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Racial/Ethnic Composition, Social Disorganization, and Offsite Alcohol Availability in San Diego County, California*

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Abstract

We draw upon social disorganization theory to examine the effects of community characteristics on the distribution of offsite alcohol outlets in San Diego County, California. Of particular interest is whether alcohol availability varies according to neighborhood racial/ethnic composition once measures of social disorganization (socioeconomic disadvantage, residential instability, and racial/ethnic heterogeneity) are controlled. Using data from the 1990 Census and 1993 alcohol license reports, we estimate a series of negative binomial regression models with corrections for spatial autocorrelation. The results show that percent Asian is associated with lower offsite alcohol outlet density. Once socioeconomic disadvantage is controlled, percent Latino is related to lower alcohol availability. Although similar suppressor patterns are observed, percent Black is generally unrelated to outlet density. Consistent with social disorganization theory, socioeconomic disadvantage and residential instability predict increased alcohol availability. Neighborhood racial/ethnic composition is either unrelated or inversely related to outlet density once social disorganization and other neighborhood characteristics are taken into account.

Keywords

Alcohol outlets; alcohol availability; race and ethnicity; social disorganization theory; neighborhoods

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Alcohol availability, measured by the distribution of alcohol outlets in neighborhoods and communities, is a major public health concern. Studies show that alcohol availability or alcohol outlet density is associated with higher rates of sexually transmitted infections (Scribner, Cohen and Farley, 1998), driving under the influence (Treno, Grube and Martin, 2003), lethal and non-lethal violence (e.g., Gorman, Zhu and Horel, 2005; Hipp, 2007; Nielsen and Martinez, 2003; Peterson, Krivo and Harris, 2000), alcohol-related hospital admissions (Tatlow, Clapp and Hohman, 2000), and mortality from liver disease, cardiovascular disease, and homicide

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(Cohen, Mason and Farley, 2004; Scribner, Mackinnon and Dwyer, 1994; Watts and Rabow, 1983; but see Jones-Webb et al., 2008). Given the apparent public health significance of alcohol availability and related concerns for environmental justice (Romley et al., 2007), attention must be directed to the social distribution of alcohol outlets in communities.

Despite linkages between alcohol availability and adverse outcomes, characteristics of neighborhoods in which outlets tend to be located and concentrated have received relatively little attention. Similar to research on the concentration of other potentially harmful types of businesses, including fast food restaurants (e.g., Block et al., 2004) and tobacco outlets (e.g., Hyland et al., 2003), a number of studies have specifically highlighted the racial/ethnic compositions of communities in which alcohol outlets are concentrated (Dawkins, Farrell, and Johnson 1979; LaVeist and Wallace, 2000; Romley et al., 2007). Some research shows that alcohol outlet density is positively associated with the percentage of Black residents in Washington, DC (Dawkins et al., 1979), Baltimore (LaVeist and Wallace, 2000), and in various U.S. cities (Jones-Webb et al., 2008). In an analysis of outlet density across U.S. zip codes, Romley and colleagues (2007) find that the average number of liquor stores per mile is higher for Blacks, Latinos, and Asian/Pacific Islanders and lower for Native Americans than for Whites although per capita liquor store density is higher for only for Blacks compared to Whites. Another study found that race/ethnic composition is unrelated to alcohol outlet density in Newark, NJ (Gorman and Speer, 1997).

In this paper, we draw on social disorganization theory (Shaw and McKay, 1969) to examine and better understand community characteristics that may predict the concentration of offsite alcohol outlets. Although originally concerned with community conditions like delinquency, crime, and tuberculosis, social disorganization theory offers potentially important insights concerning how characteristics of communities, including race/ethnic composition, might be related to alcohol availability. Shaw and McKay (1969) identified three structural indicators of social disorganization, including socioeconomic disadvantage, racial/ethnic/nativity heterogeneity, and population instability. They recognized that the structural conditions of social disorganization (e.g., socioeconomic disadvantage) could undermine social control (i.e., community's ability to control the behavior of residents and visitors in order to realize common goals) and lead to a range of criminal and public health outcomes at the community level (Cohen, Farley and Mason, 2003; Gruenewald et al., 2006; Lochner et al., 2003; Peterson et al., 2000; Sampson, Raudenbush, and Earls, 1997; Sampson and Wilson, 1995).

Does social disorganization contribute to the concentration of alcohol outlets in communities? To this point few studies have addressed this question. Nevertheless, research consistently shows that alcohol outlets, especially offsite outlets, are more heavily concentrated in economically deprived neighborhoods characterized by low levels of median income, low rates of high school graduation, and high rates of service sector jobs, poverty, unemployment, and substandard housing (Dawkins et al., 1979; Gorman and Speer, 1997; Jones-Webb et al., 2008; LaVeist and Wallace, 2000; Pollack et al., 2005; Romley et al., 2007).

If communities characterized by racial/ethnic minorities, socioeconomic disadvantage, and residential instability tend to have higher alcohol outlet densities, why is this the case? According to social disorganization theory, minority racial/ethnic composition contributes to adverse outcomes through racism and discrimination as well as unfavorable social and economic circumstances (Sampson and Wilson, 1995; Shaw and McKay, 1969). For example, communities with substantial minority populations are often characterized by socioeconomic disadvantage and residential instability, which tend to undermine political and financial capital and therefore the ability to mobilize and exercise political and social influences that are usually necessary to resist the emergence and concentration of alcohol outlets (Peterson et al., 2000; Sampson et al., 1997; Wilson, 1996) and fast food restaurants (Kwate, 2008). In support of this perspective, Velez and colleagues (2003: 650; see also Kwate, 2008) note that more "affluent communities are positioned to garner law enforcement, other protective services… and zoning restrictions that limit the encroachment of bars, other establishments with liquor licenses…."

