What Do We Know About NYC's Stop and Frisk Program? A Spatial and Statistical Analysis

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ABSTRACT

Since its inception, New York City's stop-and-frisk program has been controversial. The policy allows police officers to stop, question, and frisk individuals who are suspected of committing, having committed or about to commit a crime. Advocates of this policy contend that its purpose is to protect civilians and police officers, as it enables officers to detain persons that they believe are in possession of unlawfully concealed weapons. Critics maintain that the practice violates civil rights and leads to racial profiling. Limited research has moved beyond these types of descriptive examinations of the Stop and Frisk data. Our project employs data from the U.S. Census Bureau and the New York Civil Liberties Union on 2011 NYPD stops and frisks. In moving beyond the descriptive stage, this research utilizes a spatially centered analytical approach to measure and identify geographic clusters of high Stop and Frisk rates across New York City police precincts and subsequent spatial regression to link variations in those rates to community level characteristics. Results indicate both significant spatial clusters of high rates of race-specific stops and a series of statistically significant relationships of those variations to similar variations in explanatory variables.

Keywords: Stop-and-frisk, spatial regression, community characteristics, racial bias

INTRODUCTION

The tension between due process and crime control exerts considerable influence on criminal justice policy and practice. Rarely has this tension been more pronounced than in New York's Stop and Frisk policy, which allows police officers to stop, question, and frisk individuals who are suspected of committing, having committed, or about to commit a crime. The purpose of this policy is protection for both police officers and society as a whole. If an officer believes that a citizen may be a threat, he or she has the authority to detain and pat down the citizen, ostensibly for the purpose of confiscating weapons. State courts recently have reviewed Stop and Frisk policies, and despite some criticisms that the policy encourages racial profiling and violates the civil rights of pedestrians and drivers who are stopped, this practice continues in New York City.

The extent of police Stop and Frisk in New York City (NYC) has increased over the years, particularly since the beginning of Mayor Bloomberg's tenure. Between 2002 and 2011, the number of individuals stopped in New York rose from 97,296 to 685,724. The complete number of stops made within this time period totaled 4,356,927 [1]. When considering the rate of stops carried out by the NYPD, police stop six of every 100 residents [2]. Despite public

criticisms of the high number of stops and calls for police oversight, Mayor Bloomberg has claimed that Stop and Frisk has led to a steady decline in crime in New York City and strongly opposes federal efforts to monitor the NYPD's practice of Stop and Frisk [3].

Statistics suggest that certain police behaviors associated with Stop and Frisk may be of concern to individual rights advocates. Police used at least one act of force in close to 22 percent of all recorded stops, and blacks and Hispanics were more likely to be subject to police use of force compared to whites [1]. Research also indicates that a small number of police officers are responsible for a majority of citizen stops. In 2006, seven percent of NYPD officers accounted for 54 percent of all stops [2]. This statistic brings into question the impact of police bias. If bias is not a factor, rates of Stop and Frisk should be fairly stable across neighboring locales, but if certain neighborhood characteristics or demographic traits are associated with higher rates of Stop and Frisk, this perhaps could suggest police bias. Alternately, high rates of Stop and Frisk in particular neighborhoods could indicate targeted policing efforts towards high crime areas. This study will delve deeper into police practices and their relationship to demographic and neighborhood factors. The following research aims to determine if certain community-level characteristics impact rates of Stop and Frisk across New York City and is directly informed by a series of reports and research articles documenting potential determinants of recent NYC Stop and Frisk patterns.

LITERATURE REVIEW

Stop and Frisk policies first emerged in 1964, when New York state legislators approved an amendment that allowed police officers to stop and question citizens who were "reasonably" suspected of involvement in a crime. The written protocol for police to initiate a Stop and Frisk in New York states that in order to stop an individual, police need to have reasonable suspicion that the person is or will be involved in the commission of a crime. To frisk a citizen, police must have reason to suspect that the individual possesses a weapon [1]. Police justifications for initiating a Stop and Frisk have expanded considerably in the last decade. Police currently can stop an individual if they observe any of the following situations: scalping tickets, riding a bicycle on the sidewalk, selling untaxed cigarettes, furtive movements, a suspicious bulge in a jacket/coat pocket or pant pocket, wearing clothes that are commonly worn during the commission of a crime, carrying a suspicious object, and exhibiting behaviors that suggest an individual could be chasing a victim or acting as a lookout during a drug transaction [2]. In 2011, police listed "furtive movement" as the most common reason for stopping citizens, citing this reason in 51 percent of all stops [1].

Cases in Support and Against: Benefits to the Public vs. Civil Rights Violations

Proponents of the Stop and Frisk policy have articulated the benefits of this practice. Stop and Frisk is advantageous in that it empowers police officers to protect themselves against armed citizens by empowering them to search citizens for weapons. Stop and Frisk led to the retrieval of 780 guns in 2011 [1]. However, it should be noted that this number represents only a tiny fraction (.01%) of the total number of frisks that resulted in weapons recovery. Nevertheless, because police safety is an essential component of effective law enforcement, the legal system has tended to uphold the practice of Stop and Frisk.

A second benefit noted by supporters is that it has contributed to a reduction in the state prison population. In the early 1990s, the New York Police Department (NYPD) shifted its law enforcement practices to focus on low-level and quality of life offenses. What started as "broken windows" policing gradually evolved into Stop and Frisk practices. The shift diverted law enforcement resources from felony arrests, which are those most likely to end in incarceration, and led to a rise in arrests for misdemeanor offenses. From 1988 to 2008, the

number of felony arrests in New York City decreased by 72 percent, ultimately contributing to a 17 percent decrease in the state's correctional population between 2000 and 2009 [4]. For this reason, proponents claim that Stop and Frisk is in part responsible for the significant decline in the number of people incarcerated in New York.

