challenge institutions by challenging the meaning, or representation, of the spaces they occupy. Protesters do not choose locations at random, but instead frequently occupy spaces that, in addition to being publicly visible, have distinguishable symbolic characteristics that they can engage with.

ii. Linking Walkability and Location

Walkability may have an impact on which of these prominent, symbolic places are used most often in demonstrations. A government building located in a walkable environment, for example, might attract more protests than a government building surrounded by less walkable infrastructure. This could be because protestors feel safer demonstrating in a space where they, as pedestrians, have more protection from vehicles. In surveys, safety and comfort have been shown to be high priorities for pedestrians (Distefano, Leonardi, and Liotta 2023). Walkability might also operate through convenience. Walkable environments facilitate all sorts of pedestrian activity; therefore, spots located along the routes of many pedestrians become natural gathering points (Schwartzstein 2020). Finally, protestors may choose more walkable locations because of visibility. McCarthy and McPhail also contended that protesters rely on publicly prominent spaces because, as places where members of the public often come and go, public forum locations are suitable for promoting face-to-face interaction with onlookers in order to convey an effective message (McCarthy and McPhail 2006). The more people walk in an area, the more people become exposed to the protestors' claims, so combining visible and symbolic locations makes for a particularly potent strategy for protestors (McGahern 2017). Nejad (2013), in a study

of protests in Tehran, made a similar argument. He argued that "the effectiveness of a crowd generally depends on its ability to push the city into an anti-structural status" and that "public spaces… at the heart of the urban configuration are not only natural places for crowds to occur; claiming such places actually maximizes the effect of the protest" (Nejad 2013:171). For Nejad, occupying spaces of high activity not only gives protesters visibility, but allows them to more effectively disrupt the city's operations in a bid for attention. In summary, protesters may choose more walkable locations to protest in because of their safety as pedestrian spaces, their accessibility for the largest number of protesters, and their potential to maximize exposure and disruption.

This disruptive quality of protestors in walkable spaces can be seen through the example of the public square. Deaton (2015) examined revolutionary movements in Paris, Prague, and Tehran, and concluded that movements rely on characteristics of the built environment to succeed. He argued that "movements rise and fall with their ability to occupy urban space," and that particularly useful are public squares with a long association with the governance of the country (Deaton 2015). A well publicized example of just such a phenomenon can be found by examining Cairo's Tahrir Square. As a prominent public square located in the heart of the city, its accessibility by foot for the majority of Cairenes (Schwartzstein 2020) has long made it popular with protestors. Famously, it was the spatial nucleus of the 2011 protests that forced a regime change. By laying claim to the square, protestors were able to both physically weaken the government's anti-protest countermeasures and symbolically reclaim a public space that had previously been taken away by an authoritarian regime (Gregory 2013). It has been speculated in popular media that the current Egyptian government's ongoing project to move the government out of Cairo and into a new, sparsely populated planned city in the metropolitan region's

outskirts, is being undertaken so that the government will no longer have to contend with the problem of citizens taking over Tahir, or for them to take over any similarly situated public plaza that would cripple governmental operations (Ellis 2022; Menshawy 2021; Schwartzstein 2020). In a related effort, the government has widened several key roads within Cairo to make it harder for protestors to march on them (Ellis 2022). The example of Tahrir square demonstrates how, when prominent public spaces are located within strategic, walkable corridors, actors can leverage location to maximize their protests' exposure and effectiveness.

III. Linking Walkability and Protest

There are two major strands of theory and research that suggest mechanisms through which walkability may impact protest frequency. Despite the work done in these fields, research bridging walkable spaces with the prevalence of protests is limited. Some studies in this small field make an implicit qualitative link between walkability and protest without mentioning the former. Zhao (1998) argued that student protests during the 1989 pro-democracy movement in Beijing were facilitated through the nature of the built environment in Beijing's university district (Zhao 1998). He found that communal spaces located strategically at the center of student activity were used prominently in mobilization efforts, and that the concentration of universities close together allowed students to easily relay information between campuses. Nejad used topological analysis to explain why 2009 antigovernment protesters in Tehran gathered where they did (Nejad 2013). He showed that the most common places for crowds to spontaneously gather were along the city's most highly integrated streets, home to high levels of commercial land use. Though he didn't mention it specifically, these built environment features (street connectivity and mixed-use surroundings) are classic indicators of walkable spaces (Jacobs 1961).

Walkability is specifically named in few studies. Among them, Knudsen and Clark (2013) found that neighborhoods with high density, mixed-aged buildings, short city blocks, and high walking levels were associated with a higher prevalence of social movement organizations, a study which opened up the possibility of furthering this link to protests themselves (Knudsen and Clark 2013). Németh and Carver studied the sites of 10 of the largest public space protests in the US and found that all of them had high walkability compared to the other areas of their respective cities (Németh and Carver 2017). Therefore, the available literature contributes to the proposition that walkability and protest are linked.

