Drinking Context and Drinking Problems Among Black, White, and Hispanic Men and Women in the 1984, 1995, and 2005 U.S. National Alcohol Surveys*

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ABSTRACT. Objective: The purpose of this study was to investigate the preferred drinking contexts of different gender and ethnic groups (white, black, and Hispanic men and women), by examining where these groups do most of their drinking and to what extent drinking contexts preferences are associated with certain drinking-related consequences. **Method:** The study used data from the 1984, 1995, and 2005 U.S. National Alcohol Surveys. Among current drinkers, cluster analyses of volume drunk in six contexts (restaurants, bars, others' parties, or when spending a quiet evening at home, having friends drop over at home, and hanging out in public places) were used to classify individuals by their drinking context preferences in each gender by ethnicity subgroup. **Results:** We identified three highly similar drinking context-preference clusters within each of the six subgroups: (1) bar-plus group (did most drinking in bars, plus much in other venues), (2) home group (did most drinking at home, and a fair amount elsewhere), and (3) light group (drank almost nothing quietly at home and also less in other settings than the other two clusters). For a number of ethnic-by-gender groups, context preference group assignment predicted drinking-related problems, over and above general drinking patterns. For example, for all groups, the bar-plus preference group relative to the light group showed higher risk of arguments, fighting, and drunk driving, after taking into account the volume consumed, frequency of heavy drinking, age, and year of survey. **Conclusions:** Examining individuals' preferred drinking contexts may provide important information to augment overall drinking patterns in risk and prevention studies. (*J. Stud. Alcohol Drugs* **70:** 16-26, 2009)

THE RELATIONSHIP BETWEEN drinking patterns and alcohol-related problems is well established; that is, drinking more and in heavy quantities increases the likelihood of experiencing alcohol-related problems (Greenfield and Rogers, 1999; Heeb and Gmel, 2005; Treno et al., 2000; Wells et al., 2005). Drinking contexts also influence how much individuals drink. For example, most drinkers consume more alcohol in bars and at parties than at restaurants and in other settings (Clark, 1985; Searles et al., 1995). Similarly, a recent multilevel analysis by Kairouz and Greenfield (2007) showed that a large part of the variability in drinking relates to the context, whereas much stems from individual differences such as gender. Previous research on drinking contexts has focused on exploring frequency and amount of drinking in various settings rather than classifying people by where they do the most drinking (Clark, 1985; Harford, 1978; Treno et al., 2000). Researchers have explored what kinds of individuals go to given drinking contexts; for example, how often black, white, or Hispanic individuals visited particular settings, such as bars or street corners, and how often they drank in those settings (Clark, 1988; Caetano and Herd, 1988). Research by Herd and Grube (1993) is an exception, but they considered only black and white female drinkers. Using a national sample of 5,221 adults, they explored whether black and white women differed in how often they drank in particular types of social settings and whether drinking in different contexts independently predicted alcohol-related problems.

We extended this approach by looking at black, white, and Hispanic female and male drinkers and (1) classifying drinkers according to what we term their "*context preferences*" using cluster analyses of alcohol intake in six contexts (i.e., restaurants, bars, at others' parties, on a quiet evening at home, when having friends come over to their homes, and hanging out in public places); (2) examining the prevalence and time trends of these types of drinkers defined by their context preferences with national data at 10-year intervals between 1984 and 2005; and (3) testing the hypothesis that context preference (i.e., where a person tends to drink more, or less, within the six settings) will be related to certain acute harms (e.g., alcohol's negative consequences) after controlling for that individual's overall (12-month) drinking pattern. We asked the following: Is where one prefers to drink a useful indicator for predicting problem risk beyond overall pattern of intake?

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Drinking context and heavy drinking

To understand why it is important to examine the pattern of drinking across a variety of contexts, it is useful to consider the role that drinking in one setting—the bar or tavern—is theorized to play in contributing to heavy drinking and problems. Pearson (1979) argued that heavy drinking in the tavern (here defined as consuming a high volume in that setting) is reinforced through rituals and ceremonies, including buying rounds, buying drinks for others, last call, and happy hour (Clark, 1981). The more often individuals drink at bars, the more often they encounter these rituals and are exposed to the bar's heavy drinking norms (Aarons et al., 1999; Nusbaumer et al., 1982). Over time and with the intermittent reinforcement provided by bar or tavern patronage, heavy drinking may become the habitual mode of drinking (Clark, 1988; Single, 1993). This might generalize to other settings but may also carry special risks because of features of the bar environment, where drinking may be heaviest.

Although bars may simply draw patrons who are already inclined to drink heavily (a selection effect), longitudinal research has found that bar patronage is more likely to precede than to follow high volume consumed in bars and other drinking contexts (Curran et al., 1996). This suggests that bars are environments in which patrons learn to drink heavily. This social learning theory of heavy drinking as related to bars, however, may apply more to whites than to other ethnic groups. Research has shown that blacks and Hispanics are less likely to drink in bars than whites, even when controlling for income, age, and employment status (Treno et al., 2000). Thus, minority men and women may drink heavily in environments other than bars, but it is unknown if such places act in a similar manner to encourage heavy drinking.

Drinking context and drinking problems

Certain drinking contexts are associated with alcohol-related problems. Most research has focused on public drinking contexts, demonstrating that locations such as bars (and, for young people, cars and dances) are linked to alcohol-related aggression (Graham et al., 2005; Rossow, 1996; Stockwell et al., 1992; Graham and Wells, 2001). Research suggests that this relationship is the result of the concentration of intoxicated people (Graham et al., 2006b), rowdiness, and sexual competition (Graham et al., 2006a). Researchers have also theorized that this relationship may be explained by looser norms governing social behavior and the absence of "social guardians" in public drinking locations (Wells et al., 2005). Less attention has been paid to exploring potential links between drinking contexts and other alcohol-related problems. For example, it is unknown if drinking in a private location, such as one's home, rather than a public location is more or less likely to be associated with arguments or fights with one's spouse.

Objectives

In this article, relying on cross-sectional, multiethnic, national surveys spanning 2 decades (1984, 1995, 2005), we explore whether individuals may be classified according to preferences for drinking in particular drinking contexts. We also examine group trends in preference-based types of drinkers between 1984 and 2005. Social learning theory provides a theoretical framework for understanding such contextual patterns and drinking behaviors; we chose to implement context drinking with 12-month summary volumes per setting (How Often You Drink in Each × Typical Quantity). Our third objective is to explore whether drinkers with particular preferences for certain drinking settings are at higher risk of specific negative consequences, over and above the risks from their overall (12-month) drinking pattern.