While proponents praise the policy's effectiveness, critics claim that the Stop and Frisk policy blurs the line between lawful police questioning and the detainment of citizens without probable cause. Stop and Frisk enables police to detain citizens and come up with a justification for their arrest during the course of the encounter. Moreover, critics have argued that the policy may violate Fourth Amendment rights against unlawful searches and seizures [5]. The Fourth Amendment requires police to establish probable cause – the set of circumstances that would lead a reasonable person to believe that a crime was, is, or will be committed. However, under the provisions of Stop and Frisk, only reasonable suspicion, a much lower standard, is needed [6]. Accordingly, the courts have legitimized Stop and Frisk and encouraged its use by conceiving the practice as one that is outside the scope of constitutional protection.

Some critics also present a discouraging picture of the policy's outcomes, particularly in regards to the apprehension of offenders. For instance, in 2006 and 2011, fewer than 12 percent of stops resulted in an arrest or summons [1-2], which suggests that the practice is not targeting individuals who pose a risk to public safety. The objective of Stop and Frisk is to enhance the ability of law enforcement to apprehend criminals and to prevent crime before it occurs, particularly concerning gun-related offenses. While the Stop and Frisk policy may make some citizens feel safe, the practice also has resulted in claims of police bias.

Police Bias

Scholars have noted that the decision making processes of police officers can be influenced by unconscious profiles based on stereotypes related to race, ethnicity, age, and the gender of citizens. These stereotypes may emerge from personal, vicarious, and/or media influence [7]. Scholars also argue that continuous police deployment in "hot spots" (commonly associated with poor, minority, and high-crime areas) may further substantiate some of the racial stereotypes associated with race and criminality [8].

According to various studies and reports, Stop and Frisk has disproportionately impacted minority citizens [9-10]. When the courts initially upheld such practices, critics claimed that those most affected would primarily consist of minorities and residents of low-income neighborhoods [11]. According to recent reports, minorities remain the most common target of Stop and Frisk. In both 2006 and 2011, nearly 90 percent of all stops involved non-whites [1-2]. In 2011, nearly 53 percent of those stopped were black, approximately 34 percent were Hispanic, and nine percent were white. Moreover, when considering the percentage of frisks that lead to the detection of weapons, in 2011, police uncovered weapons on less than two percent of blacks and Latinos [1]. Of all the white citizens frisked, police uncovered contraband in just over six percent [2, 9].

In response to the claims that Stop and Frisk is a form of racial profiling, police have defended the high incidence of stops involving minorities on the grounds that minorities commit disproportionately more crimes than whites, particularly in public spaces. Some research suggests that black drug users and dealers are more likely to engage in drug use and sales in public spaces, which increases their risk of exposure to police attention [12].

A consequence of Stop and Frisk is its impact on citizen perceptions of police legitimacy. Police policies and practices influence the attitudes of citizens towards law enforcement. If citizens believe that police actions are transparent, justifiable, and equitable, they are more likely to view police as legitimate authority figures. Legitimacy is associated with greater citizen compliance and cooperation during encounters with police. When citizens feel that police actions are unlawful or unfair, they are less likely to comply with police requests and demands [13]. Stop and Frisk policies may undermine perceptions of police legitimacy, particularly in the eyes of minorities, who are more distrustful of police than the general public. Police could enhance legitimacy by acting transparently and informing citizens of the reasons for confronting them, which would minimize perceptions of bias. Also, allowing citizens to explain their situation, treating citizens with politeness, and exhibiting sensitivity during their interactions enhance perceptions of police legitimacy because citizens who observe this behavior are more likely to defer to the authority of police [13]. Because the data suggest that minorities are far more likely than whites to be subject to Stop and Frisk, this policy may be undermining community perceptions of police legitimacy, particularly amongst minority citizens and in areas with high minority populations.

Police Enforcement and Community Characteristics
There is a relationship between the level of police activity in a given community and the demographic characteristics of the citizens in that community. Research indicates that certain demographics are associated with an increased likelihood of police contact. For instance, young people and racial minorities have more contact with law enforcement [14] and are more likely to be represented in criminal justice statistics. However, because it is difficult to disentangle the myriad conditions that affect each neighborhood, community-level characteristics appear to have a stronger impact on police practices than individual characteristics. In inner-city neighborhoods, which tend to be more socially disorganized than prosperous suburban communities, there is more poverty, unemployment, transience, single parent families, and street crime. Residents from inner-city communities have a tenuous relationship with police and face a higher likelihood of arrest compared to residents in more affluent communities.

Research has explored the relationship between age and crime and the impact of age on the likelihood of police contact. Statistics indicate that juveniles commit a disproportionate amount of crime and are overrepresented in official arrest reports [15]. Other studies suggest that juveniles are common targets of police. Regarding vehicular stops, many studies have concluded that younger drivers are significantly more likely to be stopped and receive citations compared to older drivers [16]. Stop and Frisk data similarly suggest that police focus their efforts disproportionately on young people, particularly young people of color. Black and Hispanic youths comprise less than five percent of the population in New York City but accounted for more than 41 percent of stops in 2011 [1].

The impact of citizen race in Stop and Frisk is difficult to ignore. Minorities are considerably more likely to come into contact with police, particularly in situations in which a stop and frisk could occur. As noted above, statistics from 2011 reveal that blacks and Hispanics accounted for nearly 90 percent of all police stops [1]. Police stops of minorities are most likely to occur in areas with high white populations; these are known as "racial incongruity" stops [10]. Prior contact with law enforcement increases the likelihood of future contact with police. Research indicates that black adolescent males who have previously experienced police discrimination reported higher levels of subsequent perceived racial discrimination by police [17]. This suggests that black adolescent males subjected to Stop and Frisk are more likely to be stopped and frisked in the future. Studies also demonstrate that black adolescents experience more

discrimination from police in predominantly white neighborhoods, particularly those that have had recent growth in the black population [17].

