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Adolescent drinking in different contexts: What behaviors do parents control?

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ABSTRACT

Previous research suggests that the context in which drinking occurs contribute to specific alcohol-related problems. In the current study we assessed how often adolescents attended different contexts in which they could drink, how often they drank in those contexts, and whether drinking patterns and parental monitoring were related to alcohol use in those contexts. We collected survey data from 1217 adolescents 15–18 years of age in 24 midsized California cities. Measures included past-year frequencies of attending and drinking in restaurants, bars/nightclubs, and outdoor places, typical hours spent at home (i.e., own home or someone else's home), perceptions of parental control and disclosure to parents about free time activities, and demographics. Multilevel zero-inflated negative binomial models were used to assess associations between drinking patterns, parental control, and disclosure and frequency of attending and drinking in specific contexts. There were large variations in attending contexts in which drinking could take place. More frequent drinking was related to less time spent at home, while heavier drinking was associated with more time spent at home. Parental control was related to less frequent attendance at bars/nightclubs, and disclosure to less frequent involvement in outdoor activities and spending more time at home. Among drinkers, frequencies of attendance were strongly related to frequencies of drinking in all contexts except the home. Parental control and disclosure were related to more frequent drinking at restaurants and exposure to bars/nightclubs and drinking at outdoor activities. Parental monitoring may reduce exposure to risks by shifting adolescent contexts for alcohol use.

1. Introduction

Previous research shows that the context in which drinking occurs (e.g., parties, own home, outdoor places) can contribute to specific alcohol-related problems, such as aggression, risky sex, and driving after drinking alcohol (Bersamin, Paschall, Saltz, & Zamboanga, 2012; Graham, Wells, & Jelley, 2002; Huckle, Gruenewald, & Ponicki, 2016; Mair, Cunradi, Gruenewald, Todd, & Remer, 2013; Mair, Lipperman-Kreda, Gruenewald, Bersamin, & Grube, 2015; Mair, Ponicki, & Gruenewald, 2016). For example, in a recent study we found that problems with parents or police were associated with more frequent drinking in outdoor places (e.g., parking lots or street corners), but these risks declined at higher levels of drinking (Mair et al., 2015). In contrast, the volume, but not frequency, of alcohol consumed at someone else's home without parents and at restaurants, bars or nightclubs was associated with greater risks of experiencing violence. This research highlights the importance of focusing on contexts in which adolescent alcohol use occurs and the processes by which young people select specific contexts for drinking. Understanding contexts most closely related to underage drinking and problems would allow enforcement agents, health practitioners, and parents to modify and control opportunities for use and reduce problems. In this study we assessed how often young people attended different contexts in which they could drink and how often they drank in those contexts, regardless of how much time they typically spend in them. We further investigated whether parental monitoring was related to attending and using alcohol in these contexts.

Over the early life course, underage drinking is distributed differently across different physical locations (e.g., parties, own home, outdoor places) and as adolescents get older they change their use of these places for drinking (Lipperman-Kreda, Mair, Bersamin, Gruenewald, & Grube, 2015). A few previous studies have shown that adolescents with different individual characteristics and drinking patterns drink in different contexts (Anderson & Brown, 2010;

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Goncy & Mrug, 2013; Harford & Grant, 1987; Harford & Spiegler, 1983; Lipperman-Kreda et al., 2015). In line with social-ecological theories (Gruenewald, Remer, & Lascala, 2014), this previous research suggests that adolescents deliberately select drinking environments that fit their drinking patterns. However, the observed associations between drinking patterns and drinking contexts may be a result of how often adolescents are in specific contexts in which they could potentially drink, rather than attributes of those contexts per se. For example, frequent drinking at home may simply reflect the time spent in the home environment, rather than a causal relationship. To address this issue, we investigate (1) whether adolescent drinkers visit certain contexts more or less often than non-drinkers and (2) whether they consume alcohol in these contexts, regardless of how much time they spend in them.

