



Published in final edited form as:

Soc Sci Med. 2015 August ; 138: 201–209. doi:10.1016/j.socscimed.2015.06.019.

Can You Party Your Way to Better Health? A Propensity Score Analysis of Block Parties and Health

Lorraine T. Dean, ScD^a, Amy Hillier, MSW, PhD^b, Hang Chau-Glending, DO^c, SV Subramanian, MA, MPhil, PhD^d, David R. Williams, MDiv, MPH, MA, PhD^e, and Ichiro Kawachi, MD, PhD^f

^aUniversity of Pennsylvania School of Medicine, Department of Biostatistics and Epidemiology, 909 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104

^bUniversity of Pennsylvania, School of Design, 102 Meyerson Hall, 210 South 34th Street, Philadelphia, PA 19104

^cValley Medical Center, Department of Family Medicine, 3915 Talbot Rd South, Suite 401, Renton, WA 98055

^dHarvard School of Public Health, Department of Social and Behavioral Sciences, 7th Floor, 677 Huntington Ave, Boston, MA 02115

^eHarvard School of Public Health, Department of Social and Behavioral Sciences, 6th Floor, 677 Huntington Ave, Boston, MA 02115

^fHarvard School of Public Health, Department of Social and Behavioral Sciences, 7th Floor, 677 Huntington Ave, Boston, MA 02115

Lorraine T. Dean: ltdean@upenn.edu; Amy Hillier: ahillier@design.upenn.edu; Hang Chau-Glending: hchau39@gmail.com; SV Subramanian: svsubram@hsph.harvard.edu; David R. Williams: dwilliams@hsph.harvard.edu; Ichiro Kawachi: ikawachi@hsph.harvard.edu

Abstract

While other indicators of social capital have been linked to health, the role of block parties on health in Black neighborhoods and on Black residents is understudied. Block parties exhibit several features of bonding social capital and are present in nearly 90% of Philadelphia's predominantly Black neighborhoods. This analysis investigated: (1) whether or not block parties are an indicator of bonding social capital in Black neighborhoods; (2) the degree to which block parties might be related to self-rated health in the ways that other bonding social indicators are related to health; and (3) whether or not block parties are associated with average self-rated health for Black residents particularly. Using census tract-level indicators of bonding social capital and records of block parties from 2003 to 2008 for 381 Philadelphia neighborhoods (defined by census tracts), an ecological-level propensity score was generated to assess the propensity for a block party, adjusting for population demographics, neighborhood characteristics, neighborhood

Corresponding author: Lorraine T. Dean, Sc.D., 909 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104, ltdean@upenn.edu; 1-617-331-8981.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

resources and violent crime. Results indicate that in multivariable regression, block parties were associated with increased bonding social capital in Black neighborhoods; however, the calculation of the average effect of the treatment on the treated (ATT) within each propensity score strata showed no effect of block parties on average self-rated health for Black residents. Block parties may be an indicator of bonding social capital in Philadelphia's predominantly Black neighborhoods, but this analysis did not show a direct association between block parties and self-rated health for Black residents. Further research should consider what other health outcomes or behaviors block parties may be related to and how interventionists can leverage block parties for health promotion.

Keywords

Philadelphia, Pennsylvania, USA; social capital; block parties; Black/African-American neighborhoods; self-rated health; propensity score

INTRODUCTION

The concept of social capital grows from the observation that social relationships can create a form of capital that can have positive effects on multiple outcomes, including health (Hanifan, 1916; I. Kawachi, 1999; Putnam, 1993, 1995). Social capital may be considered the ecological analog to individually-based social support, and is considered a social determinant of health and health behaviors. Social capital relates to resources embedded within groups, i.e. it is a contextual construct, and is distinguished from social support because social support relates to interpersonal relationships at the individual level. Studies of social capital and self-rated health overwhelmingly support that high social capital is related to better self-rated health (Ichiro Kawachi, Subramanian, & Kim, 2007). Public health researchers have offered that social capital may be positively associated with health through: diffusion of information about health-promoting behaviors; maintenance of healthy behavioral norms or deterrence of risky behaviors through informal social control; promotion of access to services; affective support or other psychosocial pathways that act directly or indirectly; and empowerment to engage political policies that impact community health (Berkman & Kawachi, I 2000; Kawachi & Berkman, 2001; Ichiro Kawachi et al., 2007).

Examining differences in social capital and health within racial/ethnic groups is important because there is often more variation in health outcomes within racial/ethnic groups than between them, which is true for the Black/African-American population in the US (Arthur & Katkin, 2006; Read & Emerson, 2005; Williams, 1997; Williams & Jackson, 2000). Further, there is a need to explore what might be culturally-relevant indicators of social capital that are prevalent in Black neighborhoods, for example block parties (Dean & Gilbert, 2010; Gilbert & Dean, 2013).

Block Parties as a Space for Cultivating Social Capital

By nature, cultivating social capital must occur in a community-based context, which can occur within one's residential neighborhood. As Oliver & Myers define them, "block parties

are generally understood... to be consensual events that convey a sense of sociability and community to residents of a particular area” (Oliver & Meyer, 1999) who feel a sense of collective belonging and solidarity. By that definition, block parties may be relevant to forms of bonding social capital because they are a manifestation of solidarity among residents within a neighborhood. Bonding social capital refers to resources that are available to members of a group who are similar to each other with respect to social position and identity (Kim, Subramanian, & Kawachi, 2006) and who are of the same community (Harpham, 2008), making it particularly relevant for research on neighborhoods. It may exist within the context of racial/ethnic groupings or geographic locations where people who are demographically similar would interact (Poortinga, 2012), especially in cities that are highly segregated by race. Bonding social capital, in the forms of social trust, reciprocity, and civic participation, has been linked to better subjective mental health outcomes (Fone et al., 2007; McKenzie, Whitley, & Weich, 2002), lower suicide rates (Helliwell, 2004) and violent crime (Kennedy, Kawachi, Prothrow-Stith, Lochner, & Gupta, 1998), and may be a buffer to the adverse effects of neighborhood deprivation (Cattell, 2001; Fone et al., 2007; McKenzie et al., 2002). Block parties might also reflect collective efficacy, or the collective willingness of residents to intervene on behalf of the common good based on mutual trust and solidarity among residents (Kim, Subramanian, & Kawachi, 2007; Sampson, Raudenbush, & Earls, 1997) because neighborhood residents must sign a petition agreeing to allow the block party. Block parties might represent social cohesion, or how interconnected the group is, social participation, or participation in local organizations, and volunteerism, how involved the group is in service activities, all of which are social capital indicators that have been associated with health. That is to say, block parties may be a context in which the mechanisms between social capital and health are at work. For instance, block parties may be a space where neighbors exchange information about how to keep healthy, or knowing that neighbors might disapprove of risky behaviors, might discourage unhealthy actions through informal social control.