Research on police-citizen interactions has considered a variety of community-level and individual characteristics that affect these encounters. However, research has yet to consider the impact of community-level characteristics on rates of Stop and Frisk in neighboring communities. If rates of Stop and Frisk are distributed evenly across neighboring communities, this would suggest that community factors do not have a strong impact on police behavior in regards to Stop and Frisk. However, if some neighborhoods show higher rates of Stop and Frisk relative to nearby neighborhoods, then it is possible that demographic or community characteristics are having some impact on police activity. While these points are raised in the current literature, the purpose of this study is to explicitly test for such relationships. Here we have employed a spatially centered analytical approach to take advantage of the spatially referenced data available for analysis in which we identify and measure geographic "hot-spots" (or spatial clusters) of high Stop and Frisk rates across New York City. Following the identification of spatially non-random distributions of the Stop and Frisk rate across the city, we have also linked these rates to literature driven community level characteristics, which include age, race, gender, education, nativity, and residential stability.

METHODS

This research project involved of an analysis of New York City precinct level data from 2010-2011 in New York City. Data pertaining to the dependent variable, NYPD Stop and Frisk activity in 2011, were obtained from the New York Civil Liberties Union (NYCLU). NYPD officers are required to record information pertaining to each stop and frisk that they conduct; however, this data initially was not released for public consumption. The NYCLU successfully sued the NYPD to obtain access to the Stop and Frisk database, and they have since released this data publicly [1].

The independent variables were obtained from the U.S. Census Bureau's 2010 decennial census report. These variables represent the community characteristics associated with precinct level aggregations of block-group census data. This aggregation allows us to compare community conditions/characteristics with precinct level rates of Stop and Frisk activities.

The precinct level independent variables consist of race (percent of White/Black/Hispanic), education (percent of the population with a bachelor's degree), non-native (percent that is foreign born), age (percent that is over age 16), and occupied housing (percent of residences that are occupied). The data were analyzed in two phases: first, a descriptive examination of individual variables; and secondly, an explanatory approach predicting Stop and Frisk rates at the precinct level given the community characteristics. The first stage includes a description of rates of Stop and Frisk in both statistical and spatial form. Spatially, we employ Exploratory Spatial Data Analysis (ESDA) techniques to identify potential statistically significant non-random spatial patterns across New York City precincts. Spatial clusters will be identified given the "neighborhood" definition, which is defined as any precincts that share a geographic boundary (i.e. being statistically weighted neighbors).[1] Using this neighborhood weighting definition, the Moran's I statistic is examined as the indicator of global spatial autocorrelation - positive coefficients of the Moran's I indicate that areas close together are statistically similar, which would insinuate spatial clustering. The general Moran's I is specified as:

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[1] We employed a Queens Neighborhood Weight Matrix based on the contiguity of precincts given shared borders. For further review, see [18].

$$I = \sum W_{ij} \frac{[(x]_i - \bar{x})(x_j - \bar{x})}{[(x]_i - \bar{x})}$$

$$I = \sum W_{ij} \frac{(x_i - \bar{x})(x_j - \bar{x})}{(x_i - \bar{x})}$$

where, I is equal to the spatially weighted (W_{ij}) correlation of the stop and frisk rate (x) in each local precinct (i) and the average stop and frisk rate of the identified neighborhood (j) divided by the local rate of stop and frisk. The values of the above equation range from +1 – indicating strong positive spatial autocorrelation, to 0 – indicating a random relationship, to -1 – indicating strong negative spatial autocorrelation. A permutations-based statistical test will be used to test the null hypothesis (no spatial association or spatial randomness).

In addition to the global test of spatial autocorrelation, Anselin's Local Indicator of Spatial Association (LISA) statistic is used to identify local clusters of police precincts that report statistically significant relationships in rates of Stop and Frisk between the local unit (i) and its neighborhood (j). This approach repeats the spatial cluster analysis for each precinct. The result is an output based on the relationship of precinct i to the jth precinct – a result that indicates positive spatial clustering (neighboring precincts are similar), negative spatial clustering (neighboring precincts are unlike one another), or random spatial distribution (neighboring precincts are not alike or unalike) [19]. The equation for the LISA statistic is:

$$I_i = \sum W_{ij}(x_i - \bar{x})(x_j - \bar{x})$$

In this equation, I_i (LISA) equals the weight indicator (W_{ij}) multiplied by the product of the local unit value (x_j) minus the global mean (x-bar) and the precinct average value of the same variable (x_i) minus the global mean (x-bar) divided by the overall mean rate (S^2). Following the test for spatial dependence in the Stop and Frisk data, it became apparent that the explanatory phase of the analysis requires a correction for the non-random spatial distribution of the rates. This next phase entailed a series of four regression models. The first model will test the effect of the independent variables on the total rate of Stop and Frisk. The next three models will test the effect of the independent variables on the rate of Stop and Frisk by specific racial categories: black citizens, Latino citizens, and white citizens. Each model includes a spatially weighted lag variable that controls for spatial dependence that was identified from the Moran's analysis.

The regression model for explaining variations in stop and frisk rates is as follows:

$Y = \alpha + \rho W_y + \beta_1 X_1 + \ldots + \beta_n X_n + e$

where, the Stop and Frisk rate (Y) is equal to a constant (α) plus the spatially weight lag effect of neighboring precincts (ρW_y) plus the effects of the community characteristics ($\beta_1 X_1 + \ldots + \beta_n X_n$) plus an unexplained residual (e).

