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Social Capital and the Neighborhood Alcohol Environment

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Abstract

We examine whether neighborhood alcohol outlet density is associated with reduced social capital and whether this relationship is mediated by perceived neighborhood safety. Hierarchical models from a random sample of Los Angeles, CA and Louisiana residents (N=2881) from 217 census tracts were utilized. Substantial proportions of the variance in collective efficacy (Intraclass correlation coefficient, ICC = 16.3%) and organizational participation (ICC=13.8%, Median Odds Ratio = 1.99) were attributable to differences between neighborhoods—suggesting that these factors may be influenced by neighborhood-level characteristics. Neighborhood alcohol outlet density was strongly associated with reduced indicators of social capital, and the relationship between collective efficacy and outlet density appears to be mediated by perceived neighborhood safety. Findings support the concept that off-premise alcohol outlets in the neighborhood environment may hinder the development of social capital, possibly through decreased positive social network expansion.

Keywords

Social Capital; Social Organization; Alcohol Outlets; Neighborhoods

INTRODUCTION

Social capital is often defined as those features of social life and structure (i.e., social networks, norms of reciprocity, and trust in others) that facilitate cooperation for mutual benefit (Putnam et al., 1993). Despite numerous critiques, social capital is still regarded as an important concept in understanding health disparities and poorer health (Baum, 2000, Carpiano, 2006, Muntaner and Lynch, 2002, Poortinga, 2006, Portes, 1998, Szreter and Woolcock, 2004, Ziersch et al., 2005). The health benefits of social capital are achieved at the neighborhood or individual levels through information resources and diffusion, social influence and control, and social solidarity. Communities with higher levels of social capital are often thought of as cohesive and thriving communities.

Most public health research on social capital refers to the original definitions of Bourdieu (Bourdieu, 1986), Coleman (Coleman, 1990), and Putnam (Putnam, 2000) that

characteristically include two components of social capital—a structural and a cognitive component—that represent the norms and networks that enable people to act collectively. The structural component of social capital includes aspects such as networks, connectedness, associational life and civic participation. The cognitive component includes aspects such as perceived support, trust, social cohesion and perceived civic engagement. Social capital has also been theorized as having both horizontal and vertical dimensions, each with its own forms of cognitive and structural influences (Szreter and Woolcock, 2004).

There now appears to be general agreement that the core concept associated with social capital is the network of interpersonal and organizational ties that exist in the social environment (Putnam, 2004). While the effects of social capital may have individual-level consequences (e.g., access to information or other goods and services, sense of belonging, social support), the construct of social capital itself is a collective phenomenon (Lochner et al., 1999, Subramanian et al., 2005, Subramanian et al., 2003). Defined in this way—as a context (i.e., social network) in which individuals are embedded—paves the way for research into how the social and physical environment can influence social capital by shaping social networks. In fact, a number of studies have explored the relationship between the environment and social networks (Carpiano, 2006, Cattell, 2001, Freeman, 1992, Leyden, 2003, Sampson and Groves, 1989, Sampson et al., 1997). For example, Leydon observed that walkable, mixed-use neighborhoods (i.e., more “traditional” neighborhoods that allow residents to perform daily activities without the use of a car) may encourage the development of social networks given that residents are more likely to know their neighbors, resulting in trust and social engagement (Leyden, 2003). In this study we add to the existing literature by examining how the physical neighborhood environment (i.e., off-premise alcohol outlets) is related to indicators of social capital, as measured by perceived cognitive and structural social capital.

We hypothesize that off-premise alcohol outlets, e.g., liquor stores – or establishments that sell alcohol purchased for consumption “off” the premises– may directly or indirectly affect health through their impact on the development of positive social networks and therefore social capital (Scribner et al., 2007). This effect may work in one of two ways: 1) contraction or expansion of existing social networks and/or 2) competing social networks. The effect is dependent on whether the outlet is an asset or a detriment to the neighborhood. In the case of network expansion or contraction, a well run outlet could provide a meeting place for residents to expand their social interactions; alternatively, it could lead to network contraction if the outlet does not cater to local neighborhood residents and instead threatens residents with loud noise, unruly patrons, trash, late hours of operation, and other incivilities that have been linked to off-premise alcohol outlets (e.g., crime). In the case of a competing social network, a poorly run alcohol outlet represents an even greater detriment to the neighborhood if it has a competing social network of individuals who do not share the same neighborhood goals as the neighborhood residents (i.e., drug dealers, gang members, prostitutes). A greater concentration of poorly run outlets may then result in a reduction of positive social networks in those neighborhoods, resulting in a potential decrease in social capital formation and its consequences (i.e., perceived collective efficacy or capacity for a neighborhood to intervene on problems and active participation) (Cattell, 2001). Figure 1 summarizes these relations.

While a well-run alcohol outlet may be beneficial to the neighborhoods, the theoretical underpinning of our conceptualization is linked to the role of incivilities in urban communities (Taylor, in press, Taylor et al., 1985) and in previous research on the impact of alcohol outlets on health outcomes. In research on the effects of alcohol outlets on neighborhoods, multiple studies have found that outlets (liquor stores, but also bars and nightclubs) are associated with social and physical disorder, particularly as manifested in violence. Specifically, alcohol outlet density has been associated with violence in Austin and San Antonio, Texas (Zhu et al., 2004), Camden, New Jersey (Gorman, 1998), Kansas City, Missouri (Reid et al., 2003), Los

Angeles, California (Scribner et al., 1995), New Orleans, Louisiana (Scribner et al., 1999), Newark, New Jersey (Speer et al., 1998), and California (Gruenewald et al., 2006, Gruenewald and Remer, 2006). However, the mechanism of this association has not been carefully studied, although various theoretical explanations have been offered. Some include social contextual models, niche theory and assortative drinking (Gruenewald, 2007) that are closely related to social network formation and behavior as defined in our conceptualization of social capital.

The objective of this study was to determine whether neighborhood off-premise alcohol outlet density is associated with reduced social capital and whether this relationship is mediated by perceived neighborhood safety. Perceptions of safety may be influenced by the local alcohol environment, representing potential links between neighborhood alcohol outlet density and positive social network access. In the current study, we examine indicators of structural and cognitive indicators of social capital, with constructs capturing both potential bonding and bridging dimensions.