Parental monitoring may also influence youth's drinking in different contexts, especially if youth make determinations about how likely it is that they will be caught, get in trouble, or disappoint their parents if they were to drink in a specific context. Although previous research has shown that higher levels of perceived parental monitoring, parent-child communication, and parent-child closeness are associated with delayed or reduced levels of adolescent substance use (Duncan, Duncan, Biglan, & Ary, 1998; Moore, Rothwell, & Segrott, 2010; Patock-Peckham, King, Morgan-Lopez, Ulloa, & Moses, 2011; Ryan, Jorm, & Lubman, 2010; Stattin & Kerr, 2000; Webb, Bray, Getz, & Adams, 2002), no previous study has investigated associations between these measures and adolescents' use of specific contexts for drinking.

Parental monitoring reflects parents' knowledge of their children's whereabouts and social connections through passive or active tracking, surveillance, or attention (Kerr, Stattin, & Burk, 2010; Patock-Peckham et al., 2011). However, recent research suggests that parents' knowledge of youth whereabouts is also a function of youth disclosure of what they do during free time, a possible proxy for parent-child closeness and communication (Stattin & Kerr, 2000). Therefore, to investigate whether parental monitoring alter how often adolescents attend and drink in specific contexts, we need to consider both parental control and adolescent disclosure to their parents of what they do during free time. Understanding the contribution of parental monitoring to drinking in specific contexts can support the development of effective messaging to parents about their role and about specific monitoring practices that can help reduce drinking and drinking-related problems in this age group.

To better understand how adolescents use specific contexts for drinking and what behaviors might be altered by parental monitoring, we investigated the following research questions in a sample of 15–18 year olds in 24 California cities:

(1) Do underage drinkers differ from non-drinkers in their overall use of different contexts in which drinking can occur?
(2) Do parental control and disclosure to parents about free time activities alter how often youth use specific contexts in which drinking can occur?
(3) Controlling for overall exposure to different contexts, what are the relationships of parental control, disclosure to parents, and drinking patterns with drinking in those contexts?

The first question allows us to assess whether adolescent drinkers tend to spend more time in certain contexts regardless of whether these locations promote alcohol use. The second question will allow us to determine whether parental monitoring might explain these associations. Finally, we will look more closely at drinkers only to better understand whether and how parental monitoring and drinking patterns explain drinking in specific contexts, over and above general use of those contexts.

2. Materials and methods

2.1. Sample of cities

Our study included adolescents (15–18 years old) who participated in a study in 24 midsized California cities. These cities were purposively selected from a geographically diverse sample of 50 non-contiguous California cities with populations between 50,000 and 500,000 (Lipperman-Kreda et al., 2015; Paschall, Lipperman-Kreda, Grube, & Thomas, 2014). The subset of 24 cities was chosen because they had relatively high levels of underage drinking, drinking and driving, and alcohol-related motor vehicle crashes based on three data sources: (1) the California Healthy Kids Survey, (2) a survey of over 8000 adults conducted by the Prevention Research Center, and (3) the California Statewide Integrated Traffic Reporting System. These 24 cities are part of an ongoing randomized trial to evaluate the effects of environmental strategies to reduce community alcohol problems. Data for the current analyses were collected at baseline before the interventions began.

2.2. Survey methods

Households within each city were randomly sampled from purchased lists of landline and cell phone exchanges. An invitation letter describing the study and inviting participation was mailed to households sampled from landline exchanges, for which we had address information, followed by telephone contact. Households sampled from the lists of cell phone exchanges were contacted by cell phone only. Households and participants were screened for eligibility based on city of residence and age. Of the total completed interviews, 6% were from the cell phone sample list. Participants were surveyed through a computer-assisted telephone interview (CATI). The interviews were given in either English or Spanish at the respondent's request and lasted approximately 20 min. Twenty youths (1.6%) asked to do the interview in Spanish. The survey took place in 2013–2014. The estimated response rate for this survey was 42%. Respondents received $20 as compensation for their participation in the study. Institutional review board approval was obtained prior to implementation of the study.

2.3. Survey sample

The current study is based on data from 1217 adolescents (52% male, M age = 16.23 years, SD = 0.90). An average of 51 youths (range: 32–63, SD = 6.18) were interviewed in each city. Sample characteristics are provided in Table 1.

