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## Does outdoor alcohol advertising around elementary schools vary by the ethnicity of students in the school?

Keryn E. Pasch<sup>a</sup>, Kelli A. Komro<sup>b</sup>, Cheryl L. Perry<sup>c</sup>, Mary O. Hearst<sup>a</sup>, and Kian Farbaksh<sup>a</sup>

<sup>a</sup>*Epidemiology and Community Health, University of Minnesota, Minneapolis, USA*

<sup>b</sup>*Epidemiology and Health Policy Research, University of Florida, Gainesville, USA*

<sup>c</sup>*Michael and Susan Dell Center for Advancement of Healthy Living, University of Texas, Austin, USA*

### Abstract

**Objectives**—The objectives of this study were to determine: (1) if the number of outdoor alcohol advertisements around schools varied by ethnicity of students in the school, and (2) how the content of alcohol advertising around schools varied by the ethnicity of students in the school.

**Methods**—All outdoor alcohol advertisements within 1500 feet of 63 Chicago schools were documented and coded for content and theme. On average, the ethnic make-up of schools was 54.9% African American, 24.4% Hispanic, and 16.2% White; 79.7% of students were low SES. To compare the mean number and type of ads by ethnicity of the school, schools were coded by ethnicity (i.e. 20% or more Hispanic students compared with less than 20% Hispanic students).

**Results**—Youth attending schools with 20% or more Hispanic students were exposed to 6.5 times more alcohol advertising than students attending schools with less than 20% Hispanic students. Schools with 20% or more Hispanic students were also surrounded by more beer advertising and alcohol advertisements on bars and liquor stores.

**Conclusions**—Alcohol advertising is more prevalent around schools with 20% or more Hispanic students. Policies should be considered to reduce the amount of alcohol advertising around schools.

### Keywords

Alcohol advertising; Hispanic youth; Adolescents

### Introduction

Advertising is both pervasive and influential in American culture. In 2005, over 271 billion dollars were spent on advertising in the United States. Beer, wine, and liquor advertising ranked 18<sup>th</sup> in the total amount of advertising spent, at 2.2 billion dollars (1). Hispanics have been called “the customers of the future”(2) as Hispanics are the fastest growing ethnic group in the United States (3). In 2004, almost 40% of Hispanics were under the age of 20, compared to 30% of the general population (4). According to the United States Census, there were 753,644 Hispanics<sup>1</sup> living in Chicago in 2000, 26% of the total population of the city (5). The majority of the Hispanic population in Chicago consists of persons from Mexican (70.4%), Puerto Rican (15.0%), Central American (3.1%), and South American (2.8%) descent (5). Only 15.5% of Hispanic youth in Chicago were born outside of the United States (6).

<sup>1</sup>Hispanic is defined as a person of Mexican, Puerto Rican, Cuban, other Central or South American, or other Spanish culture or origin, regardless of ‘race’

Hispanic youth are more likely to use alcohol and get drunk at younger ages than non-Hispanic youth (7). Alcohol use by age 13 is most common among Hispanics (29.8%), followed by Blacks (27.9%), then Whites (23.7%) (8). In addition, according to a national survey of 8<sup>th</sup> grade youth in 2005 the prevalence of all alcohol use including lifetime, past year use, past month use, binge drinking, and drunkenness were higher among Hispanic youth than African-American or White youth (7).

Geographic information systems have been critical in determining the density and placement of alcohol advertising. Geographic information systems are computer-based systems that allow for the integration and analysis of geographic or spatial data (9). The epidemiology of spatially related phenomenon, as in the case of alcohol-related stimuli, such as advertising placement, is particularly appropriate for geographic information systems-based research (10-12). Geographic information systems technology can enhance researchers understanding of the geographic influences on alcohol use and integrate geographic and social factors into the understanding of alcohol-related problems (11,13). In addition, geographic information about the risk factors associated with alcohol problems is crucial for advancement of prevention and treatment (10).