METHODS

Study Sites & Selection of Census Tracts

The cross-sectional study was conducted in Louisiana and California, which have different demographics, different retail sales patterns and different cultural attitudes towards alcohol. In Louisiana there are areas (such as New Orleans) that are very permissive with alcohol, allowing purchases 24 hours a day, 7 days per week, and other areas that are “dry” (alcohol sale prohibited) or where the sale of alcohol is limited to certain hours. Los Angeles has more uniform retail sales patterns but a highly diverse population, allowing us to study the impact of alcohol marketing practices in different ethnic groups.

The study took place between October 4, 2004 and August 28, 2005 in Louisiana and October 19, 2005 in Los Angeles County. Sampling was limited to urban residential census tracts, with urban defined as having more than 2,000 residents per square mile in the 2000 U.S. census. We randomly selected 114 of these census tracts in southeastern Louisiana and 114 census tracts in Los Angeles County, for a total of 228 census tracts. In Louisiana, data collection was suspended when Hurricane Katrina struck, after measurements were collected in 103 census tracts. For the purpose of the present study, a census tract was used as a proxy for neighborhood. The resulting sample included 2881 individuals—1578 from Los Angeles County and 1303 from Louisiana. The research was approved by RAND Corporation, Charles R. Drew University of Medicine and Science, the Louisiana State University, and Tulane University Institutional Review Boards.

Survey Procedures

Sampling employed a two-stage procedure that involved selecting census tracts stratified by location (Los Angeles vs. Southern Louisiana) in the first stage and sampling approximately 10 households per census tract in Los Angeles and in Louisiana using a list-based systematic sample in the second stage. A list-based sample was chosen because in addition to the phone numbers we also required the corresponding addresses for geocoding. Up to 25 contact attempts were made.

Several steps were taken to improve response rates including sending advance letters, providing incentives (a $15 check upon completion), toll-free numbers, and answering machine messages. These channels supplemented and reinforced the work of interviewers, who provided information tailored to respondents’ questions. Advance letters were sent to all unique addresses in the household sample. In the event multiple phone numbers were matched to the same address, only one letter was sent to that address. The advance letter explained the data

collection project and encouraged respondents to participate. It also provided the toll-free telephone number for the participant to call and complete the survey and the number for the Principal Investigator at RAND for the participant to call to get more information about the study. The cooperation rate, the proportion of all cases interviewed of all eligible respondents ever contacted, was 76.2% in Los Angeles and 79.8% in Louisiana for the phone survey. The response rates for Los Angeles County and the state of Louisiana were 34.4% and 37.9%, respectively, based on the method codified by the Council of American Survey Research Organizations (CASRO).

Data Sources

Individual level data was obtained from the phone survey. Counts of alcohol licenses for all years came from the California Department of Alcohol Beverage Control (ABC) and the Louisiana Department Alcohol and Tobacco Control (ATC). Alcohol outlets were classified based on their license to sell alcohol off-premise (liquor stores, grocery stores, and convenience stores) using license codes provided by the ABC or ATC (depending on state). Neighborhood-level sociodemographic characteristics were obtained from the 2000 U.S. Census.

All unique address listings for survey respondents and alcohol outlets were geo-coded and mapped to the 2000 Census tract areas, and individual data sources were matched by census tract. Over 98 percent of addresses were matched using Arcview GIS software (ESRI Inc, Redlands, CA) along with Los Angeles County and Louisiana TIGER street files from the 2000 Census. Addresses that the computer were unable to match were hand placed with the help of an Internet mapping site (Mapquest) and a Thomas Guide map book.

Measures

The primary outcomes of interest included indicators of social capital—active organizational membership and collective efficacy. Items are detailed in Table 1. Active membership was measured with participation indicators—whether the respondent belonged to a church or religious organization, a community or neighborhood association, and whether they voted in the last election. Participation was measured as participation in none to all three of the organizations. Cognitive social capital or perceived collective efficacy was measured with a five-item Likert scale measuring social cohesion and informal social control (see Table 1). Items were summed to create an index, ranging from 0 to 20 (Cronbach's alpha = 0.85). Individual-level items were aggregated to obtain proxies for neighborhood-level social capital indicators.

Although not a primary outcome, we also examined as an additional covariate, specific aspects of neighborhood structure that may influence the development of social networks and organizations and, in turn, social capital in a community (Sampson, 2003, Sampson et al., 1999, Sampson et al., 1997, Metro Chicago Information Center, 2005). Indicators of neighborhood structure were based on 2000 U.S. Census estimates. An index of endogenous social organization was created and included two different subcomponents: interaction potential and stability. These were taken from the larger Metropolitan Information Center's Community Vitality Index (Metro Chicago Information Center, 2005), and have been used by others to examine neighborhood structure conducive to the development of social capital, namely social control, collective efficacy and lower neighborhood crime rates (Sampson et al., 1999, Sampson, 2003, Sampson et al., 1997, Bursik, 1988). For the purposes of the present analysis, these measures were based on a very simplified set of assumptions of the constructs. The scale demonstrated moderate reliability in this sample (Cronbach's alpha = 0.65).

Interaction potential included: (1) neighbor interaction, defined as the percentage of households that are not linguistically isolated (assuming that a common language is vital to a

community's capacity to participate fully in the larger social and economic structure); (2) social support, defined as the percentage of households with more than one person; and (3) at home, measured as the percentage of households with one or more adults not in the labor force (with the assumption that these households are ones where someone may have more time to invest in building relationships in the community).

Stability included: (1) mobility, defined as the percentage of all households that reported that they moved in the past five years, reverse coded (assuming that neighborhood stability contributes to neighborhood connectedness, which may increase social capital); and (2) immigration, measured as the percentage of foreign-born residents who entered the U.S. and their specific census tract within five years of the 2000 U.S. Census, also reverse coded (assuming immigration results in significant social and cultural adjustments that may hamper development of social cohesion).

The primary exposure of interest was off-premise alcohol outlet density. Outlet density was measured as the ratio of the number of off-premise alcohol outlets to the square mile area in each tract based on 2000 geographic census data. The number of outlets per roadway mile was also calculated and compared for consistency and results were consistent.

Additional environmental measures of the neighborhood alcohol environment included individual geographic distance to the nearest off-premise outlet, and the mean or aggregated distance to the nearest off-premise outlet (aggregated responses of individual distances for each census tract).