Method

Study samples

We used 1984, 1995, and 2005 U.S. National Alcohol Survey (NAS) data. These large cross-sectional surveys, each including black and Hispanic oversamples, were fielded approximately 10 years apart. The 1984 and 1995 NAS surveys (N7 and N9) were face-to-face interviews conducted by the Institute for Survey Research of Temple University, using stratified national household probability samples of 110 (1984) and 100 (1995) primary sampling units within a sampling frame representing the 48 contiguous states. The 2005 NAS was a computer-assisted telephone interview survey using list-assisted random digit dialing, sampling households in all 50 U.S. states and Washington, DC, conducted by DataStat Inc. of Ann Arbor, Michigan. All surveys relied on trained interviewers, were given in Spanish when preferred, and randomly selected adults ages 18 years and older within the household.

In the 1984 NAS (n = 5,221), black and Hispanic respondents were oversampled within 100 primary sampling units, with an additional 10 sampling units having high black and Hispanic populations (1,777 white, 1,947 black, 1,453 Hispanic, and 44 others; response rate = 72%-76%). For more details on the sampling design, see Santos (1991). The 1995 NAS (n = 4,925) also included a large oversample of black and Hispanic respondents (1,636 white, 1,582 black, 1,585 Hispanic, and 122 others; response rate = 76%-77%). For the 2005 NAS, the list-assisted random digit dialing approach was used to collect a main probability sample plus additional samples of blacks and Hispanics. As before, black oversamples were in geographic areas where there was a higher density of the black population, whereas Hispanic oversampling used Hispanic surname lists. There were 6,919 respondents (3,967 white, 1,610 black, 1,054 Hispanic, and 288 others) representing an overall response rate of 56%.

Six published methodological studies on the NAS interview mode differences (in-person vs telephone interviews, the latter yielding lower response rates similar to other computer-assisted telephone interview surveys) have indicated good comparability of prevalence findings for alcohol consumption and associated problems, as summarized in Greenfield et al. (2006).

Data sets were weighted to represent the U.S. national household populations in 1984, 1995, and 2005, using interpolations from census data by age, gender, and region and accounting for nonresponse. Because of clustered sampling and poststratification, standard errors in logistic regression analyses were adjusted using the survey command of the Stata statistical package (Release 7.0; StataCorp LP, College Station, TX). All analyses were limited to current 12-month drinkers providing data on drinking contexts (1984: n = 3,212; 1995: n = 2,817; and 2005: n = 4,256).

Measures

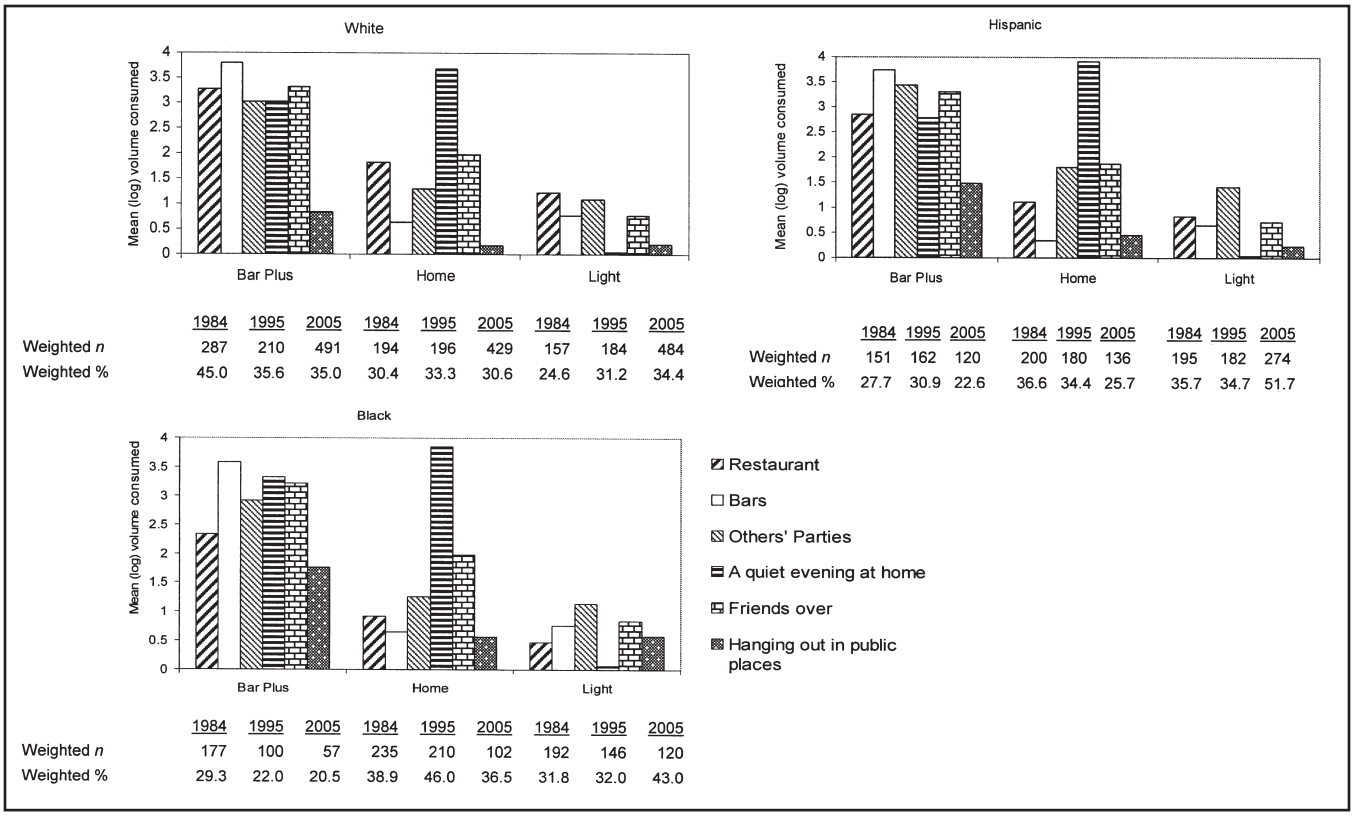
Context of drinking variables. Respondents were asked how often in the past year they went out for an evening meal in a restaurant (not including fast food places and luncheonettes); went to bars, taverns, or cocktail lounges; went to a party in someone else's home; spent a quiet evening at home; had friends drop over and visit in their home; and hung around with friends in a public place such as a park, street, or parking lot. Answer categories were "never," "sometimes, but less than once a month," "1 or 2 times a month," "3 or 4 times a month," and "once a week or more." For calculating 12-month frequencies and volumes, values were range midpoints (i.e., 0, 6, 18, 42, and 78 times per year, respectively). The proportion of drinking occasions in each context was then asked, with response options of "never," "less than half the time," "about half the time," "more than half the time," and "almost all the time." For volume calculations, these were recoded to 0, 0.25, 0.5, 0.7, and 0.9, respectively. Lastly, respondents who drank in each setting were asked how many drinks they typically had. (A "drink" was defined as a 12-oz bottle, can, or glass of beer; a 4-oz glass of wine; or a mixed drink with 1 shot of distilled spirits.) Volume per setting was computed as Frequency of Involvement × Proportion of Drinking Occasions × Typical Number of Drinks. For multivariate analyses, to reduce the skew, volume + 1 values in each setting were logged.