Block parties may be especially important for certain neighborhoods over others. By year 2008, nearly 90% of the 162 predominantly Black neighborhoods (as defined by when the raw number of Blacks per census count was higher than any other racial/ethnic category in that census tract) in Philadelphia had at least one block party per year, yet few researchers have looked at how block parties may be related to social capital for Black neighborhoods. Block parties tend to be in neighborhoods with long-term residents that have an established block captain who gathers the requisite 75% of signatures on the petition to get a block party permit (Hang, 2006). Block parties are informal gatherings that may occur once or up to a few times per year, require few resources to host, and which require little preparation beyond the initial petition and advertisement by posting flyers or word-of-mouth. They create a space for relationship-building and sharing about resources available in the neighborhood. With increased commute times between work and home that keep residents away from their neighborhoods, block parties are a space for neighbors to connect and feel mutually supported. They may be a symbol of the residents’ ability to come together and lay a platform to address more complex social issues (Hang, 2006).

To date, no published research studies have explored block parties in the context of social capital mechanisms in Black neighborhoods, though the potential benefits of block parties

have been noted (Oliver & Meyer, 1999). Furthermore, examining block parties in isolation of other neighborhood structures removes it from the social and environmental contexts that frame how social capital is fostered. Block parties need to be explored in the context of the characteristics of the neighborhoods in which they exist. Neighborhood resources, residential characteristics (e.g., housing density, residential segregation), crime, and neighborhood demographics, may be potential confounders between block parties as a form of social capital, and self-rated health for Black neighborhoods. A neighborhood with available economic developments such as banks, check-cashing establishments, high homeownership or symbols of social investment such as murals and community development corporations might indicate a neighborhood that has been invested in by neighbors and by city government. Longer commute times to work may be an indicator of less time to spend in one's neighborhood or fewer economic resources for employment in or near one's residential neighborhood. The physical boundaries and spatial layouts of the neighborhood may affect whether or not a block party can physically exist, and social characteristics may affect the likelihood that a block party will happen. For example, living in an area where houses are close together and have a high housing density would provide a physical space to hold a block party. Thus, accounting for number of households, housing units, families, overcrowding and residential blocks per square mile could be important. Areas that are unsafe due to high crime rate may have lower social capital (Kennedy et al., 1998; Takagi, Ikeda, & Kawachi, 2012), may cause residents to be fearful of being outdoors, which would erode both social capital and decrease the likelihood of block parties, or conversely be more likely to have block parties if residents come together in targeted efforts to lower crime rates. Black segregated neighborhoods tend to be low-resource, be less safe, and suffer from elements of neighborhood disadvantage (Massey & Denton, 1993; Quillian, 2012) which would be related to health and to whether or not an area is an appropriate setting for a block party. The relationships between block parties and these factors is yet unknown, but should be considered in analysis. Exploring a large number of neighborhood characteristics may require special statistical methods designed for dealing with a high number of confounders, like propensity score analysis.

This exploratory analysis uses OLS regression and propensity score matching to assess how a block party, as a potential indicator of social capital, might be related to the average health of Black residents in Philadelphia, Pennsylvania neighborhoods.

METHODS

The first part of the analysis was designed to answer the question of whether or not block parties are an indicator of bonding social capital for Black neighborhoods. It uses OLS regression with social capital indicators as independent variables and block parties as an outcome. The relationship between social capital indicators and self-rated health are explored in parallel, to assess the degree to which conventional social capital indicators are related to health and to see if it mimics the relationship between other bonding social capital indicators and health. The second part of the analysis was designed to explore the association between block parties as an independent variable and self-rated health of Black residents only.

Data Sources and Study Population

All data were de-identified secondary data, thus this analysis was not considered to be human subjects research and met the criteria of being IRB-exempt. For the outcome variable, self-rated health, and the social capital variables, data were combined from the 2004, 2006 and 2008 Southeastern Pennsylvania Household Health Survey data set administered by the Public Health Management Corporation (PHMC) (Design and Implementation of the 2008 Southeastern Pennsylvania Household Survey, 2008 Household Healthy Survey Documentation, Public Health Management Corporation). The PHMC data set is based on responses to a random digit dialing telephone survey of individuals 18 years of age and older from a probability sample of households in the five counties in the Greater Philadelphia Metropolitan Area. The sample included both home and cellular phones. The sample size ranged from 4,415 – 4,394 households and response rates ranged from 25–27%. Individual-level data were aggregated to census tract levels to obtain neighborhood averages of self-rated health and social capital. Census tracts were proxies for neighborhoods.

Information on other neighborhood resources and characteristics was obtained from the US Census 2000 and the Cartographic Modeling Lab at the University of Pennsylvania, which stores primary data collected by city agencies, publicly accessible data sets. Crime rates were collected from the Philadelphia Crime Lab (<http://cml.upenn.edu/crimebase/>) based on records from the Philadelphia Police Department.

Key Variables

Block Parties—Block party date and locations from 2003 to 2008 were obtained from the Philadelphia Streets Department’s public record, with permission. In order to register a block party, Philadelphia community members must nominate a block captain in their neighborhood to submit an application with at least 75% of a block’s signatures to the Department of Streets. The application requests permission for a block party on a specified date, and is usually submitted in the first six months of the year, since the majority of block parties occur between May and August. Because the number of block parties is constrained by the number of blocks in a census tract, a geographic variable was created by dividing the number of block parties in 2008 (the year in which the most tracts had registered a block party) by the number of blocks per square mile within a census tract.

Self-Rated Health—The PHMC data provided the self-rated health variable, which had a 4-point Likert-type response scale for the question “On a typical day, how would you rate your health?” Individual respondents could indicate their health to be “poor”, “fair”, “good”, or “excellent” with higher numbers representing better health outcomes. The self-rated health variable was aggregated to the census tract level, leaving one average self-rated health value assigned to each Philadelphia census tract using the 2000 US Census Tract designations.

Social Capital—The PHMC data are collected at the individual level, but being that social capital is inherently a contextual measure, was aggregated to the census-tract level so that each census tract was assigned one average value per census tract for each dimension of social capital measured.

An oblique (promax) rotated principal components factor analysis suggested a three-measure composite score to represent social cohesion ($\alpha=0.71$), covering feelings of belongingness, interpersonal trust, and neighborliness: “Please tell me if you strongly agree, agree, disagree, or strongly disagree...: I feel that I belong and am a part of my neighborhood” [belongingness]; “Most people in my neighborhood can be trusted” [interpersonal trust]; and “Please rate how likely people in your neighborhood are willing to help their neighbors with routine activities such as picking up their trash cans, or helping to shovel snow. Would you say that most people in your neighborhood are always, often, sometimes, rarely, or never willing to help their neighbors?” [neighborliness]. Higher numbers represented higher social cohesion.