The primary potential mediator in the relationship between alcohol outlet density and indicators of social capital was perceived neighborhood safety, assessed with a four point scale of how safe the respondent feels it is to be outdoors in their neighborhood (1= "very unsafe" to 4= "very safe").

Covariates of interest included both individual- and neighborhood-level factors. Individual factors included sociodemographic characteristics such as age, race, ethnicity (Hispanic vs. non-Hispanic), marital status (married vs. not married), education (0 to 5, never attended school to college graduate), employment (employed full-time, legally, vs. other), car ownership (yes/no), annual income (1 to 3, < $20,000 to ≥ $75,000), and the number of children in household. Also examined were individual factors potentially associated with the outcomes, mediators, and/or exposure of interest such as the number of years living in their neighborhood, the level of visible alcohol use in neighborhood (1= "never see drinking outside" to 5= "almost every day"), and witnessed or experienced violence in neighborhood (yes/no).

Neighborhood-level covariates included aggregated individual responses to select items (as shown in Table 3), as well as census tract measures from the U.S. Census (2000). Census-based measures included racial and ethnic composition (% White, % African American, % Hispanic), education (% with less than high school education), percentage below the U.S. Federal poverty level, median household income, and economic deprivation. Economic deprivation was measured using a Z-score standardized index of concentrated disadvantage (Sampson and Morenoff, 2004) measuring economic disadvantage in racially segregated urban neighborhoods and defined by the percent of families below the poverty line, percent of families receiving public assistance, percent of unemployed individuals in the civilian labor force, percent of families with children that are female-headed, and percent of residents who are black (Cronbach's alpha = 0.85).

Geographic census items that may impact the amount of pedestrian travel in a neighborhood included street density (linear miles of street per square mile), block size (area per square mile),

intersection density (intersections per square mile), and the percentage of four-way intersections (Dill, 2003).

Statistical Analyses

All analyses were performed with SAS version 9 and ArcGIS version 9. Bivariate analyses included chi-square and t-test statistics and simple correlations where appropriate. Two-level hierarchical linear (using PROC MIXED) and ordinal (using PROC GLIMMIX) regression models, with individuals (first level, n=2881) nested within neighborhoods or census tracts (second level, n=217) were used to examine the contextual effect of alcohol outlet density on indicators of social capital—for collective efficacy and organizational participation (an ordinal variable in this study), respectively. Such models allow for estimates of variance components at both the individual- and neighborhood-level (Bryk and Raudenbush, 1992, Singer, 1998, Snijders and Boskers, 1999). Partitioning variance in this way accounts for the variance in individual-level outcomes that can be attributed to differences between neighborhoods, expressed as the intraclass correlation coefficient (ICC). The ICC was calculated for the linear model as:

$$\frac{V_{\text{neighborhood}}}{V_{\text{neighborhood}} + V_{\text{individual}}}$$

where $V_{\text{neighborhood}}$ = variance between neighborhoods and $V_{\text{individual}}$ = variance within neighborhoods or between individuals. For the ordinal model, the ICC was calculated by following the formula of Snijders based on an underlying continuous variable with $V_{\text{individual}} = \Pi^2/3$ (Snijders and Boskers, 1999). However, the pseudo ICC for non-linear models may not be appropriate and therefore we also calculated and examined the Median Odds Ratio (MOR) as described by Merlo and colleagues (Merlo et al., 2006).

For each outcome variable, the following models were examined: (1) an empty or unconditional means model which is only a function of the neighborhood-level random intercept (used to obtain the amount of clustering in social capital indicators within neighborhood); (2) crude bivariate multi-level models including alcohol outlet density only; (3) crude bivariate analysis (i.e., chi-square and t-tests or Fisher's Exact and Mann-Whitney where appropriate) were used to identify significant relationships between other covariates and the outcomes, as well as between other covariates and outlet density; (4) multivariate multi-level models including additional salient individual- and neighborhood-level covariates along with alcohol outlet density; and (5) multivariate models from (4) that included the potential mediators. Final models were based on variables significantly associated with the outcomes and manual backwards selection of variables to identify potential confounders.

Mediation by perceived safety and outdoor activity was assessed by including, separately, each potential mediator in a multivariate model with off-premise outlet density and other salient covariates. Removal of the effect of density after inclusion of the potential mediator, and a significant relationship between the mediator and social capital outcomes was deemed indicative of mediation.

All of the individual-level variables were centered at their respective means. The effects of any spatial autocorrelation in the data was taken into account with repeated measures of spherical clustering, based on the tract centroids (i.e., the geometric center of the census tract) and state plane coordinate system in miles, using a 2.5 mile lag distance. This procedure adjusted the standard errors and significance tests to account for any inflation or deflation due to geographical clustering. Moran's I estimates were also calculated to examine the amount of clustering in social capital indicators explained by the models.

RESULTS

Table 2 presents characteristics of survey participants and characteristics according to study location. The majority of respondents were female (63.9%) and substantial proportions were white (41.4%) or African American (27.6%). Approximately one-fifth was Hispanic. Respondents ranged in age from 18 to 65 (mean=42.9 years; standard deviation(SD)=13.2). Greater proportions of respondents in Louisiana than California were female, older in terms of age and age categories, and black. Nearly half (46.9%) of all respondents indicated they were married and 62.2% were employed full-time. Approximately 33 percent of respondents reported an annual income of < $20,000, 45 percent an annual income of $20,000 to $74,999, and 22 percent an annual income of ≥ $75,000. The average number of years lived in their neighborhood was 11.9 (SD=11.1), with Louisiana respondents indicating a longer time in their neighborhood. The average distance to the nearest off-premise outlet was 0.5 miles and distance to the nearest off-premise outlet was greater for Louisiana than California respondents. Nearly 20% of respondents reported witnessing or experiencing violence in their neighborhood yet, on average, reported a moderately high perception of safety in their neighborhood.

Respondents drank, on average, 51.7 days out of the year, with an average of 1.3 drinks per day. Nearly 20 percent were classified as binge drinkers. The average level of visible alcohol consumption in the neighborhood was 2.4 or between at least once a year to once a month, with 44.5 percent never seeing drinking outside, 15.3 percent seeing it at least once a year, 12.4 percent seeing it at least once a month, 14.5 percent seeing it at least once a week, and 13.3 percent seeing it almost every day. Compared to California respondents, Louisiana respondents reported a greater frequency of visible alcohol use in their neighborhood and number of drinks consumed per day, and they were more likely to be classified as binge drinkers.