IV. Current Study

In summary, the current study explores the relationship between walkability and protest frequency. Drawing on prior scholarship, I theorize two distinct mechanisms through which a positive relationship may be expected to operate: the social and strategic mechanisms. The strategic mechanism, which draws on recent interdisciplinary scholarship on public space (Deaton 2015; Nejad 2013), relates to the spatial characteristics, including safety, convenience, and visibility, that make walkable locations hospitable to protestors. The social mechanism, informed by theorists from the fields of social capital (Putnam 2001), urban studies (Jacobs 1961), and social movements (McAdam [1982] 1999) suggests that walkability increases social capital, which in turn increases civic participation, including, for this study's purpose, demonstrations. These mechanisms operate in the absence of established work linking walkability and protest directly. Though this link has been tentatively explored by some recent empirical research, including Knudsen and Clark (2013) who study walkability and social movement organizations (Knudsen and Clark 2013), and Németh and Carver (2017) who have a limited sample size of 10 protest locations (Németh and Carver 2017), there has not yet been a

large-scale study of protest frequency and walkability, likely because it is rare that a protest event is widespread and sustained enough for meaningful between-city comparisons to be made. The current study looks to fill that gap through a case study of 2020 Black Lives Matter protests in the United States in which 118 of the country's largest cities are analyzed. Guided by the strategic and social mechanisms, I conduct analyses to test two hypotheses on walkability's predictive power on increased protest frequency:

H1 (strategic): more protests will happen in public form places contingent on their walkability.

H2 (social): a city's overall walkability will impact the number of protests seen in that city, regardless of protest location.

Chapter 3 - Methods

I. Data and Variables

i. Dependent Variable - Protests

On May 25th, 2020, George Floyd, a Black man living in Minneapolis, was killed by police officers while in custody. This event was captured on video and quickly grabbed national headlines. The resulting protests, calling for racial justice and police accountability, spread quickly to every large city in the country and continued throughout the summer of 2020. Protests were often organized by pre-existing local Black Lives Matter chapters, which had formed before Floyd's death in response to prior instances of similar racially-charged incidents of police violence. Several million protestors took part in thousands of demonstrations, making the George Floyd protests some of the largest, if not the largest, in US history (Buchanan, Bui, and Patel 2020). The widespread and sustained nature of these protests makes them a commonality between all major US cities from which to compare protest frequency.

Protests are the dependent variable in this study. In my operationalization of the term, the term protest is widely inclusive, and refers to marches, strikes, rallies, demonstrations, vigils, riots, counter-protests, and any other event where one or more people occupy public space to make some demand, specifically in this case claims related to racial justice or police accountability. The only protests that do not count are the small number which occur exclusively online or exclusively in vehicles, since these types of demonstrations are unrelated to theories of how space creates protest. My protest data come from two sources. The Armed Conflict Location & Event Data Project (ACLED) is a nonprofit that collects global data about political violence and protest events (The Armed Conflict Location & Event Data Project 2019). They rely largely

on media sources to collect their data, though they source from other crowd counting databases as well. Protest events within ACLED data contain a *date* column, an *associated actor* column, and a *notes* column. In the latter, a human-written summary of the event is given, including location and protestor claims if these variables are known. A 2012 study suggested that ACLED data have quality control issues that could be indicative of bias; however, the author suggests that researchers can take steps to account for this bias and notes that ACLED at the time was the only comprehensive source for tracking non-violent events (Eck 2012).

The problems noted with the ACLED data are similar to the known issues with collecting newspaper data (Ortiz et al. 2006). Therefore, to eliminate as much bias as possible, I use an additional data source in my analysis. The online project Crowd Counting Consortium (CCC) has compiled publicly available protest data across all US cities since 2017 by relying on news articles, social media posts, and user submissions to capture events (Pressman and Chenoweth 2023). Their data include protest date, city, location, crowd size, type of demonstration, and protest issues. Each data point also includes source links to the online article or social media post where the information was retrieved from. I used these links in many instances to confirm the accuracy of the CCC's data. To my knowledge, there are no studies which specifically check the completeness of the CCC's data collection, but the source has been found to accurately capture protest crowd size by comparing its estimates to cell phone data (Sobolev et al. 2020) and has been used in at least one recent study of Black Lives Matter protests in the United States (Ebbinghaus, Bailey, and Rubel 2024)

I retrieved my data from the CCC on February 21, 2022 and from ACLED on September 1, 2022, both in spreadsheet format. For each source, I limited my data collection to cities with over 200,000 people at the 2020 US Census. Sampling all cities within this population cutoff is a

viable sampling strategy for this paper, because most of the extant literature on walkability and social capital focuses on large urban areas. The mechanisms that link walkability and protest are not well understood in small cities or rural areas and are therefore reasonably beyond the scope of this analysis. From this starting point, I excluded Minneapolis, an outlier as location of Floyd's death, as well as St. Paul, its immediate neighbor, and Washington D.C., another potential outlier due to the prominence of federal infrastructure with a long history of protest located there. This gave me a total of 118 cities. Next, I limited my data to protests that occurred between May 26 and July 31, 2020, the time period when the majority of Floyd-related protests took place in the United States. Though protests would continue through the rest of the summer and into the fall, by the end of July there had been a significant drop-off in their frequency (Buchanan et al. 2020). I then extensively cleaned both protest datasets. First, I made sure all protests in my dataset were clearly pro Black Lives Matter or anti-police brutality events. For the CCC data, this was done by looking under the *claims* and *issues* columns for phrases that matched or were similar to "antiracism" or "against police brutality." For the ACLED data, it was done by looking at the *associated actor* columns, which often listed "Black Lives Matter" as an actor, as well as the *notes* column. Then, I removed protests that were classified as online protests (n=3) or car caravans (n=33), both of which represented a miniscule of the total and were not disproportionately concentrated in any city. Then I standardized all of my data by time. To do so, I considered an individual protest to involve one group of actors over a maximum period of one day and treated all of these instances as separate data points. For example, if protestors gathered in a location on June 1 and left on June 2, this would appear as two protests in my data analysis. Additionally, if three separate protests happened in the same city on June 1, they would show up as three separate data points in my analysis.