Overall drinking pattern: Volume and heavy drinking. Overall alcohol consumption volume was assessed using the "Knupfer Series" (KS) beverage-specific, graduated-frequencies items (Room, 1990). The KS items first ask the frequencies of drinking wine, beer, and distilled spirits (separately) using a nine-level categorical scale, followed in each case by asking the proportion of time the respondent drinks each beverage in three quantity ranges: one to two, three to four, and five or more drinks (response categories same as for the context of drinking variables). Overall volume is calculated by summing the responses with an appropriate algorithm (Greenfield, 2000; Room, 1990) using a log transform to reduce the skew. For heavy drinking, from the KS we calculated days per year drinking three or more (women) or five or more (men) drinks. The choice of level for women was in recognition of gender-related problem-drinking norms, with three or more (women) versus five or more (men) used successfully in prior studies (e.g., Delucchi et al., 2004). This variable did not require transformation.

Alcohol-related problem variables. Social consequences were measured by positive responses to 10 12-month acute-problem dichotomous items (affirm, deny problem) included in all surveys. Areas selected were those plausibly related to contexts, including the following: (1) legal trouble and accidents (five items; e.g., "My drinking contributed to getting hurt in an accident or elsewhere," and "I had trouble with the law about drinking when driving was not involved"); (2) arguments and fighting resulting from drinking (two items: "I have gotten into a heated argument while drinking," and "I have gotten into a fight while drinking"); (3) negative reactions of or criticisms from a partner because of drinking (two items: "A spouse or someone I lived with got angry about my drinking or the way I behaved while drinking," and "A spouse or someone I lived with threatened to leave me because of my drinking"); and (4) a one-item, self-reported drunk driving indicator (i.e., "In the last 12 months, have you driven a car when you had drunk enough to be in trouble if the police had stopped you?"). In each case, any affirmed item was taken as the problem indicator.

Analytical procedure

Initially, cluster analyses considered each individual's logged volumes in the venues to determine if there were clusters of individuals with similar profiles of drinking volume-by-drinking contexts (i.e., context preferences). Analyses were disaggregated by gender, ethnic group (white, black, and Hispanic), and also survey year. However, the similarity of the gender-by-ethnic group results for the survey years was great enough to support pooling data from all survey epochs, with the advantage that contextual cluster group membership was defined the same way across time, allowing meaningful pooled and trend comparisons of the cluster-analysis-defined groups. The "other" racial/ethnic category (n = 255) was omitted from the analysis owing to small size and indeterminate meaning. The clustering method used was k means, with cluster assignment based on the Euclidian distance metric, suitable for large samples (SPSS Inc., 1996). In each gender-by-ethnic group case, three-cluster solutions were found to be more viable than solutions with four or more clusters. We labeled the resulting contextual drink-



White	1984	1995	2005	1984	1995	2005	1984	1995	2005
Weighted *n*	287	210	491	194	196	429	157	184	484
Weighted %	45.0	35.6	35.0	30.4	33.3	30.6	24.6	31.2	34.4

Hispanic	1984	1995	2005	1984	1995	2005	1984	1995	2005
Weighted *n*	151	162	120	200	180	136	195	182	274
Weighted %	27.7	30.9	22.6	36.6	34.4	25.7	35.7	34.7	51.7

Black	1984	1995	2005	1984	1995	2005	1984	1995	2005
Weighted *n*	177	100	57	235	210	102	192	146	120
Weighted %	29.3	22.0	20.5	38.9	46.0	36.5	31.8	32.0	43.0

FIGURE 1. Men's drinking context preferences for three ethnic groups (white, Hispanic, black) in 1984, 1995, and 2005 U.S. National Alcohol Survey. (Tables beneath figure provide percentages in context-preference groups for each year.)

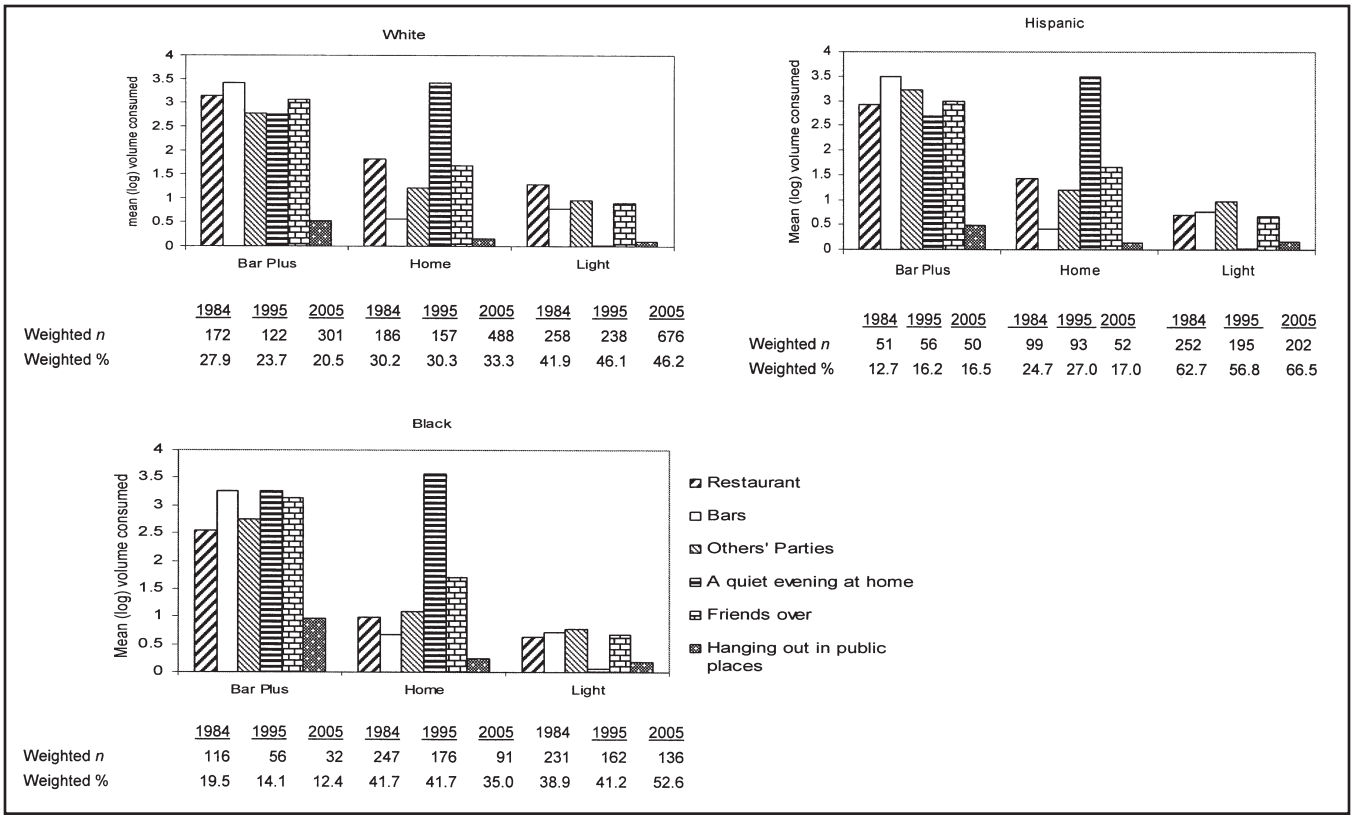
ing preference clusters according to the context(s) in which the highest volume of alcohol was consumed: a bar-plus cluster (i.e., heavy consumption in bars, and large amounts everywhere else), a home cluster (i.e., heavy consumption at home, and a fair amount everywhere else), and a light cluster (i.e., those who consumed relatively less in all settings compared with bar-plus or home drinkers, and virtually nothing "quietly at home"). Although each cluster solution was similar, the group assignment was based on the specific gender-by-ethnic group analysis.