Neighborhood-level characteristics are presented in Table 3. The mean percentage White, African American, and Hispanic population for sampled tracts was 39.6, 14.5, and 47.9, respectively. Approximately one-fifth of the tracts were below the Federal U.S. poverty level and the median household income was $38,576. Mean level of concentrated disadvantage was 1.47 (±3.76). The average off-premise outlet density per square mile was 11.56 (±10.03).

Although not shown, sampled tracts in Louisiana differed on several sociodemographic and socioeconomic variables compared to tracts in California. Fifty-two percent of Louisiana tracts could be classified as majority-white neighborhoods, while only 15% of Los Angeles tracts fit this description. Louisiana tracts also had significantly smaller percentages of their residents under 18 and much lower population density than Los Angeles tracts. However, there were no significant differences in median household income by site. Nonetheless, study location was controlled for in multivariate analyses.

Neighborhood characteristics according to levels of collective efficacy and organizational participation are presented in Table 4. Tracts high on indicators of social capital (as defined by the mean value of these indicators) had a greater proportion of White residents, fewer Hispanic residents, greater education and annual household income, lower concentrated disadvantage, and a greater number of residential years in the neighborhood. Neighborhoods with greater social capital indicators also had significantly fewer off-premise alcohol outlets per square mile. The amount of visible alcohol use in the neighborhood was lower, although drinking days per year were higher, among tracts with greater markers of social capital. The percentage of four-way intersections was lower and average block size higher among neighborhoods with higher levels of social capital indicators.

Table 5 presents the results of multi-level linear models with collective efficacy as the outcome. In Model A, the empty model, the variance in individual perceived collective efficacy is partitioned into its individual-and neighborhood-level components, enabling us to determine

the amount of variance in the outcome measure explained at each level. Although most of the variance in collective efficacy was partitioned to the individual-level (83.7%), 16.3% of perceived collective efficacy was attributable to differences in the mean level of collective efficacy between neighborhoods—suggesting that collective efficacy may also be influenced by neighborhood-level characteristics.

Model B (Table 5) added neighborhood or census tract off-premise outlet density to the empty model. A strong effect for alcohol outlet density was observed, with higher off-premise alcohol density associated with less perceived collective efficacy ($\beta = -0.1055$, $p < 0.0001$). The magnitude of the effect was such that a two standard deviation difference in off-premise outlet density across neighborhoods was associated with a two point decrease in the level of perceived collective efficacy. In addition, the reduction in the ICC due to the addition of effect of off-premise alcohol outlet density indicates that 21.5% of the variance partitioned to the neighborhood-level and 3.1% of the total variance were explained by the addition of off-premise alcohol outlet density.

In Model C (Table 5), the addition of other covariates explained an additional 75.0% of the variance partitioned to the neighborhood level in perceived collective efficacy. The reduction in the neighborhood-level variance resulting from the addition of individual level covariates to the model indicates that a portion of the variance partitioned to the neighborhood-level may be due to the grouping of residents with similar individual characteristics and therefore similar perceptions of collective efficacy. The addition of concentrated disadvantage may have also reduced some of the neighborhood-level variance given its relationship to alcohol outlet density. Nonetheless, the effect of off-premise alcohol outlet density remained after including the additional covariates (Model C, $\beta = -0.04761$, $p < 0.01$).

Adding perception of neighborhood safety appeared to mediate the observed relationship between alcohol outlet density and perceived collective efficacy. In model D (Table 5), adding perception of neighborhood safety rendered the estimate of alcohol outlet density insignificant, decreasing the effect of outlet density to only one-fourth unit in the level of collective efficacy for a two standard deviation change in alcohol outlet density ($\beta = -0.04761$ to -0.01293). Respondents with greater perceived neighborhood safety also indicated greater perceived collective efficacy—with an increase of 2.5 units in collective efficacy for a two standard deviation change in perceived safety.

The results of multi-level ordinal models with organizational participation as the outcome is presented in Table 6. As with perceived collective efficacy, in Model A (the empty model), although most of the variance in organizational participation was partitioned to the individual-level (86.2%), 13.8% of organizational participation was attributable to neighborhood differences in participation and the residual heterogeneity between neighborhoods (MOR=1.99) suggests strong area level differences in organizational participation. A strong effect for off-premise alcohol outlet density was also observed (Model B, Table 6), with higher off-premise alcohol density associated with less organizational participation ($\beta = -0.03195$, $p < 0.0001$)—a 0.64 decrease in the level of participation for a two standard deviation difference in off-premise outlet density across neighborhoods. Furthermore, 22.1 % of the variance partitioned to the neighborhood-level and 2.7% of the total variance were explained by the addition of off-premise alcohol outlet density.

The addition of other covariates explained an additional 59.1% of the variance partitioned to the neighborhood level in organizational participation (Model C, Table 6), yet the effect of off-premise alcohol outlet density remained ($\beta = -0.00469$ $p < 0.01$). Unlike perceived collective efficacy, adding perception of neighborhood safety did not appear to mediate the observed relationship between alcohol outlet density and organizational participation (Model D, Table

6), with the effect of outlet density remaining and no significant effect of perceived neighborhood safety.

DISCUSSION

In the present study, we examined two indicators of cognitive and structural social capital—collective efficacy and organizational participation. Substantial proportions of the variance in collective efficacy (16.3%) and organizational participation (13.8%) among respondents in this study were attributable to differences between neighborhoods—suggesting that these factors may be influenced by neighborhood-level characteristics. Neighborhood off-premise alcohol outlet density was strongly associated with reduced social capital, supporting the concept that off-premise alcohol outlets in the neighborhood environment may hinder the development of social capital. While a similar previous study found no significant relationship between alcohol outlet density and collective efficacy once concentrated disadvantage was taking into account (Cohen et al., 2008), the relationship remained among participants in this study—perhaps due to differences in respondent and/or neighborhood characteristics.