Collective efficacy was represented by the yes-no item “Have people in your neighborhood ever worked together to improve the neighborhood?” In later waves of the data, the question added the prompt “For example, through a neighborhood watch, creating a community garden, building a community playground, or participating in a block party.”

Social participation was measured by the item “How many local groups or organizations in your neighborhood do you currently participate in such as social, political, religious, school-related, or athletic organizations?” and was recoded to be dichotomous to represent either any participation or none at all.

Volunteerism addressed the frequency of social participation with the item: “How many times in the past 12 months have you volunteered your time to do any unpaid work to help people besides your family and friends or people you work with?” This item was recoded as dichotomous to reflect having volunteered “never” or “one or more times” in the past 12 months.

Neighborhood Characteristics—US Census 2000 census tract data on the number of families, housing units, percent owner or renter occupied, and percent overcrowded were included because the opportunity for block parties may be affected by the housing layout of a neighborhood. The number of census blocks per square mile was calculated by counting the number of census blocks whose center point (centroids) fell within a square mile area.

Neighborhood Resources—Neighborhood resources were selected based on hypothesized or demonstrated relationships with health, social capital, and/or the likelihood of block parties. These include addresses of: murals, check-cashing locations, community development corporations, billboards, banks, and recreation centers. Characteristics were chosen using the Delphi method of consultation with experts in social capital and city planning, and by what data were available for analysis.

Violent Crime—The number of aggravated assaults each year from 2000 through 2006 was included as a metric of violent crime. Aggravated assaults may be a more representative measure of safety than the homicide rate since homicides are calculated only for fatal events, and assaults are calculated by for any violent event.

Segregation—A census-tract level segregation measure based on racial composition was used to account for social exclusion of Black neighborhoods. Recognizing that, in a densely populated area, residents may access resources in blocks adjoining their own, the measure represents a ratio of the exposure of one household within a census tract compared to the potential for interaction across surrounding tracts (Wong, 2002). Philadelphia's tracts are predominantly Black or White, so a 2- group measure was sufficient. This measure has been used in at least three other peer-reviewed published studies (S. Grady, 2006; S. C. Grady & McLafferty, 2007; White et al., 2011). While the segregation measure was intended to capture the degree of interaction that Black neighbors might have with White neighbors, percent race was separately assessed and was intended to capture the raw numbers of Blacks and Whites in a tract.

Population Demographics—The 2000 US Census provided raw counts for race, age, high school graduation rates, poverty, and commute time for each census tract. Predominantly Black neighborhoods were designated as when the raw number of Blacks per census count was higher than any other racial/ethnic category in that census tract.

STATISTICAL APPROACH

Preliminary Analysis: STATA SE10.0 statistical package (StataCorp, 2007) was used to calculate means and standard deviations of key variables. Two-sample t-tests determined if the differences between neighborhoods (tracts) with or without block parties were significant at $p < 0.05$.

To ensure that social capital variables were related both to block parties and to self-rated health, separate OLS regressions were performed with block parties as the outcome and self-rated health as the outcome. For each of the four social capital indicators, social cohesion, collective efficacy, social participation, and volunteerism, a separate linear regression estimated the relationship between each indicator and block parties, and was repeated for self-rated health. Regressions were performed first across all neighborhoods, and then in predominantly Black Philadelphia neighborhoods, all controlling for the percentage of the population below 200% of the federal poverty line per US 2000 Census data. To assess the degree to which the relationship between social capital indicators and block parties may differ for Black or White neighborhoods, an interaction term was included in the final models, representing the interaction between each respective social capital and neighborhood composition, either predominantly Black or predominantly White. After creating regression models and plotting the interactions, simple linear regression generated coefficient estimates, 95% confidence intervals, and p-values for self-rated health and block parties as outcomes, for the percentage of the population below 200% of the federal poverty line per US 2000 Census data.

Propensity Score Matching: Propensity score matching was used to explore the relationship between block parties and self-rated health of Black residents when accounting for other neighborhood characteristics. Because the OLS regression suggested that block parties may only be meaningful to the health of Black residents, the outcome for the propensity-score analysis was aggregated self-rated health scores only for Black respondents. Propensity

score matching is a multivariable scoring method that collapses predictors of an exposure or “treatment” into a single value that represents the probability of being exposed, or being “treated,” given a set of neighborhood characteristics. It is ideal for isolating the effects of the exposure, block parties, above and beyond other neighborhood-level characteristics (Oakes & Johnson, 2006; Rosenbaum & Rubin, 1983) because it allows for estimation of the effect of having a block party on self-rated health in a non-exposed neighborhood, if that same neighborhood would have had a block party. Propensity score analysis has been increasingly used in cohort and case-control studies (Rassen et al., 2012) (Mansson, Joffe, Sun, & Hennessy, 2007) and has been applied to observational data as a means of reducing confounding (Li, Shen, Wu, & Li, 2011; Lin & Chen, 2014).

Propensity score analysis works by minimizing differences between a “treated” group (one that has had a block party) to an untreated group (one that has never had a block party) through matching on common characteristics, a technique used to reduce bias introduced by a large number of covariates in regression. The “treatment” of block parties could not be randomly assigned to neighborhoods, so the propensity score matched neighborhoods that had block parties to similar neighborhoods that did not have block parties, and calculated the difference in self-rated health between the two groups. If a neighborhood with a block party has the same propensity score as a neighborhood without a block party, the two neighborhoods would be expected to have a similar composition of neighborhood characteristics, or covariates, to the extent that the neighborhoods could be considered exchangeable. With the covariate distributions balanced, the assumption is that the only difference between matched scores is the treatment status, or whether or not the neighborhood had a block party. This difference represents the counterfactual hypothetical, or the effect on health that introducing a block party could have on a neighborhood that never had a block party.

STATA’s *pscore* (Becker & Ichino, 2002) and *psmatch2* Mahalanobis functions (Leuven & Sianesi, 2003) were used to estimate propensity scores using a logit model for the dichotomous outcome for whether or not the neighborhood had registered a block party. The propensity score was stratified into quintiles within which units were matched with replacement, which allowed the use of more of the tracts. The average effect of the treatment on treated using stratification (ATT-s) was calculated within each of the propensity score’s strata (within which covariates are balanced and unmatched observations are dropped) and averaged. Stratification helps to achieve 95% of the bias reduction when there are more than 5 strata (Caliendo & Kopeinig, 2008; Cochran & Chambers, 1965; D’Agostino, 1998; Rosenbaum & Rubin, 1983).

