Alcohol outlets, social disorganization, and non-violent crimes in urban neighborhoods

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Abstract

Many studies show an association between alcohol outlets and violence, though fewer consider non-violent crime. We add to this literature using block group data from Milwaukee, Wisconsin, to explore whether (1) on- and off-premise alcohol outlet density is related to thefts from vehicles and vandalism and (2) social disorganization moderates these associations. Using spatially informed regression models, we found positive effects of on-premise alcohol outlet density on thefts from vehicles. We also found positive effects of on- and off-premise alcohol outlet density on vandalism. Social disorganization was not a consistent moderator of these associations.

Keywords: Alcohol outlet density; non-violent crime; social disorganization

Introduction

There is substantial evidence from studies in multiple disciplines like criminology, public health, and epidemiology of an association between alcohol availability and violent crime rates (Snowden 2015). Alcohol availability is usually operationalized as alcohol outlet density and has been found to be associated with rates of homicide (Scribner et al. 1999), simple and aggravated assaults (Pridemore and

This is the author's manuscript of the article published in final edited form as:

Snowden, A. J., Stucky, T. D., & Pridemore, W. A. (2016). Alcohol outlets, social disorganization, and non-violent crimes in urban neighborhoods. *Journal of Crime and Justice*. https://doi.org/10.1080/0735648X.2016.1176949

Grubesic 2013; Snowden and Pridemore 2013a), and other types of violent crimes like rape, robbery, and domestic violence (Livingston 2011; Scribner, MacKinnon, and Dwyer 1995; Snowden, 2016a; Snowden and Freiburger 2015b). Less is known, however, about the impact of alcohol outlets on non-violent crimes. This is important because non-violent and violent crimes often have different structural correlates and because there are theoretical reasons to believe the effects of alcohol outlet density on these types of crime may vary. Although non-violent crimes are less serious than violent crimes, they are much more common and play a key role in the daily quality of life of community members and in their perceptions of neighborhood safety and vitality, all of which hold important implications for individuals and neighborhoods. Therefore, the goal of this study was to examine the impact of alcohol outlet density on non-violent crimes.

Our study makes several important contributions to the literature on alcohol outlets and crime. First, we focus on non-violent crimes as an outcome. Second, we test the hypothesis of differential effects of on- and off-premise alcohol outlets. Third, we test a recent innovative hypothesis in this literature that community-level social disorganization moderates the association between alcohol outlet density and crime (Pridemore and Grubesic 2012). Finally, we take important methodological factors into account, including (1) using block groups as our units of analysis, which are the smallest units for which common measures of structural covariates of crime are available and which are generally accepted proxies for neighborhoods in crime and health research, and (2) estimating spatially informed regression models, which is important because of the likelihood of spatial autocorrelation generally and because research on incivilities and fear of crime reveals the presence of supra-neighborhood localized processes (Wyant 2008).

Literature review

The importance of studying non-violent crimes

Prior research on the effects of alcohol outlets has mainly focused on violent crime. There are meaningful reasons to extend this research to non-violent crimes. First, non-violent and violent crimes often possess differential structural-level predictors. Second, there are theoretical reasons to believe the effects of alcohol outlets will vary for non-violent and violent crime. Third, non-violent crimes are much more common in everyday life and research shows quality of life in an area can be adversely affected by non-violent crime, disorder, and incivilities. For example, in a phone survey of Houston residents Zhao, Lawton, and Longmire (2015) found respondents' fear of crime was associated with the incidence of reported violent, non-violent, and disorder offenses near their homes. Similarly, McGarrell, Giacomazzi, and Thurman (1997) found fear of crime was associated with neighborhood disorder in a survey of residents of Spokane, Washington (see also Robinson et al. 2003; Wyant 2008). Some research showed neighborhood disorder has negative effects on the level of health for residents, and this may be because neighborhood disorder increases depression and anxiety for residents (Hill, Ross, and Angel 2005). Thus, studying whether alcohol outlets are associated with non-violent crimes is a worthwhile extension to the literature.