The hypothesized mechanism through which alcohol outlets in a neighborhood may decrease the amount of positive social capital is through decreased positive social network expansion and/or competing social networks. The theoretical underpinning of our conceptualization is linked to the role of incivilities in urban communities (Taylor, in press, Taylor et al., 1985). The notion of incivilities, first popularized by Wilson and Kelling (1982) in the early 1980s as “Broken Windows”(Wilson and Kelling, 1982), is the theory that the presence of any disorder, physical or social, encourages more disorder (Cohen et al., 2000, Sampson, 2003, Sampson and Groves, 1989, Taylor, in press). Skogan (1986) modified the theory by suggesting that the effect of incivilities involves a neighborhood dynamic, and not just a localized effect limited to a small group (Skogan, 1986, Helliwell and Putnam, 2004, Taylor, in press). Skogan used city level indicators of incivilities (e.g., abandoned housing) to document an association with neighborhood decline. A related theory was proposed by Jacobs who noted that, as disorder increases, the “eyes on the street” retreat in fear and this promotes conditions for increased disorder (Jacobs, 1961, Taylor, in press). In our conceptualization, an off-premise alcohol outlet in a neighborhood represents a spatial focus for incivilities associated with physical (e.g., graffiti, liquor advertising, trash) and social (e.g., loitering, drug sales, prostitution, altercations) disorder (Scribner et al., 2007). Consequently, the presence of off-premise alcohol outlets may hinder the expansion of a positive underlying neighborhood social network and lead to competing neighborhood social networks as the “eyes on the street” (Jacobs, 1961) and “defensible space” (Newman, 1972) are reduced. Not all off-premise outlets are bad, however, and in this analysis we make very general assumptions to test our hypothesis.

As potential markers for neighborhood social and physical disorder (Sampson and Raudenbush, 1999, Scribner et al., 2000, Cohen et al., 2008, Scribner et al., 2007), the presence of poorly-run off-premise alcohol outlets may have both direct and indirect effects on resident’s perception of safety and ability to form constructive social networks. Perceived neighborhood safety did emerge as a potential mediator between perceived collective efficacy and alcohol outlet density. In neighborhoods perceived as being unsafe, residents may be less likely to spend time outdoors and to network in a way that may build positive social capital, given that residents may have to compete with social networks associated with disorder, crime, and other incivilities that have often been linked to off-premise alcohol outlets.

Fear of neighborhood environment, including fear of crime and victimization, is a severe individual- and community-level problem that may influence how freely people move about the places where they reside (Liska et al., 1988). Fear of neighborhood environment may be a marker for neighborhood disorder. Taylor (1999: 65) writes: “Incivility indicators are social

and physical conditions in a neighborhood that are viewed as troublesome and potentially threatening by its residents and users of its public spaces." Disordered neighborhoods, often in economically disadvantaged areas, are more likely to lack formal and informal social controls (Sampson et al., 1997). Not only is fear associated with social controls and potential social capital, but it has also been associated with health. Fear is likely a critical factor in the stress process and stress-related outcomes (Perkins et al., 1990, Stafford et al., 2007). It has also been linked to fewer community social and psychological ties, which can also have an impact on risk behavior and other health outcomes (Stafford et al., 2007). Social isolation, as a potential result of neighborhood crime and mistrust (Krause, 1991), has been linked to adverse health outcomes (Berkman and Glass, 2000, House et al., 1988). While many neighborhood conditions may invoke fear, results suggest that factors in the built environment can play a significant role in the level of fear experienced by residents. Even if not directly impacting fear, the influence of the built environment on perception of neighborhood conditions is important and must be addressed.

Despite important findings, many limitations must be recognized. Data are based on a cross-sectional survey of residents and include only two individual-level indicators of social capital, therefore the complete picture of how societal, community, and individual level factors may impact actual social capital development cannot be realized from our data. The endogenous social organization measure is also based on a set of very simplified assumptions for purposes of analysis and may not capture the actual construct it purports to represent. Furthermore, because the present study tests a secondary aim, the survey was not geared toward social networks and did not collect information on the social networks of respondents. Therefore, a complete test of our hypothesis in full was not possible at this time and is one avenue for future research. Also, the measure of fear did not distinguish between being outdoors night or day, or alone or with others as other studies, which may have made a difference in responses.

Furthermore, our measure of neighborhood alcohol outlet density was based on a census tract count rather than residential boundaries. Because respondents may live closer to outlets in contiguous tracts rather than their own tract, outlet density within residential boundaries may be a more realistic measure of outlet density. Another limitation is the low response rate, which may have introduced some selection bias if respondents differed from non-respondents with respect to social capital indicators and neighborhood alcohol exposure. Unfortunately, data on non-responders is not available to assess differences although the demographics of the study sample suggest that the sample may include more women and older individuals than in the general population of adults over age 18. The use of incentives, however, may have decreased selectivity. An additional limitation is the absence of more proximal measures of social disorder such as crime rates and abandoned housing, which may have strengthened the hypothesis-testing of interest.

In addition, observed effects could be due to endogenous factors that we were unable to control for in this study. For example, it may be that the individuals who contribute to collective efficacy in a neighborhood or for whom alcohol outlets may be more or less likely to influence their degree of collective efficacy may have moved out of neighborhoods with different levels of alcohol exposure and/or collective efficacy. To identify this effect, a longitudinal study is needed. However, we explored potential social stratification using propensity score methodology (Oakes and Kaufman, 2006). We examined the probabilities or propensities for living in a tract/neighborhood with high versus low off-premise alcohol outlet density (based on median split), according to potential individual sociodemographic confounders included in the final models (i.e., sex, age, race, ethnicity, education, income, and years lived in neighborhood). The propensity score model resulted in a propensity score for each respondent, which we then used to examine overlap between the types of respondents who lived in high versus low alcohol outlet density neighborhoods. Based on results, there appeared to be little

social stratification based on outlet density given the good amount of overlap in propensity values based on neighborhood alcohol exposure. Furthermore, strata (five) were formed from the propensity scores, and comparisons of covariate differences between exposure categories within each stratum revealed no differences in covariates (data not shown but available by request).

Nonetheless, results support the importance of the local alcohol environment on potential social capital, possibly through its impact on perceived fear. Each of these physical and social environmental factors may lead to adverse health outcomes. Our proposed conceptual model will be tested on various health behaviors and outcomes in future studies.