Although prior research has contributed to our understanding of the social distribution of alcohol outlets in communities, two important issues call for further investigation. First, because race/ethnic composition is a key factor related to alcohol outlet density in some studies (Dawkins et al., 1979; LaVeist and Wallace, 2000; Romley et al., 2007; but see Gorman and Speer, 1997), it is important to examine whether this relationship endures when controlling for socioeconomic characteristics of communities. That is, are outlets concentrated in areas with high proportions of race/ethnic minorities per se, or do such patterns reflect social disorganization in communities as would be suggested by the theory? In addition, while several studies have focused on Black composition as a risk factor for outlet density (and for the concentration of fast food restaurants and tobacco outlets (e.g., Block et al., 2004; Hyland et al., 2003; Kwate, 2008)), less is known about the effects of Latino or Asian composition for the concentration of such businesses. Second, existing studies typically omit controls for other potentially important community characteristics and land uses that may be related to alcohol availability. It is therefore unknown whether the effects of racial/ethnic composition, socioeconomic standing, and residential instability on alcohol outlet density persist with adjustments for such control measures. Most extant research (Dawkins et al., 1979; Gorman and Speer, 1997; LaVeist and Wallace, 2000; Romley et al., 2007; but see Jones-Webb et al., 2008) also does not address issues related to spatial effects, an important limitation.

With these limitations of previous studies in mind, we seek to address the following research questions: Are offsite alcohol outlets concentrated in communities with higher percentages of racial/ethnic minorities? If so, are the effects of racial/ethnic composition explained by socioeconomic disadvantage, residential instability, and racial/ethnic heterogeneity? To answer these questions, we examine the distribution of alcohol outlets in San Diego County, CA. By using these data we build on prior research, which is generally restricted to northeastern U.S. cities with limited racial/ethnic heterogeneity. San Diego County is racially and ethnically diverse, with a majority non-Latino White population and sizeable proportions of Latinos, Blacks, and Asians. In addressing our research questions, we seek to extend the literature by considering community-level (i.e., census tract) predictors of offsite alcohol outlet density, disaggregated by type (i.e., package stores and beer/wine only outlets). We also correct for spatial autocorrelation, an important issue in analyses involving geographic units (e.g., Anselin et al., 2000; Land and Deane, 1992; Sampson, Morenoff and Gannon-Rowley, 2002).

Method

Data

The unit of analysis is the census tract, a common proxy for communities (e.g., Hipp, 2007; LaVeist and Wallace, 2000; see Sampson et al., 2002). Data for all but one of the independent variables were obtained from 1990 Census information (U.S. Bureau of the Census, 1992). Data for the other independent variable – the number of shopping centers – were obtained from a program called Integrated Realty Information System published by PropertyKey for commercial properties defined as "shopping centers." The address of each shopping center was used to geocode it into the tract in which it was located, and the number of centers was aggregated to the tract level. Over 93% of 1,140 shopping centers were successfully geocoded. Alcohol outlet information is based on alcoholic beverage outlets with active licenses in 1993 in San Diego County. Although the Census and outlet data are derived from different years, this is sometimes the case with community level research (e.g., Dawkins et al., 1979; Jones-Webb et al., 2008; Romley et al., 2007). The address for each active license was geocoded into the tract in which it was located, and the number of outlets was aggregated to the tract level. Of 1,900 active offsite outlets in 1993, 1,853 (97.5%) were successfully geocoded.

The census data and the alcohol outlet data are from the early 1990s. Although somewhat dated at this juncture, we use them for two reasons. First, to the extent that racial/ethnic composition and/or social disorganization factors are associated with greater numbers of offsite alcohol outlets, our data provide insights into the community contexts in which outlets tend to be located. Some municipalities and states (including California) have enacted policies restricting the numbers of new licenses, often based on crime rates and high outlet densities (e.g., Johnson, 1998; State of California, 2005). Our data therefore enable us to explore the relationships between community factors and where alcohol outlets are/were concentrated before implementation of such policies. This provides insights into whether outlets were concentrated in areas with high proportions of race/ethnic minorities and/or disorganization before their locations were restricted. Second, social disorganization theory posits relatively durable structural patterns and relationships, and we expect that such associations between neighborhood context and alcohol outlets would persist through the present barring implementation of policies designed explicitly to reduce outlet density. Thus, our data enable us to explore contextual factors associated with where outlets are concentrated as well as to test the utility of social disorganization theory for understanding alcohol outlet densities in communities.

The data file contains 424 census tracts in San Diego County in 1990. Twenty-one tracts were excluded, including those that are military bases, with more than 55% of adults in military housing and/or more than 80% of working adults in the military (co-occurring for all but one tract), and those with fewer than 500 residents (see also Block et al., 2004; LaVeist and Wallace, 2000). The minimum resident requirement helps ensure reliable measures of tract conditions.

Variables

Three dependent variables are examined. Similar to LaVeist and Wallace (2000; see also Jones-Webb et al., 2008), only offsite outlets (i.e., retailers that sell alcohol for consumption elsewhere) are considered. We examine the total number of offsite outlets and consider separately the two types: “package stores,” which sell beer, wine, and liquor, and “beer/wine-only” outlets, such as convenience stores or supermarkets, which sell only beer and wine.