Alcohol outlet density and non-violent crimes: theory and research

Two broad theories could explain why alcohol outlets might play a role in community rates of non- violent crimes. First, place-based theories (Gorman, Gruenewald, and Waller 2013) like routine activities theory posit an association between alcohol outlet density and non-violent crime rates due to the routinized behaviors of individuals who purchase and consume alcohol, with motivated offenders and suitable targets converging in time and space, absent capable guardians (Cohen and Felson 1979). There are more suitable targets for non-violent relative to violent crime because of the widespread availability of insufficiently protected public and private properties. Further, increased alcohol consumption generally accompanies high alcohol availability (Stockwell and Gruenewald 2001). In areas with high alcohol availability, more individuals may thus be disinhibited and take advantage of opportunities for crime (becoming motivated offenders), while intoxicated individuals are less capable of being effective

guardians. In these situations, one might expect increases in destruction of property, vandalism of unprotected structures, and similar low-level offenses. Additionally, areas with high alcohol availability may draw motivated offenders because they may contain more vulnerable victims and less effective guardianship (Brantingham and Brantingham 1995).

Second, social integration explanations (Gorman, Gruenewald, and Waller 2013) like social disorganization theory argue some neighborhoods possess reduced levels of the collective efficacy necessary to exert informal social control over the behavior of community members or other events in their community (Sampson and Groves 1989; Sampson, Raudenbush, and Earls 1997). Socially disorganized communities may also lack the neighborhood ties, mutual trust, and institutional resources (Sampson, Morenoff, and Gannon-Rowley 2002) to garner political power and to work with local stakeholders to limit the opening and licensing of alcohol outlets in their neighborhood. Alcohol outlets may also be nuisance facilities that disrupt community organization because they attract outsiders and young people and sell intoxicating beverages. Thus, high alcohol outlet density may both result from and contribute to the community disorganization that is so often associated with crime.

Although only a few studies examined the relationship between alcohol outlets and non-violent crimes, their findings suggest an association. In one study, total, on-, and off-premise alcohol outlet density were significantly associated with several types of non-violent crimes, including vandalism, nuisance crimes, public alcohol consumption, driving while intoxicated, and underage alcohol possession and consumption (Toomey et al. 2012). Two other studies found alcohol outlet density was associated with several types of disorder and incivility like drunkenness (Donelly et al. 2006) and with vandalism, public urination, vomiting, and drunkenness near college campuses (Wechsler et al. 2002). Further, although one study found no significant association between total alcohol outlet density and malicious property damage like destruction and defacement of public, commercial, and private properties (Stevenson, Lind, and Weatherburn, 1999), another found the density of bars and clubs (but not off-premise outlet density) was significantly associated with property damage (Cameron et al. 2012). Finally,

living in close proximity to bars, clubs, or pubs has been found to be associated with being kept awake at night, and those who lived in close proximity to liquor stores reported greater property damage (Wilkinson and Livingston 2012).

Several questions remain unanswered that are important for a nuanced understanding of the role that alcohol availability plays in non-violent crimes. First, do the effects of outlets on non-violent crime vary by outlet type? Second, are any low-level effects of alcohol outlet density limited to disorder and amenity-related outcomes or are they consistently related to non-violent crimes such as vandalism or thefts from vehicles? Finally, the finding that community social disorganization moderates the impact of alcohol outlet density on violent crime (Pridemore and Grubesic 2012) has not been tested for non-violent crime.

Distinguishing the effects of on- and off-premise outlets

Alcohol outlets are retail establishments licensed to sell alcohol beverages and they vary in fundamental ways. Broadly speaking, on-premise alcohol outlets are places where alcohol is purchased and consumed while at the premises (e.g., bars, pubs, taverns, or restaurants). Off-premise alcohol outlets are places where alcohol is purchased but cannot be consumed at the business (e.g., liquor, convenience, or grocery stores). There are theoretical reasons to believe different outlet types may have a different influence on crime. Some of the possible differential effects include reduced guardianship (Cohen and Felson 1979) and the micro-environment where alcohol outlets are located (Eck and Weisburd 1995; Roman et al. 2008). For example, on-premise alcohol outlets may contribute to crime by providing a flow of inebriated patrons who are disinhibited from socially acceptable behavior and who take advantage of opportunities for vandalism of property. Additionally, areas with high availability of on-premise alcohol outlets are likely attractive for motivated offenders (e.g., local residents or non-intoxicated non-patrons) coming to these areas because on-premise patrons leave their cars unattended for longer periods of time relative to vehicles of off-premise outlet patrons. However, the larger social and micro-environment where alcohol outlets are located can also have an effect on non-violent crimes (e.g., Eck and Weisburd

1995). Off-premise alcohol outlets tend to be concentrated in economically disadvantaged and minority communities (LaVeist and Wallace 2000; Nielsen et al. 2010; Snowden, 2016b) either because of a lower retail operating cost due to lower land and structure rents common in socioeconomically disadvantaged areas or because these areas lack the collective efficacy necessary to limit the opening of off-premise alcohol outlets (Morrison, Gruenewald, and Ponicki 2015; Pridemore and Grubesic 2012).