We used multiple logistic regressions to examine the incremental predictive value of adding dummy variables indicating the context preference group (bar-plus vs light, home vs light) to models predicting the alcohol-related problems, controlling for age (18-29, 30-49, and 50 years and older) and year of survey (Model 1). We performed separate logistic regression analyses for each of the gender/ethnic groups and each of four problems, in turn. We determined if contextual drinking preference improved the prediction of drinking problems above and beyond overall consumption patterns by adding to the basic model (log) overall volume (KS volume) and frequency of heavy drinking (three or more drinks a day for women, five or more drinks a day for men) (Model 2).

Results

Contextual drinking preference clusters

Figure 1, for men, and Figure 2, for women, present bar graphs for each ethnic group, showing each context preference group's mean consumption (log volume) in each of the six drinking contexts. The graphs indicate where most of a particular context preference group's drinking takes place by showing the relative intake in each drinking context (see captions to figures). Similarly, for each gender-by-ethnicity group, Table 1 shows the mean of volume in drinks per year consumed in each setting. We report the results for white male drinkers first, because they may be taken as the reference group. Consistent with previous research (Spradley and Mann, 1975), white men belonging to the bar-plus drinking group were found to do most of their drinking in bars, but the amount was almost as much everywhere else, except in outdoor public places (see Figure 1, white). Bar-plus drinkers are relatively ubiquitous drinkers. Also among white men, home drinkers showed a marked preference for drinking at home, usually on "a quiet evening" but sometimes in restaurants and when friends stopped by. This context-preference



	White								
	1984	1995	2005	1984	1995	2005	1984	1995	2005
Weighted *n*	172	122	301	186	157	488	258	238	676
Weighted %	27.9	23.7	20.5	30.2	30.3	33.3	41.9	46.1	46.2

	Hispanic								
	1984	1995	2005	1984	1995	2005	1984	1995	2005
Weighted *n*	51	56	50	99	93	52	252	195	202
Weighted %	12.7	16.2	16.5	24.7	27.0	17.0	62.7	56.8	66.5

	Black								
	1984	1995	2005	1984	1995	2005	1984	1995	2005
Weighted *n*	116	56	32	247	176	91	231	162	136
Weighted %	19.5	14.1	12.4	41.7	41.7	35.0	38.9	41.2	52.6

FIGURE 2. Women's drinking context preferences for three ethnic groups (white, Hispanic, black) in 1984, 1995, and 2005 U.S. National Alcohol Survey. (Tables beneath figure provide percentages in context-preference groups for each year.)

group drank in bars markedly less and also drank very little in public places. The light group drank almost nothing on a quiet evening at home and also very little in other social venues. Overall, all the white male context-preference groups (bar-plus, home, and light) consumed more in restaurants, on average, than any of the other gender- and ethnic-specific cluster groups.

Also in Table 1, Hispanic men in the bar-plus group consumed more drinks annually relative to both black and white men drinkers. By definition, they also did most of their drinking in bars, plus a large amount elsewhere (see Figure 1, Hispanic). Hispanic men in the home cluster preferred drinking quietly at home and drinking somewhat when friends visited or when they were at others' parties. The profile of the Hispanic male light group looked very similar to that of white men.

Table 1 also suggests that black male bar-plus drinkers look very similar to their white male counterparts except they drink less at restaurants and quite a bit more in public places such as street corners and parks (as is somewhat true for black men in the other context-preference groups). On average, black male bar-plus, home, and light drinkers consumed more drinks at home on a quiet evening, relative to any other gender- and ethnic-specific cluster groups (see Figure 1, black). The light group black men are quite similar to white male counterparts.

Regarding women's drinking context preferences, Table 1 suggests that white women's drinking patterns were very similar to their white male counterparts, although white women generally drank less in all instances than white men. Like white men, white women belonging to the bar-plus cluster drank mostly in bars, and nearly equivalent amounts elsewhere except outdoors (see Figure 2, white). White women home drinkers, on the other hand, drank mostly at home, usually on a quiet evening. They also drank a fair amount in all other settings, except in bars and public places. Like their white male counterparts as well, white women in all groups (bar-plus, home, and light) consumed more alcohol in restaurants compared with other women.

Table 1 shows that Hispanic women bar-plus drinkers did most of their drinking both in bars and at others' parties but also a fair amount elsewhere, except in public places. Also like their Hispanic male counterparts, Hispanic women home drinkers drank mostly at home on a quiet evening. They drank a fair amount in restaurants and with friends but not in bars and public places (see Figure 2, Hispanic). Hispanic women's light group resembles the white women's equivalent group.

