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Beverage- and Brand-Specific Binge Alcohol Consumption among Underage Youth in the U.S

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Abstract

Background and Objectives—Binge drinking is a common and risky pattern of alcohol consumption among youth; beverage and brand-specific consumption during binge drinking is poorly understood. The objective was to characterize beverage- and brand-specific consumption associated with binge drinking among underage youth in the U.S.

Methods—An internet panel was used to obtain a sample of 1,032 underage youth aged 13–20, who drank alcohol in the past 30 days. For each brand consumed, youth reported drinking quantity and frequency, and whether they engaged in binge drinking with that brand (≥ 5 drinks for males, ≥ 4 for females). Each youth reporting binge drinking with a brand constituted a binge drinking report.

Results—Overall, 50.9% of youth binge drank with ≥ 1 brand, and 36.5% of youth who consumed any particular brand reported binge drinking with it. Spirits accounted for 43.8% of binge drinking reports. Twenty-five brands accounted for 46.2% of binge drinking reports. Many of these brands were disproportionately associated with binge drinking relative to their youth market share.

Conclusions—Binge drinking among youth is most commonly involves spirits, and binge drinking is concentrated within a relatively small number of brands. Understanding factors underlying beverage and brand preference among binge drinking youth could assist prevention efforts.

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INTRODUCTION

Alcohol use among underage youth (i.e., those persons younger than the legal drinking age) and young adults is a considerable public health problem worldwide and in the U.S. (Hingson & White, 2014; Office of Juvenile Justice and Delinquency Prevention, 2005; U.S. Department of Health and Human Services, 2007). Binge drinking, also called “heavy episodic drinking,” accounts for most of the alcohol consumed by underage youth (Office of Juvenile Justice and Delinquency Prevention, 2005). The 2009 Youth Risk Behavior Survey found that 24% of high school students in the U.S. binge drank during the prior 30 days (Eaton et al., 2010). Of youth drinkers, over two thirds binge drink, and over a fifth do so frequently (Bonnie & O’Connell, 2004). Binge drinking is associated with drunk driving, risky sexual behavior, physical and sexual assaults, injuries, and suicide (U.S. Department of Health and Human Services, 2007). Developing effective interventions to reduce alcohol-related consequences and costs depends on having a better understanding of youth binge drinking and the factors that influence it.

In the U.S., the legal age for purchase and/or public possession of alcohol is 21 years of age; it is lower in most European countries. While much is known about binge drinking among underage youth in the U.S., (Cremeens, Miller, Nelson, & Brewer, 2009; Maldonado-Molina, Reingle, Tobler, & Komro, 2010; Moore & Werch, 2007; Naimi, Brewer, Miller, Okoro, & Mehrotra, 2007; Werch et al., 2006), little is known about the types of alcohol or brands that youth consume during binge drinking episodes. Identifying the types of alcohol and specific brands with which youth are binge drinking could inform the development of public health and prevention strategies to reduce alcohol-related harms among youth. Some alcohol policies are type-specific, so for example alcohol taxes could be raised on specific alcohol products (e.g., spirits) or on the basis of its alcohol content. Furthermore, understanding brand-specific associations with youth binge drinking might inform efforts to enforce or inform restrictions on marketing practices that may promote underage drinking..

BACKGROUND/LITERATURE

Moore and Werch conducted a two-year longitudinal study on beverage-specific alcohol consumption patterns for six types of beverages including wine, beer, liquor, flavored coolers, fortified wine, and malt liquor (Moore & Werch, 2007). They found that ninth graders (typically 14–15 years old) most commonly reported drinking flavored coolers during the past 30 days, but that students were increasingly likely to report drinking liquor and beer as they got older. In a later investigation, Werch et al. concluded that females consumed more flavored coolers than males and drank more wine when binge drinking, whereas males consumed greater quantities of beer and malt liquor (Werch, et al., 2006). Maldonado-Molina et al. found that among seventh graders (typically 12–13 years old) in Chicago, consumption of hard liquor was associated with increased risk for drunkenness (Maldonado-Molina, et al., 2010). Another study found that so-called “designer drinks” (e.g., fortified wines, flavored alcoholic beverages) were associated with heavier alcohol use and greater loss of control among youth drinkers (Hughes et al., 1997).

One study identified the specific brands of alcohol that youth consume during binge drinking episodes. Tanski et al conducted a cross-sectional survey of 2,699 adolescents, ages 16 to 20, representing all regions of the United States (Tanski, McClure, Jernigan, & Sargent, 2011). Overall, 68% named a favorite brand: of those 53% named a distilled spirit brand; 42% named a beer brand and 3.3% named a wine/cider brand. Those citing a beer or distilled spirits brand were more likely to be a recent binge drinker than those citing a wine/cider brand.

The Tanski study could not directly determine whether consumption of each resident's favorite brand actually involved binge drinking. In addition, the survey only inquired about each respondent's favorite brand, rather than all brands recently consumed. With a nationally representative sample of youth ages 13–20, the present study goes beyond that investigation to examine brand-specific alcohol use and how frequently consumption of each brand involved binge drinking.

