Published in final edited form as:

Alcohol Clin Exp Res. 2013 June ; 37(6): 993–1000. doi:10.1111/acer.12059.

WHERE THE INDIVIDUAL MEETS THE ECOLOGICAL: A STUDY OF PARENT DRINKING PATTERNS, ALCOHOL OUTLETS AND CHILD PHYSICAL ABUSE

Bridget Freisthler, Ph.D. and
UCLA Department of Social Welfare

Paul J. Gruenewald, Ph.D.
Prevention Research Center, Pacific Institute for Research and Evaluation

Abstract

Background—Despite well-known associations between heavy drinking and child physical abuse, little is known about specific risks related to drinking different amounts of alcohol in different drinking venues. This study uses a context specific dose-response model to examine how drinking in various venues (e.g., at bars or parties) are related to physically abusive parenting practices while controlling for individual and psychosocial characteristics.

Methods—Data were collected via a telephone survey of parents in 50 cities in California resulting in 2,163 respondents who reported drinking in the past year. Child physical abuse and corporal punishment were measured using the Conflict Tactics Scale, Parent Child version. Drinking behaviors were measured using continued drinking measures. Data were analyzed using zero inflated Poisson models.

Results—Drinking at homes, parties or bars more frequently was related to greater frequencies of physically abusive parenting practices. The use of greater amounts of alcohol in association with drinking at bars appeared to increase risks for corporal punishment, a dose-response effect. Dose-response relationships were not found for drinking at homes or parties or drinking at bars for physical abuse nor for drinking at home and parties for corporal punishment.

Conclusion—Frequencies of using drinking venues, particularly bars and home or parties, are associated with greater use of abusive parenting practices. These findings suggest that a parent's routine drinking activities place children at different risks for being physically abused. They also suggest that interventions that take into account parents' alcohol use at drinking venues are an important avenue for secondary prevention efforts.

Keywords

dose-response alcohol use; drinking venues; child physical abuse; alcohol outlets

INTRODUCTION

A rich literature demonstrates that alcohol use is associated with children's risk for physical abuse (Berger, 2005; Famularo et al., 1986; Kelleher et al., 1994; Murphy et al., 1991). At the individual level, parents who abuse or are dependent on alcohol have higher odds of committing child physical abuse (Dube et al., 2001). At the ecological level, greater alcohol

outlet densities are also related to higher rates of child maltreatment (Freisthler, 2004; Freisthler et al., 2007; Freisthler and Weiss, 2008). This study is the first to integrate person-level and ecological characteristics in an examination of parent drinking contexts that place children at risk for physical abuse.

Child Physical Abuse and Alcohol Use

Official statistics from child welfare agencies show that over 120,000 children were victims of substantiated reports of physical abuse in 2009 (US DHHS, 2011). Seven percent of those children lived in California (US DHHS, 2011). The Fourth National Incidence study (NIS-4), which includes children not necessarily reported to the child welfare system but known to professionals (i.e., teachers, doctors), found 323,000 children were victims of physical abuse (Sedlak et al., 2010). Both of these studies are likely to underestimate the true incidence of child physical abuse in the general population (Straus et al., 1998).

In general, rates of physical abuse are higher among individuals reporting heavy drinking or identified as alcohol abusers or dependents (Berger, 2005; Famularo et al., 1986; Kelleher et al., 1994; Murphy et al., 1991; Sun et al., 2001). NIS-4 found that alcohol was an issue in 11.1% of cases where at least moderate harm by physical abuse occurred (Sedlak et al., 2010). Among cases investigated for child maltreatment, 7.3% of caregivers had a positive screen for alcohol problems and 2.2% more were identified as alcohol dependent (Gibbons et al., 2005). Alcohol-abusing parents were more likely to be reported multiple times to the child welfare system for child maltreatment than those parents who did not abuse alcohol (Fluke et al., 2008; Murphy et al., 1991; Wolock and Magura, 1996). These findings suggest that as long as parents do not abuse or are not dependent on alcohol, other patterns of parental alcohol use present a lower risk for physical abuse among children.

Routine Drinking Activities: Venues, Outlets, and Child Maltreatment

These observations of parental alcohol abuse at the individual level are complemented by population studies that suggest ecological circumstances of drinking may also affect risks for child physical abuse. Studies of alcohol outlet density and child maltreatment show that areas with higher density of bars have higher rates of overall child maltreatment (Freisthler, 2004; Freisthler et al., 2005; 2007). Densities of off-premise outlets (i.e., establishments that sell alcohol to be consumed elsewhere) have been related to higher rates of child physical abuse (Freisthler et al., 2004), accidental injuries and child abuse injuries (Freisthler et al., 2008), and rates of maltreatment over time (Freisthler et al., 2007).