TABLE 1. Mean volume (drinks/year) for female and male current drinkers by context-preference group for each ethnic group (pooled 1984, 1995, and 2005 data)

	Women									Men								
	Black			Hispanic			White			Black			Hispanic			White		
Context	Bar-plus	Home	Light	Bar-plus	Home	Light	Bar-plus	Home	Light	Bar-plus	Home	Light	Bar-plus	Home	Light	Bar-plus	Home	Light
Restaurant	25.74	6.35	2.57	33.19	9.06	3.67	40.37	12.63	8.17	27.33	5.89	2.28	39.39	7.26	5.72	50.20	13.42	8.81
Bars	55.36	3.04	5.10	71.15	1.53	6.07	59.16	2.47	5.43	82.45	3.48	7.49	117.15	1.76	8.46	105.21	3.46	6.95
Others' parties	26.25	4.94	3.74	72.91	5.33	6.63	27.59	5.35	4.26	43.38	8.79	9.20	77.74	17.80	11.43	51.72	8.40	6.99
A quiet evening at home	46.36	54.10	0.13	60.25	45.60	0.07	41.67	38.36	0.06	81.44	84.20	0.17	66.96	79.18	0.09	60.57	60.14	0.10
Friends over	51.42	19.26	5.10	65.15	14.70	4.77	43.46	12.18	5.58	76.14	28.14	9.79	93.69	23.41	5.85	63.45	23.94	5.09
Hanging out in public places	21.43	2.64	1.19	7.86	0.52	2.57	6.01	0.62	0.76	35.97	10.70	9.65	36.01	8.64	3.85	16.52	2.68	2.72
Total	226.56	90.33	17.83	310.51	76.74	23.78	218.26	71.61	24.26	346.71	141.2	38.58	430.94	138.05	35.4	347.67	112.04	30.66
Grand total	334.72			411.03			314.13			526.49			604.39			490.37		

Black women belonging to the bar-plus group did most of their drinking in bars, when friends were visiting at their home, and at home, usually on a quiet evening. They also drank a fair amount everywhere else. Overall, however, the black women bar-plus group drank less in bars compared with bar drinkers in all other ethnic and gender groups (see Table 1 and Figure 2, black). The black women home cluster did most of their drinking during a quiet evening at home, a fair amount when friends dropped by, and very little elsewhere. Black women light drinkers, like other counterparts, drank almost nothing at home on a quiet evening and very little in other venues.

Trends in drinking context preferences for ethnic-by-gender groups

Although trends were not tested, data tables in Figures 1 (for men) and 2 (for women) provide the relative percentage of all drinkers at each epoch assigned to each context-preference group. In the initial decade between 1984 and 1995, there seems to have been a general decrease in the bar-plus context preference (i.e., fewer people were classified as bar-plus drinkers) across all gender and ethnic groups, except Hispanic men and women, who in contrast showed some increase in this context preference. In the second decade between 1995 and 2005, the prevalence of bar-plus context-preference drinkers among all ethnic-by-gender groups continued to decline, except among the white men and Hispanic women, for whom it remained stable. Regarding the home context-preference group, in the black and white ethnic groups, between 1984 and 1995 the percentages of women remained stable, whereas the representation of men increased. During the same initial decade (1984-1995), the percentage of Hispanic men with the home drinking preference declined. However, in the second decade (1995-2005), there was a slight decrease in home drinking context preference for all ethnic-by-gender groups except white women.

As for the light context-preference group, over the 2 decades, with some minor variations, there seemed to be a general increase in prevalence across all ethnic-by-gender groups. However, prevalence in the light cluster for white men increased in both decades, whereas the ethnic minority men prevalence increased more in the second decade, especially that of Hispanic men. For white women the increase in prevalence was greater in the first decade, whereas for the Hispanic women, the prevalence declined and then rose above the initial level. Finally, for black women the prevalence increase was slow in the first decade and much greater in the second decade. For all ethnic groups in the most recent survey (2005), larger percentages of women, compared with men, were classified in the light context preference, from about one half for white and black women to two thirds for Hispanic women. The proportions of men assigned to the light group ranged from about one third for whites to about one half for Hispanics, with black men intermediate. These gender contrasts in prevalence tend to be the inverse for those seen in the bar-plus groups.

Drinking context preferences and alcohol problems

We assessed the relationship between preferred drinking contexts and each of the four alcohol-related problems (i.e., arguments and fighting, drunk driving, accidents and trouble with the law, and problems with spouse). Recognizing that the drinking context-preference groups have different *overall* drinking patterns, we wished to see whether an individual's contextual preference for drinking adds information controlling for overall drinking pattern. Therefore, we specified two logistic regression models for each gender by ethnic group (analyzed separately). Both models (see *Analytical proce-*

TABLE 2. Logistic regressions predicting arguments and fighting in the past 12 months giving adjusted odds ratios for bar-plus and home groups (light group is reference), age, and survey year (Model 1), and adding heavy drinking and volume (Model 2) for gender and ethnic groups (with 95% confidence intervals)

	Black women		Hispanic women		White women		Black men		Hispanic men		White men	
Variable	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]
Home drinkers[c]	2.16†	1.68	1.30	1.19	1.08	0.92	1.60	1.30	1.76*	1.39	1.70	1.06
	(1.15-4.06)	(0.87-3.25)	(0.49-3.45)	(0.45-3.14)	(0.56-2.11)	(0.44-1.90)	(0.93-2.75)	(0.76-2.22)	(1.02-3.03)	(0.80-2.43)	(0.90-3.21)	(0.56-2.01)
Bar-plus drinkers[c]	4.18†	2.61†	11.78†	8.55‡	5.03‡	2.93†	3.90‡	2.50†	5.52‡	3.52‡	5.37‡	2.29†
	(2.19-7.95)	(1.29-5.31)	(4.60-30.1)	(2.83-25.9)	(2.85-8.88)	(1.45-5.93)	(2.13-7.16)	(1.26-4.98)	(3.12-9.77)	(1.91-6.49)	(3.13-9.21)	(1.27-4.15)
Age	0.97†	0.96†	0.96†	0.96†	0.95‡	0.95‡	0.97‡	0.97‡	0.96‡	0.95‡	0.94‡	0.94‡
	(0.94-0.99)	(0.94-0.99)	(0.93-0.99)	(0.93-0.99)	(0.93-0.97)	(0.93-0.97)	(0.95-0.98)	(0.95-0.98)	(0.93-0.98)	(0.92-0.97)	(0.92-0.96)	(0.93-0.96)
1995 (2000 is reference)	2.92‡	2.79‡	0.99	0.95	1.13	1.42	1.21	1.28	3.12‡	3.68‡	0.98	1.13
	(1.71-4.99)	(1.59-4.92)	(0.35-2.82)	(0.35-2.61)	(0.64-2.00)	(0.77-2.60)	(0.72-2.03)	(0.75-2.20)	(1.70-5.70)	(2.03-6.66)	(0.63-1.52)	(0.69-1.83)
2005 (2000 is reference)	1.19	1.32	1.01	0.81	0.77	0.88	1.11	1.24	1.91*	2.31*	0.89	0.94
	(0.50-2.86)	(0.54-3.22)	(0.35-2.93)	(0.25-2.65)	(0.46-1.29)	(0.50-1.54)	(0.60-2.07)	(0.65-2.39)	(1.00-3.64)	(1.19-4.47)	(0.59-1.34)	(0.61-1.47)
Frequency (3+/5+)		1.004		1.008		1.008		1.001		1.008*		1.006*
		(0.997-1.012)		(0.994-1.023)		(0.998-1.018)		(0.997-1.006)		(1.002-1.014)		(1.001-1.011)
Volume consumed		1.007		1.001		1.012		1.008†		0.999		1.007
		(0.996-1.018)		(0.985-1.019)		(0.999-1.025)		(1.002-1.015)		(0.990-1.009)		(0.999-1.015)

[a]Controlling for age and year of survey; [b]controlling for age, year of survey, (log) overall volume consumed, and frequency of heavy drinking—days drinking three or more (women) or five or more (men) drinks in a day; [c]light drinkers are reference group.
*$p < .05$; †$p < .01$; ‡$p < .001$.