Finally, I combined the two datasets, using my own judgment to ensure that every protest was recorded only once in my final dataset. For this step, I used information on crowd size and arrest estimates contained in both datasets, as well as the links to news articles from the CCC dataset and the human-written summaries of the ACLED dataset, to help me determine whether an event one data source captured was the same as an event from the other source. Of the 3,867 protests that emerged from this cleaning process, 24% were protests only found in the ACLED data, 38% were only found in the CCC data, and 38% were found in both datasets.

ii. Independent Variable - Walkability

Walkability is the primary independent variable for my study. The National Walkability Index developed by the EPA (Environmental Protection Agency 2021) is one of the most prominent tools available to researchers studying walkability. It collects data at the census block group level and assigns each block group a walk score between 1 and 20. The variables it uses in calculating walkability are intersection density, proximity to transit stops, and employment and household mix, consistent with the contentions made by Jacobs' school of thought on walkability as well as indices constructed in later research (Jacobs 1961; Frank et al. 2005). It is currently in its second iteration, the first having been published in 2017 and the second in 2021. Despite the second iteration being published after the George Floyd protests, the databases it uses for its calculations were published between 2017 and 2020, removing the possibility of reverse causality. The WalkScore® tool, another prominent index of US walkability (Walk Score 2024), was also considered for this analysis, but its current available data were collected after the protests, eliminating it from consideration. Nonetheless, the EPA tool and WalkScore are in broad agreement of what constitutes walkability; they displayed a correlation of 0.787 when I compared their scores at the city level, giving me further confidence in the applicability of the

EPA measure. Furthermore, the National Walkability Index has been validated by researchers as an accurate predictor of actual walking by Americans, both for transportation and leisure purposes (Watson et al. 2020). These multiple avenues of validation and the theoretically appropriate operationalization of walkability make the index a strong choice for inclusion in the analysis.

iii. Control Variables

There were a number of control variables considered for the analysis, which stem from sociological and social psychological theories on what drives people to protest. Social identity theory, which holds that members of a threatened identity will protest on behalf of that identity, suggests that in this case, cities with higher proportions of Black residents might protest more (van Stekelenburg and Klandermans 2013). This certainly seems to be the case in the context of Black Lives Matter protests, as previous studies have found that pre-George Floyd Black Lives Matter protests were more likely to occur in cities with more reported officer-involved fatalities involving Black people (Williamson, Trump, and Einstein 2018). Sociologists also use the concept of biographical availability (McAdam 1986) to predict protest, hypothesizing that people who are younger, unemployed, or have lower income are more likely to protest because they have less to lose from doing so and also have more time (Schussman and Soule 2005). Finally, prior research also suggests that protesting is a tool used more often by the political left (Schussman and Soule 2005), and this is certainly true for the Black Lives Matter protests, which American democrats are more sympathetic towards than republicans (Pew Research Center 2023).

I controlled for the following variables: percent Black alone, reported officer-involved fatalities (of any race) since 2013, percent democrat, and a composite biographical availability variable. The former three variables are the most directly tied to the issues surrounding the Black Lives Matter movement at the time of George Floyd's death, while the latter variable was created from additional relevant demographic variables in an effort to avoid redundancy and keep the control selection manageable in consideration of the small sample size of cities. Correlations between median household income, unemployment rate, median age, education (as measured by percent of residents with at least a bachelor's degree), and income inequality (as measured by the gini index), were assessed using a principal component analysis. The PCA revealed a strong correlation between income, unemployment, and education (see appendix A). These three variables were then standardized and averaged (changing *unemployment* rates to *employment* rates) to create the biographical availability variable, while age and income inequality were dropped from the model altogether. All controls were calculated at the city level, as it is unlikely that the demographics of each protest location's specific block or neighborhood would match the demographics of those who came to protest.

Race, income, unemployment, education, income inequality, and age data were taken from the 2019 ACS (U.S. Census Bureau 2019). Officer-involved fatalities were obtained through the database *Mapping Police Violence,* and the year 2013 was determined because the database tracks fatalities starting from that year (Campaign Zero 2023). Percent democrat was operationalized as the percentage of voters who voted for Hillary Clinton in the 2016 presidential election, since this election was the closest immediate predecessor to the protests. This information was calculated at the city level by collecting election shapefiles from the nonpartisan Redistricting Data Hub repository (Redistricting Data Hub 2024), then using ArcGIS to

aggregate precinct-level results onto the borders of all cities in the dataset. These city borders were obtained from a separate shapefile created by the US Department of Health and Human Services (U.S. Department of Health and Human Services 2023).

II. Analytic Strategy

i. Within-City Analysis

I conduct three separate analyses to test the relationship between walkability and protest, all using Stata v18.0. While the latter two test my hypotheses explicitly, the first analysis represents a preliminary step in establishing the existence of a phenomenon linking walkability to protest. This first model involves testing whether George Floyd protestors usually congregated in walkable locations within their own cities. This is accomplished by taking a selection of cities from my database, calculating the average walk score between all protest locations, and comparing it with the average walk score of each city's census block groups.