For the purposes of comparison, two propensity score estimates were generated: one using a sample of unmatched neighborhoods, and the other using the sample of matched neighborhoods that would benefit from bias reduction.

RESULTS

Of the 381 neighborhoods (defined by census tracts) in Philadelphia, 293 of them had at least one block party between the years of 2003 to 2008. Neighborhoods with block parties

were significantly more populated, had higher percentages of females, were more likely to be impoverished, have a higher number of households, families, and housing units, with a higher percentage of Blacks, were more likely to be racially residentially segregated, with more murals, community development corporations, recreation centers, and higher rates of violent crime (Table 1). Neighborhoods with block parties had a significantly lower average rating of self-rated health (score=2.86 out of 4) compared with neighborhoods with no block party (mean score of 2.97).

Table 2 compares relationships between social capital indicators and block parties with social capital indicators and self-rated health, with subanalysis on predominantly Black neighborhoods. Social capital indicators were not related to block parties across all neighborhoods; however, predominantly Black neighborhoods had significant and positive associations with block party exposure for social cohesion, collective efficacy, and volunteerism, but not social participation. The interactions between social capital and Black race for block parties were negative and significant for social cohesion and collective efficacy.

Social cohesion, social participation and volunteerism were positively associated with self-rated health across all neighborhoods, but only social participation remained significantly positive when looking within Black neighborhoods. The interaction term estimated that each 1-point increase in social participation was associated with a 0.74 decrease in average health rating in a Black neighborhood. Visual inspection of plots of the interaction model showed that at the lowest levels of social participation, Black neighborhoods report better health than White neighborhoods; however, in all but the areas with lowest social participation, Black neighborhoods have poorer health relative to White neighborhoods.

Standardized differences of each of the neighborhood characteristics before and after matching are reported in Table 3 and provide validation that the covariates in the propensity score are balanced. Prior to propensity score matching, the standardized differences for characteristics between neighborhoods with and without block parties was larger than after matching, resulting in bias reduction. The only exceptions were the percent male and percent high school graduates, which became less balanced and exceeded the 10% threshold after matching. These covariates were later dropped in the propensity score analysis due to an inability to balance the propensity score. The bias reduction achieved by propensity score matching for the remaining variables suggest that propensity score-matched regression model is superior to an unmatched model estimation. Still, despite the bias reduction achieved, some of the standardized differences remained above 10%, indicating that some of the covariates were distributed significantly differently after matching.

After satisfying the covariate balance, the effect of block parties was estimated using the propensity score. The log odds and standard for ATT-s estimates (Figure 2) for the unmatched (0.93, 95% CI:[0.82–1.06]) and matched samples (1.10, 95% CI:[0.65–1.87]) both have confidence intervals that overlap 1, suggesting that the propensity for exposure to block parties has no effect on self-rated health among Black residents.

DISCUSSION

This analysis attempted to answer the questions of: (1) whether or not block parties are an indicator of bonding social capital in Black neighborhoods, based on OLS regression results; (2) the degree to which block parties might be related to self-rated health in the ways that other bonding social indicators are related to health, based on OLS regression results; and (3) whether or not block parties are associated with average self-rated health for Black residents particularly, using propensity score analysis. Results suggest that while block parties may be an indicator of social capital in Black neighborhoods particularly, block parties are not associated with better or worse self-rated average health of Black residents.

OLS regression results suggest that block parties may be an indicator of social cohesion, collective efficacy, and volunteerism, but not social participation forms of bonding social capital in Black neighborhoods, specifically: associations that do not hold across neighborhoods of other predominant racial/ethnic groups. When examining why this association might be different between Black and White neighborhoods, the negative interaction of social capital and predominant neighborhood race further suggested divergence of Black and White neighborhoods on the value of block parties as a form of social capital. If Black and White neighborhoods diverge on whether or not block parties reflect social capital, this may suggest that indicators by which social capital is measured may need to be culturally tailored. It also calls into question whether or not existing indicators are resonant across cultural groups, and suggests that putting efforts into understanding why different indicators behave differently by cultural groups. For example, higher voter registration rates have been linked to low social capital in Black, low-SEP neighborhoods, but linked to higher social capital in White neighborhoods (Hero, 2004). Using voting as an indicator of social capital in Black neighborhoods may not be a relevant measure, especially for a population that has been marginalized from voting through institutionalized practices to deter civic participation. Such measures of social capital may not be as resonant in Black neighborhoods compared to other racial/ethnic groups and the results of this study suggest that block parties may be culturally resonant indicators of social capital for Black neighborhoods. Beyond being culturally resonant, this analysis suggests that block parties reflect specific dimensions of social capital. In this case, the lack of significant association between block parties and social participation along with the presence of a positive association between volunteerism and block parties may reflect that block parties represent a certain depth of participation, not just whether or not neighborhoods were active.

While block parties may be an indicator of social capital for Black neighborhoods, block parties were not associated with good average self-rated health for Black residents as would be expected since block parties behaved similarly to social capital indicators in the OLS regression. The OLS regression demonstrated that across all neighborhoods higher social cohesion, social participation and volunteerism were related to better self-rated health in this sample, consistent with findings from other research studies (Kim et al., 2007). This preliminarily suggested that if block parties can also be an indicator of social capital, block parties might also be related to health. But when the relationship between block parties and average health ratings of Black residents was directly assessed in the propensity score

analysis, block parties were not associated with health, similar to other social capital indicators. These findings may align with several other studies which suggest that the strength of the relationship between social capital indicators is less for Blacks than Whites (I. Kawachi, 1999; Kim et al., 2006; Kim et al., 2007), which reinforces why race, as a social construct, should receive special attention in social capital studies. Social capital may have different returns on health for Black or White neighborhoods. In fact, the positive relationship between social capital and self-rated health largely disappeared when looking within Black neighborhoods only, suggesting that White neighborhoods drive the overall positive associations observed between social capital and health. The interaction term further suggested that social capital may have a different association with health in Black neighborhoods compared with White neighborhoods: in neighborhoods of low social capital, Blacks had better health than Whites, but in neighborhoods of high social capital, Whites had better health than Blacks.