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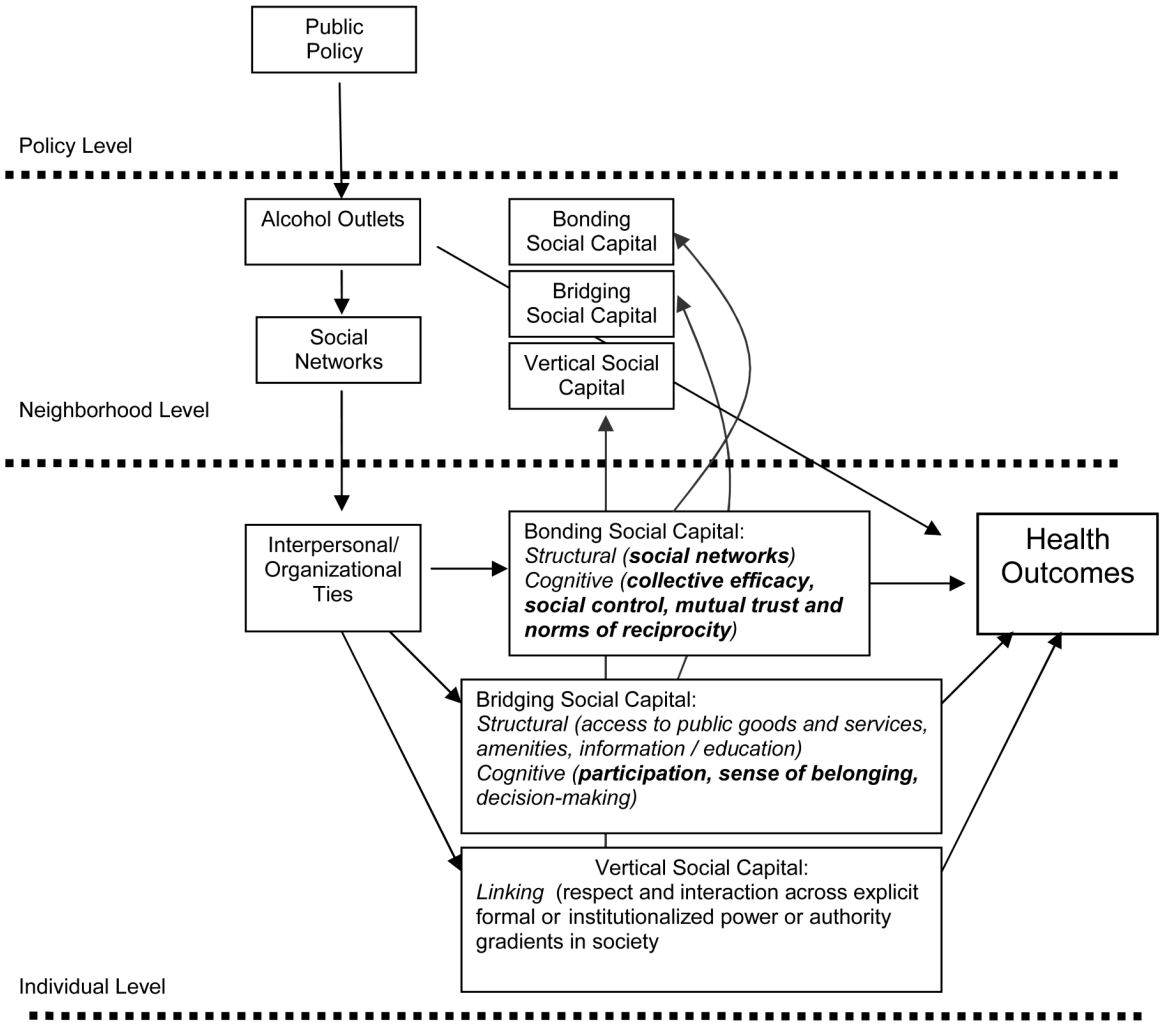

Figure 1. Conceptual Model Alcohol Outlets, Social Capital, and Health Outcomes

Note. In the current study, indicators of structural and cognitive forms of social capital are examined, with constructs capturing both bonding and bridging dimensions. In the absence of information on interpersonal and organizational ties, we test the association between alcohol outlet density at the neighborhood level and both individual-level and aggregated (mean responses across neighborhood) indictors of social capital.

Table 1

Indicators of Social Capital

Item	Mean	S.D.	Range	Cronbach α
Social Cohesion Items[a]				
People in the neighborhood share the same values	1.52	1.19	0–4	
People in the neighborhood are willing to help neighbors	2.94	1.41	0–4	
People in the neighborhood can be trusted	2.56	1.48	0–4	
Informal Social Control Items[a]				
Neighbors could be counted on to do something if youth were spray- painting graffiti on a local building	2.57	1.69	0–4	
Would do something if fire station closest to home was threatened with budget cuts	2.77	1.52	0–4	
Collective Efficacy Scale	11.87	6.17	0–20	0.85
Active organizational participation	1.56	0.91	0–3	
Voted in last presidential election (n, %)	1942	71.98%		
Belong to a community or neighborhood association (n, %)	678	25.10%		
Belong to a religious organization (n, %)	1587	58.71%		
Neighborhood-level endogenous social organization	0.70	0.09	0.40–0.92	0.65

[a]Social cohesion items on scale from 0 (“strongly disagree”) to 4 (“strongly agree”). Informal social control items on scale from 0 (“very unlikely”) to 4 (“very likely”).

Note. Responses based on non-missing values.