Therefore, any association between on-premise alcohol outlets and vandalism may be due to dis-inhibition of outlet patrons, while any association between on-premise alcohol outlets and thefts from vehicles may be due to attractive targets and lack of guardianship. Additionally, any association between off-premise alcohol outlets and vandalism, and between off-premise alcohol outlets and thefts from vehicles, may be due to the larger micro-environment in which off-premise alcohol outlets are embedded.

A large body of empirical literature suggests both types of outlets are also associated with violent crime rates (e.g., Gruenewald and Remer 2006; Lipton et al. 2013; Livingston 2008a, 2008b; Pridemore and Grubesic 2013; Roman et al. 2008; Snowden and Pridemore 2013a, 2013b; Zhu, Gorman, and Horel 2004). For example, density of on-premise alcohol outlets is associated with assaults at relatively large (Lipton and Gruenewald 2002) and smaller levels of aggregation (e.g., Pridemore and Grubesic 2013; Snowden and Pridemore 2013a). Off-premise alcohol outlet density is also associated with violence (Gruenewald and Remer 2006; Snowden and Freiburger 2015b), and these types of alcohol outlets appear to have a greater effect on violence relative to on-premise alcohol outlets (Pridemore and Grubesic 2013). Due to the smaller number of studies of the association between alcohol outlets and non-violent crimes, however, any differential effects of on- and off-premise alcohol outlets on non-violent crimes are unclear and so we disaggregated alcohol outlet density by outlet type in our study.

The moderating role of social disorganization

Bringing multiple literatures together, Pridemore and Grubesic (2012) argued organized neighbor-hoods are better able to exercise social control over residents and visitors in multiple ways to

diminish the effects of alcohol outlet density on violent crime. They hypothesized organized communities can reduce the impact of alcohol outlet density on violence by influencing the behavior of (1) patrons of both on- and off-premise outlets, (2) alcohol outlet owners, management, and staff, and (3) law enforcement and other officials. For example, organized neighborhoods are likely better able to provide informal surveillance of outlet patrons and their social interaction around alcohol outlets. Organized neighborhoods are probably also in a stronger position to make demands on outlet owners and man-agers for more responsible retail practices (Responsible Retailing 2010) that can help prevent them from becoming deviant places. Finally, if organized communities cannot affect the behavior of alcohol outlet patrons and management, they are probably more likely than disorganized neighborhoods to seek and receive the aid of formal social control agents like the police, alcohol regulatory agencies, and other local officials. Thus, Pridemore and Grubesic (2012) hypothesized that even given similar alcohol outlet densities, we should expect rates of crime and violence to be lower in socially organized communities. Their study revealed strong support for their hypothesis for violent crime. We examine this hypothesis for non-violent crime.

Data and methods

Research site and units of analysis

We used block group data from Milwaukee, Wisconsin. Milwaukee is the largest city in Wisconsin, covering land area of about 96 square miles with an estimated population of about 600,000 residents (US Census Bureau 2014). Relative to the rest of the state, Milwaukee is an exceptionally diverse city, with 45% of the residents being white, 40% African-American, 17% Hispanic or Latino, and 4% Asian (US Census Bureau 2014). Milwaukee home ownership rates and median household income are below and poverty above the state average (US Census Bureau 2014).

The units of analysis were 572 census block groups that lie within the city of Milwaukee boundaries. The population of these census block groups ranged between 288 and 3391, with a mean of

1045 (US Census Bureau 2010). The area of these 572 census block groups ranged from 0.03 square miles to 3.70 square miles, with a mean of 0.17 square miles (US Census Bureau 2010).