For this analysis, I selected eight cities from my database: Tampa, Philadelphia, Cincinnati, Charlotte, Buffalo, San Diego, Tacoma, and Houston. These cities give me diversity in terms of region, population, and walkability, and importantly have location information for the vast majority of their protests. From my protest dataset, I take all protests in these cities that have location information and use Google Maps to obtain their precise addresses where possible. I then use the National Walkability Index to find the walk score for the block group of each address. For protests where the location is vague, such as those that simply mention "downtown" or a certain neighborhood, I again use the assistance of Google Maps to find the census block groups that most closely overlap with the broader location in question, taking average walk scores between multiple block groups when necessary. Average walk scores are also used when a

single protest spans multiple locations that transcend block groups. To calculate a city's overall walk score, the average walk score of all its block groups was calculated using the assistance of ArcGIS Pro.

This is a useful preliminary test of the relationship based on its ability to show if there is a strong tendency for protestors to gather in more walkable locations within a given city. However, given the literature on protest locations (Endres and Senda-Cook 2011; McCarthy and McPhail 2006), a potential confounder exists for this analysis. If the George Floyd protestors are found to protest in more walkable locations, it may be that they targeted highly visible public forum locations, which are usually located in more walkable census block groups such as downtowns. Therefore, further analysis at the location level is needed.

ii. Location-Based Analysis

My second analysis is an explicit test of the strategic mechanism (H1). Informed by the literature (Endres and Senda-Cook 2011; McCarthy and McPhail 2006) on the symbolic and strategic value of specific protest locations, my second model controls for the types of destinations that protestors are likely to frequent by using location type as the unit of analysis. This involved creating categories for five different location types, combing through the protest data for all cities, and exclusively counting the protests that occurred in these locations. These five categories of location type are:

a. City halls
b. City or county courthouses
c. Police headquarters
d. Public parks or plazas

e. State capitol buildings

Of these location types, (b), (d), and (e) are considered part of the traditional public forum, while (a) and (c) are part of the limited public forum (McCarthy and McPhail 2006). Furthermore, all five can be considered to constitute places with symbolic meaning as discussed by Endres and Senda-Cook. Most of these locations represent institutions the protestors were attempting to engage with. City halls and state capitols represent governments, courthouses represent institutions of justice, and police headquarters represent a direct confrontation with the systemic racial violence the protestors stood against. Parks and plazas are more variable in their symbolic meaning, depending on what locations they are close to or what monuments and other symbols they contain. However, protestors may also choose these locations for their ability to accommodate large crowds. Specifically for this category, since every city has many public parks, I only counted those that saw multiple protests, only including parks with a single protest if there were no others in that city that saw more. I considered this a reasonable step because, instead of having endless parks in my dataset that were not used for protest, I only captured parks that the public had deemed to have some value for protesting. This process resulted in some cities contributing multiple parks to the final analysis while others contributed none. For all the other location types, I added them to the dataset even if there were no protests. Sometimes, two or more of the location types would be in the same spot within a city. For example, a police headquarters might be located inside a courthouse, or a public park might be just outside the city hall. If a park was directly facing one of the other location types, that park was considered a constituent part of that other location type, and I would not separately categorize it as a park. If two of the other location types were either (a) in the same building or (b) facing the same street segment, I would consider these protests as having taken place at whichever location type was

more frequently mentioned in the dataset (e.g. “protestors gathered at city hall”), as doing so was my best available method for determining which institution the protestors were primarily there to confront. Whenever I had to make a determination on this, the other location types at that spot would not have an entry logged into the analysis.

Table 1 - Descriptive Statistics for the Five Types of Protest Locations

	N	**Mean**	**St. Dev.**	**Minimum**	**Maximum**
City Hall	120	3.308	5.664	0	40
Courthouse	104	2.144	6.994	0	67
Police HQ	101	1.812	3.340	0	28
Park	139	4.842	9.151	1	73
Capitol	20	12.1	15.987	1	58

Per capita rates of events such as protest are best analyzed using the Poisson family of regressions to account for OLS violations of normal distribution of data and homogenous error variance (Osgood 2000). These specific protest data are also overdispersed (see tables 4 and 5), making a negative binomial regression an appropriate model for this analysis. Furthermore, for the protest counts at city halls, courthouses, and police headquarters, there is an excessive frequency of 0s. Therefore, a zero inflated negative binomial regression is the best model for those three locations. A negative binomial regression is most appropriate for parks, which, by my data collection methods, have no 0s, and state capitol buildings, all of which saw at least 1 protest. I conduct separate regressions for each location type across cities on the walk scores of those locations, using negative binomial regressions or zero inflated negative binomial regressions where appropriate and including all control variables in each model. City population size as of the 2020 census was included as an exposure variable in all regressions to account for protest rates.

iii. City-Based Analysis

My final model tests the social mechanism (H2) by using the city as the unit of analysis. Analyzing protest at the city level is a viable social mechanism test for several reasons. Firstly, specific location considerations are non-existent in the model. Additionally, a positive association found between walkability and protest in this analysis will show that the average walk score of a city's census block groups impacts protest frequency. Despite the heterogeneity of city neighborhood contexts, when there are more neighborhoods with greater walkability, that translates for more potential for social group formation and more organizational capacity for repeated protest, evidence of which would then be expected to show up at the city level. I first operationalize a city's overall walk score as the average walk score of all its census blocks groups. Again, given that protests are an overdispersed (see table 6) count variable, a negative binomial regression is the appropriate model choice. I regress protests on the citywide walk score averages, once again employing population size as an exposure variable and using the same control variables from the location-based analysis. All independent variables were standardized for location-based and city-based models.