Alcohol billboard advertising has been found to be disproportionately located in minority neighborhoods (14-19). In general, addictive products are advertised more frequently in black and Hispanic neighborhoods as compared with non-Hispanic white neighborhoods (17,18, 20,21). Hackbarth, Silvestri, and Cosper (1995) conducted a study of alcohol and tobacco billboards and freestanding outdoor signs targeted at poor communities and found minority and poor wards were burdened with more billboards that advertised alcohol as compared to white wards. The researchers estimated that a child walking to school in a predominantly African American or Hispanic neighborhood was three times more likely to see an alcohol or tobacco advertisement than a child walking to school in a predominantly White neighborhood (18). Another study of billboards in Chicago wards found that there were 11.8 alcohol billboards on average in the Hispanic majority wards as compared to 0.7 in the White majority wards (17). Hispanic youth aged 12-20 are also exposed to more alcohol advertising in other media including magazines, radio, and television than youth in general (22).

While previous research has documented the number of alcohol billboards in Chicago neighborhoods (17,18) and the influence of alcohol advertising around schools on alcohol behaviors and intentions (23), none has documented how the number and content of alcohol advertising specifically around schools varies by ethnicity of the schools. Therefore, the first aim of this study was to determine if the number of free-standing outdoor alcohol advertisements (billboards, bus stops, etc.) as well as any alcohol-related advertisements posted on storefronts, bars, restaurants and liquor stores within a 1500 foot radius of a school, varied by ethnicity of students in the school sites. The second aim was to determine how the content of alcohol advertising around schools varied by the ethnicity of students in the school sites.

This study is important as Hispanic youth are at higher risk for alcohol use than either White or African-American youth and exposure to alcohol advertising has been shown to increase alcohol use (24-27) and intentions to use alcohol (23,27,28). Many marketers are capitalizing on the growing Hispanic population and targeting their marketing efforts at this group. Therefore, it is crucial to determine if alcohol advertising around schools is related to the ethnicity of students in the school to reduce exposure to this negative influence for this high risk group.

## Methods

### Study Design

This study was a supplement to a larger randomized controlled trial, Project Northland Chicago (PNC), of primarily elementary schools and surrounding community areas in the city of Chicago (29,30). The aim of PNC was to reduce adolescent alcohol use. Schools were recruited for PNC by selecting schools for recruitment that included grades 5 through 8, had relatively low mobility rates (< 25%), and were larger schools (30 or more students per grade) from a list of all public schools in Chicago. Schools that participated in PNC were located throughout the city of Chicago and had similar demographic characteristics to students throughout the Chicago school district (29,30). Individual-, school-, and community level data were collected for all participating students, parents, schools and communities. Project Northland Chicago focused on sixth grade students in the 2002-2003 school year and continued intervention and evaluation (e.g., repeated surveys of students) activities through 2004-2005 when the students were in eighth grade. The present study, which sought to document and describe the outdoor alcohol advertising environment around schools participating in Project Northland Chicago, was supplementary to the larger randomized trial.

### Participants

For this study, the schools are the unit of analysis. Two out of the 61 Project Northland Chicago Schools had split campuses which resulted in 63 school sites. On average, schools consisted of 54.9% African American (range: 0.2% - 100%), 24.4% Hispanic (range: 0% - 99.6%), and 16.2% White (range: 0% - 77.1%) students. The average socio-economic status of the schools was low with 79.7% of students receiving free or reduced price lunch (range: 10.1% - 100%).

### Measures

Detailed street maps were created demarcating a 1500 foot radius around each study school site using ArcView Geographic Information Systems software (31). The outdoor alcohol advertisements were documented using digital cameras and the exact location of a print ad or ad cluster was documented to the nearest hundred thousandth of a degree using a Global Positioning Systems Device (GPS) (Garmin, eTrex Venture). Other documented details included the location of the ad (bus stand/bench, billboard, liquor store, grocery or convenience store, bar, other), number of advertisements at the location, and a brief description of the ad. One wide angle photo of each GPS location where advertisements were found, as well as a close-up photo of each individual sign/ad or ad cluster, was taken. Close up photographs were used for content coding. All billboards and bus stops were documented regardless of content; however, storefronts and restaurants/bars were only photographed if the advertisements contained alcohol-related content. Each advertisement was also linked to the school it was located around through a school identification code. Seven school sites (10%) were randomly selected to be assigned to two different data collection teams for quality control purposes. Comparisons revealed no significant differences between the mean number of alcohol advertisements in the original and quality control school sites. The data collection was implemented between April 11 and May 16, 2003.