Three independent variables consistent with social disorganization theory are examined, including socioeconomic disadvantage, residential instability and racial/ethnic heterogeneity. We created a disadvantage index based on percentage of households in poverty, percentage of households that are female-headed and have children under age 18, percentage of males 16 and older who are unemployed, and percentage of employed persons working in low-skill jobs. A factor analysis showed that all variables loaded on one factor (i.e., loadings of .79 to .91) and produced an index with high reliability (α=.89). Z-scores for the items were summed and divided by four. Residential instability is an index (α=.79) comprised of percentage of persons five and older who moved between 1985 and 1990 and percentage of housing that is renter occupied. Z-scores for these items were summed and divided by two. Similar to Sampson and Groves (1989) and Hipp (2007), racial/ethnic heterogeneity (EH) in each tract (k) is measured as:

$$EH_k = 1 - \sum_{1}^{j=J} {G_j}^2$$

where G is the proportion in the population comprised of racial/ethnic group j (of J groups). The groups included are non-Latino Whites, Blacks, and Asians; Latinos; and, others. The measure can range from 0 (homogeneity) to .889 (proportional distribution) (Gibbs and Martin, 1962). To more fully examine whether racial/ethnic composition is important for alcohol outlets as found elsewhere (Dawkins et al., 1979; Jones-Webb et al., 2008; LaVeist and Wallace, 2000; Romley et al., 2007), continuous variables for the percentages of tract residents that are Latino, Black, and Asian are also examined.

Seven control variables are included to address other community characteristics and land uses that may influence outlet locations; failure to control for such measures may produce spurious results. First, the number of tract residents (natural log) is included in all models. This enables us to account for population density, as more outlets may be located in tracts with larger populations. Next, a dummy variable is coded as 1 for tracts immediately adjacent/bordering military bases and those containing small portions of bases (with less than 10% of the population in military housing). This measure reflects the fact that more outlets may be located near bases. A dummy variable for location in the old San Diego downtown entertainment area (yes=1) is included. Reflecting San Diego County's composition, a dummy variable is included for tracts containing Native American reservations or lands under tribal jurisdiction (yes=1). Percentage of young males 18 to 24 years is entered as a control variable, given that outlets may be located in tracts with larger such populations. Also, we include a measure of tract size in square miles (square root is used because of skewness), as all else equal, geographically larger tracts are likely to contain more outlets. Finally, to address the possibility that shopping centers offer considerable foot and vehicle traffic and thus may be attractive business sites, and because outlets may be located in areas with much commercial activity due to zoning restrictions, the number of shopping centers in the tract is included as a control variable (e.g., Block et al., 2004; Gruenewald et al., 2006). This measure is truncated at 12 or more centers due to extreme outliers for a few tracts.

Analyses

The dependent variables are outlet counts rather than per capita or geographic rates. We chose this approach because the mean number of outlets is relatively small, and 14.2% of tracts have no offsite outlets, 26.4% have no package stores, and 24.5% have no beer/wine-only outlets. Appropriate estimation techniques for count data are Poisson or negative binomial regression. Diagnostics indicate that overdispersion is present with the dependent variables. Thus, negative binomial regression is a better technique for the analyses than Poisson regression (Long, 1997).

For theoretical and methodological reasons, corrections for spatial autocorrelation are used in all multivariate models. It may be that communities with conditions conducive to the presence of many outlets are systematically clustered, rather than randomly distributed. Furthermore, due in part to the arbitrary nature of geographic divisions (e.g., census tracts), analyses involving such units typically are interrelated (i.e., have spatial dependence) (Anselin et al., 2000; Gruenewald, Millar and Roeper, 1996; Gruenewald et al., 2006). Clustering of high outlet areas (positive spatial autocorrelation) or of low outlet tracts near a high outlet tract (negative autocorrelation) due to factors such as zoning decisions should be reflected in the analyses. Failing to correct for such external processes that may impact outlet locations can produce erroneous results (Anselin et al., 2000).

While the application of spatial diagnostics with count data can be problematic (Kubrin, 2003), Moran's I diagnostics suggest the presence of spatial autocorrelation. Following a procedure based on Land and Deane's (1992) two stage least squares (2SLS) regression approach (c.f., Baller and Richardson, 2002; Hipp, 2007; Kubrin, 2003), spatial lags were created for the measures of alcohol outlets and were included in the negative binomial models.

Model-specific lags were created by first estimating fitted (predicted) values of each dependent variable. The fitted values were imported into Spacestat (Anselin, 2001). Centroid coordinates for each tract were used to create a distance matrix, which was transformed into an inverse distance matrix. As no limits were imposed, the weight each tract received was based on the distance between tracts. The matrix was row-standardized to ensure that weights for each tract summed to 1. The weights were used to create spatial lag averages based on fitted values of outlet-specific outcomes, and lags were included in all analyses (Anselin et al., 2000). (Analyses using raw lags (actual numbers of outlets) produced very similar results.)