Dependent variables

Our non-violent crime-dependent variables were (1) thefts from vehicles and (2) vandalism of property. We examined thefts from vehicles because to date, no prior study examined this particular non-violent crime type, but it is a crime that might be expected to occur near alcohol outlets, and we examined vandalism of property to allow for comparison with prior studies that examined this non-violent crime type. Additionally, we examined thefts from vehicles and vandalism of property together because these crimes usually result in a small dollar value loss, but they increase residents' fear of crime and erode residents' feelings of security and safety and their confidence in police (Keister 2007). We obtained these data from the City of Milwaukee Community Mapping and Analysis for Safety Strategies public applications website. Data were based on incidents that occurred between 1 January 2013, and 31 August 2013. This seven-month window into crime data was used because of availability of comparable data across the two crime types. The data included incident number, date, time, and location of the incident, which we geocoded using ArcMap 10.1 For each block group, we calculated the density per square mile of thefts from vehicles and of vandalism of property. We standardized the dependent variables per square mile (i.e., spatial density) rather than by the population of the census block groups. If we standardized the data with a traditional population-based rate, the resulting measure would take into account only the population that lives in each block group and fail to account that offenders and victims travel to other block groups as they go about their daily activities and their involvement in the nighttime economy (Pridemore and Grubesic 2013). The distribution of each of these variables was positively skewed and so we recalculated these scores using a square root transformation. This trans-formation worked better than using a log base 10 function to reduce the skewness of the distribution.

Independent variables

We obtained data on all active alcohol outlet licenses from the Wisconsin Department of Revenue in summer 2013. These data included license address, which we geocoded using ArcMap 102, and license type (i.e., on-premise or off-premise). Using these data, we calculated on- and off-premise alcohol outlet density per square mile for each block group. Since the distribution of each of these densities was skewed, we recalculated the scores using a square root transformation. As with the dependent variables, this transformation yielded the most appropriate reduction in skewness values relative to other transformations.

Control variables

Consistent with previous alcohol crime research also considering the influence of social disorganization (e.g., Nielsen, Martinez, and Lee 2005; Snowden and Freiburger 2015b), we created a variable to directly measure social disorganization levels in census block groups. We operationalized social disorganization as an index consisting of four traditional measures of social disorganization: poverty, residential instability, single-headed households, and ethnic heterogeneity. This approach follows those utilized by prior alcohol availability studies from criminology, sociology, epidemiology, and public health (e.g., Benson et al. 2004; Emerick et al. 2014; Nielsen, Martinez, and Lee 2005; Pridemore and Grubesic 2012; Roman et al. 2008; Snowden and Pridemore 2013b). While there are many slight variations using measures from the U.S. Census, we used very frequently used measures that capture classical (Shaw and McKay 1942) – like poverty, residential mobility, and ethnic heterogeneity – and contemporary (Sampson and Groves 1989) – like single-headed households – aspects of social disorganization.

Our measure of poverty – calculated based on the proportion of individuals in the block group with income below poverty level – was consistent with the measurement of poverty carried in our prior studies. Our measure of residential instability was calculated as the proportion of renter-occupied housing units, which is consistent with prior research in this area (e.g., Evans et al. 1995; Lipton et al. 2013; Lockwood 2007; McCord and Ratcliffe 2007; Peterson, Krivo, and Harris 2000; Snowden and Freiburger

2015b). Our measure of family disruption was consistent with prior research in this area and was calculated as the proportion of all households in the block group that had a single parent (either female- or male-headed) and with a child under the age of 18. Our last measure of social disorganization was ethnic heterogeneity, which was calculated using the Lieberson Index (Lieberson 1969) and is consistent with prior research (Morgan and Jasinski, forthcoming; Osgood and Chambers 2000; Roman et al. 2008; Warner and Pierce 1993). Once we calculated the raw scores for each of these four individual variables, we created a social disorganization index by standardizing the raw scores and then summing these standardized scores and dividing by four.

More recent research in this area has identified additional community characteristics, such as population density and young males that may influence social cohesion, solidarity, and integration. Therefore, we included these additional control variables in our models. We measured population density based on the number of residents per square mile and we measured young males as the proportion of all block group residents who were 15 to 24 years of age. We also controlled for the distance of census block centroids from the city center because both Park and Burgess (1969) and Shaw and McKay (1942) found that downtown areas tend to have higher crime rates, as was also done with more recent research on social disorganization (Rice and Csmith 2002; Smith, Frazee, and Davison 2000). We obtained the socioeconomic data for the control variables from the US Census Bureau. Our models do not control for proportion African American or proportion non-white because we capture these constructs in our neighborhood ethnic heterogeneity measure.

Analytic method

We used ArcMap 10 software to clean, geocode, and manage data and employed GeoDa and GeoDaSpace software (Anselin, Syabri, and Kho 2006) to estimate spatially lagged models and account for spatial autocorrelation of non-violent crimes across neighboring block groups. We estimated spatial regression models using a first-order queen contiguity spatial weight matrix.3 We conducted four sets of analyses. The first two sets of analyses examined thefts from vehicles and vandalism of property,

respectively,4 and we estimated separate models for on- and off-premise alcohol outlet density.5 The last two sets of analyses tested for the moderating effects of social disorganization on the relationship between alcohol outlet types and thefts from vehicles and vandalism of property, respectively.