Where a parent drinks may be an important factor in the maltreatment risk for children. Parents who drink more often in their own home, at parties, in their friends' homes, or at relatives' homes would presumably purchase alcohol from off-premise outlets (e.g., liquor stores). Parents may also be more likely to bring their children with them to these drinking locations than to on-premise venues (e.g., bars) and, of course, when drinking at home children are more likely to be present. Greater quantities of alcohol appear to be consumed by parents when drinking at friends' homes, relatives' homes or parties (Paredis et al., 2011). Routine drinking in these locations could lead to more frequent use of physical abuse through the disinhibiting effects of alcohol. A possible dose-response relationship might exist where drinking at these venues and higher levels of drinking are related to more frequent use of physical abuse. The link between the ecological (i.e. outlets) and the individual (i.e., heavy alcohol use) may reside in those routine activities that represent interactions of drinkers in different contexts for drinking.

On the other hand, drinking risks may be greatest at low levels of drinking if those risks are more likely to occur at lower drinking levels (e.g., more child care activities during

moderate drinking levels compared to heavy drinking). In this way, venue specific effects may be separated from effects related to drinking levels. Theories related to the disinhibiting effects of alcohol suggest that greater levels of drinking are expected to lead to greater problems for all contexts. This study enables a direct test of this hypothesis.

In a first attempt at understanding the role of drinking context for abusive parenting practices, Freisthler (2011) found that parents who drank frequently in their own home, at bars, and at parties were more likely to use physical abuse. This study did not examine the separate impacts of drinking patterns and venue use in the etiology of physical abuse or corporal punishment and was conducted with a small convenience sample. Although previous studies have found significant associations between drinking locations and risks for alcohol problems (Gruenewald et al., 1995; Paradis et al., 2011; Treno et al., 2000, 2008), none has specifically examined the relationship of drinking venues to child physical abuse.

Linking the Individual to the Ecological: Venue-Specific Dose-Response Models

The current study will examine the degree to which alcohol use in conjunction with different drinking venues affects risks for child physical abuse. Two problems arise when seeking to explain relationships between drinking and child physical abuse. First, specific contexts for use may enable or support abusive parenting practices as part of the problematic self-reinforcing effects of ‘assortative drinking,’ the tendency of drinkers to drink with like-minded others in specific venues (i.e., context specific effects; Gruenewald, 2007). Second, frequencies of physical abuse may be related to greater frequencies and quantities of alcohol consumed, a dose-response effect that may be independent of categorizations of users as abusers or dependent (i.e., disinhibition effects). Distinguishing these effects can be achieved through application of quantitative dose-response models (Gruenewald et al., 2004, 2010; Russell et al., 2009).

Gruenewald and colleagues (2010) found that drinking problems among college students (e.g., hangovers) increased rapidly at relatively low drinking levels and leveled off after 3 or more drinks. These risks could be differentiated between drinking venues with greater risks associated with drinking at fraternity or sorority parties (Gruenewald and Ponicki, 2009). This study is the first to use this model of venue-specific dose-response alcohol use and alcohol outlets to examine how they may be related to a parent’s use of physical abuse.

MATERIALS AND METHODS

Study Sample

A general population telephone survey of parents or legal guardians 18 years or older was conducted across 50 cities in California with about 60 participants in each city (range 47–74). Data were obtained 3,023 respondents who had at least one child 12 years old or younger and lived with the parent at least 50% of the time. The final sample includes the 2,163 parents who report drinking in the past year (see Table 1 for descriptive statistics). The 50 cities chosen for this study had a population between 50,000 and 500,000. These cities were chosen from a total number of 138 cities this size in the California and designed to maximize ecological validity, but excluded large cities in the state (e.g., Los Angeles, San Francisco). By design, cities were also distinct places separated from one another by other city and county areas. Thus no city was located directly adjacent to another city included in the study. Poststratification survey weights based on race/ethnicity, gender, and household type (single vs. two parent households) were constructed to increase generalizability to all 138 cities of this size in California.

Data Collection Procedures

Data were collected using computer-assisted telephone interview (CATI) techniques by a survey research firm. Listed addresses and telephone numbers obtained from various sources were used to develop the sample for the study. Using listed samples appears to be unbiased relative to random digit dialing techniques (Brick et al., 1995; Kempf and Remington, 2007; Tucker et al., 2002). All individuals found on these listed samples were sent a pre-announcement letter describing the study. Potential respondents were given the option to opt out of the survey by contacting the survey research firm via a toll-free number. Data were collected during from March to October in 2009. Surveys took, on average, thirty minutes to complete and were conducted in either English or Spanish. Respondents gave verbal consent and received \$25 for participating in the survey. The response rate for the survey was calculated to be 47.4% using standard definitions of the American Association of Public Opinion Research (AAPOR, 2002).

Measures

Child Physical Abuse: The dependent variables (frequency of corporal punishment and physical abuse) were measured using the Parent-Child Conflict Tactics Scale (Straus et al., 1998). This scale includes five items on corporal punishment including spanking a child on the bottom with a bare hand or belt and four items on physical assault (i.e., abuse) including hitting with a fist or kicking a child. Corporal punishment is included in this study, because although it often is not physical abuse, the use of physical force (e.g., spanking) is on a continuum of parenting behaviors that can be deemed physically abusive under certain circumstances (e.g., it causes an injury). Children who have experience frequent corporal punishment often have similar outcomes to children who are physically abused including delinquency and alcohol abuse (Gershoff, 2002; Holmes and Robins, 1987; Widom, 1989; Widom et al., 1995).