Two types of results are presented. The first are descriptive statistics for the variables. Second, results from multivariate analyses are presented as six models for each outcome.[1] The first model includes the racial/ethnic composition, population size, and spatial lag items. This enables consideration of the association between these factors and offsite outlets before controlling for other community characteristics and provides the baseline effect of race/ethnic composition. In the second model racial/ethnic composition items as well as the control and spatial lag measures are included. This enables examination of the effects of racial/ethnic composition net of those of other potentially important control predictors (which are often left out of other studies) on the number of outlets. In the third through fifth models, a social disorganization measure is entered. Specifically, Model 3 includes race/ethnic heterogeneity in order to better isolate the unique effects of race/ethnic composition. Models 4 and 5 add disadvantage and instability, respectively, to assess possible indirect effects of race/ethnic composition on alcohol outlets. The last model includes all social disorganization measures along with racial/ethnic composition, control and spatial lag variables. Thus Model 6, the full model, tests whether race/ethnic composition is associated with alcohol availability net of confounds and potential mediators of this relationship. Overall, this modeling approach enables examination of relationships between each disorganization element, as well as of their combined influence, for alcohol outlets net of the effects of control variables. Total offsite outlets and its two components – package stores and beer/wine only outlets – are examined as dependent variables since there may be differences in predictors across outcomes.

Results

Table 1 shows descriptive statistics for the alcohol outlet and community characteristics variables. On average, there are approximately 4.4 outlets per tract, including 2.2 beer/wine-only outlets and 2.2 package stores. Concerning racial/ethnic composition, the heterogeneity measure's mean indicates that tracts fall between completely homogenous and proportional in composition, although this varies. Two-thirds (67.8%) of County residents are non-Latino White, about 20% are Latino, and fewer than 7% of tract residents are Black or Asian.

In order to examine the relationships between total offsite outlets, racial/ethnic composition, and social disorganization measures, Table 2 presents negative binomial regression results. The first model shows the results for racial/ethnic composition, population size and the spatial lag. In Model 1 for total offsite alcohol outlets, the percentage of Latinos is positive and significant, the percentage of Blacks is not significant, and the percentage of Asians is negative and significant. The tract population is positive and significantly related to the number of offsite alcohol outlets, a finding that holds across models. Model 2 shows results for racial/ethnic composition and the control variables. In this model the percentages of Latinos and of Blacks are not associated with the number of total offsite outlets, while the percentage of Asian residents is negative and significant. Several control variables are positive and significantly

[1]Variance inflation factors (VIFs) were examined to assess collinearity. In one model a VIF was 4.33, although all VIFs in that and other models were below 3.75. Mean VIFs for all models were below 2.4, and correlations from negative binomial regression coefficient matrixes contained no values approaching .9. We therefore do not view collinearity as a concern.

related to offsite outlets, including the percentage of young males, downtown location, and number of shopping centers. The findings for the latter variable persist across models. The spatial lag is negatively related to offsite outlets in models 2 through 6; communities with more outlets tend to be located near those with fewer.

Models 3 through 6 provide the opportunity to disentangle the effects of racial/ethnic composition and social disorganization measures for total outlets. Model 3 includes the racial/ethnic heterogeneity measure. This predictor is positively related to the number of offsite outlets; more heterogeneous communities tend to have more outlets. The percentages of Latinos and Blacks remain non-significant, while the percentage of Asians is negative and significant. The variable for location near a military base is also positive and significant, while the effects of other control variables are similar to those in Model 2.

Model 4 includes the socioeconomic disadvantage index. Community disadvantage is positively related to offsite outlets, such that there are more outlets in tracts with greater disadvantage. In this model, the percentages of Latinos, Blacks and Asians are all negatively related to the number of total offsite outlets. The inclusion of the disadvantage index also causes the adjacent to military bases variable to be non-significant, while the impacts of other control variables are similar to previous models.

Model 5 of Table 2 includes the residential instability index. Residential instability is positively and significantly related to the number of total offsite outlets; there are more outlets in communities with more population turnover. In this model, the effects of the percentages of Latinos and Blacks are again non-significant, while the negative effect of percentage of Asians persists. Changes are evident for the control variables. The adjacent to military bases variable is positive and significant, as is tract size. The percentages of young males and whether the tract is in downtown San Diego turn non-significant with the inclusion of the residential instability index. The sizes of coefficients for the number of residents and the spatial lag are smaller than in Model 4, but they remain significant.

In Model 6, all three social disorganization measures are included. Race/ethnic heterogeneity is no longer significant, while the disadvantage and residential instability indexes are positively related to the number of offsite outlets.[2] For these latter two items, coefficient sizes are smaller relative to previous models, but they remain significant. With the effects of the three social disorganization variables held constant, the percentages of Latinos, Blacks and Asians are all negative and significant. The effects of the control variables are similar to results in Model 5, but the size of the spatial lag coefficient is larger in Model 6.

Table 3 presents negative binomial regression results for package stores; these results are largely similar to those for total outlets. In the first model, the percentage of Latinos is positively associated with the number of package stores, the percentage of Blacks is not significant, and the percentage of Asians is negatively related to such outlets. The size of the tract population is positive and the spatial lag is negatively related to package stores, findings that hold across models. In Model 2, the percentages of Latinos and Blacks are not related to the number of package stores, while the percentage of Asians is negative and significant. Among the control variables, percentage of young males, whether the tract is located in the downtown area, and number of shopping centers are positively related to the number of package stores. Except for downtown location (which becomes non-significant), results for the racial/ethnic composition and control variables persist in Model 3 with racial/ethnic heterogeneity included. Racial/ethnic heterogeneity is positively related to the number of package stores.

[2]Racial/ethnic heterogeneity becomes non-significant due to the inclusion of residential instability in the analyses, but not community socioeconomic disadvantage (results not shown; available by request).

In Model 4, the disadvantage index is included in the analysis. The disadvantage index is positively related to the number of package stores. In this model, the percentages of Latinos and Asians are negatively associated with package stores, while the percentage of Blacks is not significant. Percentage of young males is non-significant while number of shopping centers (positive) is significantly related to package stores, findings which persist in Models 5 and 6.