Results

Descriptive statistics for all variables are presented in Table 1. The table shows the densities of thefts from vehicles, vandalism of property, and alcohol outlets, per square mile. Milwaukee block groups contained on average about 34 incidents of thefts from vehicles per square mile and about 46 incidents of vandalism of property per square mile (i.e., about 5 counts of thefts from vehicles and about 4 counts of vandalism of property). Milwaukee block groups averaged about 22 alcohol outlets per square mile (i.e., about 2 alcohol outlets), most of which (73%) were on-premise alcohol outlets (e.g., bars and restaurants). The social disorganization index ranged from −6.02 (lower levels of social disorganization) to 8.16 (higher levels of social disorganization).

Table 2 shows the results of spatial lag regression models when thefts from vehicles density were regressed on alcohol outlet types, social disorganization, and control variables for Milwaukee block groups. Model 1 shows the results for on-premise alcohol outlet density, net of control variables, revealing a positive and significant association with thefts from vehicles density ($b = 0.25$, $p = 0.00$). Model 2 shows results for off-premise alcohol outlets. The results fail to reject the null hypothesis of no association between off-premise alcohol outlet density and thefts from vehicles density ($b = 0.08$, $p = 0.14$), but this two-tailed p-value suggests a possibility of a marginal effect given our one-tailed hypothesis, though again we caution against drawing strong conclusions for this finding.

To explore the potential moderating effects of social disorganization, we first estimated baseline effects of social disorganization on these property crimes. Results of Model 1 suggest no significant association between social disorganization and thefts from vehicles density ($b = 0.04$, $p = 0.39$), net of on-

premise alcohol outlet density. Results of Model 2 suggest social disorganization was not significantly associated with thefts from vehicles density (b = 0.01, p = 0.89), net of off-premise alcohol outlet density.

To get a general estimate of overall model fit for these models, we employed a pseudo-R-square metric. The models in Table 2 explained 35–38% of the variance in the density of thefts from vehicles. We also found the spatial lag term (Rho) associated with thefts from vehicles was a positive and significant contributor to the models, revealing the importance of controlling for spatial dependence when examining this relationship at the block group level. Finally, we consulted the multicollinearity condition number (a diagnostic that can suggest problems with the stability of the regression results due to multicollinearity when the condition number is greater than 30), and found that multicollinearity was not a problem in the models.

Table 3 shows the results of spatial lag regression models when vandalism of property density was regressed on alcohol outlet types, social disorganization, and control variables for Milwaukee census block groups. Model 3 shows results for on-premise alcohol outlet density, revealing that on-premise alcohol outlet density was positively and significantly associated with vandalism of property density (b = 0.10, p = 0.00). Model 4 provides the results for off-premise alcohol outlet density, showing that off-premise alcohol outlet density was positively and significantly associated with vandalism of property density in Milwaukee (b = 0.10, p = 0.05), although the borderline significance value prohibits us from making strong conclusions.

As with thefts from vehicles, we also estimated baseline effects of social disorganization on vandal-ism of property. Model 3 shows social disorganization was positively and significantly associated with vandalism of property density (b = 0.28, p = 0.00), net of on-premise alcohol outlet density. Model 4 shows a positive and significant association between social disorganization and vandalism of property density (b = 0.26, p = 0.00), net of off-premise outlet density. In terms of the overall model fit using the pseudo-R-square metric, the models shown in Table 3 explained 51–52% percent of the variance in vandalism of property density. The spatial lag term (Rho) for vandalism density was positive and a

significant contributor to the models. The value of the multicollinearity condition number for Models 3 and 4 suggested multicollinearity was not present in the models.

To summarize the main effects, on-premise alcohol outlet density was positively and significantly associated with density of thefts from vehicles. Results suggested a possible marginal association between off-premise alcohol outlet density and thefts from vehicles density. Additionally, both on- and off-premise alcohol outlet densities were associated with vandalism of property. Our results also showed social disorganization was associated with vandalism of property, but not with thefts from vehicles, net of both on- and off-premise alcohol outlet densities.