Table 2

Characteristics of Participants According to Study Location

	Louisiana % n=1578	California % n=1303	Total N=2881
Sex		†	
Male	33.7%	38.6%	1578 (54.8%)
Female	66.3%	61.4%	1303 (45.2%)
Age group		‡	
18–25	11.2%	14.0%	372 (12.9%)
26–35	16.8%	23.5%	589 (20.4%)
36–45	21.0%	20.1%	588 (20.4%)
46–55	29.1%	22.5%	729 (25.3%)
56–65	22.0%	19.8%	603 (20.9%)
Mean age (s.d.)	44.1 (12.9)	41.9 (13.3) ‡	42.9 (±13.2)
Race		†	
White	54.0%	45.7%	1192 (41.4%)
Black	41.2%	16.9%	794 (27.6%)
Asian	1.2%	5.5%	99 (3.4%)
American Indian	0.6%	0.5%	16 (0.6%)
Pacific Islander	0.0%	1.1%	18 (0.6%)
Multi-racial	1.5%	1.7%	44 (1.5%)
Hispanic	4.8%	38.2% ‡	663 (23.0%)
Married (yes)	47.0%	47.4%	1352 (46.9%)
Education			
No degree/less than H.S.	8.7%	17.3%	393 (13.6%)
H.S. diploma	28.2%	21.5%	705 (24.5%)
More than H.S./some college	23.6%	23.2%	687 (23.8%)
4-year College Degree or More	39.6%	38.0%	1086 (38.0%)
Employed full-time, legally (yes)	63.3%	61.6%	1791 (62.2%)
Annual income			
< $20,000	33.8%	32.2%	890 (33.0%)
$20,000 – $74,999	44.9%	44.2%	1204 (45.0%)
≥ $75,000	21.3%	23.6%	612 (22.0%)
Car ownership (yes)	87.4%	85.7%	2493 (86.5%)
Mean number of children in household (s.d.)	0.7 (1.1)	0.9 (1.2)	0.8 (±1.2)
Mean years lived in neighborhood (s.d.)	12.6 (11.8)	11.2 (10.6) †	11.9 (±11.1)
Mean distance to nearest off-premise outlet (miles)	0.6 (±1.6)	0.5 (±0.6) †	0.5 (±1.1)
Frequency of visible alcohol use in neighborhood		§	
Never see drinking outside	39.3%	38.1%	1182 (44.5%)
At least once a year	17.7%	13.7%	407 (15.3%)
At least once a month	13.2%	11.9%	329 (12.4%)
At least once a week	13.3%	15.3%	385 (14.5%)
Daily	16.5%	11.0%	352 (13.3%)
Witnessed or experienced violence in neighborhood (yes)	20.6%	19.3%	535 (19.8%)
Mean level of perception of neighborhood safety (s.d.) (1 to 4)	3.3 (0.9)	3.1 (0.8) †	3.2 (0.9)
Drinking days per year (0 to 365) (s.d.)	54.2 (87.8)	50.2 (88.6)	51.9 (88.3)
Drinks per day on days drink (s.d.)	1.4 (1.4)	1.2 (1.4) §	1.3 (1.4)
Binged at least one day in the last month (yes)	19.0%	16.6% §	477 (17.6%)

‡ *Note*. P-value: < 0.0001;

† < 0.01;

§ < 0.05. Responses based on non-missing values.

Table 3

Neighborhood-level characteristics (N=217)

	Mean (± s.d.)
Aggregated organizational participation/structural social capital	1.33 (±0.39)
Aggregated collective efficacy/cognitive social capital	11.07 (±2.89)
Mean endogenous social organization	0.70 (±0.09)
% White	39.76 (±20.84)
% African American	14.50 (±20.00)
% Hispanic	47.90 (±29.21)
% Neighborhood with < high school education	37.77 (±23.04)
Mean annual household income	38,576 (±22,739)
% Below poverty	21.89 (±13.13)
Mean concentrated disadvantage	1.47 (±3.76)
Aggregated number of years lived in neighborhood	11.07 (±4.20)
Mean off-premise outlet density per square mile	11.56 (±10.03)
Aggregated distance to nearest off-premise outlet	0.45 (±0.57)
Aggregated visible alcohol use in neighborhood	2.32 (±0.78)
Aggregated drinking days	47.61 (±33.99)
Aggregated drinks per day	1.20 (±0.43)
Aggregated binge drinking	15.78 (±10.64)
Aggregated witnessed or experienced violence in neighborhood	21.00 (±17.02)
Aggregated level of perception of neighborhood safety	3.07 (±0.47)
Mean street density (linear miles of street per square mile)	18.91 (±6.42)
Mean block size (area per square mile)	9.11 (±9.96)
Mean intersection density (intersections per square mile)	167.78 (±94.71)
% Four-way intersections	44.85 (±22.74)

Note. Responses based on non-missing values.

Table 4

Characteristics of Neighborhoods with High and Low Levels of Social Capital Indicators (N=217)

	High Collective Efficacy	Low Collective Efficacy	High Organizational Participation	Low Organizational Participation
	Mean (s.d)		Mean (s.d.)	
Aggregated organizational participation/ structural social capital	1.59 (0.42)	1.19 (0.31) ‡	---	---
Aggregated collective efficacy/cognitive social capital	---	---	13.26 (2.84)	10.18 (2.42) ‡
Mean endogenous social organization	0.70 (0.78)	0.62 (0.08) ‡	0.70 (0.10)	0.63 (0.07) ‡
% White	50.42 (25.83)	33.78 (14.50) ‡	48.33 (26.91)	36.23 (16.78) ‡
% African American	13.34 (22.31)	15.16 (18.71)	18.89 (26.98)	12.71 (16.21)
% Hispanic	28.72 (24.89)	58.79 (25.78) ‡	25.50 (22.17)	57.12 (26.75) ‡
% Neighborhood with < high school education	21.93 (18.97)	46.67 (20.27) ‡	19.65 (15.61)	45.15 (21.48) ‡
Mean annual household income	53,036 (29,779)	30,455 (11,528) ‡	53,469 (32,157)	32,509 (13,710) ‡
% Below poverty	12.69 (9.99)	27.04 (11.86) ‡	14.24 (13.41)	24.99 (11.74) ‡
Mean concentrated disadvantage	−0.63 (3.12)	2.65 (3.59) ‡	0.42 (5.03)	1.89 (3.04) †
Aggregated number of years lived in neighborhood	13.75 (3.85)	9.56 (3.80) ‡	12.84 (4.65)	10.35 (3.82) ‡
Mean off-premise outlet density per square mile	7.75 (8.23)	13.69 (10.35) ‡	5.77 (5.59)	13.91 (10.49) ‡
Aggregated distance to nearest off-premise outlet	0.69 (0.74)	0.33 (0.41) ‡	0.69 (0.77)	0.35 (0.44) ‡
Aggregated visible alcohol use in neighborhood	1.89 (0.72)	2.57 (0.71) ‡	1.96 (0.88)	2.47 (0.69) ‡
Aggregated drinking days	64.84 (40.79)	37.93 (24.99) ‡	60.46 (37.65)	42.37 (31.18) ‡
Aggregated drinks per day	1.27 (0.39)	1.15 (0.44)	1.19 (0.29)	1.20 (0.47)
Aggregated binge drinking	17.96 (11.11)	14.54 (10.23)	13.58 (8.34)	16.66 (11.37)
Aggregated witnessed or experienced violence in neighborhood	0.12 (0.18)	0.27 (0.14) ‡	0.19 (0.21)	0.22 (0.14)
Aggregated level of perception of neighborhood safety	3.43 (0.37)	2.87 (0.39) ‡	3.38 (0.42)	2.94 (0.43) ‡
Mean street density (linear miles of street per square mile)	19.99 (6.89)	19.17 (6.44)	18.06 (5.03)	20.04 (7.07)
Mean block size (area per square mile)	11.85 (14.03)	7.90 (4.31) §	13.58 (15.37)	7.59 (3.90) §
Mean intersection density (intersections per square mile)	175.91 (112.11)	187.08 (94.34)	148.88 (66.49)	196.99 (109.03) §
% Four-way intersections	36.75 (18.97)	46.43 (20.21) †	35.75 (18.55)	45.88 (20.26) †