The residential instability index is included in Model 5. Residential instability is a positive and significant predictor of the number of package stores. The percentage of Latinos is again non-significant (as is the percentage of Blacks), while the percentage of Asians is negative and significant. The effects of the control variables are similar to those in Model 4, although the sizes of coefficients are smaller for number of residents and the spatial lag.

All three social disorganization measures are included in Model 6. Racial/ethnic heterogeneity is not significant, while the disadvantage and residential instability indexes are positive and significant predictors of the number of package stores.[3] The percentages of Latinos and Asians are both negative, while the percentage of Blacks is non-significant in this model.

Table 4 presents negative binomial regression results for beer/wine only outlets. In Model 1 the percentage of Latinos is positive and significant, the percentage of Blacks is not significant, and the percentage of Asians is negative and significantly related to such outlets. Tract population size is positively associated with beer/wine only outlets, a finding that persists across models. Neither the percentage of Latinos nor of Blacks is significant in Models 2 and 3, while the percentage of Asians is negatively associated with the number of beer/wine outlets. The findings remain after controlling for race/ethnic heterogeneity in Model 3; this variable is not related to beer/wine outlets. Except for the downtown location variable, which is significant only in Model 2, and for percentage of young males (significant in Models 2 and 3), effects of the control variables are similar in Models 2 through 6. That is, tracts adjacent to military bases, those larger in square miles, and with more shopping centers have more beer/wine only outlets. The spatial lag is negatively related to the number of such outlets in all models except 1 and 5.

In Model 4, socioeconomic disadvantage is included. This index is positively associated with the number of beer/wine only outlets. With the disadvantage index in the analysis, the percentages of Latinos and Blacks, along with the percentage of Asians, are negatively related to beer/wine outlets. In Models 5 and 6, only the percentage of Asians is significant. Model 5 includes the residential instability index, which is positively associated with the number of beer/wine outlets. In Model 6, which includes all three social disorganization measures, both the disadvantage and residential instability indexes are positively related to beer/wine only outlets.

Overall our results suggest that socioeconomic disadvantage and residential instability are important and consistent predictors of the numbers of alcohol outlets, while the racial/ethnic composition of communities (both in terms of heterogeneity and percentages of each ethnic minority group) has effects contrary to what might be expected based on other studies. To better illuminate the relationships between disadvantage and offsite outlets, Figure 1 presents a map showing the pattern described above. The top and bottom quartiles and the middle quartiles combined are shown for disadvantage and total offsite outlets. As Figure 1 reveals, the highest disadvantage levels tend to be in and near the city of San Diego, near Mexico, and toward the northern end of the county. Only a few of the most disadvantaged quartile of tracts have 0 or 1 outlet. This is especially true of the most disadvantaged tracts in the downtown

[3]Racial/ethnic heterogeneity is rendered non-significant by the inclusion of residential instability in the analysis (results not shown; available by request).

San Diego area and farther south. Conversely, in the least disadvantaged quartile, only a few tracts have 7 to 30 outlets, and many have 0 or 1.

Discussion/Conclusion

This paper examined community characteristics associated with the presence of offsite alcohol outlets in San Diego County, CA. Building on prior research, we aimed to advance the literature by assessing if racial/ethnic composition and/or other community characteristics are related to offsite alcohol availability. In particular, drawing upon social disorganization theory (Shaw and McKay, 1969), we considered the roles of racial/ethnic heterogeneity and composition, socioeconomic conditions, residential instability, as well as other potentially important community factors, for locations of offsite outlets. Negative binomial regression correcting for spatial autocorrelation was employed.

Our results suggest that racial/ethnic composition is either not related to or is negatively related to alcohol outlets once community socioeconomic conditions and residential instability are taken into account. Specifically, when not controlling for the other social disorganization measures, racial/ethnic heterogeneity was negatively related to total offsite outlets and to package stores, indicating that there are more outlets in more homogeneous areas. Heterogeneity was not associated with the number of package stores. Theoretically, more heterogeneous areas should possess less social control and lower collective efficacy (Sampson et al., 1997; Shaw and McKay, 1969) and therefore more outlets, so this finding is somewhat surprising. However, once we controlled for residential instability, racial/ethnic heterogeneity was not related to total offsite outlets or to package stores.

Beyond examining heterogeneity, the role of racial/ethnic composition for outlets was also examined by inclusion of measures for the three largest minority groups in the County. When not accounting for the community land use or disorganization items, the percentage of Latinos was positive, the percentage of Asians was negative, and the percentage of Blacks was unrelated to the numbers of offsite alcohol outlets. Yet, with the control measures in the analyses, the percentages of Latino and Black residents were not related to the number of offsite outlets while the percentage of Asians remained negatively associated with outlets. Once disadvantage and population instability were accounted for, the percentages of Latinos and Blacks became negative and significant predictors of total outlets and package stores (but were largely unrelated to beer/wine only outlets), while the percentage of Asians remained negatively related to all three outcomes. The findings for the percentages of Latinos, Blacks, and Asians are in line with social disorganization theory (Shaw and McKay, 1969) in that socioeconomic factors and residential mobility are more consistent predictors of offsite alcohol availability. Furthermore, these findings suggest that the apparent positive relationships between minority racial/ethnic composition and alcohol outlets may be mitigated by other tract conditions (e.g., commercial activity, disadvantage, residential instability) often omitted in related analyses.