TABLE 3. Logistic regression predicting drinking-related consequences in the past 12 months giving adjusted odds ratios for bar-plus and home groups with light group as the reference group (same Models as Table 2, with 95% confidence intervals)

		Drunk driving				Accidents and trouble with the law				Problem with spouse			
		Home		Bar-plus		Home		Bar-plus		Home		Bar-plus	
Group	*n*	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]
White													
Women	2,572	1.32 (0.66-2.64)	1.20 (0.59-2.41)	7.80‡ (4.71-12.9)	5.57‡ (3.22-9.66)	0.58 (0.14-2.46)	0.70 (0.16-2.98)	2.52 (0.84-7.61)	3.77* (1.06-13.4)	0.53 (0.18-1.56)	0.44 (0.15-1.26)	3.57‡ (1.74-7.31)	1.77 (0.76-4.08)
Men	2,474	1.52 (0.96-2.41)	1.21 (0.78-1.89)	7.53‡ (5.16-11.0)	4.82‡ (3.22-7.21)	0.81 (0.33-1.97)	0.57 (0.21-1.53)	2.01* (1.05-3.87)	1.05 (0.50-2.20)	1.85 (0.93-3.64)	1.31 (0.67-2.57)	4.32‡ (2.46-7.59)	2.14* (1.15-3.99)
Hispanic													
Women	981	1.04 (0.32-3.32)	0.98 (0.29-3.30)	5.66† (1.87-17.1)	4.14* (1.24-13.9)	1.79 (0.26-12.3)	1.34 (0.15-11.8)	8.26* (1.60-42.6)	3.49 (0.38-31.8)	2.51 (0.95-6.63)	2.33 (0.86-6.33)	5.21‡ (2.07-13.1)	3.65† (1.47-9.08)
Men	1,439	1.19 (0.64-2.23)	0.98 (0.52-1.84)	5.13‡ (2.78-9.47)	3.37‡ (1.73-6.56)	1.09 (0.56-2.13)	0.64 (0.32-1.28)	2.63† (1.28-5.43)	1.09 (0.49-2.42)	1.80* (1.03-3.14)	1.27 (0.69-2.36)	4.05‡ (2.42-6.76)	2.05* (1.12-3.77)
Black													
Women	1,320	0.62 (0.18-2.15)	0.60 (0.17-2.14)	7.67‡ (3.03-19.4)	6.51‡ (2.32-18.3)	12.16* (1.48-100.1)	7.53 (0.92-61.5)	17.13* (1.91-153.7)	8.53 (0.84-86.6)	2.37 (0.89-6.32)	1.60 (0.56-4.52)	1.24 (0.39-3.88)	0.41 (0.11-1.50)
Men	1,109	1.01 (0.51-1.99)	0.92 (0.46-1.82)	3.81‡ (2.02-7.16)	3.13† (1.63-6.00)	0.82 (0.39-1.73)	0.60 (0.27-1.30)	1.34 (0.63-2.87)	0.58 (0.23-1.48)	1.32 (0.74-2.35)	1.10 (0.62-1.97)	2.44* (1.21-4.91)	1.65 (0.70-3.88)

[a]Controlling for age and year of survey; [b]controlling for age, year of survey, (log) overall volume consumed, and frequency of heavy drinking—days drinking three or more (women) or five or more (men) drinks in a day.

*$p < .05$; †$p < .01$; ‡$p < .001$.

dure section) control for age and survey year, with Model 2 adding overall volume and heavy drinking to the base model (Model 1) to reveal the incremental contribution that drinking context preference might make beyond 12-month drinking patterns.

Arguments and fighting

In Table 2, summarizing the logistic regression model predicting arguments and fighting, Model 1 enters as predictors the context-preference indictors (bar-plus and home, each referenced to light), plus age, and survey year. After controlling for age and year of survey, the bar-plus drinkers compared with light drinkers (regardless of gender or ethnicity) were more likely to report arguments and fighting. Model 2 adds overall volume and heavy drinking frequency to determine if contextual drinking-preference clusters serve simply as proxies for drinking pattern (Midanik and Greenfield, 2000) or if they contributed independently to arguments and fighting. Although the adjusted odds ratios for the context-preference indicators were reduced compared with those for Model 1 across gender by ethnicity groups, bar-plus drinkers versus light drinkers tended to report more arguments and fighting after accounting for overall pattern variables (see Table 2, Model 2 entries). By contrast, home drinkers were not at significantly increased risk of arguments and fighting, except for Hispanic men and black women (see these groups, Table 2), and only in Model 1. In none of the six gender-by-ethnicity groups did membership in the home cluster place one at significantly increased risk for arguments and fighting once overall drinking pattern was controlled. For black women and, especially, Hispanic men, there are significant period effects, with the 1995 survey associated with the highest reports of arguments and fighting in both models.

Drunk driving

Table 3 gives a summary of logistic regressions that predict (separately) each of the remaining three drinking-related consequences (i.e., drunk-driving, accidents and trouble with the law, and problems with spouse). Bar-plus drinkers of all ethnic and gender groups were at significant risk for drunk-driving (see Table 3, bar-plus, Model 1), with adjusted odds ratios ranging from 3.8 to 7.8. This was true even after controlling for overall volume consumed and heavy drinking (Model 2), although with somewhat diminished odds ratios ranging from 3.1 to 6.5. As might be expected, home drinkers of all ethnic-by-gender groups were not significantly more likely to face this risk (see Table 3).

Accidents and trouble with the law

Bar-plus drinkers of all ethnic and gender groups (except black men and white women), relative to light drinkers, were significantly more likely to report having accidents or trouble with the law in the past 12 months (see Table 3, accidents and trouble with the law, bar-plus drinkers, Model 1). However, after controlling for overall drinking (Model 2), this risk was no longer significant for all ethnic-by-gender groups except white women. For the latter, the adjusted odds ratio is actually strengthened and becomes significant when the overall drinking pattern is taken into account (Model 2). Relative to light drinkers, home drinkers did not report a greater risk for accidents and trouble with the law, except black women (Model 1), who had a large adjusted odds ratio. But for these women, the risk, although still large, became nonsignificant after controlling for overall drinking pattern (Model 2), with both models showing wide confidence intervals in this case.