Note. High collective efficacy and organizational participation at the neighborhood or census tract level were defined as average of respondent's scores for the two scales, defined as high if above mean and low as at or below the mean.

‡ *Note.* P-value: < 0.0001;

† < 0.01;

§ < 0.05. Responses based on non-missing values.

Table 5

Hierarchical Linear Regression Model of Collective Efficacy (N=217 tracts, N=2881 obs)

Variables	Model A Empty Model	Model B Model with Off- Premise Outlet Density	Model C Model with Individual and Other Neighborhood Predictors	Model D Model with Perception of Neighborhood Safety
		Estimate (Standard Error)		
β (constant/intercept)	11.8307 (0.2074) ‡	12.8972 (0.2572) ‡	2.8415 (0.9013) ‡	1.5964 (0.9451) ‡
Individual-Level Variables				
Sex[a]			−0.9518 (0.2300) ‡	−1.0688 (0.2256) ‡
Age (years)			0.05653 (0.0096)	0.05676 (0.0094) ‡
Race (White = referent)				
African American			0.09185 (0.4166) *	−0.2613 (0.4092)
Other			0.6122 (0.3359)	0.5009 (0.3296)
Hispanic ethnicity			0.005323 (0.3714)	0.02191 (0.3638)
Education[a]			0.6976 (0.1172) ‡	0.6484 (0.1151) ‡
Income[a]			1.1722 (0.1843) ‡	1.0454 (0.1811) ‡
Number of years lived in neighborhood			0.003153 (0.0111)	0.001643 (0.0109)
Perception of neighborhood safety				**1.3387 (0.1324)** ‡
Tract-Level Variables				
Off-premise outlet density per square mile		**−0.1055 (0.01705)** ‡	**−0.04761 (0.0129)** †	−0.01293 (0.0127)
Study location[a]			1.1575 (0.3020) †	0.8940 (0.2923) †
Concentrated disadvantage			−0.2092 (0.0377) ‡	−0.1345 (0.0370) ‡
Random Effects				
Variance between neighborhoods/tracts	6.1797	4.8522	1.2137	1.0319
Variance between individuals	31.7716	31.7565	30.0949	28.8259
Intraclass correlation coefficient (ICC)	16.3%	13.2%	3.9%	3.5%
Akaike information criterion (AIC)	16472.3	16443.2	16191.0	15993.2

‡ Note. P-value (2-sided): < 0.0001;

† < 0.01;

§ < 0.05;

* < 0.10.

[a] Comparisons made for: males vs. females; lowest to highest education and income levels; and Louisiana vs. California.

Table 6

Hierarchical Ordinal Regression Model of Active Organizational Participation (N=217 tracts, N=2881 obs)

Variables	Model A Empty Model	Model B Model with Off- Premise Outlet Density	Model C Model with Individual and Other Neighborhood Predictors	Model D Model with Perception of Neighborhood Safety
			Estimate (Standard Error)	
Individual-Level Variables				
Sex[a]			−0.2407 (0.0315) ‡	−0.2373 (0.0312) ‡
Age (years)			0.01543 (0.0013) ‡	0.01527 (0.0013) ‡
Race (White = referent)				
African American			0.3477 (0.0557) ‡	0.3494 (0.0562) ‡
Other			0.01815 (0.0449)	0.02137 (0.0452)
Hispanic ethnicity			−0.1787 (0.0453)	−0.03119 (0.0492)
Education[a]			0.1595 (0.0159) ‡	0.1665 (0.0158) ‡
Income[a]			0.1387 (0.0249) ‡	0.1587 (0.0249) ‡
Number of years lived in neighborhood			0.00274 (0.0015) *	0.00281 (0.0015) *
Perception of neighborhood safety				**0.00636 (0.0182)**
Tract-Level Variables				
Off-premise outlet density per square mile		**−0.03195 (0.00513)** ‡	**−0.00469 (0.00146)** †	**−0.00359 (0.00147)** †
Study location[a]			0.3214 (0.0347) ‡	0.3141 (0.0353) ‡
Concentrated disadvantage			−0.00072 (0.0045) ‡	−0.00047 (0.0046) ‡
Random Effects				
Variance between neighborhoods/tracts	0.5267	0.4103	0.1680	0.1573
Variance between individuals *b*	3.29	3.29	3.29	3.29
Intraclass correlation coefficient (ICC)	13.8%	11.09%	5.08%	4.56%
Median Odds Ratio (MOR)[b]	1.99	1.84	1.48	1.46
−2 Res Log Likelihood	7005.63	6980.65	6405.05	6320.13

‡ Note. P-value (2-sided): < 0.0001;

† < 0.01;

§ < 0.05;

* < 0.10. Due to space constraints, the 3 intercepts were not presented here for each model

[a] Comparisons made for: males vs. females; lowest to highest education and income levels; and Louisiana vs. California.

[b] ICC=Intraclass correlation coefficient (with individual-level variance calculated using the formula of Snijders based on an underlying continuous variable with $V_{individual} = \Pi^2/3$ (Snijders and Bosker, 1999). Because of limitations of the ICC for non-linear outcomes, the Median Odds Ratio (MOR) (Merlo et al., 2004) was also calculated.