The results for Black composition in San Diego County are inconsistent with prior research which suggests that outlet density is positively associated with the percentage of Black residents in Washington, DC (Dawkins et al., 1979), Baltimore (LaVeist and Wallace, 2000), and other U.S. cities (Jones-Webb et al., 2008). However, our results corroborate evidence which suggests that racial/ethnic composition is unrelated to alcohol outlet density in Newark, NJ (Gorman and Speer, 1997). Given the modest and inconsistent nature of prior research, it is difficult to compare our results for Latino and Asian racial/ethnic composition. In their analysis of outlet density across U.S. zip codes, Romley et al. (2007) found the average number of liquor stores per mile was higher for Latinos and Asian/Pacific Islanders than for Whites, but it was lower for Native Americans than for Whites. Per capita liquor store density was lower for Latinos and Asian/Pacific Islanders than for Whites, while Whites and Native

Americans did not differ. Although our results are inconsistent with Romley and colleagues' analysis of average liquor store density, they substantiate their analysis of per capita liquor store density. Both studies, however, illustrate the need to incorporate other groups in addition to Blacks when considering relationships between racial/ethnic composition of areas and alcohol outlet density.

There are several possible explanations for the differences between our results and those of other research, especially concerning Black communities. First, measures included in our analyses were more extensive than those considered in previous studies (Dawkins et al., 1979; Gorman and Speer, 1997; Jones-Webb et al., 2008; LaVeist and Wallace, 2000; Romley et al., 2007). Racial/ethnic heterogeneity and composition, socioeconomic conditions, residential instability, and other potentially important community characteristics and land uses were included in this research. Failing to control for relevant variables may have produced spurious results in earlier studies. Considerations related to region also may be relevant. We examined San Diego County, a predominately White area with Latinos as the largest ethnic minority population (U.S. Bureau of Census, 1992), a setting more heterogeneous than those previously studied and one of the few locations outside of the northeast that has been considered. LaVeist and Wallace (2000), Dawkins and colleagues (1979), and Gorman and Speer (1997) examined predominately Black, east coast cities with small Latino populations (except Newark). Economic restructuring also impacted Baltimore and Newark more than other sites. Disadvantaged Black communities in Baltimore, Newark, and Washington, DC, are likely to be more consistent with Wilson's (1987, 1996) notion of the "underclass" than those in San Diego County. Similarly, Jones-Webb et al. (2008) focused on inner-city communities in 10 U.S. cities with high levels of economic distress. Thus, variations across settings and regions related to economic transformations and subsequent changes (e.g., availability and types of jobs, poverty) may account for some differences in results across studies. Because of this possibility, it is important to consider alcohol outlet densities in locations outside of the northeast.

Beyond the findings for racial/ethnic heterogeneity, two other key structural elements of social disorganization – economic disadvantage and residential instability – were positively related to all three measures of offsite alcohol outlets. These findings are consistent with social disorganization theory in that such communities should possess lower levels of collective efficacy and be able to exert less social control (Sampson et al., 1997; Shaw and McKay, 1969) to influence locations of alcohol outlets. More broadly, the findings support the utility of social disorganization theory for understanding community patterns of alcohol availability. However, because it may be lack of affluence rather than disadvantage that is problematic for communities (e.g., Wen, Browning and Cagney, 2003), this should also be considered as a predictor of alcohol outlets in future studies. Future research should examine the spatial patterning of outlets in other settings, including those with both large Black and Latino populations. The present investigation demonstrated the importance of examining community conditions (e.g., residential instability) and land uses (e.g., shopping centers) that may be related to with alcohol availability, but are rarely taken into account. Finally, the role of spatial processes requires consideration in community studies (Gruenewald et al., 2006; Sampson et al., 2002). Findings for the spatial lags suggest that alcohol outlets are not evenly distributed across communities, and failure to correct for spatial effects can produce erroneous results (Anselin et al., 2000).

Five limitations of the current research are important to note. First, this is a cross-sectional study and it is not possible to specify causal processes associated with community characteristics and alcohol availability. Second, we examined offsite alcohol outlets in only one county in the U.S., which may not be representative of other locations. Third, we were unable to examine the locations of onsite outlets as these data were not available 1993. Fourth, we used census tracts as proxies for communities. While a widespread practice (e.g., Hipp, 2007; LaVeist and Wallace, 2000; Pollack et al., 2005; see Sampson et al., 2002), tracts do not necessarily conform to neighborhood boundaries. Finally, our data are from the 1990s. Although somewhat dated, they reflect actual conditions before California began limiting new alcoholic beverage licenses due to high crime rates or high concentrations of outlets in areas in 1995 (State of California, 2005).

Despite these limitations, we believe the findings contribute to understanding the types of locations in which alcohol outlets are concentrated, and they highlight the need to differentiate between socioeconomic and other community characteristics and racial/ethnic composition in future research in this area. Of course, racial/ethnic composition is closely tied to socioeconomic conditions, as noted in social disorganization theory (Braveman et al., 2005; Sampson and Wilson, 1995; Shaw and McKay, 1969; see also Kwate, 2008). However, given that some studies indicate that alcohol outlet density is related to racial/ethnic composition of communities, research that takes into account broader socioeconomic characteristics and population instability is needed to determine if both factors are salient. Regarding policy implications, zoning and licensing can be used by local communities to control alcohol availability and use (Gruenewald et al., 1996; Romley et al., 2007). Indeed, California passed laws limiting new licenses in areas with high outlet densities or crime rates 20% or more above the local mean (California Trade and Commerce Agency, 1999). The location of alcohol outlets in especially disadvantaged areas is perhaps another factor that should be considered by state and local governments (Hill and Angel, 2005; Pollack et al., 2005). While not all outlets are problematic, given the multitude of consequences linked to outlet densities (e.g., Gruenewald et al., 2006; Livingston, 2008; Nielsen and Martinez, 2003; Peterson et al., 2000; Tatlow et al., 2000) their distribution across communities is important to understand and may provide a means to begin to address a wide array of social problems and public health concerns.