One coder coded all of the advertisements for type (i.e. alcohol, tobacco, media, etc.), as all free-standing advertisements were photographed regardless of content. After a random check of 10% of the advertisements to ensure accuracy of coding, two independent, trained coders coded all alcohol advertisements for content. Detailed written instructions and descriptions of all codes were provided for the coders. Content coding included the number and characteristics of the models in the ad, presence of animals or humans, and theme of ad. Advertisements with models were coded for attractiveness cues including rugged individualism, sophisticated/high fashion, sex appeal, fame/expertise, friendliness, and femininity. Codes for no model cues and

other models cues were also included. Attractiveness cues were adapted from an article by Schooler, Basil, & Altman (1996). Schooler and colleagues found that rugged individualism/machismo and sex appeal were most likely to be used in conjunction with alcohol advertisements (14).

Theme coding was based on 22 alcohol advertising codes developed by Finn and Strickland for both television and magazine advertising (32,33). The codes included wealth and affluence, achievement and success, conformity, medicinal benefits, self-reward (due to self-esteem), information (product related), foreign settings, humor, (close) friendship, tradition or heritage, camaraderie, quality, religious symbolism, sexual connotations, risk taking/rebellion (hedonism in Finn and Strickland's coding system), (change of state) relaxation, impress others, love and romance, special occasions and holiday celebrations, "general" success, individuality, and physical activity. We adapted the coding system for use in an urban setting with youth as potential targets of the advertisements. This adaptation resulted in 26 codes, including four theme categories added to Finn and Strickland's original 22 codes. The four additional theme categories included recreation, culture (defined as using the local culture to promote the product), losing weight/weight, and brand name only. Several theme categories were marked as being particularly youth-oriented (appealing to youth): conformity, humor, friendship, camaraderie, sexual connotations, risk taking/rebellion, impress others, love/romance, individuality, recreation, and losing weight. If at least one of the youth-oriented theme codes was noted for an advertisement, that advertisement was marked as youth-oriented. One ad could be coded with multiple themes. After coding all of the advertisements, the error rate between the coders was 0.2%. The two coders then discussed all discrepant codes and 100% agreement was established thereafter. The coding system is available upon request.

Focus groups were conducted with youth in two intervention pilot schools to ensure the validity of the designation of advertisements as youth-oriented. The research team selected eight advertisements, four youth-oriented and four non-youth-oriented to test our coding system. An ad was selected on the basis of how well it fit into the category of either youth or non-youth-oriented advertisements. The focus group questions were based on those by Waiters, Treno, and Grube (2001) (34). Four focus groups were held with eight to nine ethnically diverse 7<sup>th</sup> and 8<sup>th</sup> grade students in each group (for a total of 36 youth). The focus groups validated our coding system as the youth in the focus groups found that the advertisements coded as youth-oriented were appealing to youth and the advertisements that were coded as non-youth-oriented were not appealing to youth.

### School Categorization

The Chicago Public Schools define 'Hispanic' as a "person of Mexican, Puerto Rican, Cuban, other Central or South American, or other Spanish culture or origin, regardless of 'race'" (35). In order to compare the mean number and type of ads by ethnicity of students in the school, school sites were coded by ethnicity of the students (i.e. Hispanic and non-Hispanic). Using data obtained from the Chicago Public Schools, it was determined that a comparison of Hispanic (20% or more Hispanic students) and non-Hispanic schools (less than 20% Hispanic students) would be most appropriate as those schools classified as non-Hispanic were mostly African-American (mean percentage of African-American students in each non-Hispanic school was 87%). However, in order to determine the most appropriate cut point to dichotomize schools, four sets of analyses using four different cut points were run to perform a sensitivity analysis on our estimates. Previous research has used the cut point of 30% to classify neighborhoods as predominately one ethnicity (14,20). To create the 30% cut point, Schooler and colleagues ran exploratory analyses to determine which cut points would result in a more equal distribution of neighborhoods while still allowing for ethnic differences (14). They suggested that a stricter criteria (i.e. 50% or more) would have increased the likelihood

of finding differences, so the researchers determined the 30% cut point was the most appropriate, conservative cut point. For this study, a sensitivity analysis was conducted to determine if using an even more conservative cut-point of 20% would be comparable to the 30% cut point used in previous research as well as how a 35% and 50% cut point might affect outcomes. School categories were created based on the percentage of Hispanic students (20%, 30%, 35%, and 50%). The mean number of alcohol advertisements was then calculated for each of the categories and the means were compared using a t-test (see Table 1). In each of the categories, the mean number of alcohol advertisements was significantly different when comparing schools with 20%, 30%, 35%, or 50% Hispanic students to schools with less than 20%, 30%, 35%, or 50% Hispanic students, respectively. Therefore, from the sensitivity analysis we were able to determine that a 20% cut-point would provide a more conservative criterion than previously used but not lose information about the differences in the number of alcohol advertisements by the ethnicity of students in the school.