Table 2 - Descriptive Statistics for Variables in the City-Level Analysis

	Mean	**St. Dev.**	**Minimum**	**Maximum**
Walk Score	12.024	1.933	6.910	15.900
Protests	32.771	72.764	0	756
Percent Black	0.206	0.176	0.005	0.779
Bio. Availability	0	0.829	-2.213	2.532
Fatalities	20.805	21.079	0	119
Percent Democrat	0.606	0.143	0.215	0.948

Chapter 4 - Results

I. Within-City Analysis

Table 3 - Within-City Analysis Results

City	Average Walk Score: City	Average Walk Score: Protests	St. Dev.
Charlotte	11.004	14.722	1.613
Houston	12.229	14.9523	2.7701
San Diego	12.723	14.810	3.299
Cincinnati	12.737	16.896	2.071
Tampa	12.860	16.699	2.543
Buffalo	13.579	18.242	0.633
Tacoma	13.603	15.107	2.206
Philadelphia	14.756	16.499	2.295

For each of the eight cities in the within-city analysis, the average walk score of their protest locations was higher than the average walk score of the city overall (see table 3). For four cities (Charlotte, Cincinnati, Tampa, and Buffalo), this discrepancy was pronounced by at least one full standard deviation. This analysis suggests that protestors consistently choose more walkable locations within their own cities for their activities. Though this analysis does not take into account that specific public forum locations are likely located in these walkable areas, this potential confounder will be explored further in the more rigorous location-controlled analysis.

II. Location-Based Analysis

Table 4 - Location-Based Regression Results (ZINB Models)

	Coeff.	95% Conf. Interval
Panel A - City Halls		
Walk Score	0.233	[-0.035, 0.501]
Percent Black	0.177	[-0.084, 0.438]
Bio. Availability	0.329*	[0.026, 0.632]
Fatalities	-0.135	[-0.335, 0.065]
Percent Democrat	0.175	[-0.085, 0.435]
Constant	-12.1	[-12.335, -11.865]
n=120		
LR test of alpha=0: chibar2(01) = 238.43 | Prob >= chibar2 = 0.000		
Panel B - Courthouses		
Walk Score	0.924***	[0.457, 1.390]
Percent Black	-0.054	[-0.488, 0.381]
Bio. Availability	0.207	[-0.233, 0.646]
Fatalities	-0.315*	[-0.607, -0.024]
Percent Democrat	0.051	[-0.286, 0.389]
Constant	-12.712***	[-13.064, -12.359]
n=104		
LR test of alpha=0: chibar2(01) = 220.09 | Prob >= chibar2 = 0.000		
Panel C - Police HQs		
Walk Score	0.447**	[0.122, 0.772]
Percent Black	0.226	[-0.086, 0.538]
Bio. Availability	0.026	[-0.314, 0.365]
Fatalities	-0.277*	[-0.504, -0.050]
Percent Democrat	0.046	[-0.252, 0.344]
Constant	-12.572***	[-12.846, -12.298]

n=101	
LR test of alpha=0: chibar2(01) = 82.38 | Prob >= chibar2 = 0.000	

* p<.05, ** p<.01, *** p<.001

Table 5 - Location-Based Regression Results (Negative Binomial Models)

	Coeff.	**95% Conf. Interval**
Panel A - Parks/Plazas		
Walk Score	0.317**	[0.110, 0.523]
Percent Black	0.005	[-0.216, 0.226]
Bio. Availability	0.062	[-0.195, 0.318]
Fatalities	-0.59***	[-0.774, -0.406]
Percent Democrat	-0.234	[-0.472, 0.004]
Constant	-12.175***	[-12.373, -11.976]
n=139		
LR test of alpha=0: chibar2(01) = 631.88 | Prob >= chibar2 = 0.000		
Panel B - Capitols		
Walk Score	-0.338	[-0.834, 0.157]
Percent Black	-0.376	[-0.855, 0.103]
Bio. Availability	0.452	[-0.097, 1.000]
Fatalities	-0.769***	[-1.172, -0.367]
Percent Democrat	-0.475	[-0.982, 0.033]
Constant	-10.735***	[-11.108, -10.362]
n=20		
LR test of alpha=0: chibar2(01) = 123.89 | Prob >= chibar2 = 0.000		

* p<.05, ** p<.01, *** p<.001

H1 predicted that higher walkability in public forum locations would be associated with higher protest frequency. Overall, the results from the location-based regressions (see tables 4 and 5) trend in this direction, with caveats related to consistency and statistical power.