Respondents answered the questions for a “focal child” who was defined as a child twelve or under with the most recent birthday. Respondents were asked to report the number of times they used each behavior in the past year with response categories ranging from “None” to “More than 10 times in the past year.” These responses were then summed using the middle range of each category to get a frequency of corporal punishment and physical abuse. Data on parenting practices were obtained using Interactive Voice Response (IVR) technology to minimize bias related to social desirability.

Alcohol Outlets: Data on the location of licensed establishments that sell alcohol were obtained from the California Department of Alcoholic Beverage Control. Outlets were divided into three categories: bars and pubs, restaurants that serve alcohol, and off-premise outlets based upon their license type. The number of alcohol outlets for each type was calculated within a half-mile radius of each respondent’s address. 99% of the outlets were successfully geocoded.

Anxiety and Depression: Past month symptoms of depression or anxiety were measured using items from the Primary Care Evaluation of Mental Disorders (PRIME-MD) tool. Having depressive symptoms meant that the respondent answered positively to either having been bothered a lot by little interest or pleasure in doing things or having been bothered a lot by feeling down, depressed, or hopeless. Respondents who answered affirmatively to (1) having been bothered a lot by “nerves,” or feeling anxious or on edge; (2) having been bothered a lot by worrying about a lot of different things; or (3) having had an anxiety attack (suddenly feeling fear or panic) were considered to have symptoms of anxiety. Internal consistency was .65 for depression and .61 for anxiety.

Impulsivity: The Dickman Dysfunctional Impulsivity Scale (Dickman, 1990) was used to measure impulsivity. Dysfunctional impulsivity was defined as acting rapidly and inaccurately (e.g., I often get into trouble because I don't think before I act) and measured using 7 items. Responses were either "yes" or "no." Items were summed, after reverse coding for some items, where higher items indicated higher levels of impulsivity. Internal consistency was .73.

Frequency of Drinking Venue Utilization and Dose-Response: Respondents were asked the frequencies with which they had 1 or more, 2 or more, 3 or more, 6 or more, and 9 or more drinks in the past 4 weeks. Respondents who have not used alcohol in the past 4 weeks are asked the same questions over the past 365 days (allowing the method to be extended to low frequency drinking). Drinking patterns were measured using a graduated frequency approach derived from the above questions that provides model-based estimates of dimensions of drinking patterns using a mathematical model described in Gruenewald et al. (1996b; 2003a,b). Venue utilization was measured in terms of the frequency during the prior 28 or 365 days when respondents reported attending these venues where drinking occurred and self-reported drinking in these venues, including (1) at home, (2) in bars, (3) in restaurants, and (4) at parties outside of the home. All measures related to drinking patterns and drinking venues were scaled to a 28 day metric.

Central to an understanding of the relationship between drinking and problems is the recognition that drinking must occur in some place, that both non-drinking and drinking risks occur in those places, and that greater amounts of drinking in each place may or may not be related to greater risks for any specific problem. Gruenewald et al. (2010) analyzed relationships between drinking and problems among college students to show that risks related to frequencies of drinking can be distinguished from risks related to drinking at greater levels (e.g., 1, 2, or 3 or more drinks) by noting that risks related to drinking can be treated as separable additive 'exposures' to use at different levels:

$$R = \beta_0 E_0 + \beta_1 E_1 + \beta_2 E_2 + \beta_3 E_3 + \dots + \beta_n E_n \quad (1)$$

where E_i is the number of days on which i drinks were consumed. Problem risks related to non-drinking days are equal to $\beta_0 E_0$. Problem risks related to days on which one drink was consumed equal $\beta_1 E_1$, etc. The β_i represent risks associated with drinking i drinks on any given day. The assumption that β_i increase linearly with drinking levels leads to the simple reduced form equation:

$$R = a + bF + c(V - F) \quad (2)$$

Risks related to drinking are a linear function of drinking frequencies, F , and total volume, V , minus frequency, $V - F$. Noting that drinking volumes are simply the product of frequencies and average drinking quantities, $V = QF$, equation 2 can be rewritten:

$$R = a + bF + cF(Q - 1) \quad (3)$$

showing that risks related to drinking frequencies scale nonlinearly with average drinking levels. This equation shows that average drinking quantities will always be nonlinearly related to drinking risks and suggests that inclusion of main effects related to drinking quantities, a common practice among alcohol epidemiologists, will lead to the mis-specification of dose-response relationships.