Coding of the school sites by student ethnicity using the 20% cut point resulted in 27 school sites with 20% or more Hispanic students and 36 school sites with less than 20% Hispanic students. The mean percentage of Hispanic students in the schools with 20% or more Hispanic students was 53.8% and in the schools with less than 20% Hispanic students it was 2.4%. This difference was tested using a t-test and it was significant ( $p < 0.0001$ ). There were also significant differences between the percent of African-American and White students in the schools with 20% or more Hispanic students compared with schools with 20% or less Hispanic students. In the schools with less than 20% Hispanic students the mean percentage of African-American students was 87.7% and in schools with 20% or more Hispanic students it was 11.2% ( $p < 0.0001$ ). In schools with less than 20% Hispanic students the mean percentage of White students was 8.2% and in schools with 20% or more Hispanic students it was 26.9% ( $p = 0.001$ ). The mean low income rate (% of students receiving free/reduced price lunch) for schools with 20% or more Hispanic students was 82.1% and for schools with less than 20% Hispanic students it was 76.5%; this difference was not significant ( $p = 0.32$ ).

### Statistical Analysis

SAS Version 9.1 (36) was used to create total counts and mean numbers of ads overall and by characteristic and location for each category of school (i.e. Hispanic vs. non-Hispanic). T-tests were used to determine if the mean number and content of the alcohol advertisements differed between school type (i.e. schools with 20% or more Hispanic students vs. schools with less than 20% Hispanic students).

## Results

### Alcohol Advertisements by Ethnicity of School

School sites with 20% or more Hispanic students had 771 total alcohol advertisements around 27 school sites or 28.6 alcohol ads per school and school sites with less than 20% Hispanic students had 160 total alcohol advertisements around 36 school sites or 4.4 alcohol ads per school. The ratio of alcohol advertisements around school sites defined by Hispanic ethnicity was 6.5 to 1, meaning that students attending a school with 20% or more Hispanic students had the potential to see almost seven times as many alcohol advertisements each day as students attending a school with less than 20% Hispanic students. The t-test for unequal variances found that the mean number of alcohol advertisements around school sites with 20% or more Hispanic students was significantly different from the mean number of alcohol advertisements around school sites with less than 20% Hispanic students ( $t = -3.89$ ,  $p = .0005$ ) (see Table 2).

Location of alcohol advertisements was significantly different between school sites with 20% or more Hispanic students (versus school sites with less than 20% Hispanic students). Schools

with 20% or more Hispanic students were more likely to have ads appear on bars ( $t = -5.00$ ,  $p < 0.0001$ ), liquor stores ( $t = -2.43$ ,  $p = 0.02$ ), and other locations ( $t = -2.28$ ,  $p = 0.03$ ) (see Table 2). Youth attending schools with 20% or more Hispanic students were exposed to 4 to almost 9 times as many of these advertisements as compared to youth attending schools with less than 20% Hispanic students. School sites with 20% or more Hispanic students were also more likely to have beer advertised around them as compared to school sites with less than 20% Hispanic students ( $t = -4.01$ ,  $p = 0.0004$ ), exposing youth to over seven times as many beer advertisements.

Focusing on themes by ethnicity of students in the school, school sites with 20% or more Hispanic students had more alcohol advertisements using the theme of culture to advertise the product than school sites with less than 20% Hispanic students ( $t = -3.07$ ,  $p = 0.005$ ). Youth in schools with 20% or more Hispanic students saw over 26 times more alcohol advertisements which used culture to advertise the product than youth in schools with less than 20% Hispanics. There were no significant differences in any of the other themes by ethnicity of the school. Alcohol advertisements around schools with 20% or more Hispanic students were also more likely to use cartoons ( $t = -2.37$ ,  $p = 0.02$ ) or animals ( $t = -3.65$ ,  $p = 0.001$ ) than alcohol advertising around schools with less than 20% Hispanic schools, exposing youth in schools with 20% or more Hispanic students to 5 to 12 times as many of these types of advertisements. No significant differences were found in attractiveness or model cues. There were no significant differences in the number of youth-oriented advertisements by ethnicity of the school. Results of characteristics appearing on less than 10 alcohol advertisements are not reported.