2.4. Measures

2.4.1. Frequency of drinking and heavier drinking

We used measures of drinking frequencies and heavier drinking which allow us to distinguish effects related to these two aspects of drinking patterns (Gruenewald et al., 2014). All survey respondents were asked, “Have you ever had a whole drink (more than a sip or a taste) of an alcoholic beverage?” A whole drink was defined as a bottle or can of beer, malt liquor, or flavored malt beverage, a glass of wine, a shot of liquor, or a whole mixed drink. To measure past-year alcohol use frequency (F), respondents who answered “yes” were asked, “In the past 12 months, on how many days did you have a whole drink of an alcoholic beverage?” Respondents were also asked, “In the past 12 months, on the days when you drank alcohol, how many drinks did you typically have?” Heavier drinking was calculated as [(F × typical number of drinks) − F], representing the total past-year volume beyond one drink per occasion. This heavier use measure is based upon a validated dose-response model and it allows us to better distinguish effects related to occasions of use from impacts of heavier use on these occasions (Gruenewald & Mair, 2015; Gruenewald, Wang-

Table 1
Sample characteristics and descriptive statistics (N = 1217 youths).

Variables	Percent	Mean (*SD*)	Range
Drinking frequency, past year	–	4.7 (16.4)	0.0–200.0
Heavier drinking [(F * Q) − F], past year	–	13.9 (71.3)	0.0–1495.0
Age	–	16.2 (0.9)	15.0–18.0
Female	47.7		
Non-Hispanic White	62.1		
Parent education	–	15.9 (2.2)	6.0–18.0
Weekly disposable income	–	29.9 (56.9)	0.0–600.0
Parental control	–	4.3 (1.0)	1.0–5.0
Disclosure to parents	–	3.5 (1.0)	1.0–5.0
Number of days at restaurants, past year	–	52.5 (59.7)	0.0–365.0
Number of days at bars/nightclubs, past year	–	1.0 (9.79)	0.0–300.0
Number of days in outdoor places, past year	–	86.3 (107.5)	0.0–365.0
Number of hours a day at home[a]	–	13.9 (3.8)	3.6–24.0
Number of days drank at restaurants, past year[b]		0.3 (1.8)	0.0–25.0
Number of days drank at bars/nightclubs, past year[b]		0.2 (1.4)	0.0–20.0
Number of days drank in outdoor places, past year[b]		5.5 (22.4)	0.0–360.0
Number of days drank at home[b]		8.6 (18.9)	0.0–230.0

[a] Weighted measure of number of hours at home or someone else's home on a typical day during: (a) school year (0.47), (b) school vacation (0.28), and (c) weekend (0.25).
[b] Among past-year alcohol drinkers (N = 444).

Schweig, & Mair, 2016). For both measures, we assigned a value of zero to respondents who answered "no" to the lifetime alcohol use item.

2.4.2. Frequency of attending different contexts

We asked all survey respondents about the number of days in the past 12 months they went to restaurants, bars/nightclubs, and outdoor places such as parks, beaches, parking lots, sidewalks or street corners. Respondents were also asked about the number of hours they spent in their own home or someone else's home on (1) a typical weekday during school year, (2) a typical weekday during school summer vacation/break, and (3) a typical day on the weekend. We weighted the past-year number of hours at home or someone else's home as 170 weekday school days (47%), 91 summer vacation weekdays (25%), and 104 weekend days (28%).

2.4.3. Frequency of drinking in different contexts

Those who reported both past-year alcohol use and being in at least one of these four places (i.e., restaurants, bars/nightclubs, outdoor places, own home or someone else's home) were also asked about the number of days in the past year they drank alcohol in each place.

2.4.4. Parental monitoring

To measure parent control we asked survey respondents "If you were out very late one night, how often would your parents ask that you explain what you did and who you were with?" To measure disclosure to parents, respondents were asked "How often do you keep secrets from your parents/guardians about what you do during your free time?" Response options included never (1), rarely (2), sometimes (3), most of the time (4), and always (5). We reverse-coded response values of the second item so higher values represented greater parental control and greater disclosure to parents.