Spousal criticism of drinking

Bar-plus drinkers were also more likely than light drinkers to experience spousal criticism of their drinking, except black women (see Table 3, spousal criticisms, bar-plus drinkers, Model 1). This added risk remained significant in a number of instances, except among white women and black men and women, after controlling for the effects of overall drinking pattern (Model 2). By contrast, home drinkers, relative to light drinkers, were not at significant greater risk for spousal criticisms, except Hispanic men (Model 1); even for these men, this risk did not remain significant after introducing overall drinking controls (Model 2).

Discussion

The main purpose of this study was to determine whether classifying individuals by settings where they preferentially drink could shed light on their drinking problems. Much prior research in the United States exploring drinking contexts has focused on bar environments (e.g., Curran et al. [1996]), which are more likely to be frequented by whites than blacks and Hispanics. We wanted to examine potential racial and gender differences in preferred drinking contexts and the implications of these differences. First, we had some success in operationalizing the construct of drinking context preference using cluster analyses of log volume by setting. A striking finding was that largely the same three contextual drinking "types" were yielded by the cluster analyses for each of the six gender-by-ethnicity groups. The types identified involved one group preferentially drinking at bars but elsewhere too, one group drinking mostly at home, and a third group tending to drink little in any setting but especially not quietly at home. However, the proportions of each gender by ethnic group in each context-preference group appeared to vary over the 20-year period studied.

Descriptively, we found that white women's contextual drinking patterns are similar to white men's but at volumes

approximately half to two thirds of their levels. Especially, bar drinking norms appear to remain gender specific, even if associated rituals might induce patrons to drink more heavily. Smaller but increasing proportions of Hispanic women in the bar-plus preference group did much of their drinking in bars, and the proportion with the bar-going preference is converging over time with white women, a result that was not previously found and that contrasts with earlier results (Treno et al., 2000).

We found that the heaviest drinking for black men occurred in the home, followed by a fair amount in remaining locations including bars and outdoor public places (the latter venue is much more common among black men and women drinkers). Nonetheless, black men drank nearly as much in bars as at home, a finding somewhat at odds with previous research suggesting black men were less likely to drink in bars (Treno et al., 2000). Previous research on drinking contexts that did not identify parties and bars as likely heavy drinking locations for Hispanic and black men and women was often based on local rather than national samples; additionally, measurement differences may account for some discrepancies because volume, used here, is Frequency × Amount. Importantly, however, we see a broad shift over the 2 decades in most of the gender-by-ethnicity groups to an increase in the light drinking style. Intriguingly, one characteristic of the light style is that there is very little or no drinking on quiet evenings at home—implying the shift for all groups is toward lighter drinking in venues outside the home. Trends in preferring either the home or bar-plus contextual drinking style appear more variable across the gender-by-ethnicity groups. Some changes may be the result of economic factors (given it costs less to drink at home than at bars); may be equally attributable to increases in the perceived consequences of drunk driving; may tend to favor lighter drinking and the safer home setting; or, in the case of Hispanic women especially, who over time more appear to be becoming bar-plus drinkers, may be in part at least an indication of greater acculturation. Changes in venues themselves may be a factor too. Clearly, more detailed and comprehensive research on drinking contexts among ethnic minority populations is needed.

Because the overall amount of drinking varied by context-preference group, as did the usual amount consumed, in examining the possible role of drinking context preferences in predicting specific alcohol-related problems, it was important to control for overall drinking volume and heavy drinking in our analyses. We selected drinking-related consequences for study that were conceptually most relevant for drinking context choices. The bar-plus preference was predictive of problems such as arguments and fights, after controlling for overall drinking pattern, similar to numerous prior findings indicating that bars as drinking venues are associated with aggression (Graham and Wells, 2001). However, bar-plus drinkers drink heavily in many settings; routine activity theory suggests they may be more exposed to altercations everywhere.

It is also interesting to note that over and above overall drinking pattern, evidence that a contextual-preference association with problem risk was found for drunk driving, and to some extent (and in certain groups only—white men and Hispanics of either gender) spousal problems, but not generally for accidents and legal trouble. However, for white women, accounting for drinking pattern *strengthened* the relationship between the bar-plus indicator and accidents and legal trouble owing to drinking. This suggests that it is more the context-preference style (heavy drinking in many different venues) than the overall volume per se that may affect the risk relationship for this group. This seems plausible because more traveling around is associated with heavy drinking in multiple places, but we have no idea why this might be more so for white women than any other subgroup. Consistent with previous studies (Treno et al., 2000), our examination suggested that across all gender and ethnic groups, bar-plus drinkers were considerably more likely than light drinkers to drink and drive (with very high adjusted odds ratios found for the bar-plus dummy variable in both the drunk driving models). In all cases the bar-plus drinking group was at higher risk. Thus, as hypothesized, the preferred drinking situation indeed plays a role in drinking outcomes. These individual behavioral preferences for drinking venue (in this case, drinking in many places) can add information relevant to risk appraisal, although we caution that this is an associational result with no evidence as to causation.

Drinking rituals and norms associated with certain locations—such as restaurants—may be more restrictive than those associated with bars, thereby promoting safety and comparatively less heavy drinking. Identifying the preferred drinking locations for different gender and ethnic groups, then, has the potential to shed light on overall drinking patterns from a subcultural perspective and may inform risk analyses in these populations. Identifying the preferred heavy drinking locations for such groups may help policymakers devise more effective culturally appropriate preventive interventions. For example, using responsible beverage service strategies in bars, so as not to serve intoxicated patrons, may reduce the reinforcement for drinking heavily in such environments, which might improve safety in these settings. New studies on bar drink sizes suggest that bartenders may serve regular patrons and heavy drinkers larger drinks, and there is some indication from a recent methodological study that bars catering to black patrons may serve particularly large drinks (Greenfield and Kerr, 2008; Kerr et al., 2008). This practice could be altered by responsible beverage training to reduce positive reinforcement for bar-plus drinkers.

A limitation of the current study is that it was descriptive with regard to differences between gender by ethnic groups' context preferences and also how the percentages in the context-preference groups may have changed over time. It

was beyond the scope of the study to test these differences, given the focus on the possible relationship of context preference with acute alcohol-related problems in the subgroups. Furthermore, these associational findings are based on 12-month duration measures rather than event- or occasion-based measures, and our data cannot be used to identify a particular context most "responsible" for given problems. We explored the idea that where one prefers to drink (across one or more settings) is itself an aspect of one's drinking pattern. Our associational results offer some support for the notion that such context preferences may be useful in predicting problem risks.

This study is among the first to comprehensively investigate gender and ethnic group drinking context preferences in the United States over the last 2 decades. Nevertheless, it is clear that much additional research on drinking contexts is needed to fully understand the role context plays in drinking behavior and to inform prevention and policy interventions and how these may be made more culturally sensitive.