## Discussion

Geographic information systems are a useful tool in alcohol prevention research. Geographic information systems allow researchers to visually document the location and density of advertisements within specified areas, such as the area around schools. This study found that total alcohol advertising was significantly more likely to be found around schools whose enrollment is 20% or more Hispanic students compared with schools whose enrollment is less than 20% Hispanic. In addition, schools with 20% or more Hispanic students have more alcohol advertisements on bars, liquor stores and other locations (most often restaurants). Students attending these schools are exposed to 6.5 times more alcohol advertising overall and almost ten times as many alcohol advertisements on bars. This increased exposure may lead to beliefs that alcohol use is more normative than it actually is in the community. Two studies conducted of billboard advertising in Chicago found similar results with more alcohol advertising located in minority neighborhoods (17,18). Other studies have also found similar results in other locations when looking at minority communities (14-16,20,21). While these studies in Chicago did find more alcohol advertising in both African-American and Hispanic neighborhoods, the present study found increased alcohol advertising only around schools with 20% or more Hispanic students. One possible explanation for this difference is that some African-American communities in Chicago have mobilized around this issue (16) and may have been effective in reducing the amount of alcohol advertising in their neighborhoods.

Alcohol advertising around schools with 20% or more Hispanic students also used the culture of the community significantly more than alcohol advertising around schools with less than 20% Hispanic students. For example, the logo of a local sports team or a symbol of Hispanic culture such as the use of Mexico's national colors were used. Alazanz and Wilkes (1998) suggest that alcohol companies use cultural symbols to market to disenfranchised populations (16). In addition, using the local culture, with such symbols as the local sports teams or ethnically related words or pictures may lead to more brand recognition among youth as they may attribute those characteristics to the product. This could put youth at even greater risk for future alcohol use as increased brand recognition may influence alcohol use among

adolescents. Future research is needed which explores the influence of using local culture on beliefs, attitudes, and alcohol use among youth.

This study also found that alcohol advertisements around schools with 20% or more Hispanic students were more likely to use cartoons or animals to advertise the product than alcohol advertisements around schools with fewer than 20% Hispanic students. Previous research in both alcohol and tobacco has shown that youth are more likely to like and remember advertisements with images such as cartoons and animals (34) and greater awareness of alcohol advertisements has been associated with increased risk for alcohol use among youth (37,38). Youth around schools with 20% or more Hispanic students were five to twelve times more likely to see alcohol advertisements with cartoons or animals, therefore putting them at greater risk for alcohol use.

This study does have several limitations. We were not able to document how many students took a school bus to school from distant neighborhoods, which could limit their exposure to the alcohol advertising around the schools. However, schools in Chicago are primarily neighborhood schools, so this is of less concern than it might be in other large cities. Future research should include information on how youth travel to school to determine if youth who are driven or take the school bus to school are not as exposed to alcohol advertising as those youth who walk to school. Another limitation is that the theme of culture did include logos for local sports teams which were a majority of the culture advertisements. While not all youth are interested in sports, the linking of local sports team with alcohol brands does suggest an endorsement of the product which could lead to the belief among youth that local teams support alcohol use. Additionally, this analysis did not examine other potential confounding factors such as family or other environmental influences, future work should explore how these factors may be related to alcohol advertising. A final limitation was the small number of youth oriented advertisements as well as other advertising themes which may have decreased our ability to detect a difference in the prevalence of these advertisements by ethnicity of the school. Future work is needed which includes other types of advertisements, such as in-store and point of purchase advertising, which may increase the number of youth oriented advertisements.

Despite these limitations, the findings of this study suggest that Hispanic elementary and middle-school-aged youth are disproportionately targeted by alcohol advertising around schools. Restrictions are needed to prohibit alcohol advertising around schools as previous research has shown that exposure to alcohol advertising is associated with increased alcohol use and intentions to use (23-28). Special attention should be paid to the targeting of ethnic minorities by alcohol advertising. This is especially important as Hispanic youth are at higher risk of early onset of alcohol use as well as high risk alcohol use (7). The Hispanic community can learn from the experiences of the African American churches who led several successful campaigns to reduce environmental alcohol exposure to advertising in African American communities. Hispanic leaders should use their successful track record to advocate for reduced targeted alcohol advertisement in school and community areas with large Hispanic populations.