One possible explanation for why block parties were not related with self-rated health in propensity score analysis is that Black residents, who are most likely to live in Black neighborhoods given the high degree of residential segregation, may be more likely to face adverse exposures. Deleterious elements in Black neighborhoods with block parties may overshadow any potential positive relationship between block parties and health, similar to what has been found in other studies of social capital and health in Black populations (Cutrona, Russell, Hessling, Brown, & Murry, 2000; Ross, 2000; Schootman et al., 2007). Neighborhoods with block parties had higher rates of violent crime, were more densely populated, overcrowded, had more venues for investing in ways that do not build wealth such as check-cashing vendors and rental property occupancy, and were more likely to be in poverty, all of which are social factors that may overshadow any positive associations between block parties and self-rated health. Conversely, neighborhoods with the most deleterious elements may organize more block parties as a curative action. Even after using the propensity score to account for nearly 30 neighborhood characteristics, including deleterious neighborhood elements, results still suggest that the propensity for block parties had essentially no effect on average self-rated health for Black residents. Residents in neighborhoods that do not have block parties would not be expected to be worse off in terms of health than those that have block parties, even when accounting for their deleterious effects.

A final possible explanation for the null association between block parties and health is that block parties may represent forms of social capital that do not confer health benefit to Black residents. Evidence to support that explanation appear in the OLS regression results for social participation, which was not associated with block parties but was associated with self-rated health in Black neighborhoods. The forms of social capital that are associated with block parties may not be utilized for health promotion, or it may be that neighborhoods with healthier people have less need for the types of social capital that block parties engender. Neighborhoods that do not have block parties may be missing out on the types of social capital that block parties engender, or those neighborhoods may be engaging other forms of social capital.

Simply because block parties are no better or worse for Black self-rated health does not invalidate their potential for health promotion. On the contrary, it is possible that block parties and the forms of social capital they engender have not been fully leveraged for promotion of healthy behaviors. Block parties may operate on health behaviors via the mechanisms common to other indicators of social capital: through diffusion of health information, social control that deters unhealthy behaviors, promotion of health-related services, affective support, and political empowerment (Berkman & Kawachi, 2000; Gilbert & Dean, 2013; I. Kawachi & Berkman, 2001; Ichiro Kawachi et al., 2007). As block parties are most relevant to Black neighborhoods, interventionists may consider them an entry point to encourage health behaviors that can reduce health disparities in diseases for which Blacks are at higher risk, and for which disparities have persisted despite existing interventions. For example, there is some evidence that social capital is related to more cancer screening behaviors (Leader & Michael, 2013), which applies in Black neighborhoods (L. Dean et al., 2014; L. T. Dean et al., 2014). This may be because block parties can provide a space for residents to share and encourage about these behaviors, or for connecting residents to services. Further exploration of the role of block parties on health behaviors is warranted.

Limitations

The response rate to the PHMC questions was low; however, PHMC's response rates fall within the range of response rates of other well-used and respected community-based surveys that use random-digit dialing, like the California Health Interview Survey (California Health Interview, 2009), and the nationally renowned Behavioral Risk Factor Surveillance System (Centers for Disease & Prevention, 2009).

A common critique of social capital indicators is that endogeneity arises when social capital indicators are actually precursors or consequences of social capital (Kim et al., 2007). As an example, in a later wave of the PHMC questionnaire, the collective efficacy item asked if the respondent had participated in an event "like a block party." Using an item like this for this analysis is akin to asking if someone had ever participated in a block party, and then attempting to show how the answer to that question predicts actual block party participation rates. The question's response is in fact its own predictor. However, the distribution of the response to this question matched that of the earlier waves when the block party portion was not asked, so was retained in the combined social capital averages.

Census data from year 2000 and crime data from 2000 to 2006 did not completely overlap with block party data collected from 2003 to 2008. The gap helped to account for any lagged effects that neighborhood characteristics or crime may have had on future block parties.

As an exploratory study, and the first of its kind, there was no previous research to inform the choice of neighborhood-level variables, and so variables that were statistically reliable and readily available were used. The data from the CML and the Streets Department, though readily available, may not have been complete, in which case neighborhood characteristics may be more or less similar than reported.

CONCLUSION

Plainly speaking, if a Black neighborhood that had never had a block party decided to have one, throwing a block party would be no better or no worse for health. Though block parties may be considered an indicator of social capital for Black neighborhoods, they were not associated with average self-rated health of Black residents; however many of the conventional social capital indicators were also not associated with health in predominantly Black neighborhoods. The null effect of propensity for block parties on health leaves room for further exploration, but the potential use of block parties as an indicator for social capital in Black neighborhoods opens a new opportunity for understanding which social resources are available to be leveraged for health promotion. The results suggest that block parties may be related to social cohesion, collective efficacy, and volunteerism for Black neighborhood residents. Results affirm that accounting for race is important in understanding neighborhood social capital. Further analysis might use a different selection of neighborhood characteristics to comprise the propensity score, such as structural characteristics like the number of schools or parks. Further analysis might also consider using a different outcome variable than self-rated health, like health behaviors. Whatever the case, block parties are yet an understudied resource in Black neighborhoods and they should be given more attention in future research and in consideration of health interventions for Black populations.

Acknowledgements

This work was supported by the National Institutes of Health and National Cancer Institute grants 1F31CA136236 and 1K01CA184288.

References

- Arthur CM, Katkin ES. Making a case for the examination of ethnicity of Blacks in United States Health Research. *J Health Care Poor Underserved*. 2006; 17(1):25–36. [PubMed: 16520504]
- Becker SO, Ichino A. Estimation of average treatment effects based on propensity scores. *Stata Journal*. 2002; 2(4):358–377.
- Berkman, LF.; Kawachi, I. *Social Epidemiology*. Vol. 1. USA: Oxford University Press; 2000.
- Caliendo M, Kopeinig S. Some practical guidance for the implementation or propensity score matching. *Journal of Economic Surveys*. 2008; 22(1):31–72.
- California Health Interview, S. Response Rates. In: Cervantes, IF.; Norman, GJ.; Brick, MJ.; Edwards, S., editors. *CHIS 2007 Methodology Series*. Vol. 4. Los Angeles, CA: UCLA Center for Health Policy Research; 2009.
- Cattell V. Poor people, poor places, and poor health: the mediating role of social networks and social capital. *Soc Sci Med*. 2001; 52(10):1501–1516. [PubMed: 11314847]
- Centers for Disease, C., & Prevention. 2008 Behavioral Risk Factor Surveillance System (BRFSS). Summary data quality report. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2009.
- Cochran WG, Chambers SP. The planning of observational studies of human population. *Journal of Royal Statistical Society*. 1965; 128(2):234–266.
- Cutrona CE, Russell DW, Hessling RM, Brown PA, Murry V. Direct and moderating effects of community context on the psychological well-being of African American women. *J Pers Soc Psychol*. 2000; 79(6):1088–1101. [PubMed: 11138756]
- D'Agostino RB Jr. Propensity score methods for bias reduction in the comparison of a treatment to a non-randomized control group. *Stat Med*. 1998; 17(19):2265–2281. [PubMed: 9802183]