2.4.5. Demographics

Youths reported their gender, age, and race/ethnicity. Race/ethnicity was treated as a dichotomous variable (non-Hispanic White versus other). Youths were also asked to report the highest level of education their mother or female guardian and father or male guardian had completed. Response categories included less than 8th grade, eighth grade, some high school, high school graduate or GED, technical, vocational, or trade school, some college, junior college graduate (A.A. or Associate's degree), college graduate (B.A. or B.S.–Bachelor's degree), and graduate or professional school after college (Master's, Ph.D., Lawyer, Doctor). These items were recoded into the number of years of education using the highest reported education for either parent. Lastly, youths were asked, "How much spending money do you receive or earn in a typical week? Please count only money that you can spend on whatever you want. Do not count money that is given to you to spend only on things like bus fare or lunch."

2.5. Data analysis

Preliminary specification tests indicated that all outcomes were negative binomial distributed with considerable zero inflation. Stata v.14 zero-inflated negative binomial (ZINB) models were therefore used to assess all outcomes with a sandwich variance estimator to correct for loss of unit independence related to nesting of adolescents within cities. A logistic distribution was assumed to represent zero inflation and further specification tests were conducted to assess correlates of this component of each analysis model; each covariate was tested separately and all covariates nominally significant ($p < 0.05$) were included in the inflation equation.

We conducted two sets of analyses. In the first, we included both past-year drinkers and non-drinkers (N = 1217) to investigate associations of youths' drinking patterns (i.e., past-year drinking frequency and heavier drinking) and parental monitoring (i.e., parental control and disclosure to parents) with past-year number of days at (1) restaurants, (2) bars/nightclubs, (3) hanging out in outdoor places, and (4) average number of hours per day at home or someone else's home. We controlled for youths' characteristics (i.e., age, gender, non-Hispanic White, parental education and weekly disposable income). In this set of analyses, non-Hispanic White was the only measure identified as contributing to the zero inflation component of the models, in each case indicating less inflation among non-Hispanic White respondents. In the second set of analyses, we included past-year drinkers only (N = 444) to investigate associations of youths' drinking patterns and parental monitoring with the number of days they drank in these locations in the past year, adjusting for frequency of being in each location and controlling for youths' demographics. Different combinations of independent variables were found to be nominally significant across dependent measures.

3. Results

3.1. Do underage drinkers differ from non-drinkers in their overall use of different contexts in which drinking can occur?

Descriptive statistics of study variables are in Table 1. Results of ZINB models assessing the frequency of attending the different contexts by underage drinkers and non-drinkers are in Table 2. Drinking frequency and heavier drinking were not associated with number of days attending restaurants, bars/nightclubs, or outdoor places. Whereas an increase of one day of drinking in the past year was associated with a 1% decrease in the number of hours per day at home, an increase of one drink (beyond the first drink) per occasion in the past year was associated with a 1% increase in the number of hours per day at home.

3.2. Do parental control and disclosure to parents about free time activities alter how often youth use specific contexts in which drinking can occur?

A 1-unit increase in parental control was associated with a 19% decrease in the number of days the youth reported being in bars/nightclubs (Table 2). In addition, each unit increase in disclosure to parents was associated with an 11% decrease in the number of days youths reported hanging out in outdoor places and a 3% increase in the number of hours per day they spent at home.

Table 2
Results of multilevel zero-inflated negative binomial analyses to examine associations of drinking patterns and parental monitoring with frequency of attending different contexts among underage drinkers and non-drinkers (N = 1217).