To test for the possibility that social disorganization moderates the impact of alcohol outlet density on non-violent crimes, we calculated two interaction terms: social disorganization index by on- and by off-premise alcohol outlet densities. Table 4 shows the results when thefts from vehicles density were regressed on social disorganization interaction terms, alcohol outlet types, and control variables for Milwaukee census block groups. The results shown in Models 5 and 6 suggest social disorganization did not moderate the relationship between on-premise outlet density and thefts from vehicles density ($b = -0.02$, $p = 0.17$) and between off-premise outlet density and thefts from vehicles density ($b = 0.01$, $p = 0.79$). The models estimated in Table 4 explained 38% of the variance in thefts from vehicles density. The spatial lag term (Rho) for thefts from vehicle density remained a significant contributor to the models, and multicollinearity was not evident in the models.

We also tested for moderating effects of social disorganization on the relationship between alcohol outlet types and vandalism density. Table 5 shows the results when vandalism of property density was regressed on social disorganization interaction terms, alcohol outlet types, and control variables for Milwaukee. The results shown in Models 7 and 8 suggest social disorganization moderated the effects of both on-premise ($b = -0.03$, $p = 0.01$) and off-premise ($b = -0.04$, $p = 0.04$) alcohol outlet densities on vandalism of property, although in the opposite direction of what we expected. The models estimated in Table 5 explained 52% of the variance in vandalism density. As with earlier models, the spatial lag term

(Rho) for vandalism of property density remained a significant contributor to the models, and multicollinearity was not evident in the models.

To identify the presence of more global processes that operate in the association between alcohol outlets and non-violent crime and to test the reliability of our findings, we also estimated these associations using data from a similar large Midwestern city, and we report these findings in the Appendix A. Results were generally similar. In Indianapolis, we found similar positive effects of on-premise alcohol outlet density on thefts from vehicles and a similar lack of moderating effects of social disorganization on the association between off-premise alcohol outlet density and thefts from vehicles.

Discussion

Using Milwaukee, Wisconsin, block groups as units of analysis, crime data from the Milwaukee Police Department, and controlling for several structural characteristics associated with crime, we found evi-dence of an association between alcohol outlets and non-violent crimes. Areas with higher densities of on-premise alcohol outlets (e.g., bars and restaurants) had higher densities of thefts from vehicles, net of control variables. Areas with higher densities of off-premise alcohol outlets (e.g., convenience and liquor stores) had higher densities of thefts from vehicles, although p-values did not allow for strong conclusions. Areas with higher densities of both on- and off-premise alcohol outlet densities had higher densities of vandalism of property.

Taken together, these findings are similar to few previous studies that examined associations between alcohol outlet density and non-violent crimes. For example, density of on- and off-premise alcohol outlets was found to be significantly associated with vandalism in prior studies (Toomey et al. 2012; Wechsler et al. 2002). Prior studies also found density of bars and clubs was significantly associated with property damage (Cameron et al. 2012) and that living in proximity to liquor stores was associated with reports of property damage (Wilkinson and Livingston 2012), and our study supports similar conclusions. To our knowledge, there are no such studies that examined the role of alcohol outlets

in thefts from vehicles. The findings of our study about the associations between alcohol outlets and thefts from vehicles suggest that this type of non-violent crime is associated with the density of on-premise alcohol outlets (and we found some evidence of a marginal effect for off-premise alcohol outlets).

The results suggest that the effects on property crime of alcohol outlets are more consistent for on-premise outlets than for off-premise outlets. This makes sense if one considers the situation from a routine activities perspective. Both types of outlets might bring strangers together for a short period of time, but only on-premise outlets bring these individuals together for lengthy periods of time and likely involve much greater effects in respect to guardianship. The vehicles near a bar are likely to be left unattended for much longer than near a carryout or liquor store. Additionally, the patrons of a tavern are much more likely to be intoxicated, both reducing guardianship and potentially increasing the supply of motivated offenders. Therefore, another avenue for future research is to explore whether these differences between on- and off-premise outlets are robust for other types of non-violent crime.

We also tested whether social disorganization moderated the effects of alcohol outlets on non-violent crime. Our results for non-violent crime are not consistent with those of Pridemore and Grubesic (2012) who found that alcohol outlet density had a greater impact on violent crime in socially disorganized areas. Although we did find some evidence that social disorganization moderated the effect of alcohol outlet premises on non-violent crime, social disorganization appeared to dampen the effect of alcohol outlets on vandalism rather than enhance it. One possible explanation for this could be in the types of crimes we studied. It could be that the minor crimes examined in this study are less likely to be reported in socially disorganized areas (see Baumer 2002). Another possible explanation could be differences in attractive targets across communities with different levels of social disorganization. There is evidence that poorer and socially disorganized communities have greater alcohol outlet density (Snowden, 2016b), but they also probably possess fewer attractive targets for theft. Given these divergent findings across crime types on the moderating effects of social disorganization, further study is warranted.