Gruenewald and Ponick (2009) note that total frequencies of drinking, F , can be treated as composed of frequencies of drinking in different venues, $F = f_1 + f_2 + f_3 + \dots + f_n$ and that equation 3 can be rewritten to account for venue specific risks:

$$R_i = a_i + b_i F_i + c_i F_i (Q_i - 1) \quad (4)$$

where now the index i designates different drinking places, bars, restaurants, at home, etc., and total risk, R , is a sum of venue specific risks R_i . They further show that if we make the strong assumption that drinking quantities are the same across all drinking places, $Q = q_1 = q_2 = q_3 = \dots = q_n$, this model can be estimated with minimal data on frequencies of drinking in different places and average drinking levels, Q . Most studies of venue use or drinking contexts include this information. Equation 4, however, also shows that risks related to drinking in different places may scale very differently with respect to drinking quantities. For this reason, interpretation of dose-responsiveness, c_i , from these models should be made with care. Model based estimates of b_i represent average levels of risk associated with drinking at specific venues and are independent of effects related to drinking quantities. Using minimal data, model based estimates of c_i will represent either different risks related to heavier drinking between venues, c_i , or effects related to variations in drinking quantities, q_i , around average levels, Q . Observed statistical differences in c_i across venues will be indicative of differences in dose-responsiveness between places, directing future investigations into the sources of these risks. Descriptive information about dose-response variables can be found in Table 2.

Demographics: Control variables included age and gender of the focal child. Characteristics of the respondent included age (recoded to categories of 18–30, 31–45, 46 and older), number of children in the household, marital status (1 = currently married or cohabiting), race/ethnicity, and income (seven categories ranging from less than \$20,000 to greater than \$150,000).

Analysis Procedures

Data were analyzed using zero inflated Poisson models with counts of the number of times parents used each of the corporal punishment or physical abuse in the past year¹. The first model incorporates demographic, personality, and drinking variables described above while the second models adds the outlet variables. Indicator variables were included for forty-nine of the fifty cities for all models (not presented here).

RESULTS

Results are in Tables 3 and 4 for severe physical abuse and corporal punishment, respectively. Model 1 contains the individual, psychosocial and dose-response drinking variables. Model 2 adds information about the ecological context, in the form of number of alcohol outlets by type (e.g., bars, restaurants, off-premise).

Respondents used less physical abuse with boys and more with older children (see Table 3). Being male and having more children was related to more use of physical abuse. Respondents reporting that they were non-Hispanic black, Asian or “other” race used physical abuse more often and Hispanic respondents less often than whites. Higher scores on the impulsivity measure was related to greater use of physical abuse. Parents who reported symptoms of anxiety used less physical abuse.

¹In results not presented here we also conducted logit models of the relationship between dose-response drinking and both corporal punishment and physical abuse. The results for the dose-response variables were similar, drinking frequency at restaurants was related to higher odds of using corporal punishment.

The frequency of drinking at bars or homes and parties was positively related to the use of physically abusive parenting practices. More frequent drinking at restaurants was inversely related to these practices. The effect size for bars was about 11.4 times greater than that for drinking at homes or parties. Interpreted in the framework of the dose-response model (equations 1–4) these effects indicate that drinking at bars may increase risks for use of physical abuse by about 12%. In contrast, drinking at home and parties would appear to increase use of physical abuse by about 1%.

Dose-response effects related to greater levels of drinking were either negative (homes/parties and bars) or not significant (and did not replicate across both models). Greater levels of drinking were associated with somewhat reduced risks for use of physical abuse, indicating that lower levels of drinking presented greatest risks. When ecological effects related to the densities of alcohol outlets were introduced the effects related to bars became not significant. This suggests that no dose-response effects are related to heavier drinking in bars. Rather all the effects are due to any drinking in bars, a purely context specific effect independent of drinking levels.

Respondents who live in areas with more bars within a .5 mile radius of their home used physically abusive parenting practices. In fact, individuals living in areas with the maximum number of bars (12 within .5 miles) used 1.7 more physically abusive parenting practices, on average per year, than other parents. A greater number of restaurants were related to less use of physical abuse.

Table 4 shows the relationship between the dose-response relationship of drinking to corporal punishment. Boys and younger children experience corporal punishment more often. Fathers use corporal punishment more often than mothers as do those respondents with more children. African American, Asian, or other race/ethnicity respondents used corporal punishment more often than white respondents. Respondents of more than one race used corporal punishment less than whites. Respondents with lower incomes and who were more impulsive report using corporal punishment more often.

The frequency of having one drink at home/parties and in bars was positively related to higher frequency of using corporal punishment while restaurants were negatively related. Compared with having one drink at homes or parties, drinking at bars is 1.45 times more risky for use of corporal punishment. Unlike physical abuse, the more one drinks at bars, the more corporal punishment is used showing significant dose-response effects. Dose-response effects were not found for drinking at home/parties. The number of local (within .5 miles) off-premise outlets was related to more frequent use of corporal punishment. Number of bars was related to less frequent use of corporal punishment.

DISCUSSION

Studies which observe statistical associations between the availability of alcohol through different settings and observed rates of different problem outcomes are increasingly common. These ecological correlations appear in many cases to be fairly robust, but do not provide insight into the specific social mechanisms which explain outlet effects. These explanations require the construction and testing of specific ecological models of human interactions in drinking environments that create risks for problems. The current study used one such model to assess dose-response relationships between drinking patterns, venue use and risks for child physical abuse while controlling for an extensive suite of individual psychosocial, demographic, and ecological conditions that also affect risks for physical abuse.