Negative binomial	Restaurants IRR (95% CI)	Bars/nightclubs IRR (95% CI)	Outdoor places IRR (95% CI)	Home IRR (95% CI)
Drinking frequency	1.00 (0.99, 1.01)	1.00 (0.97, 1.04)	0.99 (0.98, 1.00)	0.99 (0.99, 0.99)**
Heavier drinking	1.00 (0.99, 1.00)	1.00 (0.99, 1.00)	1.00 (0.99, 1.00)	1.01 (1.01, 1.01)*
Parental control	1.03 (0.98, 1.09)	0.81 (0.65, 0.99)*	0.94 (0.87, 1.02)	1.01 (0.99, 1.04)
Disclosure to parents	0.97 (0.92, 1.02)	0.83 (0.61, 1.12)	0.89 (0.83, 0.96)**	1.03 (1.01, 1.05)**
Age	1.02 (0.93, 1.11)	1.09 (0.77, 1.53)	0.94 (0.85, 1.03)	0.99 (0.97, 1.02)
Female	0.99 (0.85, 1.16)	0.33 (0.21, 0.53)**	1.11 (0.97, 1.26)	0.99 (0.97, 1.03)
Non-Hispanic White	1.08 (0.95, 1.23)	0.21 (0.76, 0.59)**	1.00 (0.84, 1.20)	1.05 (1.01, 1.09)*
Parent education	1.04 (1.01, 1.06)**	1.35 (1.16, 1.58)**	1.04 (0.99, 1.08)	0.99 (0.99, 1.01)
Disposable income	1.11 (0.99, 1.26)	2.24 (1.21, 4.12)*	1.13 (0.98, 1.30)	0.96 (0.91, 1.02)
Over-dispersion	1.00 (0.89, 1.12)	15.14 (11.35, 20.19)	1.66 (1.53, 1.81)	0.02 (0.02, 0.04)
Zero inflation	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Non-Hispanic White	− 17.06 (1.82)	− 13.50 (1.21)	− 1.15 (1.62)	0.28 (0.86)
_cons	− 5.29 (1.71)	0.15 (0.39)	− 3.86 (0.85)	− 4.92 (0.73)

* < 0.05.
** < 0.005.

3.3. What are the relationships of parental control, disclosure to parents, and drinking patterns with drinking in those contexts?

Results of analyses to examine associations of parental monitoring and drinking patterns with drinking in these contexts among past-year drinking adolescents are in Table 3. Most critically, the more often adolescents reported going to restaurants, bars/nightclubs and outdoor places the more often they used alcohol in those places. In addition, these exposure effects were distinctive and much stronger for bars/nightclubs compared to restaurants and outdoor places. Specifically, the 95% confidence intervals of the association between past year frequency of being in bars/nightclubs and drinking in bars/nightclubs [IRR = 12.83 (5.83, 28.21)] did not overlap with similar associations for restaurants [IRR = 2.11 (1.38, 3.20)] or for outdoor places [IRR = 1.55 (1.38, 1.74)].

Controlling for the frequency of being in each place, an increase of one day of drinking frequency in the past year was associated with 5% and 4% increases in number of days youth used alcohol in outdoor places and at home, respectively. No associations were found between heavier drinking and drinking at any of the locations. A unit increase in parental control was associated with a 50% increase in number of days youth drank alcohol in restaurants and with a 23% decrease in the number of days they drank alcohol in outdoor places. Additionally, there was a 66% increase in the number of days youths drank in restaurants with each additional unit increase of in reported disclosure to parents.

4. Discussion

Overall, our results indicate that drinkers and non-drinkers did not differ in the frequency or number of hours they spent in most contexts except for home (i.e., own home or someone else's). Frequent drinkers tended to spend less hours at home, whereas heavier drinkers tended to spend more hours at home. However, when focusing on where drinkers drink, frequent drinkers were more likely to drink in outdoor and private settings (i.e., own home or someone else's home), after controlling for the frequency of going to or number of hours in these places. Also, increased exposure to restaurants, bar/nightclubs and outdoor places increased the likelihood of youths drinking in these contexts. The effect of exposure was greater for being bars/nightclubs than other contexts. As a result, those adolescents who go more frequently to bars/nightclubs are at much greater risk for underage drinking.

Table 3
Results of multilevel zero-inflated negative binomial analyses to examine associations of drinking patterns and parental monitoring with frequency of drinking in different contexts among underage drinkers (N = 444).