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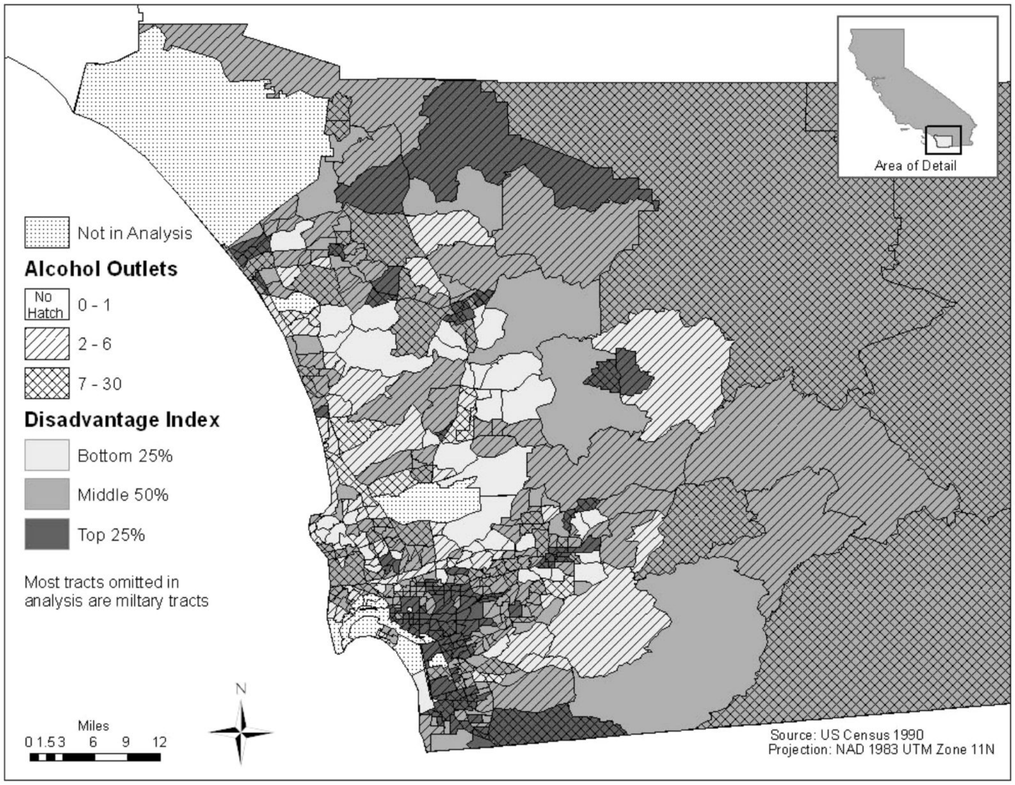

Figure 1.
Community Disadvantages and Total Offsite Outlets (by Quartiles)

Table 1

Descriptive Statistics (n=424)

	Mean	Standard Deviation	Minimum	Maximum
# total offsite	4.36	3.82	0.00	30
# package stores	2.16	2.06	0.00	10
# beer/wine stores	2.20	2.29	0.00	20
Racial/ethnic heterogeneity	.39	.18	.02	.75
Disadvantage index	0.00	.87	−1.36	4.05
Residential instability index	0.00	.91	−2.07	2.34
% White	67.79	24.02	1.89	98.87
% Latino	19.74	17.49	0.30	94.14
% Black	5.08	8.30	0.00	73.60
% Asian	6.57	7.91	0.00	76.34
Native Amer. reservation tract (yes=1)	.03	.18	0	1
Adjacent to military base (yes=1)	.10	.30	0	1
Tract area (sq. root of square miles)	1.64	2.60	.26	32.68
% young males	7.52	4.07	.30	30.63
# persons (ln)	8.53	.50	6.77	9.76
Tract in old downtown (yes=1)	.02	.13	0	1
# shopping centers	2.24	3.13	0.0	12

Table 2

Negative Binomial Regression Results for Total Offsite Outlets (n=424)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% Latinos	.008**	.003	−.000	−.012**	.002	−.009*
	(.003)	(.002)	(.003)	(.003)	(.002)	(.004)
% Blacks	−.003	.003	−.003	−.013*	.001	−.013*
	(.006)	(.005)	(.006)	(.006)	(.005)	(.006)
% Asians	−.019**	−.025**	−.035**	−.021**	−.023**	−.025**
	(.006)	(.006)	(.008)	(.006)	(.006)	(.007)
Racial/ethnic heterogeneity			.896*			.362
			(.368)			(.360)
Disadvantage index				.461**		.317**
				(.079)		(.081)
Residential instability index					.330**	.256**
					(.048)	(.051)
Native American tract (yes=1)		.067	.046	.041	.058	.032
		(.297)	(.295)	(.283)	(.281)	(.275)
Adjacent to base (yes=1)		.236	.271*	.209	.277*	.266*
		(.121)	(.121)	(.116)	(.114)	(.113)
Area (square root of square miles)		.032	.030	.031	.039*	.036*
		(.018)	(.018)	(.018)	(.018)	(.017)
% young males		.029**	.026*	.021*	−.002	−.002
		(.011)	(.010)	(.010)	(.011)	(.010)
Downtown (yes=1)		.667*	.539*	.516*	.340	.268
		(.267)	(.268)	(.254)	(.253)	(.250)
# shopping centers		.119**	.116**	.115**	.110**	.108**
		(.011)	(.011)	(.011)	(.011)	(.011)
Persons (ln)	.484**	.448**	.444**	.423**	.360**	.357**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	(.088)	(.079)	(.078)	(.076)	(.074)	(.073)
Spatial lag	−.488	−.288**	−.300**	−.348**	−.233*	−.285**
	(.290)	(.100)	(.095)	(.099)	(.092)	(.094)
Constant	−.609	−1.714*	−1.795**	−.811	−.968	−.547
Likelihood Ratio X2	37.72**	164.43**	170.15**	195.91**	206.27**	221.54**
Df	5	11	12	12	12	14