Male African and Asian American parents with more children were more likely to engage in both forms of abuse. Older female and younger male children were likely to be the focus of physical abuse and corporal punishment, respectively. Parents with greater levels of impulsivity engaged more often in both forms of maltreatment, while those with greater symptoms of anxiety engaged less often in severe physical abuse. These effects confirm prior observations in the literature (Black et al., 2001). In addition, the ecological conditions of areas in which parents lived were related to frequencies of physical abuse (greater in areas with more bars and fewer restaurants) and corporal punishment (greater in areas with more off-premise establishments and fewer bars). These complementary relationships may be a function of the fact that parents who use physical abuse also use corporal punishment, but parents who use corporal punishment do not always engage in physical abuse.

Application of the dose-response model in analyses of these data revealed an important pattern of relationships suggestive of low-level drinking risks associated with the drinking at bars or homes/parties (i.e., effects related to frequencies drinking in these places). Drinking in these venues was related to more frequent physical abuse, with drinking at bars exhibiting approximately 11 times the risk relative to homes/parties. Drinking in these venues was also related to more frequent corporal punishment.

Greater levels of drinking in association with these places, however, were related to reductions in these associations with respect to severe physical abuse (i.e., effects related to drinking quantities). This negative dose-response effect suggests that while drinking at bars and home/parties is related to greater frequencies of physical abuse, heavier drinking levels *per se* are not. Despite the lack of dose-response relationship, it is important to note that risk of using physical abuse or corporal punishment remains elevated until a parent has four or more drinks. On the other hand, greater levels of drinking in association with bars were related to greater frequencies of corporal punishment, a positive dose-response effect that suggests heavier drinking is an important factor in this behavior.

Clearly, the theoretical picture that emerges from these findings is not one of simple disinhibition due to alcohol, but one in which the social ecological facets of drinking in different places appears to put children at greater risk for severe physical abuse (i.e., parents' drinking at bars or home/parties), while parents' heavier drinking is contributory to only one outcome associated with one circumstance (i.e., corporal punishment related to heavier drinking in association with bars). While these observations require further research and validation, they throw into doubt the blanket assertion that heavier drinking *per se* is related to all forms of child abuse and neglect. Social circumstances of alcohol use may play an important and likely moderating role in the emergence of these problem behaviors.

The construction and testing of quantitative theoretical linkages between measures of the ecological circumstances in which people live and the problems experienced due to alcohol is a difficult and challenging exercise. The models here can therefore be extended to understand how drinking in specific venues may be more prevalent among certain adults with specific characteristics (e.g., young adults who may drink in bars more often) or specific characteristics of children (e.g., mothers of very young children may not drink in any venue while breastfeeding). This may be especially true given that children under five years are more likely to experience corporal punishment and slightly older children are more likely to experience physical abuse (Gershoff, 2002). The models, methods, and data presented here are intended to be just the first steps along this road and so are limited in a number of important ways, all to be refined through further work.

First is the modeling assumption that individuals drink the same average amount of alcohol at each drinking location (equation 3). Past research has shown that this is not the case:

parents drink more at bars and parties, when drinking in larger groups and outside of meals (Paredis et al., 2011). The strong effects relating drinking at bars to severe physical abuse may be due to greater levels of drinking in association with this drinking venue. Data that reflects upon levels of drinking among parents in different venues would provide an answer to this question (equation 4). The dose-response model provides guidelines for the introduction of this information in future studies and helps guide interpretation of these data.

Other limitations include the possibility that the social circumstances where alcohol is used may be affecting apparent relationships between use and these problem outcomes. Treno et al. (2007) have pointed out that individuals who prefer to drink at bars may choose to live in neighborhoods with higher numbers of bars and be prone to social influences of others using those drinking places. The low response rate may mean this study is not generalizable to all parents. Finally, we are unable to distinguish whether or not the alcohol use occurs in conjunction with use of physical force towards children or if there is a common characteristic related to both drinking and use of punitive parenting because both are measured for past month (alcohol use) or past year (alcohol use and parenting) time periods. The study controlled for many factors that might affect both drinking and use of physical abuse, such as impulsivity, to lessen the likelihood that a spurious relationship is causing the findings.

Despite these limitations, the results of this study suggest that secondary prevention efforts should be focused on those areas where parents drink, especially in those areas with higher numbers of bars. As drinking at even very low levels increases risks related to using corporal punishment or physical abuse, making alternative arrangements for child care become even more important when parents plan to drink.

Acknowledgments

Research for and preparation of this manuscript were supported by NIAAA Center grant #P60-AA006282.