Limitations

To measure our dependent variables, we used police data that included only incidents reported to the police. A significant proportion of non-violent crimes go unreported and Baumer (2002) found differential reporting of less serious crimes to police by socioeconomic disadvantage, which could bias estimates when using police data. Second, we examined crimes that occurred in the first nine months of the year, and the results may not be generalizable to fall months (September–December). Third, we examined only two types of non-violent crimes, thefts from vehicles and vandalism of property. Future research should examine other types of non-violent crimes that are important to safety, public order, and quality of life. Fourth, we were unable to control for other retail outlets that may contribute to the observed effects of alcohol outlets on non-violent crimes due to bringing potential offenders and victims together in retail areas. However, prior studies have shown that the effect of alcohol outlets on crime rates remains, even when controlling for land use and for the presence of other retail outlets (Grubesic et al. 2013; Snowden and Pridemore 2013b). Lastly, our data do not allow us to examine the proximity of alcohol outlets to main streets, intersections, or bus stops, all of which could also contribute to neighborhood levels of thefts from vehicles and vandalism of property.

Conclusion

Most empirical studies of alcohol outlets and crime examine violence rates as the outcome (e.g., Livingston 2008b; Sparks 2011). Our study is one of the few to examine whether alcohol outlets are associated with less serious non-violent crimes. Although these types of crimes are less serious, they are more common than violent crimes and are very important for daily quality of life of community members. Our study controlled for several structural variables associated with major theoretical explanations of crime and examined if on-premise and off-premise alcohol outlet densities were associated with two non-violent crimes – thefts from vehicles and vandalism of property – and if the association between alcohol outlets and non-violent crimes was moderated by social disorganization levels. We found that on-premise alcohol outlet density was associated with thefts from vehicles and vandalism of property and that off-premise alcohol outlet density is associated with vandalism of property. Unlike a prior study of outlet

density and violence, we found no evidence social disorganization exacerbates the effect of outlet density on non-violent crime, which is a theoretically important finding.

Our findings have clear policy implications for local jurisdictions. Accumulation of empirical evidence suggests density of alcohol outlets is important for both violent and non-violent crimes. While not as serious as violent crimes, non-violent crimes can have an important influence on the overall well-being and perceptions of safety of community residents. Local jurisdictions can reduce non-violent crimes by limiting the licensing of alcohol selling establishments, perhaps especially those that engage in irresponsible retail practices.

Notes

1. 97% successful match for thefts from vehicles and 99% successful match for vandalism of property.

2. 99.7% successful match rate.

3. We chose the contiguity spatial weight matrix because the units of analysis (i.e., census block groups) are arranged in a grid-like manner. We used first-order queen contiguity because we wanted to allow for equal influence of neighboring crime levels on our units of analysis. We considered but decided not to use the first-order rook contiguity matrix because rook weights would have produced fewer neighbors relative to the queen weights. As such, on average, each neighboring observation would have more influence on our census block groups.

4. We chose not to combine the dependent variables because little is known about the association of alcohol outlet density with these two non-violent crime types.

5. We estimated separate models for on- and off-premise alcohol outlets because we were interested in examining if there were differences in this association by alcohol outlet type. We estimated additional models in our sensitivity analyses that included on- and off-premise alcohol outlets in the same model. We found effects remained consistent with those presented here.

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Table 1. descriptive statistics for milwaukee ($N = 572$) block groups.

	Mean	SD	Min.	Max.
thefts from vehicles density	33.83	42.19	0	400.00
Vandalism of property density	46.26	44.46	0	300.00
total alcohol outlet density	22.39	39.77	0	400.00
on-premise alcohol outlet density	16.20	35.5	0	377.78
off-premise alcohol outlet density	6.19	11.47	0	83.33
social disorganization index	0.01	2.56	−6.02	8.16
Population density	10489.05	6583.87	376.50	51050.00
Proportion young	0.17	0.10	0.03	0.88
distance from city center	3.90	2.21	0	10.97

Table 2. spatial lag regression for thefts from vehicles density regressed on alcohol outlet types, social disorganization, and control variables for milwaukee ($N = 572$) block groups.