- Dean L, Gilbert K. Social Capital and Political Advocacy for African-American Health. *Harvard Journal of African American Public Policy*. 2010 Summer;16:85.
- Dean L, Subramanian S, Williams DR, Armstrong K, Charles CZ, Kawachi I. The role of social capital in African-American women's use of mammography. *Social Science & Medicine*. 2014; 104:148–156. [PubMed: 24581073]
- Dean LT, Subramanian SV, Williams DR, Armstrong K, Zubrinsky Charles C, Kawachi I. Getting Black Men to Undergo Prostate Cancer Screening: The Role of Social Capital. *Am J Mens Health*. 2014
- Fone D, Dunstan F, Lloyd K, Williams G, Watkins J, Palmer S. Does social cohesion modify the association between area income deprivation and mental health? A multilevel analysis. *Int J Epidemiol*. 2007; 36(2):338–345. [PubMed: 17329315]
- Gilbert, K.; Dean, L. Social Capital, Social Policy, and Health Disparities: A Legacy of Political Advocacy in African-American Communities. In: Kawachi, I.; Takao, S.; Subramanian, SV., editors. *Global Perspectives on Social Capital and Health*. New York: Springer; 2013. p. 307-322.
- Grady S. Racial disparities in low birthweight and the contribution of residential segregation: a multilevel analysis. *Soc Sci Med* 2006; 63:3013-3029. *Social Science & Medicine*. 2006; 63:3013–3029. [PubMed: 16996670]
- Grady SC, McLafferty S. Segregation, nativity, and health: Reproductive health inequalities for immigrant and native-born black women in New York City. *Urban Geography*. 2007; 8(377):397.
- Hang, C. *Building Community One Block at a Time: The correlation between block parties and health neighborhoods*. (Dissertation/Thesis). University of Pennsylvania; 2006.
- Hanifan LJ. The rural school community center. *Annals of the American Academy of Political and Social Science*. 1916; 67:130–138.
- Harpham, T. The Measurement of Community Social Capital through Surveys. In: Kawachi, I.; Subramanian, SV.; Kim, D., editors. *Social Capital and Health*. New York, NY: Springer; 2008. p. 52
- Helliwell JF. Well-being and social capital: does suicide pose a puzzle? National Bureau of Economic Research. 2004
- Hero RE. Social Capital and Racial Inequality in America. *Perspectives on Politics*. 2004; 1:113–122.
- Kawachi I. Social capital and community effects on population and individual health. *Ann N Y Acad Sci*. 1999; 896:120–130. [PubMed: 10681893]
- Kawachi I, Berkman LF. Social ties and mental health. *J Urban Health*. 2001; 78(3):458–467. [PubMed: 11564849]
- Kawachi, I.; Subramanian, SV.; Kim, D. *Social Capital and Health*. New York; London: Springer; 2007.
- Kennedy BP, Kawachi I, Prothrow-Stith D, Lochner K, Gupta V. Social capital, income inequality, and firearm violent crime. *Soc Sci Med*. 1998; 47(1):7–17. [PubMed: 9683374]
- Kim D, Subramanian SV, Kawachi I. Bonding versus bridging social capital and their associations with self rated health: a multilevel analysis of 40 US communities. *Journal of Epidemiology & Community Health*. 2006; 60(2):116–122. [PubMed: 16415259]
- Kim, D.; Subramanian, SV.; Kawachi, I. Social Capital and Physical Health. In: Kawachi, I.; Subramanian, SV.; Kim, D., editors. *Social Capital and Health*. Vol. 1. Springer; 2007.
- Leader AE, Michael YL. The association between neighborhood social capital and cancer screening. *Am J Health Behav*. 2013; 37(5):683–692. [PubMed: 23985291]
- Leuven E, Sianesi B. PSMATCH 2: Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing. 2003
- Li L, Shen C, Wu AC, Li X. Propensity score-based sensitivity analysis method for uncontrolled confounding. *Am J Epidemiol*. 2011; 174(3):345–353. [PubMed: 21659349]
- Lin HW, Chen YH. Adjustment for missing confounders in studies based on observational databases: 2-stage calibration combining propensity scores from primary and validation data. *Am J Epidemiol*. 2014; 180(3):308–317. [PubMed: 24966224]
- Mansson R, Joffe MM, Sun W, Hennessy S. On the estimation and use of propensity scores in case-control and case-cohort studies. *Am J Epidemiol*. 2007; 166(3):332–339. [PubMed: 17504780]

- Massey, D.; Denton, N. *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press; 1993.
- McKenzie K, Whitley R, Weich S. Social capital and mental health. *Br J Psychiatry*. 2002; 181:280–283. [PubMed: 12356653]
- Oakes, JM.; Johnson, JP. Propensity score matching methods for social epidemiology. In: Oakes, JM.; Kaufman, JS., editors. *Methods in Social Epidemiology*. San Francisco: Jossey-Bass; 2006. p. 364–386.
- Oliver PE, Meyer D. How Events Enter the Public Sphere: Conflict, Location, and Sponsorship in Local Newspaper Coverage of Public Events. *American Journal of Sociology*. 1999; 105:38–87.
- Poortinga W. Community resilience and health: the role of bonding, bridging, and linking aspects of social capital. *Health Place*. 2012; 18(2):286–295. [PubMed: 22037322]
- Putnam, RD. *Making Democracy Work. Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press; 1993.
- Putnam RD. Bowling Alone: America's declining social capital. *Journal of Democracy*. 1995; 6(1):65–78.
- Quillian L. Segregation and Poverty Concentration: The Role of Three Segregations. *Am Sociol Rev*. 2012; 77(3):354–379. [PubMed: 24648570]
- Rassen JA, Shelat AA, Myers J, Glynn RJ, Rothman KJ, Schneeweiss S. One-to-many propensity score matching in cohort studies. *Pharmacoepidemiol Drug Saf*. 2012; 21(Suppl 2)(S2):69–80. [PubMed: 22552982]
- Read JG, Emerson MO. Racial context, black immigration, and the US black/white health disparity. *Social Forces*. 2005; 84(1):181–199.
- Rosenbaum DR, Rubin BB. The central role of propensity scores for observational studies of causal effects. *Biometrika*. 1983; 70:41–55.
- Ross CE. Neighborhood disadvantage and adult depression. *Journal of health and social behavior*. 2000; 41(2):177–187.
- Sampson RJ, Raudenbush SW, Earls F. Neighborhoods and violent crime: a multilevel study of collective efficacy. *Science*. 1997; 277(5328):918–924. [PubMed: 9252316]
- Schootman M, Andresen EM, Wolinsky FD, Malmstrom TK, Miller JP, Miller DK. Neighbourhood environment and the incidence of depressive symptoms among middle-aged African Americans. *Journal of Epidemiology & Community Health*. 2007; 61(6):527–532. [PubMed: 17496262]
- StataCorp.. *Stata Statistical Software: Release 10*. College Station, TX: StataCorp, LP; 2007.
- Takagi D, Ikeda K, Kawachi I. Neighborhood social capital and crime victimization: comparison of spatial regression analysis and hierarchical regression analysis. *Soc Sci Med*. 2012; 75(10):1895–1902. [PubMed: 22901675]
- White K, Borrell LN, Wong DW, Galea S, Ogedegbe G, Glymour M. Racial/Ethnic Residential Segregation and Self-Reported Hypertension Among US- and Foreign-Born Blacks in New York City. *American Journal of Hypertension*. 2011; 24(8):904–910. [PubMed: 21509051]
- Williams DR. Race and health: basic questions, emerging directions. *Ann Epidemiol*. 1997; 7(5):322–333. [PubMed: 9250627]
- Williams DR, Jackson JS. Race/ethnicity and the 2000 Census: recommendations for African Americans and other black populations in the United States. *Am.J.Public Health*. 2000; 90:1728–1730. [PubMed: 11076240]
- Wong D. Modeling local segregation: A spatial interaction approach. *Geographical and Environmental Modeling*. 2002; 6(1):81–97.