References

Aarons, G.A., Brown, S.A., Coe, M.T., Myers, M.G., Garland, A.F., Ezzet-Lofstram, R., Hazen, A.L., and Hough, R.L. Adolescent alcohol and drug abuse and health. J. Adolesc. Hlth **24:** 412-421, 1999.

Caetano, R. and Herd, D. Drinking in different social contexts among white, black and Hispanic men. Yale J. Biol. Med. **61:** 243-258, 1988.

Clark, W.B. Public drinking contexts: Bars and taverns. In: Harford, T.C. and Gaines, L.S. (Eds.) Social Drinking Contexts. NIAAA Research Monograph No. 7, DHHS Publication No. (ADM 81-1097), Washington: Government Printing Office, 1981, pp. 8-33.

Clark, W.B. Alcohol use in various settings. In: Single, E. and Storm, T. (Eds.) Public Drinking and Public Policy, Toronto, Canada: Addiction Research Foundation, 1985, pp. 49-70.

Clark, W. Places of drinking: A comparative analysis. Contemp. Drug Probl. **15:** 399-446, 1988.

Curran, P.J., Harford, T.C., and Muthén, B.O. The relation between heavy alcohol use and bar patronage: A latent growth model. J. Stud. Alcohol **57:** 410-418, 1996.

Delucchi, K.L., Matzger, H., and Weisner, C. Dependent and problem drinking over 5 years: A latent class growth analysis. Drug Alcohol Depend. **74:** 235-244, 2004.

Graham, K., Bernards, S., Osgood, D.W., and Wells, S. Bad nights or bad bars? Multi-level analysis of environmental predictors of aggression in late-night large-capacity bars and clubs. Addiction **101:** 1569-1580, 2006a.

Graham, K., Osgood, D.W., Wells, S., and Stockwell, T. To what extent is intoxication associated with aggression in bars? A multilevel analysis, J. Stud. Alcohol **67:** 382-390, 2006b.

Graham, K., Plant, M., and Plant, M. Alcohol, gender and partner aggression: A general population study of British adults. Addict. Res. Theory **12:** 385-401, 2005.

Graham, K. and Wells, S. Aggression among young adults in the social context of the bar. Addict. Res. Theory **9:** 193-219, 2001.

Greenfield, T.K. Ways of measuring drinking patterns and the difference they make: Experience with graduated frequencies. J. Subst. Abuse **12:** 33-49, 2000.

Greenfield, T.K. and Kerr, W.C. Alcohol measurement methodology in epidemiology: Recent advances and opportunities. Addiction **103:** 1082-1099, 2008.

Greenfield, T.K., Nayak, M.B., Bond, J., Ye, Y., and Midanik, L.T. Maximum quantity consumed and alcohol-related problems: Assessing the most alcohol drunk with two measures. Alcsm Clin. Exp. Res. **30:** 1576-1582, 2006.

Greenfield, T.K. and Rogers, J.D. Alcoholic beverage choice, risk perception, and self-reported drunk driving: Effects of measurement on risk analysis. Addiction **94:** 1735-1743, 1999.

Harford, T.C. Contextual drinking patterns among men and women. In: Seixas, F.A. (Ed.) Currents in Alcoholism: Psychiatric, Psychological, Social, and Epidemiological Studies, Vol. 4, New York: Grune & Stratton, 1978, pp. 287-296.

Heeb, J.-L. and Gmel, G. Measuring alcohol consumption: A comparison of graduated frequency, quantity frequency, and weekly recall diary methods in a general population survey. Addict. Behav. **30:** 403-413, 2005.

Herd, D. and Grube, J. Drinking contexts and drinking problems among black and white women. Addiction **88:** 1101-1110, 1993.

Kairouz, S. and Greenfield, T.K. A comparative multi-level analysis of contextual drinking in American and Canadian adults. Addiction **102:** 71-80, 2007.

Kerr, W.C., Patterson, D., Koenen, M.A., and Greenfield, T.K. Alcohol content variation of bar and restaurant drinks in Northern California. Alcsm Clin. Exp. Res. **32:** 1623-1629, 2008.

Midanik, L.T. and Greenfield, T.K. Trends in social consequences and dependence symptoms in the United States: The national alcohol surveys, 1984-1995. Amer. J. Publ. Hlth **90:** 53-56, 2000.

Nusbaumer, M.R., Mauss, A.L., and Pearson, D.C. Draughts and drunks: The contributions of taverns and bars to excessive drinking in America. Deviant Behav. **3:** 329-358, 1982.

Pearson, D.C. A Study of the Relationship Between Taverngoing and Alcohol Abuse, Pullman, WA: Washington State University, 1979, p. 103.

Room, R. Measuring alcohol consumption in the United States: Methods and rationales. In: Kozlowski, L.J., Annis, H.M., Cappell, H.D., Glaser, F.B., Goodstadt, M.S., Israel, Y., Kalant, H., Sellers, E.M., and Vingilis, E.R. (Eds.) Research Advances in Alcohol and Drug Problems, Vol. 10, New York: Plenum Press, 1990, pp. 39-80.

Rossow, I. Alcohol-related violence: The impact of drinking pattern and drinking context. Addiction **91:** 1651-1661, 1996.

Santos, R.L. One approach to oversampling blacks and Hispanics: The national alcohol survey. In: Clark, W.B. and Hilton, M.E. (Eds.) Alcohol in America: Drinking Practices and Problems, Albany, NY: State Univ. of New York Press, 1991, pp. 329-344.

Searles, J.S., Perrine, M.W., Mundt, J.C., and Helzer, J.E. Self-report of drinking using touch-tone telephone: Extending the limits of reliable daily contact. J. Stud. Alcohol **56:** 375-382, 1995.

Single, E. Public drinking. In: Galanter, M. (Ed.) Recent Developments in Alcoholism, Vol. 11: Ten Years of Progress, New York: Plenum Press, 1993, pp. 143-152.

Spradley, J.P. and Mann, B.J. The Cocktail Waitress: Woman's Work in a Man's World, New York: John Wiley & Sons, 1975.

Spss Inc. SPSS for Windows: Base System User's Guide, Release 6.0, Chicago, IL: SPSS Inc., 1996.

Stockwell, T., Somerford, P., and Lang, E. The relationship between license type and alcohol-related problems attributed to licensed premises in Perth,Western Australia. J. Stud. Alcohol **53:** 495-498, 1992.

Treno, A.J., Alaniz, M.L., and Gruenewald, P.J. The use of drinking places by gender, age and ethnic groups: An analysis of routine drinking activities. Addiction **95:** 537-551, 2000.

Wells, S., Graham, K., Speechley, M., and Koval, J.J. Drinking patterns, drinking contexts and alcohol-related aggression among late adolescent and young adult drinkers. Addiction **100:** 933-944, 2005.