RESULTS

Descriptive Results

Census data from 2010 provided information on the independent variables in this study. Data were collected at the block group level and aggregated to the police precinct level to be consistent with the level of data at which the Stop and Frisk documentation was delivered from the NYCLU. These data are presented in Table 1 and indicate that, on average, the overall rate of Stop and Frisks across the city was 102.58 per 1,000 residents of the precinct. Our results indicate that this was far from proportional based on race. For instance, the White Stop and Frisk rate of 9.17 per 1,000 residents accounts for only about nine percent of the entire rate, but the 2010 U.S. Census reports that Whites make up roughly 44 percent of the NYC population. In contrast, the Black Stop and Frisk rate of 55.52 per 1,000 makes up about 54 percent of the entire rate, but Blacks only make up about 26 percent of the NYC population. This indicates a disproportionate rate of stops of Blacks in reference to Whites. Interestingly, the Hispanic Stop and Frisk Rate is 30.93, or about 30% of the entire rate, and this group makes up about 29% of the NYC population. These initial descriptive statistics validate the perceptions that police target minorities and minority neighborhoods most often, but seem to also indicate that Blacks are disproportionately targeted among the three most represented racial groups in the NYC.

Table I. Precinct Level Descriptive Statistics (N = 75)

	Minimum	Maximum	Mean	Std. Deviation
Dependent Variables				
Total S&F Rate	18.42	512.42	102.58	77.97
White S&F Rate	0.71	86.34	9.17	11.20
Black S&F Rate	0.96	275.02	55.52	57.79
Hispanic S&F Rate	2.1	110.99	30.93	27.28
Independent Variables				
% BA degree	3.58	36.90	14.69	8.58
% foreign born	13.20	67.23	34.28	12.63
% 16 and older	70.74	94.49	81.57	5.84
% white	2.55	92.76	44.31	25.65
% black	1.19	90.65	26.04	25.56
% male	42.87	52.80	47.45	2.11
% owner-occ housing	79.45	96.50	90.65	3.64

Descriptive statistics reveal the minimum, maximum, and mean rate of Stop and Frisk across precincts. Rates are listed in total and by race. Descriptive statistics are also given for community characteristics and reflect the minimum, maximum, and mean percentage of residents with a bachelor's degree, who are foreign born, age 16 and older, White, Black, male, and the percentage of housing in each precinct that is occupied.

A number of potential explanations for these disparities have been brought forward. Most commonly, these explanations center on socioeconomic and organizational indicators of the communities. To test such theories, we have selected a series of community characteristics that highlight the levels of education, nativity, the age distribution, the minority representation, the gender ratio, and the residential stability of the neighborhoods. Our data indicate that, across our 75 police precincts, the average percent with a BA degree is about 15 percent, the average percent foreign born is about 35 percent, the average percent of the

population older than the age of 16 is about 82 percent, the average percent white is about 44 percent, the average percent black is about 26 percent, the average percent Hispanic is about 29 percent, the average percent male is about 48 percent, and the average percent of households that are occupied is about 91 percent.

Exploratory Spatial Data Analysis

Upon visual inspection of Figure 1, one can see what appears to be a spatially non-random distribution of Stop and Frisk rates. For those familiar with New York City (NYC), it is apparent that the rates follow concentrations of minority populations with a specific accentuation of areas with high rates of Black residents. Notably, in Harlem, northern Manhattan and the South Bronx, there are high rates of Stop and Frisk. Also, in North Brooklyn and South Queens there are high rates in the Bedford Stuyvesant, East New York, Far Rockaway, and Jamaica communities. In contrast, areas traditionally known for having low rates of Black populations (i.e. South Brooklyn, North Queens, Northwest Bronx, and most of Staten Island) are consistently low in regards to the rates of Stop and Frisk.
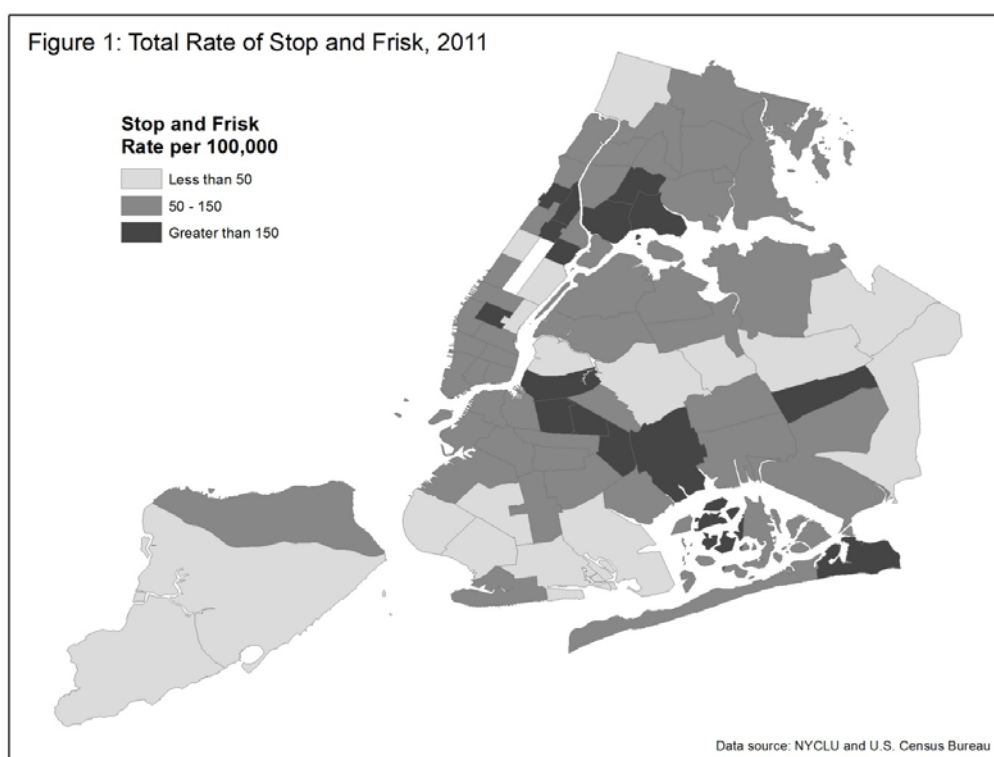

Figure I: The highest rates of Stop and Frisk occur in the South Bronx, Northern Brooklyn, and Harlem and East Harlem in Manhattan.