References

- American Association for Public Opinion Research. Standard Definitions: Final Dispositions of Case Codes & Outcome Rates for Surveys. AAPOR; Ann Arbor, MI: 2002.
- Berger LM. Income, family characteristics, & physical violence toward children. *Child Abuse Negl.* 2005; 29:107–133. [PubMed: 15734178]
- Black DA, Heyman RE, Slep AMS. Risk factors for child physical abuse. *Aggress Violent Beh.* 2001; 6:121–188.
- Brick JM, Waksberg J, Kulp D, Starer A. Bias in list-assisted telephone samples. *Public Opin Quart.* 1995; 59:218–235.
- Dube SR, Anda RF, Felitti VJ, Croft JB, Edwards VJ, Giles WH. Growing up with parental alcohol abuse: exposure to childhood abuse, neglect, and household dysfunction. *Child Abuse Negl.* 2001; 25:1627–1640. [PubMed: 11814159]
- Dickman SJ. Functional & dysfunctional impulsivity: personality & cognitive correlates. *J Pers Soc Psychol.* 1990; 58(1):95–102. [PubMed: 2308076]
- Famularo R, Stone K, Barnum R, Wharton R. Alcoholism & severe child maltreatment. *Am J Orthopsychiatry.* 1986; 56:481–485. [PubMed: 3740231]
- Fluke J, Shusterman G, Hollinshead D, Yuan YT. Longitudinal analysis of repeated child abuse reporting and victimization: multistate analysis of associated factors. *Child Maltreatment.* 2008; 13(1):76–88. [PubMed: 18174350]
- Freisthler B. A spatial analysis of social disorganization, alcohol access, and rates of child maltreatment in neighborhoods. *Child Youth Serv Rev.* 2004; 26(9):803–819.
- Freisthler B. Alcohol use, drinking venue utilization, and child physical abuse: results from a pilot study. *J Fam Violence.* 2011; 26(3):185–193. [PubMed: 21475714]

- Freisthler B, Gruenewald PJ, Remer LG, Lery B, Needell B. Exploring the spatial dynamics of alcohol outlets and Child Protective Services referrals, substantiations, and foster care entries. *Child Maltreatment*. 2007; 12:114–124. [PubMed: 17446565]
- Freisthler B, Gruenewald PJ, Ring L, LaScala EA. An ecological assessment of the population and environmental correlates of childhood accident, assault and child abuse injuries. *Alcohol Clin Exp Res*. 2008; 32(11):1969–1975. [PubMed: 18782339]
- Freisthler B, Midanik LT, Gruenewald PJ. Alcohol outlets and child physical abuse and neglect: applying routine activities theory to the study of child maltreatment. *J Stud Alcohol*. 2004; 65(5): 586–592. [PubMed: 15536767]
- Freisthler B, Needell B, Gruenewald PJ. Is the physical availability of alcohol and illicit drugs related to neighborhood rates of child maltreatment? *Child Abuse Negl*. 2005; 29(9):1049–1060. [PubMed: 16168479]
- Freisthler B, Weiss RE. Using Bayesian space-time models to understand the substance use environment and risk for being referred to Child Protective Services. *Subst Use Misuse Special Issue*. 2008; 43(2):239–251.
- Gershoff ET. Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychol Bull*. 2002; 128(4):539–579.
- Gibbons, CB.; Barth, RP.; Martin, SL. Unpublished manuscript. University of North Carolina; Chapel Hill: 2005. Substance abuse among caregivers of maltreated children.
- Gruenewald PJ. The spatial ecology of alcohol problems: Niche theory and assortative drinking. *Addiction*. 2007; 102:870–878. [PubMed: 17523980]
- Gruenewald PJ, Johnson FW, Ponicki WR, LaScala EA. A dose-response perspective on college drinking and related problems. *Addiction*. 2010; 105(2):257–269. [PubMed: 20078484]
- Gruenewald, PJ.; Ponicki, WR. A simple mathematical model of drinking patterns and drinking contexts. Paper presented at the Annual Meeting of the Kettil Bruun Society; Copenhagen, Denmark. 2009.
- Gruenewald PJ, Treno AJ, Nephew TM, Ponicki WR. Routine activities and alcohol use: constraints on outlet utilization. *Alcohol Clin Exp Res*. 1995; 19:44–53. [PubMed: 7771662]
- Gruenewald PJ, Mitchell PR, Treno AJ. Drinking and driving: Drinking patterns & drinking problems. *Addiction*. 1996; 91:1637–1649. [PubMed: 8972922]
- Gruenewald PJ, Johnson F, Light J, Lipton R, Saltz R. Understanding college drinking: Assessing dose-response from survey self-reports. *J of Stud Alcohol*. 2003a; 64:500–514. [PubMed: 12921192]
- Gruenewald PJ, Johnson FW, Light JM, Saltz RF. Drinking to extremes: Theoretical and empirical analyses of peak drinking levels among college students. *J Stud Alcohol*. 2003b; 64:817–824. [PubMed: 14743944]
- Holmes SJ, Robins LN. The influence of childhood disciplinary events on the development of alcoholism and depression. *J Child Psychol Psych*. 1987
- Kelleher K, Chaffin M, Holleberg J, Fischer E. Alcohol and drug disorders among physically abusive and neglectful parents in a community-based sample. *Am J Public Health*. 1994; 84:1586–1590. [PubMed: 7943475]
- Kempf AM, Remington PL. New challenges for telephone survey research in the Twenty-First century. *Annu Rev Publ Health*. 2007; 28:113–126.
- Murphy JM, Jellinek M, Quinn D, Smith G, Poitras FG, Goshko M. Substance abuse and serious child mistreatment: prevalence, risk, and outcome in a court sample. *Child Abuse Negl*. 1991; 15:197–211. [PubMed: 2043972]
- Paradis C, Demers A, Nadeau L, Picard E. Parenthood, alcohol intake, and drinking contexts: occasion furem facit. *J Stud Alcohol Drugs*. 2011; 72:259–269. [PubMed: 21388599]
- Russell M, Chu B, Banerjee A, Fan A, Trevisan M, Gruenewald P. Drinking patterns and myocardial infarction: a linear dose-response model. *Alcohol Clin Exp Res*. 2009; 33:1–8. [PubMed: 18828798]
- Sedlak, AJ.; Mettenburg, J.; Basena, M.; Petta, I.; McPherson, K.; Greene, A.; Li, S. Fourth National Incidence Study of Child Abuse and Neglect (NIS-4): Report to Congress. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families; 2010.