Walkability was a statistically significant predictor of protest frequency at courthouses ($p<0.001$), police headquarters ($p<0.01$), and public parks/plazas ($p<0.01$), but statistically insignificant at city halls and state capitols. However, while walkability's relationship with protests at city halls did not reach the ($p<0.05$) threshold of statistical significance, its p value of 0.089 is close to being statistically marginal ($p<0.1$). With relatively small sample sizes at each location, results of less statistical power are not entirely unexpected. The most notable instance of this is the state capitols regression, with a sample size of just 20. Given this sample size, as well as how different these walkability results were from the rest of the regressions, it is difficult to attribute any significance to this result. One reasonable interpretation of the results, therefore, is that four of the five models showed some statistically significant relationship between walkability and protest, with the only outlier being the regression with by far the lowest sample size. Overall, these walkability results provide preliminary, though not entirely conclusive, evidence in support of H1.

Of the control variables, officer-involved fatalities were negatively associated with protest frequency and statistically significant in four of the five regressions: parks ($p<0.001$), state capitols ($p<0.001$), police headquarters ($p<0.05$), and courthouses ($p<0.05$). Biographical availability had a positive, statistically significant relationship with protest frequency only in the city halls model ($p<0.05$). The percent Black and percent democrat variables were statistically insignificant in all models.

III. City-Based Analysis

Table 6 - City-Based Regression Results (Negative Binomial Models)

	Coeff.	**95% Conf. Interval**
Walk Score	0.327***	[0.157, 0.496]
Percent Black	0.416***	[0.215, 0.617]
Bio. Availability	0.258*	[0.055, 0.462]
Fatalities	-0.163*	[-0.297, -0.029]
Percent Democrat	-0.01	[-0.208, 0.187]
Constant	-9.863***	[-9.993, -9.732]
n=118		
LR test of alpha=0: chibar2(01) = 777.29 | Prob >= chibar2 = 0.000		

* p<.05, ** p<.01, *** p<.001

H2 predicted that citywide walk score averages would be a predictor of greater protest frequency for each given city. In the city-based analysis (see table 6), walk score displayed a positive relationship with protest frequency at the highest level of statistical significance ($p<0.001$), supporting H2.

Three out of the four control variables also displayed statistical significance in the city-level model. Percent Black ($p<0.001$), and biographical availability ($p<0.05$) were both statistically significant predictors of protest frequency, while officer-involved fatalities were a negative predictor of protest frequency at the ($p<0.05$) level. Percent democrat was statistically insignificant in this model.

Chapter 5 - Discussion

I. Discussion

Separate analyses tested the hypotheses that both the social and strategic mechanisms operated on protest frequency, and these hypotheses were supported to varying extents. Firstly, the more inconsistent results came from the location-based analysis (H1), where walkability was only a statistically significant predictor for three of the five location types and only significant at the ($p<0.001$) level for protests at courthouses. On the other hand, strong evidence was provided for my hypothesis at the city level (H2), where walkability and protest frequency displayed a positive relationship significant at the ($p<0.001$) level.

Interpretation of the location-based results reveals some possible explanations for the imbalanced findings. Walk score was close to being a statistically marginal predictor of protest frequency at city halls, while its negative, insignificant relationship with state capitol protest frequency is likely attributable to the small sample size. Another possible explanation for these inconclusive results is that walkability may operate on location in a manner that is not easily detected by the models. In other words, since the vast majority of popular protest locations, especially city halls, courthouses, and state capitols, are located in downtowns, which themselves tend to exhibit high walk scores, it might not matter whether a location is very walkable or just reasonably walkable to facilitate more protest events.

As for the control variables, percent Black was insignificant at all location-based models but became a statistically significant predictor of protest frequency at the city level. This makes intuitive sense. One would expect, based on social identity theory, that cities with proportionally higher Black populations would experience proportionally more frequent protests, but this

wouldn't necessarily be expected to hold for the five location types I analyzed. It appears from the data that the relationship between percent Black and protest frequency operates through a more location-inclusive view of city protests. Less intuitive are the largely inconclusive results for biographical availability and percent democrat, as well as the negative relationship suggested between officer-involved fatalities and protest, which was statistically significant at the city level and all locations except city halls. Though it is beyond the scope of this paper to develop a sophisticated explanation for these counterintuitive findings, the percent democrat variable had a 0.416 correlation with percent Black and a 0.517 correlation with walk score, making it possible that the interaction between those variables rendered the political control insignificant. As for the negative officer-involved fatality results, one possible explanation could be that instead of these incidents galvanizing a city's population to protest, they could have had a chilling effect on protest instead by instilling fear within city populations.

This study provides direct support to Németh and Carver's assertion that walkability is important to protests (Németh and Carver 2017). Their findings, in which each of the protest sites they examined had a higher walk score than the respective city's average, were supported using a very similar methodology across a greater number of protest sites in the within-city analysis. The current study's findings also contribute to Knudsen and Clark's argument that walking builts social movements by showing that walkability is associated with protest frequency (Knudsen and Clark 2013).

The clearer results of walkability's impact on protest at the city level compared to the location level suggest a stronger influence of the social capital mechanism (H2) compared to the strategic mechanism (H1). If the strategic mechanism was operating, one would expect that stronger walkability at popular locations would have incentivized protestors to feel safe,

comfortable, or visible protesting at those spots. At the city level, however, it is more likely that walkability is having an effect on protest frequency through the facilitation of networks resulting from a built environment that promotes foot traffic and accessible public spaces. Therefore, the strongest theoretical support this paper provides is to the weak ties theory of social movement building posited by Granovetter and translated to the built environment through the work of scholars like Jacobs and Zhao (Granovetter 1973; Jacobs 1961; Zhao 1998).