Taking a look at Figure 2, we see that the white rate of Stop and Frisk is consistently in the lowest category with the single exception of the midtown area in Manhattan (i.e. Times Square). In contrast, the Black Stop and Frisk rate is geographically very similar to that of the overall population map with the highest rates being in North Brooklyn, East Queens, North Manhattan, and the South Bronx. These areas, again, are associated with traditional Black communities such as Jamaica, Harlem, Bedford Stuyvesant, and East New York. The spatial pattern associated with the Hispanic rate is similar to that of Blacks with the highest rates being Greenpoint in North Brooklyn, Corona in Northern Queens, East Harlem in Manhattan, Washington Heights in Manhattan, Inwood in Manhattan, and the Soundview/Huntspoint areas of the South Bronx. In all cases, including the total Stop and Frisk Rate, it is apparent that the geographic distribution of Stop and Frisk does not follow a spatially random pattern.
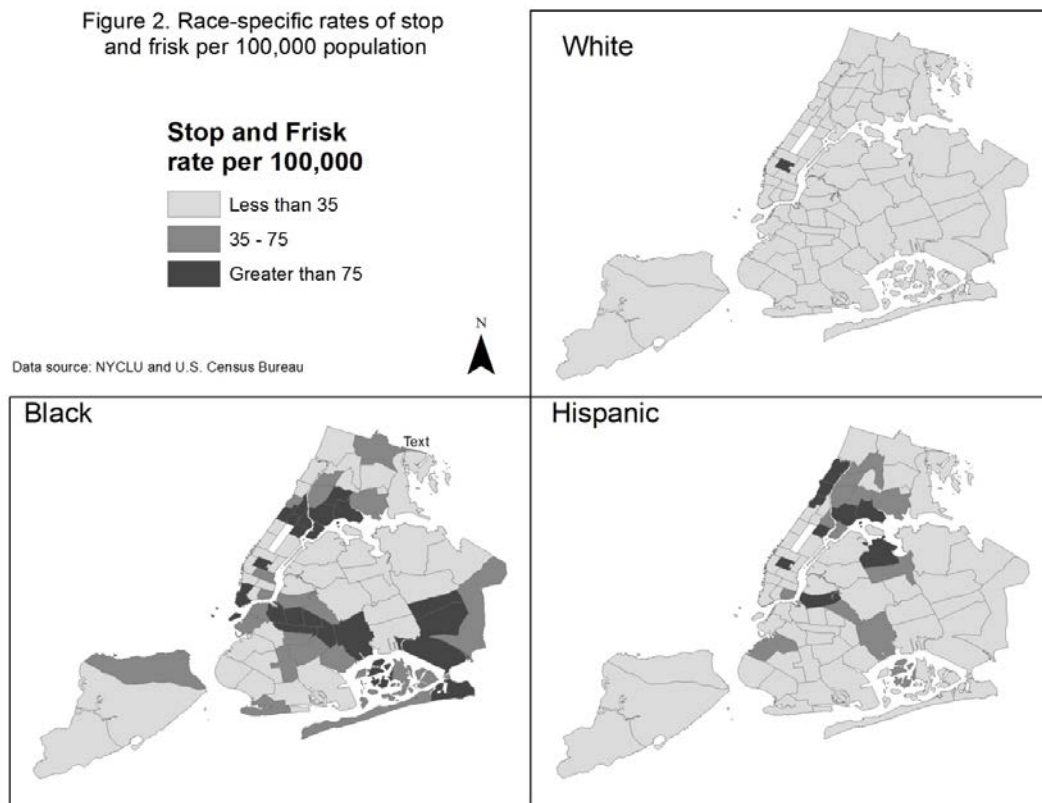
Figure II: The White population has a significantly lower rate of Stop and Frisk compared to the Black and Hispanic populations in New York

In order to formally test that in fact there is a significantly non-random distribution of Stop and Frisk Rates across the city, a series of global spatial dependence tests (Moran's I) were employed for the overall and individual race-specific rates. The results of the Moran's I test are presented in the scatterplots illustrated in Figure 3. These results indicate that, in all four cases, there is a significant amount of spatial dependence associated with the distribution of the Stop and Frisk Rate across NYC police precincts. This means that the practice of Stop and Frisk in NYC does not occur randomly, but instead follows a geographic pattern most likely linked to the spatial arrangement of community characteristics. In interpretation, the panel in Figure 3 represents the standardized rate of Stop and Frisk (x-axis) plotted against the standardized average rate of all precincts considered to be spatial neighbors (y-axis). Each point represents a police precinct with its location within the scatterplot determined by its own rate horizontally and its neighbor's average rate vertically. Given this arrangement, a positive slope (as is the case here) indicates that as precinct level rates of Stop and Frisk rise, so too do the average rates of immediately surrounding precincts. This indicates that places closer together tend to have similar rates of Stop and Frisk, or more technically, that there is a significant amount of spatial dependence associated with the Stop and Frisk rate in NYC.