METHODS

The methodology of our survey has been reported in detail previously (Siegel et al., 2013). A pre-recruited internet panel maintained by Knowledge Networks (Palo Alto, CA) was used to obtain a nationally representative sample of 1,032 underage youth ages 13–20 who had consumed at least one drink of alcohol in the past 30 days (Knowledge Networks, 2012). An online, self-administered survey assessed each of the brands of alcohol consumed by the respondents during the past 30 days. The Institutional Review Board of the Boston University Medical Center approved the protocol.

Youth Sample

Knowledge Networks maintains a pre-recruited panel of approximately 50,000 adults (including youth aged 18–20 years) who have agreed to be invited to participate in internet-based surveys (Knowledge Networks, 2012). Using this panel, Knowledge Networks recruited youth ages 13–17 and young adults ages 18–20 to participate in the survey. Panelists ages 18–20 received an email invitation directly. To identify respondents ages 13–17, older adult panelists indicated whether they had any children in this age group and, if so, whether they would grant permission to Knowledge Networks to approach one of them (randomly selected, as necessary) about participating. The email invitation did not indicate that the survey was related to alcohol consumption. All potential respondents who agreed to participate received an email with a link to a secure web site where a screening questionnaire determined if the person had consumed alcohol in the past 30 days and was thus eligible for the survey. Those who completed the survey had a \$25 gift credited to their Knowledge Networks account. For the older youth sample (ages 18–20), the overall response rate was 43.4%. For the younger youth sample (ages 13–17), the overall response rate was 44.4%.

Youth Alcohol Brand Survey

The internet-based survey instrument inquired about past 30-day consumption of 898 major brands of alcohol within 16 different alcoholic beverage types: 306 table wines, 132 beers,

86 vodkas, 77 cordials/liqueurs, 62 flavored alcoholic beverages (FABs), 54 rums, 33 tequilas, 29 whiskeys, 27 gins, 25 scotches, 23 bourbons, 15 brandies, 10 spirits-based energy drinks, 9 cognacs, 5 low-end fortified wines, and 5 grain alcohols. Descriptions and photographs of different types of alcohol is available at: http://www.syrupmagazine.com/what_it_is/what_alcohol.html.

We used the NIAAA definition of a U.S. standard drink, which contains 14 grams of ethanol (National Institute of Alcohol Abuse and Alcoholism, 2012). Thus, the survey defined a drink as a 12-ounce can or bottle of beer; a 5-ounce glass of wine or champagne; 4 ounces of low-end fortified wine; an 8.5-ounce flavored alcoholic beverage; an 8-ounce alcohol energy drink; a 12-ounce wine cooler; 8.5 ounces of malt liquor; 1.5 ounces of liquor (spirits or hard alcohol), whether in a mixed drink or as a shot; 2.5 ounces of cordials or liqueurs, whether in a mixed drink, a coffee drink, or consumed on their own; and 1 ounce of grain alcohol, whether in a mixed drink, punch, or as a shot.

Brand-Specific Alcohol Consumption, Market Share

For each brand, the survey ascertained the number of days on which it was consumed and the typical number of drinks consumed on those days. Data were recoded or “winsorized” for 12 respondents. Winsorization is the replacement of extreme values with a given, less-extreme value. In our data, the 99th percentile for maximum number of drinks per brand per day was 20. Thus, for each alcohol brand, the reported number of drinks per day was winsorized at 20. Differences in estimated market shares were similar with and without winsorization, and the top 25 brands by market share were identical.

We defined the *prevalence of past 30-day consumption* of each alcohol brand as the proportion of respondents who reported having consumed that brand in the past 30 days. To estimate *brand-specific consumption*, the number of days that respondents reported drinking a particular brand was multiplied by the typical number of drinks consumed during days it was consumed. The total number of drinks consumed by a respondent was calculated by summing drinks across all consumed brands. The *market share* for each brand was as the total drinks consumed of that brand among the entire youth sample, divided by the total number of drinks consumed by the entire youth sample (a proportion). To determine market share for each beverage types (e.g., spirits) or category (e.g., whiskey), market shares were summed for the brands within each beverage type or category.

Binge Drinking Measures

We defined *binge drinking* (“heavy episodic drinking”) for males as having five or more drinks in a row, and for females having four or more drinks in a row. For each brand they consumed, the survey asked the respondents whether they consumed that product at those levels one or more times during the past 30 days.

To assess brand-specific *binge drinking prevalence among youth*, the number of youth reporting binge drinking with a particular brand was divided by the number of youth in the entire sample. To assess *binge drinking prevalence among product consumers*, the number of youth who reported binge drinking with a particular brand was divided by the number of

youth who actually consumed that brand. To calculate these measures by beverage type or category (rather than by brand), the average value across all brands within a particular group was calculated after weighting each brand by the number of youth who consumed it.

Each respondent's report of binge drinking with a particular brand constituted a *binge drinking report*. The *proportion of binge drinking reports* for a beverage type, category, or brand was calculated by dividing the number of binge drinking reports for that type, category, or brand, respectively, by the total number of binge drinking reports among the entire youth sample.