Despite less certain findings at the location level, this paper builds upon arguments that location matters in protests by combining literature that discusses its symbolic value (Endres and Senda-Cook 2011; McCarthy and McPhail 2006) with literature regarding its strategic value (Deaton 2015; Nejad 2013) to test the idea that strategic value of symbolic places of protest is enhanced when these places are located in walkable corridors. The findings of significant positive relationships between walkability and protest at three of the five strategic location types underscore the value of this strand of research while suggesting that more empirical work is needed to further confirm or rebut the findings presented here.

II. Limitations and Directions for Future Research

Based on the data collection methods, it is inevitable that media bias probably had some impact on the results. Both the ACLED and CCC datasets are reliant on whatever is reported in popular press or social media, and media coverage is likely to pick up larger, more disruptive protest events. I hope to have accounted for as much of this bias as possible by using two datasets, both of which recorded many protests that the other dataset had missed. Similarly, 619 protests, around 16.0% of the total, had missing location data, which possibly had an effect on the within-city and location-based analyses given the relatively small protest numbers and

sample sizes. Additionally, the data cleaning methods were based on qualitative assessments by me, subjecting the final protest counts to human error, meaning I could have occasionally recorded something incorrectly. For example, maybe a location was reported in the data and I missed it, or maybe a protest occurred over multiple days and I failed to record the protest twice. Finally, this research represents a single case study, restricted to one country and a single series of protests. Understanding the impact of walkability on protest will require a more comprehensive set of studies so that scenarios across space and time can be assessed and compared.

Chapter 6 - Conclusion

Through a case study of the George Floyd protests in the United States, this study provides evidence that walkable urban design contributes to higher numbers of protest. This evidence was strongest when examining cities on the whole but also supported when specific locations, namely courthouses, police headquarters, city halls, public parks, and state capitol buildings were analyzed, suggesting that to a certain extent both the social and strategic mechanisms of walkability's impact on protest were operating. This contribution is novel because, even though the built environment has long been thought to play a role in social movements (Deaton 2015; Jacobs 1961; Zhao 1998), few studies before have empirically tested walkability's impact on protest, and those that have either did not measure protest directly (Knudsen and Clark 2013) or did not analyze more than a small handful of cities (Németh and Carver 2017).

Though this research represented a single case study, the implications for both the fields of social movements and urban sociology, especially if these results are supported in further research, are notable. For movement scholars who study protest, this study suggests that the built environment should be taken into consideration when examining the successes and failures of social movement mobilization. Scholars who study the emergence of protest often focus on political opportunities at the state level (Kitschelt 1986; McAdam [1982] 1999; Williams 2023), movements and their mobilization of resources (Breuer et al. 2015; Walsh 1981) or personal predictors of protest on the micro level (Schussman and Soule 2005; van Stekelenburg and Klandermans 2013), rendering them less well-equipped when explaining protest differences between areas where political opportunity structures are relatively equivalent and how in these situations different local chapters of a movement might obtain greater network connections and

other resources. In such cases, like the 2020 George Floyd protests in the US, considering walkability as a factor in protest prediction will strengthen existing theories. Urban sociologists, such as Lefebvre (Lefebvre [1974] 1991), and other built environment scholars have long theorized about the role that urban space has in constructing social meaning for its populations. This study contributes to this tradition through a novel empirical test that shows how space operates as a facilitator for democratic action, reinforcing findings from qualitative assessments of space's importance (Deaton 2015; Jacobs 1961; Zhao 1998). Outside the discipline of sociology, urban planners, while unlikely to design urban space with the needs of protestors in mind, can still consider this study as a positive assessment of how walking builds social capital and civic life.

Finally, it is crucial to note the implications for this research for a more general audience. This paper discussed evidence that Egypt has recently been willing to develop urban planning strategies specifically to counter the most decisive built environment impacts on protest (Ellis 2022), and other governments concerned about security are taking similar steps (Schwartzstein 2020). These processes involve restricting access to pedestrian friendly public squares, moving government infrastructure to remote, inaccessible locations, and encouraging sprawling design that favors the movement of cars over people. Citizens should be aware of the implications of these efforts to democracy. The public needs spaces to voice grievances and build coalitions, and when the accessibility of those places is threatened, so too is the public voice. Vigilance in preserving these spaces will help keep states accountable and keep the public engaged in protecting democracy.