Negative binomial	Restaurants IRR (95% CI)	Bars/nightclubs IRR (95% CI)	Outdoor places IRR (95% CI)	Home IRR (95% CI)
Place frequency[a]	2.11 (1.38, 3.20)**	12.83 (5.83, 28.21)**	1.55 (1.38, 1.74)**	1.02 (0.82, 1.27)
Drinking frequency	1.02 (0.99, 1.04)	1.01 (0.99, 1.02)	1.05 (1.03, 1.06)**	1.04 (1.03, 1.05)**
Heavier drinking	0.99 (0.99, 1.00)	0.99 (0.99, 1.00)	0.99 (0.99, 1.00)	1.00 (0.99, 1.00)
Parental control	1.50 (1.02, 2.19)*	1.08 (0.79, 1.45)	0.77 (0.59, 0.99)*	0.96 (0.87, 1.05)
Disclosure to parents	1.66 (1.10, 2.50)*	0.73 (0.49, 1.07)	0.88 (0.73, 1.07)	0.91 (0.81, 1.00)
Age	2.58 (1.87, 3.56)**	1.08 (0.58, 2.01)	0.81 (0.58, 1.13)	1.09 (0.95, 1,24)
Female	4.30 (1.55, 11.90)**	1.51 (0.75, 3.03)	1.34 (0.86, 2.11)	0.90 (0.76, 1.07)
Non-Hispanic White	0.37 (0.17, 0.84)*	2.56 (0.75, 8.72)	0.98 (0.65, 1.47)	1.26 (1.09, 1.47)**
Parent education	0.84 (0.65, 1.08)	1.08 (0.86, 1.36)	0.83 (0.73, 0.94)**	0.95 (0.89, 0.99)*
Disposable income	1.04 (0.68, 1.59)	1.34 (0.69, 2.62)	1.44 (1.09, 1.89)*	1.13 (0.98, 1.32)
Over-dispersion	0.00 (0.00, 0.27)	0.52 (0.15, 1.87)	2.28 (1.62, 3.21)	0.73 (0.59, 0.92)
Zero inflation	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Age	–	− 1.93 (0.63)	− 0.84 (1.24)	–
Non-Hispanic White	–	–	–	− 2.83 (2.61)
Parent education	− 0.35 (0.12)	–	− 0.42 (0.30)	–
Disposable income	–	1.39 (1.15)	− 14.75 (13.57)	2.29 (0.49)
Parental control	–	–	− 0.24 (0.80)	− 1.12 (0.84)
_cons	7.45 (1.94)	29.37 (10.31)	19.61 (20.14)	− 22.72 (3.51)

* < 0.05.
** < 0.005.
[a] Logged transformed because treated as an exposure measure.

Consistent with our previous findings, frequent drinkers, but not heavier drinkers, were more likely to drink in private places (i.e., home) than elsewhere (Lipperman-Kreda et al., 2015). Results of another study (Mair et al., 2015) found that physiological problems (e.g., vomiting because of drinking; not being able to remember what happened while drinking; and having a hangover or feeling sick the day after drinking) were associated with more frequent drinking both in one's own home and in someone else's home, regardless of how much alcohol youths consumed. It may be that youths who rarely drink experience physiological problems at low levels of drinking, with heavy drinking not additionally contributing to these problems.

Results of the current study also show that measures of parental monitoring relate to where adolescents go, as well as to their likelihood of drinking in these contexts. In particular, parental control was found to be associated with reduced exposure to bars/nightclubs. Although parental control had no effect on drinking alcohol in such places, youths' overall exposure to bars/nightclubs was strongly associated with drinking in these contexts. These results suggest that those youths who go more often to bars/restaurants are at greater risk for drinking in these places and therefore are at risk for potential problems. For example, among adolescents, heavier drinking in bars/nightclubs increases risk of violence, such as fights (Mair et al., 2015). Parental control may reduce underage drinking in these contexts by reducing adolescent exposure to them.