Figure 3. Moran's I test for spatial dependence in Stop and Frisk Rates
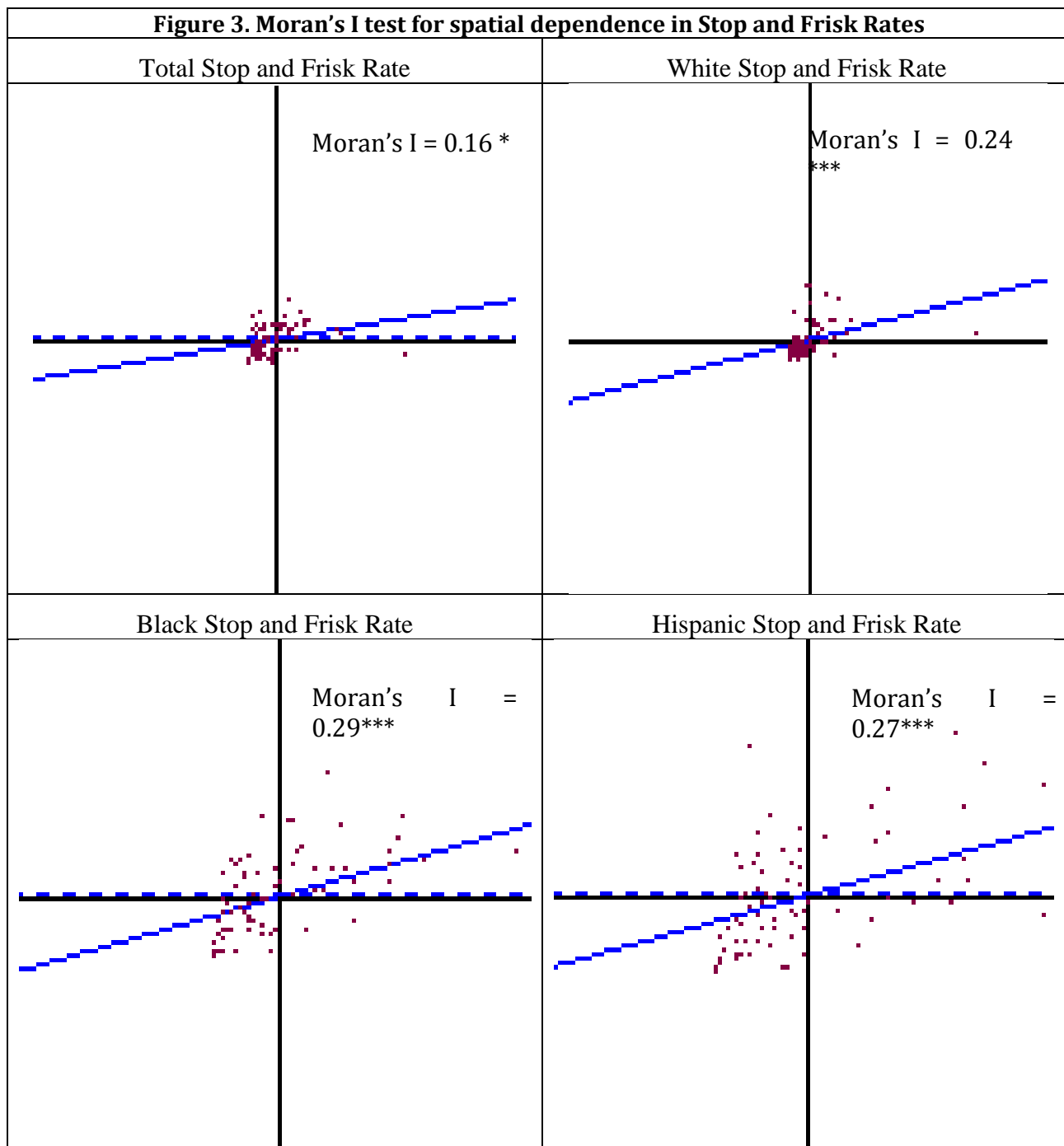

Figure III: Moran's I is a measure of spatial autocorrelation. The scatterplots indicate a non-random distribution of Stop and Frisk, meaning that neighboring locations have similar rates of Stop and Frisk.

Where exactly this spatial dependence manifests itself is also somewhat of interest to this research project. Figures 4 and 5 highlight the significant clusters of high and low Stop and Frisk rates. In regards to the overall rate, Figure 4 indicates that South Brooklyn and North Queens are both locations of large sizes where Stop and Frisk is a relatively uncommon phenomenon. However, the North Brooklyn areas of Buschwick and Bedford Stuyvesant, as well as East Harlem are geographic "hotspots" of the Stop and Frisk activity. In Figure 5, when these clusters are identified independently for Whites, Blacks, and Hispanics, one can see different geographic locations of Stop and Frisk "hotspots". For Whites, the lower east side and much of Staten Island are where Stop and Frisk most commonly occurs. For Blacks, the areas

of Canarsie, Brownsville, and Crown Heights in Brooklyn, the Rockaways in Queens, and East Harlem in Manhattan are the locations with the most common occurrences of Stop and Frisk. Finally, the "hotspots" of Hispanic Stop and Frisk center on the South Bronx neighborhoods of Huntspoint and Soundview.
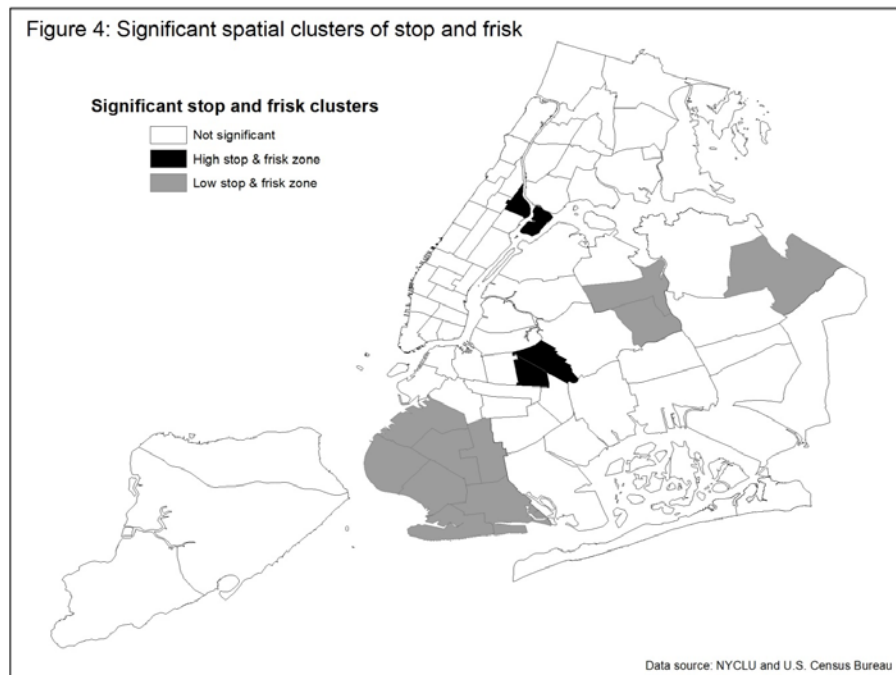