- Straus MA, Hamby SL, Finkelhor D, Moore DW, Runyan D. Identification of child maltreatment with the parent-Child Conflict Tactics Scales: development and psychometric data for a national sample of American parents. *Child Abuse Negl.* 1998; 22(4):249–270. [PubMed: 9589178]
- Sun A, Shillington AM, Hohman M, Jones L. Caregiver AOD use, case substantiation, and AOD treatment: studies based on two southwestern counties. *Child Welfare.* 2001; 80:151–177. [PubMed: 11291899]
- Treno AJ, Alaniz ML, Gruenewald PJ. The use of drinking paces by gender, age and ethnic groups: an analysis of routine drinking activities. *Addiction.* 2000; 95:537–551. [PubMed: 10829330]
- Treno AJ, Gruenewald PJ, Remer LG, Johnson F, LaScala EA. Examining multi-level relationships between bars, hostility, and aggression: social selection and social influence. *Addiction.* 2007; 103:66–77. [PubMed: 18028523]
- Treno AJ, Gruenewald PJ, Remer LG, Johnson F, LaScala EA. Examining multi-level relationships between bars, hostility and aggression: social selection and social influence. *Addiction.* 2008; 103(1):66–77. [PubMed: 18028523]
- Tucker C, Lepkowski JM, Piekarski L. The current efficiency of list-assisted telephone sampling designs. *Public Opin Quart.* 2002; 66:321–338.
- U.S. Department of Health and Human Services, Administration on Children, Youth & Families. *Child Maltreatment 2010.* Washington, D.C: U.S. GPO; 2011.
- Widom CS. Child abuse, neglect and adult behavior: Research design & findings on criminality, violence & child abuse. *Am J Orthopsychiatry.* 1989; 59:355–367. [PubMed: 2764070]
- Widom CS, Ireland T, Glynn PJ. Alcohol abuse in abused and neglected children followed-up: Are they at increased risk. *J Stud Alcohol.* 1995; 56:207–217. [PubMed: 7760568]
- Wolock I, Magura S. Parental substance abuse as a predictor of child maltreatment re-reports. *Child Abuse Negl.* 1996; 20:1183–1193. [PubMed: 8985609]

Table 1**Sample Characteristics of Respondents and Focal Children**

	Weighted %	Sample n
Gender (focal child, n = 2092)		
Male	52.3	1101
Female	47.7	991
Gender (respondent, n = 2163)		
Male	50.5	804
Female	49.5	1359
Age Groups (respondent, n = 2163)		
18–30 years	12.0	245
31–45 years	60.9	1364
46 years and older	27.1	554
Marital Status (n = 2163)		
Single	23.0	249
Married or cohabiting	77.0	1914
Race/Ethnicity (n = 2157)		
Non-Hispanic White	54.8	1386
Non-Hispanic Black	4.6	67
Hispanic	26.4	439
Asian	9.1	139
Multi-racial	2.7	72
Other	2.4	54
Income Categories (n = 2097)		
\$20,000	6.8	123
\$20,001 – \$40,000	13.4	211
\$40,001 – \$60,000	14.3	262
\$60,001 – \$80,000	14.3	316
\$80,001 – \$100,000	13.4	309
\$100,001 – \$150,000	22.3	532
\$150,001 +	15.5	344
Depressive Symptoms (n = 2142)		
Yes	18.0	334
No	82.0	1808
Anxiety Symptoms (n = 2151)		
Yes	47.0	995
No	53.0	1156

Table 2

Descriptive Statistics for Study Dependent and Independent Variables

	<u>Mean</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>
Dependent Variables				
Physical abuse frequency (n = 2013)	0.34	2.01	0	50.0
Corporal punishment frequency (n = 2017)	3.12	6.64	0	75.0
Independent Variables				
Age (years, focal child, n = 2095)	6.75	3.58	0	12.0
Number of children (n = 2163)	2.16	0.88	1	9.0
Frequency of drinking venue utilization				
Home/Parties (n = 2158)	3.75	5.96	0	33.0
Bar (n = 2161)	0.17	0.75	0	14.0
Restaurants (n = 2157)	0.51	1.28	0	20.0
Dose-Response for drinking venues				
Home/Parties (n = 2144)	3.32	12.83	0	418.4
Bar (n = 2155)	0.29	2.71	0	85.8
Restaurants (n = 2150)	0.43	1.91	0	41.4
Alcohol outlets within .5 mile of residence				
Off-premise (n = 2163)	3.18	3.68	0	33.0
Bars or pubs (n = 2163)	0.56	1.23	0	12.0
Restaurants (n = 2163)	3.99	6.23	0	79.0