Different patterns were found with regard to the effects of parental control on exposure to and drinking in the other contexts. While parental control was not associated with youth being in restaurants and outdoor settings, it was positively associated with youth drinking alcohol at restaurants and negatively associated with them drinking alcohol in outdoor contexts. The positive associations between parental control and drinking in restaurants suggest that restaurants may be places where adolescents drink under parents' supervision. Although drinking with parent supervision might be construed as protective, a recent review paper concluded that parental provision of alcohol is associated with increased adolescent alcohol use and, in some instances, with increased heavy episodic drinking and higher rates of alcohol-related problems (Kaynak, Winters, Cacciola, Kirby, & Arria, 2014). Conversely, parent control reduced drinking in outdoor settings, which are risky contexts for some adverse consequences including problems with the police (Mair et al., 2015).

Youths who reported disclosing more to their parents about what they do during their free time tended to spend less time in outdoor settings and more time at own home or someone else's home. Once we controlled for frequency of going or number of hours in these places, disclosure to parents did not predict youths' drinking, suggesting that disclosure to parents may determine where youths go or spend their time, but not whether they drink alcohol in those places. Similar to the pattern we found for parental control, greater disclosure to parents was associated with increased likelihood of drinking in restaurants. Overall, these results show the different roles that parental monitoring practices and child-parent communication may play in different contexts. Thus, parental control may reduce youth drinking in bars/nightclubs by decreasing exposure to these places whereas it may decrease drinking in outdoor settings more directly. Disclosure to parents may decrease youth drinking in outdoor settings through decreased exposure.

Our results suggest that tailored context-based messages can be developed to guide parents about their role in reducing underage drinking and drinking-related problems among their children. For example, parents can be informed that by ensuring their teens do not go to bars/nightclubs they can greatly reduce the likelihood of drinking and experiencing problems associated with drinking in these places. A different message for parents could be developed for reducing adolescent drinking and related problems at home or other settings. Parents can be informed that general monitoring may not reduce the likelihood of their teens to drink heavily in own home or someone else's home. In those settings, more direct adult supervision is may be necessary (Bersamin, Lipperman-Kreda, Mair, Grube, & Gruenewald, 2016).

A number of limitations should be noted. First, our data are drawn from mid-to-large-sized California cities, so the study results are not necessarily representative of rural or larger urban areas. Also, although we used List-assisted Random Digit Dialing approach to identify the sample, it may not be representative of all adolescents in the 24 cities and findings of this study may not generalize beyond the study sample. Second, in our analyses we considered exposure to and drinking in only four contexts, representing a small sample of possible drinking contexts. Also, we collapsed important contexts such as own home and someone else's home or different types of outdoor settings which may be differently associated with parental monitoring or drinking patterns. Third, although we acknowledge the importance of considering contextual social and situational characteristics (e.g., number of people, age composition, alcohol availability), our data do not enable us to discern the *typical* characteristics of the drinking locations to investigate their contribution to the processes by which exposure to contexts and parental monitoring affect selection and use of different contexts for drinking. Fourth, parental control and disclosure to parents were each measured with a single item and our data do not include a measure which represents parental solicitation as another important component of parental monitoring (Kerr & Stattin, 2000). Finally, because our data are cross-sectional, they do not allow us to definitively determine the causal direction of the links of parental monitoring practices, drinking patterns and individual characteristics with youth selection of drinking contexts.

Despite these limitations, results of the current study suggest that adolescents deliberately choose drinking environments that fit their drinking patterns. Moreover, our results add to the current research by showing the unique contributions of exposure to contexts and parental monitoring to the distribution of underage drinking across contexts. Our results suggest the importance of understanding the role of parental monitoring and child-parent communication for youth using and drinking in specific contexts in order to support and develop context-based interventions. Specifically, parents should be informed that parental control can reduce underage drinking and related problems (e.g., fights) in bars/nightclubs through preventing youth exposure to these risky contexts. It can also reduce underage drinking in outdoor places more directly. To the best of our knowledge, this is the first study that investigated the contribution of parental monitoring to adolescents' selection and use of specific drinking contexts. These findings may lay the ground for future research investigating this topic using more complete parental monitoring and family-related measures.

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