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**Table 1**  
Sensitivity Analysis of Cut Points by Ethnicity of Students in the Schools

| <b>Cut Point (% of Hispanic Students)</b> | <b>Number of Schools</b>                     |     |
|---|--|-----|
| 20%                                       | 27   | 36  |
| 30%                                       | 19   | 44  |
| 35%                                       | 17   | 46  |
| 50%                                       | 12   | 51  |
| <b>Cut Point (% of Hispanic Students)</b> | <b>Mean Number of Alcohol Advertisements</b> |     |
| 20%                                       | 28.6 <sup>*</sup>                            | 4.4 |
| 30%                                       | 35.1 <sup>*</sup>                            | 6.0 |
| 35%                                       | 36.2 <sup>*</sup>                            | 6.9 |
| 50%                                       | 39.8 <sup>*</sup>                            | 8.9 |

\* p<.05 for comparison of means between school types

Table 2  
 Characteristics of Alcohol Advertisements by Ethnicity of Students in the Schools\*

| Characteristic of Ad      | Total Number                                  |   |   | Mean Number                                   |   |   | t statistic | p-value | Ratio <sup>†</sup> |
|---------------------------|---|---|---|---|---|---|-------------|---------|--------------------|
|                           | # of Schools with >20% Hispanic Students n=27 | # of Schools with >20% Hispanic Students n=36 | # of Schools with >20% Hispanic Students n=27 | # of Schools with >20% Hispanic Students n=36 | # of Schools with >20% Hispanic Students n=27 | # of Schools with >20% Hispanic Students n=36 |             |         |                    |
| All Alcohol               | 771   | 160   | 28.6  | 4.4   | -3.89   | 0.0005  | 6.5:1       |         |                    |
| Bars                      | 263   | 37  | 9.7   | 1.0   | -5.00   | <0.0001                                       | 9.7:1       |         |                    |
| Billboards                | 11  | 20  | 0.4   | 0.6   | 0.76  | 0.45  |             |         |                    |
| Grocery/Convenience Store | 44  | 21  | 1.6   | 0.6   | -1.28   | 0.21  |             |         |                    |
| Liquor Store              | 373   | 58  | 13.8  | 1.6   | -2.43   | 0.02  | 8.6:1       |         |                    |
| Other Locations           | 77  | 24  | 2.9   | 0.7   | -2.28   | 0.03  | 4.1:1       |         |                    |
| Beer                      | 676   | 124   | 25.0  | 3.4   | -4.01   | 0.0004  | 7.4:1       |         |                    |
| Alcopop                   | 10  | 5   | 0.4   | 0.1   | -0.97   | 0.34  |             |         |                    |
| Distilled Spirits         | 88  | 22  | 2.4   | 0.6   | -1.72   | 0.10  |             |         |                    |
| Wine                      | 7   | 7   | 0.3   | 0.2   | -0.25   | 0.81  |             |         |                    |
| Culture                   | 143   | 8   | 5.3   | 0.2   | -3.07   | 0.005   | 26.5:1      |         |                    |
| Tradition/Heritage        | 10  | 4   | 0.2   | 0.1   | -0.86   | 0.40  |             |         |                    |
| Sexual Connotations       | 10  | 13  | 0.4   | 0.4   | -0.04   | 0.97  |             |         |                    |
| Cartoon                   | 30  | 8   | 1.1   | 0.2   | -2.37   | 0.02  | 5.5:1       |         |                    |
| Animal                    | 33  | 2   | 1.2   | 0.1   | -3.65   | 0.001   | 12.0:1      |         |                    |
| Femininity                | 6   | 12  | 0.2   | 0.3   | 0.72  | 0.48  |             |         |                    |
| Friendliness              | 11  | 4   | 0.4   | 0.1   | -1.32   | 0.20  |             |         |                    |
| Other Model Cue           | 14  | 2   | 0.5   | 0.1   | -2.00   | 0.06  |             |         |                    |
| Youth Oriented            | 26  | 15  | 1.0   | 0.4   | -1.48   | 0.15  |             |         |                    |

\* Table includes only those characteristics which appeared on at least 10 alcohol advertisements

<sup>†</sup> Ratio comparing mean number of ads around Hispanic and non-Hispanic schools for significant characteristics **Bolded** values represent statistically significant differences in mean number of ads per Hispanic school.