Table 3

Zero-Inflated Poisson Regression Models of the Relationship between Dose-Response of Drinking and Venue Utilization on Frequency of Severe Physical Abuse (n = 1888)

Variable	Model 1			Model 2		
	b	SE	p	b	SE	p
Constant	1.420	0.089	***	1.303	0.103	***
Frequency of drinking venue utilization						
Home/Parties	0.008	0.004	*	0.010	0.004	*
Bar	0.129	0.036	***	0.114	0.036	***
Restaurants	-0.066	0.020	***	-0.048	0.020	*
Dose-Response for drinking venues						
Home/Parties	-0.004	0.002	*	-0.005	0.002	*
Bar	-0.043	0.014	**	-0.023	0.015	
Restaurants	0.013	0.016		0.001	0.016	
Alcohol outlets within .5 mile of residence						
Off-premise				0.013	0.008	
Bars or pubs				0.141	0.021	***
Restaurants				-0.011	0.005	*
Male (focal child)	-0.134	0.034	***	-0.119	0.035	***
Age (years, focal child)	0.030	0.006	***	0.026	0.006	***
Male (respondent)	0.230	0.036	***	0.204	0.037	***
Age (reference group: 31–45 years)						
18–30 years	-0.007	0.076		-0.051	0.078	
46 years and older	-0.121	0.047	*	-0.054	0.050	
Number of children	0.046	0.020	*	0.045	0.021	*
Currently married or cohabiting	-0.160	0.056	**	-0.169	0.057	**
Race/Ethnicity (reference group: White)						
Non-Hispanic Black	1.060	0.063	***	0.961	0.067	***
Hispanic	-0.213	0.048	***	-0.245	0.050	***
Asian	0.403	0.062	***	0.458	0.063	***
Multi-racial	-0.371	0.265		-0.406	0.218	
Other	0.490	0.065	***	0.556	0.075	***

Variable	Model 1			Model 2		
	b	SE	p	b	SE	p
Income	−0.011	0.012		0.001	0.013	
Depressive Symptoms	0.046	0.049		0.067	0.051	
Anxiety Symptoms	−0.397	0.041	***	−0.379	0.042	***
Impulsivity	0.104	0.013	***	0.103	0.014	***

*
p < .05,
**
p < .01,

p < .001

Table 4

Zero-Inflated Poisson Regression Models of the Relationship between Dose-Response of Drinking and Venue Utilization on Frequency of Corporal Punishment (n = 1898)

Variable	Model 1			Model 2		
	b	SE	p	b	SE	p
Constant	1.465	0.054	***	1.198	0.059	***
Frequency of drinking venue utilization						
Home/Parties	0.034	0.002	***	0.033	0.002	***
Bar	0.051	0.015	***	0.048	0.016	**
Restaurants	-0.038	0.010	***	-0.032	0.011	**
Dose-Response for drinking venues						
Home/Parties	-0.017	0.001	***	-0.016	0.001	***
Bar	0.029	0.006	***	0.032	0.007	***
Restaurants	-0.003	0.006		-0.002	0.006	
Alcohol outlets within .5 mile of residence						
Off-premise				0.052	0.004	***
Bars or pubs				-0.048	0.012	***
Restaurants				-0.003	0.003	
Male (focal child)	0.054	0.018	**	0.060	0.019	**
Age (years, focal child)	-0.024	0.003	***	-0.026	0.003	***
Male (respondent)	0.153	0.018	***	0.135	0.018	***
Age (reference group: 31 – 45 years)						
18–30 years	0.037	0.029		0.009	0.031	
46 years and older	-0.158	0.031	***	-0.132	0.032	***
Number of children	0.021	0.010	*	0.026	0.010	*
Currently married or cohabiting	0.032	0.030		0.045	0.032	
Race/Ethnicity (reference group: White)						
Non-Hispanic Black	0.570	0.031	***	0.556	0.033	***
Hispanic	-0.029	0.025		-0.015	0.025	
Asian	0.360	0.033	***	0.340	0.034	***
Multi-racial	-0.228	0.069	**	-0.197	0.072	**
Other	0.235	0.072	**	0.234	0.068	***

Variable	Model 1			Model 2		
	b	SE	p	b	SE	p
Income	0.006	0.006		0.029	0.006	***
Depressive Symptoms	-0.058	0.023	*	-0.008	0.024	
Anxiety Symptoms	0.005	0.020		0.009	0.020	
Impulsivity	0.074	0.006	***	0.065	0.006	***

*
p < .05,
**
p < .01,

p < .001