Figure IV: This map shows significant clusters, or contiguous neighborhoods with similar rates of Stop and Frisk. South Brooklyn and North Queens are areas in which Stop and Frisk is relatively uncommon while Stop and Frisk occurs in high rates in East Harlem and the North Brooklyn neighborhoods of Bushwick and Bedford Stuyvesant.
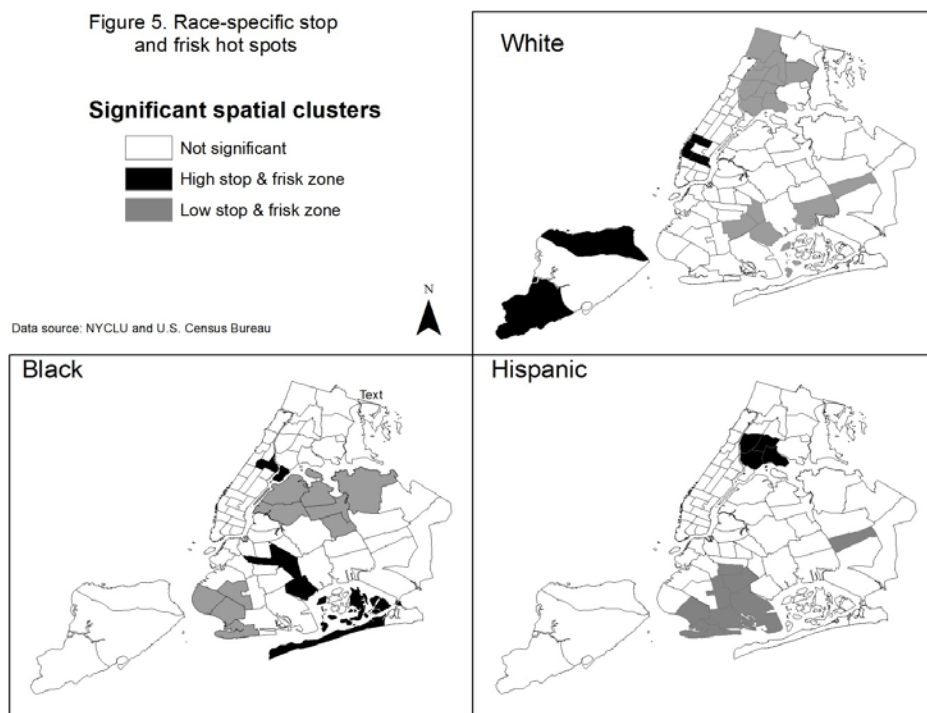

Figure V: This map shows significant clusters of Stop and Frisk by race. Whites experience high rates of Stop and Frisk in the lower east side of Manhattan and much of Staten Island. Blacks experience high rates of Stop and Frisk in the Brooklyn neighborhoods of Canarsie, Brownsville, and Crown Heights, the Rockaways in Queens, and East Harlem in Manhattan. Hispanics experience high rates of Stop and Frisk primarily in the South Bronx neighborhoods of Huntspoint and Soundview.

Spatial Regression Results

A primary goal of this research has been to statistically validate many of the descriptive treatments that have been given to the Stop and Frisk practice in the literature to this point. By mapping and exploring the spatial data, we have statistically identified significant non-random spatial distributions associated with the overall and race-specific Stop and Frisk rate as has been plotted and hypothesized by others. Given these statistical results, we now turn our attention to understanding why the Stop and Frisk rate clusters in geographic space. It has been made clear that the most widely accepted hypothesis is that community characteristics necessitate and drive the allocation of law enforcement resources and manpower to specific a community, which in turn leads to higher rates of Stop and Frisk. Here we test that hypothesis.

Table 2 presents the spatial regression results predicting the overall and race-specific Stop and Frisk rate across the 75 precincts in our sample. The results indicate that the percent Black and the percent Hispanic in the community both drive up the rate, although the percent Black increases the rate almost 10 times as much as the percent Hispanic. Also, the percent of owner-occupied housing is shown to be significantly related to lower rates of Stop and Frisk. Overall, model 1 accounts for about 33 percent of the total variation in the overall Stop and Frisk rate, but most importantly the spatial parameter is not statistically different from zero in regards to its effect. This non-significant finding associated with the spatial parameter is important to our research because the Moran's I results from Figure 3 would indicate that the result should in fact be significant as it relates to spatial dependence. Instead, what we find is that once we control for the characteristics of the community that have been hypothesized to be related to the variations in rates across the city, we no longer have spatial dependence. In essence, we have explained away the factors driving the geographic clustering by simply including socio-demographic characteristics of the population living in these communities.