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Appendix A: Tables

Table 7 - Descriptive Statistics for Cities

City	State	Walk Score	Population	N Protests
Albuquerque	NM	12.778	564559	27
Amarillo	TX	11.639	200393	5
Anaheim	CA	13.0	346824	5
Anchorage	AK	10.773	291247	8
Arlington	TX	8.039	394266	12
Atlanta	GA	12.725	498715	50
Augusta	GA	7.119	202081	5
Aurora	CO	12.401	386261	14
Austin	TX	11.742	961855	37
Bakersfield	CA	11.918	403455	13
Baltimore	MD	14.018	585708	41
Baton Rouge	LA	7.627	227470	13
Birmingham	AL	11.021	200733	20
Boise	ID	13.07	235684	63
Boston	MA	14.85	675647	53
Buffalo	NY	13.579	278349	26
Chandler	AZ	11.541	275987	2
Charlotte	NC	11.003	874579	24
Chesapeake	VA	9.686	249422	4
Chicago	IL	14.347	2746388	112
Chula Vista	CA	12.798	275487	5
Cincinnati	OH	12.737	309317	23
Cleveland	OH	12.913	372624	20
Colorado Springs	CO	11.81	478961	25
Columbus	OH	11.758	905748	39

Columbus	GA	7.344	206922	10
Corpus Christi	TX	11.632	317863	4
Dallas	TX	12.445	1304379	39
Denver	CO	14.172	715522	50
Des Moines	IA	12.301	214133	43
Detroit	MI	12.533	639111	85
Durham	NC	10.651	283506	24
El Paso	TX	12.403	678815	15
Fayetteville	NC	6.91	208501	17
Fontana	CA	11.375	208393	3
Fort Wayne	IN	11.167	263886	17
Fort Worth	TX	10.59	918915	18
Fremont	CA	13.139	230504	10
Fresno	CA	12.7	542107	12
Frisco	TX	8.056	200509	3
Garland	TX	11.996	246018	0
Gilbert	AZ	10.415	267918	4
Glendale	AZ	12.019	248325	0
Greensboro	NC	8.155	299035	16
Henderson	NV	10.958	317610	1
Hialeah	FL	14.260	223109	0
Honolulu	HI	12.017	350964	10
Houston	TX	12.229	2304580	22
Huntsville	AL	8.966	215006	19
Indianapolis	IN	11.289	887642	28
Irvine	CA	12.989	307670	6
Irving	TX	12.335	256684	1
Jacksonville	FL	11.0474	949611	22
Jersey City	NJ	13.996	292449	7
Kansas City	MO	11.434	508090	41

Laredo	TX	8.492	255205	4
Las Vegas	NV	12.357	641903	27
Lexington	KY	10.509	322570	24
Lincoln	NE	13.566	291082	22
Little Rock	AR	11.330	202591	20
Long Beach	CA	11.406	466742	9
Los Angeles	CA	14.461	3898747	115
Louisville	KY	11.311	633045	55
Lubbock	TX	8.373	257141	4
Madison	WI	13.518	269,840	42
Memphis	TN	11.416	633104	48
Mesa	AZ	11.369	504258	5
Miami	FL	15.164	442241	39
Milwaukee	WI	13.929	577222	62
Modesto	CA	13.153	218464	6
Montgomery	AL	12.198	200603	11
Moreno Valley	CA	11.066	208634	2
Nashville	TN	10.301	689447	67
New Orleans	LA	13.305	383997	25
New York	NY	13.54	8804190	756
Newark	NJ	13.793	311549	8
Norfolk	VA	13.137	238005	17
North Las Vegas	NV	12.069	262527	0
Oakland	CA	14.496	440646	95
Oklahoma City	OK	10.576	681,054	19
Omaha	NE	11.767	486051	27
Orlando	FL	13.166	307573	30
Oxnard	CA	13.635	202063	5
Philadelphia	PA	14.756	1603797	71
Phoenix	AZ	12.37	1608139	48

Pittsburgh	PA	14.598	302971	53
Plano	TX	11.584	285494	4
Port St. Lucie	FL	7.136	204851	1
Portland	OR	15.485	652503	159
Raleigh	NC	11.537	467665	40
Reno	NV	10.791	264165	12
Richmond	VA	12.81	226610	51
Riverside	CA	12.176	314998	6
Rochester	NY	13.081	211328	20
Sacramento	CA	13.734	524943	29
San Antonio	TX	11.827	1434625	27
San Bernardino	CA	12.132	222101	3
San Diego	CA	12.723	1386932	56
San Francisco	CA	15.895	873965	88
San Jose	CA	13.517	1013240	48
Santa Ana	CA	14.323	310227	6
Santa Clarita	CA	8.26	228673	6
Scottsdale	AZ	11.041	241361	5
Seattle	WA	15.454	737015	130
Spokane	WA	13.513	228989	17
St. Louis	MO	13.848	301578	37
St. Petersburg	FL	13.691	258308	32
Stockton	CA	12.809	320804	11
Tacoma	WA	13.602	219346	16
Tampa	FL	12.86	384959	40
Toledo	OH	12.629	270871	13
Tucson	AZ	12.5	542629	10
Tulsa	OK	12.138	413066	19
Virginia Beach	VA	10.791	459470	12
Wichita	KS	11.659	397532	19

Winston-Salem	NC	7.223	249545	35
Worcester	MA	12.748	206518	10
Yonkers	NY	13.746	211569	16

Table 8 - Principal Component Analysis (Factor Loadings) for Sociodemographic Variables

Variable	**Comp. 1**	**Comp 2**	**Comp. 3**	**Comp. 4**	**Comp. 5**	**Unexplained**
income	0.579	-0.226	0.006	0.534	0.573	0
age	0.273	0.304	0.904	-0.106	-0.066	0
education	0.546	0.373	-0.307	0.252	-0.637	0
unemp.	-0.524	0.078	0.212	0.8	-0.188	0
gini	-0.137	0.843	-0.208	-0.004	0.476	0

Appendix B: Figures

Figure 1 - Plotted Walk Scores and Protests