* Notes: $p < .05$,

** $p < .01$; coefficients shown with standard errors in parentheses

Table 3

Negative Binomial Regression Results for Package Stores (n=424)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% Latinos	.009**	.002	−.002	−.014**	.001	−.012**
	(.003)	(.003)	(.003)	(.004)	(.003)	(.004)
% Blacks	.001	.006	−.002	−.010	.004	−.013
	(.006)	(.005)	(.006)	(.006)	(.005)	(.007)
% Asians	−.020**	−.021**	−.035**	−.018**	−.020**	−.026**
	(.007)	(.007)	(.008)	(.006)	(.006)	(.008)
Racial/ethnic heterogeneity			1.148**			.673
			(.414)			(.409)
Disadvantage index				.459**		.329**
				(.085)		(.087)
Residential instability index					.316**	.228**
					(.053)	(.058)
Native American tract (yes=1)		.371	.339	.343	.372	.330
		(.337)	(.334)	(.327)	(.326)	(.322)
Adjacent to base (yes=1)		.124	.165	.113	.155	.163
		(.132)	(.132)	(.127)	(.127)	(.125)
Area (square root of square miles)		−.020	−.021	−.019	−.011	−.014
		(.025)	(.025)	(.024)	(.024)	(.023)
% young males		.029**	.025*	.019	.001	.000
		(.011)	(.011)	(.011)	(.012)	(.011)
Downtown (yes=1)		.597*	.449	.510	.348	.273
		(.281)	(.281)	(.268)	(.270)	(.265)
# shopping centers		.124**	.120**	.121**	.112**	.110**
		(.012)	(.012)	(.011)	(.011)	(.011)
Persons (ln)	.610**	.465**	.468**	.447**	.386**	.394**
	(.102)	(.090)	(.090)	(.087)	(.086)	(.085)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Spatial lag	−1.565**	−.702**	−.751**	−.877**	−.559*	−.733**
	(.588)	(.239)	(.227)	(.240)	(.223)	(.224)
Constant	−1.120	−2.246**	−2.380**	−1.268	−1.657*	−1.219
Likelihood Ratio X2	42.38**	150.28**	157.85**	177.44**	179.92**	195.68**
Df	5	11	12	12	12	14

* Notes: $p < .05$,

** $p < .01$; coefficients shown with standard errors in parentheses

Table 4

Negative Binomial Regression Results for Beer/Wine Only Outlets (n=424)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% Latinos	.006*	.003	.001	−.011**	.003	−.007
	(.003)	(.003)	(.003)	(.004)	(.003)	(.004)
% Blacks	−.006	−.000	−.005	−.016*	−.003	−.014
	(.007)	(.006)	(.007)	(.007)	(.006)	(.008)
% Asians	−.018*	−.027**	−.034**	−.022**	−.026**	−.024**
	(.008)	(.007)	(.009)	(.007)	(.007)	(.009)
Racial/ethnic heterogeneity			.624			.110
			(.435)			(.437)
Disadvantage index				.428**		.282**
				(.096)		(.099)
Residential instability index					.319**	.262**
					(.058)	(.063)
Native American tract (yes=1)		−.122	−.135	−.147	−.126	−.147
		(.338)	(.337)	(.332)	(.330)	(.328)
Adjacent to base (yes=1)		.363**	.388***	.348*	.394**	.384**
		(.138)	(.139)	(.136)	(.134)	(.134)
Area (square root of square miles)		.062**	.060**	.061**	.068**	.066**
		(.020)	(.020)	(.020)	(.020)	(.020)
% young males		.027*	.025*	.021	−.001	−.000
		(.012)	(.012)	(.012)	(.013)	(.012)
Downtown (yes=1)		.631*	.540	.482	.317	.260
		(.311)	(.314)	(.305)	(.303)	(.305)
# shopping centers		.103**	.101**	.099**	.094**	.092**
		(.013)	(.013)	(.013)	(.012)	(.012)
Persons (ln)	.428**	.420**	.415**	.390**	.328**	.322**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	(.103)	(.095)	(.095)	(.093)	(.091)	(.090)
Spatial lag	−.291	−.597*	−.602*	−.637*	−.481	−.510*
	(.617)	(.264)	(.255)	(.269)	(.248)	(.256)
Constant	−2.240	−2.102*	−2.167**	−1.378	−1.351	−1.041
Likelihood Ratio X2	26.13**	119.09**	121.01**	136.82**	145.93**	153.16**
Df	5	11	12	12	12	14

* Notes: $p < .05$,

** $p < .01$; coefficients shown with standard errors in parentheses