Table II. Spatial Regression Results Explaining Total and Race Specific Rates of Stop and Frisk (N = 75)

	Total Rate Model 1	White Rate Model 2	Black Rate Model 3	Hispanic Rate Model 4
% BA degree	-2.42	-0.08	-1.37	-0.61
% foreign born	-0.88	-0.23*	-0.88*	0.17
% 16 and older	0.89	0.71*	1.09	-1.11
% black	87.14*	-9.55	122.59***	-22.34
% Hispanic	9.44**	-0.64	2.81	6.02***
% male	2.76	0.54	0.02	2.01
% owner-occ housing	-9.07***	-0.11	-5.83***	-2.01*
Spatial Parameter (ρ)	-0.12	-0.01	-0.09	0.18
R-Squared	0.3314	0.3392	0.5240	0.4961
AIC	853.404	561.24	782.33	675.02

Spatial regression results indicate that the percentage of Black residents in a precinct significantly affects the rate of Stop and Frisk of Black residents and the percentage of Hispanic residents in a precinct significantly affects the rate of Stop and Frisk of Hispanic residents. The percentage of Black and Hispanic residents also had a significant effect on the total rate of Stop and Frisk. The percentage of owner-occupied housing was another variable that significantly affected the total rate of Stop and Frisk, the rate of Stop and Frisk of Black residents, and the rate of Stop and Frisk of Hispanic residents. The percentage of foreign born residents in a neighborhood affected the rate of Stop and Frisk of White and Black residents.

The same phenomena occurs in regards to all three of the race-specific models (models 2-4); however, there are some slight variations in the effect of the community characteristics as they relate to Stop and Frisk variations aside from the obvious effects of the percent Black and Hispanic on the Black and Hispanic rates. Of note, increases in the percent foreign born actually decrease the rate of Stop and Frisk for Blacks and Whites, the population over the age of 16 increases the rate for Whites (but is insignificant for other groups), and the percent of owner-occupied housing decreases the rate for both Blacks and Hispanics, but not Whites.

DISCUSSION/CONCLUSIONS

This study explored the relationship between community-level variables and rates of Stop and Frisk in New York City. The majority of prior research on Stop and Frisk has been descriptive in nature and has made only cursory conclusions about variations in individual and community level Stop and Frisk rates in NYC (for examples of more sophisticated treatments that use a multi-level modeling approach see [10]). Adding to this body of literature on Stop and Frisk, we built a series of explanatory models and employed various spatially centered statistical approaches to test the spatial relationships between descriptive variables and rates of Stop and Frisk in New York City. We found that several factors influence rates of Stop and Frisk across the city: higher rates of Black and Hispanic residents in neighborhoods are associated with higher rates of Stop and Frisk, and foreign born and owner occupied housing are negatively associated with Stop and Frisk rates. The higher the percentage of owner occupied housing in a precinct, the lower the rate of blacks and Hispanics subject to Stop and Frisk. A higher percentage of foreign born individuals in a community is related to lower rates of Stop and Frisk, particularly for Blacks and Whites.

One of the unexpected results we found was the share of stops and frisks in relation to the share of the over all NYC population. Here we find that Hispanics are stopped at a rate about equal to their representation in the NYC population. Such is not the case for Whites and Blacks. Whites are stopped disproportionately much less than they are represented in the NYC population and, in zero-sum form, Blacks are stopped disproportionately much more than their representation in the NYC population. This highlights an obvious racial aspect, which has been the focus on many of the current reports and public outcries surrounding Stop and Frisk in NYC. We again highlight this relationship, but are unable to fully explain the occurrence with our quantitative models. While race certainly has a strong impact of rates of Stop and Frisk, it is difficult to disentangle the effect of race from the impact of other variables, particularly those related to social class. Previous studies have revealed an interaction between the race and socioeconomic status of citizens in regards to the likelihood of arrest [20]. Further qualitative research is recommended in hopes of more fully understanding the discrepancies.

Although our study has provided much insight into Stop and Frisk practices across New York City precincts, there are several limitations that need to be addressed. As this study utilizes aggregate-level data, knowledge regarding individual-level data could not be extracted and assessed. Obtaining individual-level data (e.g., race of the officer, demeanor of citizens) may provide deeper insight into variations of Stop and Frisk practices throughout neighborhoods in New York City. Also, the limited variables within our data set did not allow us to examine the extent and impact of police presence in each precinct. This analysis would be useful in determining if communities with higher levels of stops and frisks are correlated with levels of police saturation.

Future research should expound on the issues addressed in this city and also attempt to uncover any causal mechanisms that would explain the significant spatial clusters of Stop and Frisk practices across New York City police precincts. Analyzing additional independent variables that may relate to Stop and Frisk, including crime rate, number of arrests, number of reported shootings, and number of weapons confiscated by police would yield more detailed information about the effect of crime and police behavior on the extent of Stop and Frisk across precincts. Future studies should use mapping and spatial analysis techniques to test the relationship between crime rates and rates of Stop and Frisk. A significant relationship could indicate that the police are focusing Stop and Frisk on the appropriate areas. Moreover, this study would further benefit from research that explores community characteristics that were not previously accounted for in our study (e.g., average citizen income; racial heterogeneity in each precinct).

In this study, we have been able to show significant spatial clusters in Stop and Frisk practices across New York City. Through spatial regression analysis, we have statistically explained the variations in Stop and Frisk given a set of socio-demographic characteristics. This research suggests that the practice of Stop and Frisk in New York City is related, at least in part, to community-level and demographic characteristics. While this may appear to suggest that police exhibit racial bias in their methods of neighborhood enforcement, it also could reflect targeted policing efforts in high-risk neighborhoods. However, because we did not include crime rates in our analyses, we cannot make this conclusion with statistical certainty.

The debate over the legality of Stop and Frisk continues amongst the public and in the courts. The practice has several benefits: it enables police officers to better protect themselves, it enhances police efforts to control crime, and it has had some effect on reducing the prison population in New York State. However, Stop and Frisk has led to claims of racial profiling, possible violations of due process rights, and it may lessen the public perception of police legitimacy, particularly in minority communities. The impending legal rulings regarding the constitutionality of Stop and Frisk will have a considerable impact on the future of this law enforcement practice.

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