	Model 1: On-premise			Model 2: Off-premise		
	b	se	*p*	b	se	*p*
on-premise density	0.25	0.04	0.00	–	–	–
off-premise density	–	–	–	0.08	0.06	0.14
social disorganization	0.04	0.04	0.39	0.01	0.05	0.89
Population density	0.00	0.00	0.00	0.00	0.00	0.00
Proportion young	−1.13	1.13	0.32	−0.50	1.15	0.66
distance from city center	−0.26	0.07	0.00	−0.33	0.07	0.00
Rho thefts from vehicles density	0.29	0.06	0.00	0.38	0.06	0.00
Constant	3.46	0.57	0.00	3.59	0.58	0.00
Pseudo-*R*-squared	0.38			0.35		
multicollinearity condition number	9.54			9.22		
S.E. of regression	2.48			2.55		

note: dependent and independent variables were square root transformed.

Table 3. spatial lag regression for vandalism of property density regressed on alcohol outlet types, social disorganization, and control variables for milwaukee ($N = 572$) block groups.

	Model 3: On-premise			Model 4: Off-premise		
	b	se	*p*	b	se	*p*
on-premise density	0.10	0.03	0.00	–	–	–
off-premise density	–	–	–	0.10	0.05	0.05
social disorganization	0.28	0.04	0.00	0.26	0.04	0.00
Population density	0.00	0.00	0.00	0.00	0.00	0.00
Proportion young	−1.71	1.02	0.09	−1.42	1.02	0.17
distance from city center	−0.04	0.05	0.47	−0.07	0.05	0.16
Rho Vandalism density	0.33	0.05	0.00	0.33	0.05	0.00
Constant	2.49	0.50	0.00	2.66	0.50	0.00
Pseudo-*R*-squared	0.52			0.51		
multicollinearity condition number	9.55			9.22		
S.E. of regression	2.24			2.25		

note: dependent and independent variables were square root transformed.

Table 4. spatial lag regression for thefts from vehicles density regressed on social disorganization interaction terms, alcohol outlet types, and control variables for milwaukee (*N* = 572) block groups.

	Model 5: On-premise			Model 6: Off-premise		
	b	se	*p*	b	se	*p*
on x social disorganization	−0.02	0.01	0.17	–	–	–
off x social disorganization	–	–	–	0.01	0.02	0.79
social disorganization	0.07	0.05	0.18	0.03	0.05	0.62
on-premise density	0.26	0.04	0.00	0.25	0.04	0.00
off-premise density	0.05	0.06	0.41	0.03	0.06	0.58
Population density	0.00	0.00	0.00	0.00	0.00	0.01
Proportion young	−1.25	1.13	0.26	−1.09	1.14	0.34
distance from city center	−0.26	0.07	0.00	−0.26	0.07	0.00
Rho thefts from vehicles density	0.29	0.06	0.00	0.29	0.06	0.00
Constant	3.43	0.58	0.00	3.43	0.58	0.00
Pseudo-*R*-squared	0.38			0.38		
multicollinearity condition number	10.31			10.48		
S.E.. of regression	2.48			2.48		

note: dependent and independent variables were square root transformed.

Table 5. spatial lag regression for vandalism of property density regressed on social disorganization interaction terms, alcohol outlet types, and control variables for milwaukee ($N = 572$) block groups.

	Model 7: On-premise			Model 8: Off-premise		
	b	se	*p*	b	se	*p*
on x social disorganization	−0.03	0.01	0.01	–	–	–
off x social disorganization	–	–	–	−0.04	0.02	0.04
social disorganization	0.34	0.05	0.00	0.31	0.05	0.00
on-premise density	0.10	0.03	0.00	0.09	0.03	0.01
off-premise density	0.09	0.05	0.07	0.14	0.06	0.01
Population density	0.00	0.00	0.00	0.00	0.00	0.00
Proportion young	−1.88	1.02	0.07	−1.96	1.03	0.06
distance from city center	−0.02	0.06	0.70	−0.03	0.06	0.60
Rho Vandalism density	0.33	0.05	0.00	0.32	0.05	0.00
Constant	2.35	0.51	0.00	2.42	0.51	0.00
Pseudo-*R*-squared	0.52			0.52		
multicollinearity condition number	10.31			10.48		
S.E. of regression	2.23			2.23		

note: dependent and independent variables were square root transformed.