Research Highlights

- Block parties may be a resonant social capital indicator in Black neighborhoods
- Block parties may not be worse or better for self-rated health for Black residents
- Propensity scores can address unmeasured confounding in neighborhood research

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

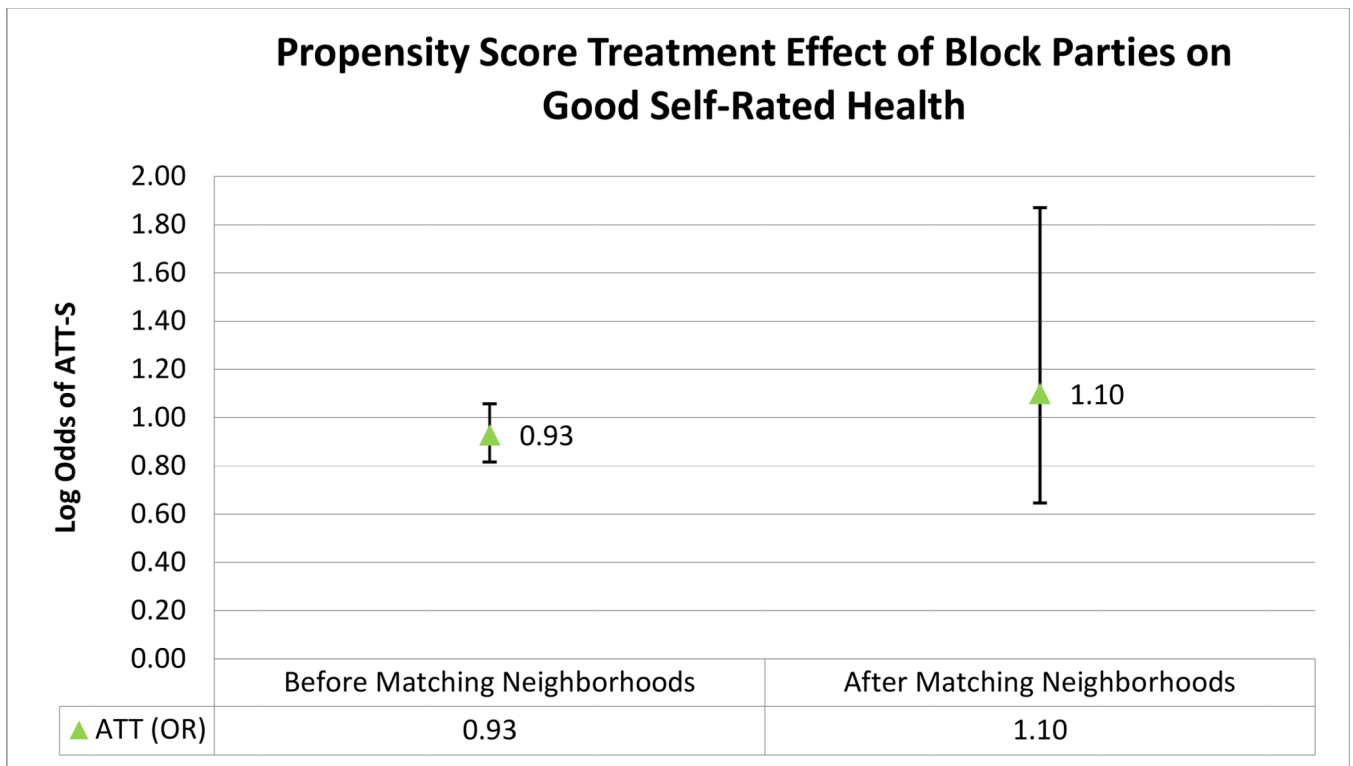


Figure 1.
 Treatment Effect of Block Parties on Good Self-Rated Health of Black Residents in Philadelphia

Table 1
 Characteristics of Philadelphia Neighborhoods (Census Tract Averages) based on Presence or Absence of Block Parties*

Characteristics of Philadelphia Neighborhoods (Census Tract Averages)	All Neighborhoods (N=381)		Block Parties (n=293)		No Block Parties (n=88)		p-value
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
<i>Population Demographics</i>							
Total population (Census 2000)	3983.07	2411.48	4287.66	2235.73	2968.92	2696.39	<.001
Percent White	44.88	36.45	39.79	35.39	61.83	34.95	<.001
Percent Black	42.00	37.36	48.06	37.44	21.80	29.26	<.001
Percent male	45.84	9.37	45.98	5.65	45.36	16.61	0.58
Percent female	51.80	10.09	52.99	6.25	47.82	17.12	<.001
Mean age	34.42	8.56	33.96	6.75	35.95	12.82	0.06
Percent high school graduates	69.02	18.51	69.54	15.15	67.30	26.89	0.32
Percent below 200% poverty line	39.12	20.69	42.98	19.01	26.24	20.95	<.001
Percent below 100% poverty line	21.02	14.68	23.17	13.94	13.86	14.89	<.001
Percent commuting more than 30 minutes	48.91	16.08	50.93	13.82	42.16	20.69	<.001
<i>Neighborhood Characteristics</i>							
Number of households	1548.74	990.16	1664.68	914.02	1162.73	1132.40	<.001
Number of families	924.75	614.97	984.13	571.76	727.06	709.38	<.001
Number of housing units	1737.42	1079.62	1879.77	994.29	1263.49	1215.52	<.001
Percent owner occupied	917.67	666.58	56.64	20.09	54.99	30.81	0.56
Percent renter occupied	631.07	561.89	42.33	19.72	35.92	27.82	0.02
Segregation index, Whites from Blacks	0.48	0.36	0.43	0.35	0.66	0.34	<.001
Segregation index, Blacks from Whites	0.44	0.36	0.51	0.35	0.22	0.28	<.001
Residential blocks per square mile	186.88	117.62	208.64	104.82	114.42	129.01	<.001
Percent overcrowded	0.56	0.97	0.63	0.99	0.32	0.85	0.008
<i>Neighborhood Resources (raw counts)</i>							
Murals	3.86	5.33	4.49	5.65	1.77	3.35	<.001
Check-cashing places	0.55	0.89	0.60	0.95	0.40	0.63	0.07
Community Development Corporations	0.23	0.50	0.27	0.54	0.08	0.31	0.001

Characteristics of Philadelphia Neighborhoods (Census Tract Averages)	All Neighborhoods (N=381)			Block Parties (n=293)		No Block Parties (n=88)		p-value
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
<i>Population Demographics</i>								
Billboards	4.95	7.00	4.71	6.55	5.76	8.30	0.22	0.65
Banks	0.86	1.99	0.88	2.16	0.77	1.27	0.65	0.001
Recreation Centers	0.46	0.68	0.51	0.71	0.30	0.55	0.001	
<i>Incidents of Violent Crimes (by year)</i>								
2000	25.83	25.39	29.90	25.97	12.30	17.63	<.001	<.001
2001	25.26	24.08	29.15	24.49	12.31	17.31	<.001	<.001
2002	24.26	23.62	28.11	24.33	11.43	15.26	<.001	<.001
2003	24.25	23.67	28.12	24.35	11.36	15.48	<.001	<.001
2004	24.41	23.01	27.92	23.12	12.74	18.45	<.001	<.001
2005	26.00	18.19	28.87	18.18	16.45	14.66	<.001	<.001
2006	26.85	24.97	30.70	25.19	14.00	19.41	<.001	<.001
<i>Self-Rated Health (n=374)</i>	2.89	0.29	2.86	0.27	2.97	0.33	0.001	0.001

* Neighborhoods were divided into those that had no block parties between 2003 and 2008, or that had any block parties in that period.

Associations between Social Capital Indicators and Block Parties compared with Associations between Social Capital Indicators and Self-Rated Health

Table 2

Regression Coefficients [#] (Standard Errors) of Social Capital Predictors and Interactions with Race	Block Parties			Self-Rated Health		
	All Neighborhoods	Black Neighborhoods	Interaction of Social Capital and Neighborhood Race	All Neighborhoods	Black Neighborhoods	Interaction of Social Capital and Neighborhood Race
Social Cohesion (n=371)	-0.003 (0.006)	0.38** (0.092)	-0.04** (0.01)	0.06* (0.02)	0.25 (0.31)	-0.03 (0.033)
Collective Efficacy (n=367)	-0.16 (0.03)	0.14** (0.04)	-0.11* (0.05)	0.09 (0.10)	0.0006 (0.12)	-0.11 (0.17)
Social Participation (n=374)	-0.033 (0.03)	0.05 (0.03)	0.02 (0.06)	0.65** (0.10)	0.24* (0.09)	-0.74** (0.19)
Volunteering (n=361)	-0.057 (0.04)	0.08** (0.02)	0.004 (0.04)	0.22* (0.07)	-0.02 (0.05)	-0.16 (0.11)

[#] Controlling for being under 200% of the poverty level;

* p<0.05,

** p<.001

Standardized Differences for Characteristics of Philadelphia Census Tract Neighborhoods Before and After Propensity Score Matchings

Table 3

Standardized Differences for Characteristics of Philadelphia Neighborhoods Before and After Propensity Score Matching	Before Matching	After Matching	% Bias Reduction
<i>Population Demographics</i>	<i>Standardized Difference %</i>	<i>Standardized Difference %</i>	<i>t-statistic</i>
Total population (Census 2000)	53.2	4.62	-2.99
Percent White	-62.7	-5.14	-0.53
Percent Black	78.2	6.05	1.80
Percent male	5.0	0.55	2.81
Percent female	40.1	4.31	1.13
Mean age	-19.4	-1.92	1.36
Percent high school graduates	10.3	1.00	4.61
Percent below 200% poverty line	83.7	7.08	-1.15
Percent below 100% poverty line	64.5	5.41	-1.05
Percent commuting more than 30 minutes	49.9	4.61	4.38
<i>Neighborhood Characteristics</i>			
Number of households	48.8	4.26	-2.42
Number of families	39.9	3.49	-3.44
Number of housing units	55.5	4.83	-2.43
Percent owner occupied	6.4	0.59	-0.87
Percent renter occupied	26.6	2.42	2.60
Segregation index, Whites from Blacks	-65.1	-5.34	-0.92
Segregation index, Blacks from Whites	90.5	7.03	2.79
Residential blocks per square mile	80.2	6.99	-6.69
Percent overcrowded	33.5	2.65	7.8
<i>Neighborhood Resources</i>			
Murals	58.6	4.29	2.08
Check-cashing places	24.7	1.85	1.58

Standardized Differences for Characteristics of Philadelphia Neighborhoods Before and After Propensity Score Matching					
	Before Matching		After Matching		
<i>Population Demographics</i>	<i>Standardized Difference %</i>	<i>t-statistic</i>	<i>Standardized Difference %</i>	<i>t-statistic</i>	
				<i>% Bias Reduction</i>	
Community Development Corporations	44.1	3.22	29.5	3.38	33.0
Billboards	-14.1	-1.24	13.9	2.00	1.6
Banks	6.3	0.46	0.8	0.10	87.7
Recreation Centers	33.7	2.61	19.4	2.06	42.3
<i>Incidents of Violent Crimes (by year)</i>					
2000	79.3	5.96	-4.9	-0.52	93.8
2001	79.4	6.01	-32.2	-3.19	59.5
2002	82.1	6.08	-21.5	-2.29	73.8
2003	82.1	6.09	-18.4	-1.98	77.7
2004	72.6	5.64	-23.9	-2.53	67.1
2005	75.2	5.86	-30.4	-3.16	59.6
2006	74.3	5.73	-41.5	-3.95	44.2
Self-Rated Health	-38.0	-3.23	1.1	0.15	97.2

** Percent bias reduction exceeds 100% because the difference that having a block party makes is much greater in the matched sample than the unmatched sample. This may be an indication of some selection bias or imbalance in the propensity score that did not meet the statistical threshold for imbalance according to STATA's propensity score balancing property. For the rest of the covariates, the standardized differences for the unmatched sample are larger than the matched sample.