To determine whether alcohol products were disproportionately consumed during binge drinking occasions relative to their overall market share, we calculated a *binge drinking report to market share ratio* by dividing the proportion of binge reports for any beverage type, category, or brand by its corresponding market share among youth respondents. A ratio of >1.0 indicates that the number of binge drinking reports was disproportionately large relative to its overall market share among the youth sample.

Weighting Procedures

Knowledge Networks applied weighting adjustments to account for selection probability, non-response to panel recruitment, and panel attrition. To make the data nationally representative, post-stratification adjustments based on demographic distributions from the Current Population Survey (CPS) conducted by the U.S. Bureau of the Census were made for gender, age, race/ethnicity, census region, household income, home ownership status, metropolitan area, and household size.

We conducted logistic regression to examine the odds of youth binge drinking with particular beverage categories (beer, spirits, FABs, wine) after controlling for respondent sex, age (13–15, 16–18, 19–20), race/ethnicity (white non-Hispanic, white Hispanic, Black non-Hispanic, other), and annual income (<\$15,000, \$15,000–39,999, \$40,000–99,999, and \$100,000).

RESULTS

Overall, 67.0% of all drinks consumed by underage youth were consumed during binge drinking occasions. Among all youth drinkers, 50.9% reported binge drinking with any (i.e., at least one) brand during the past 30 days (Table 1). By beverage type, 37.8% binge drank with at least one beer brand, 36.4% binge drank with at least one spirits brand, 24.5% with at least one and 10.8% binge drank with at least one wine brand. Among youth who consumed a particular alcohol type (i.e., as opposed to all youth), the prevalence of binge drinking for any brand within that beverage type was similar, ranging from 32.5% for beer brands to 38.4% for spirits brands. Among spirits categories, 18.8% of all youth reported binge drinking with vodka, the highest reported percentage in that category, but the greatest binge drinking prevalence among product consumers was found for brandy (65.3%) and bourbon whiskey (50.6%).

After weighting, there were 2,305 binge brand reports among the entire sample during the past 30 days, with a mean of 2.2 per youth, and a mean of 4.4 for each binge drinker. By beverage type, spirits accounted for 43.8% of binge reports, while also having the highest ratio of binge reports to youth market share (Table 1). Beer accounted for the second largest proportion of binge drinking reports (31.4%) but had the lowest binge reports to market share ratio. Within spirits, vodka accounted for the most binge reports (11.7% of all binge reports and 26.7% of all binge reports among spirits brands), while brandy and cognac had the highest ratios of binge reports to youth market share.

In logistic regression analyses to examine the adjusted odds of youth binge with particular beverage types, male sex and older age groups were risk factors for binge drinking with beer, spirits and wine. However, for FABs neither male sex nor older age were significant risk factors for binge drinking with FABs. By race, white non-Hispanics had significantly higher adjusted odds of binge drinking with beer compared with black non-Hispanics; conversely black non-Hispanics had significantly higher adjusted odds of binge drinking with FABs and wine compared with white non-Hispanics.

By brand, 11 of the top 25 brands by binge drinking prevalence were spirits brands, 8 were beer brands, 5 were FAB brands, and 1 was a wine brand (Table 2). Overall, 13.5% of all youth reported binge drinking with Bud Light in the past 30 days. Jack Daniels bourbon whiskey accounted for the second highest percentage of binge drinking among all youth, and also the second highest prevalence of consumption among product consumers. Of the five leading FAB brands, three had “parent” spirits brands that were also in the top 25 brands, including Jack Daniels (cocktails and whiskey), Smirnoff (malt beverages and vodka), and Bacardi (malt beverages and rum).

The top 25 binge brands accounted for 46.2% of all binge reports among the approximately 898 alcohol brands that were assessed in the survey, and the top 10 brands accounted for 28.5% of all binge reports (Table 2). Of the eight brands with a binge report to market share ratio ≥ 1.50 , seven were spirits brands and one (Four Loko) was an FAB. Those with the highest ratios included some brands that accounted for a relatively high proportion of binge reports (e.g., Jack Daniels whiskey), but also some brands that accounted for a relatively low proportion of binge reports and relatively low market shares (Hennessey cognac, E&J Gallo brandy). Among the nine brands with a binge report to market share ratio < 1.0 , five were beer brands, two were FAB brands, and one each were wine and spirits brands.

DISCUSSION

Although any drinking is associated with problems among youth, not all youth drinkers binge drink, and binge drinking is particularly risky for both youth and adults (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011; Centers for Disease Control and Prevention, 2012a, 2012b, 2012c; Miller, Naimi, Brewer, & Everett Jones, 2007; Siegel, Naimi, Creemens, & Nelson, 2011). This is the first study of binge drinking among underage youth that has examined the consumption of both alcoholic beverage types and specific brands. By beverage type, spirits had the highest prevalence of binge drinking among those who consumed spirits and accounted for the largest numbers of binge reports. The three leading

brands for youth binge drinking prevalence and binge drinking reports in the U.S. were Bud Light beer, Jack Daniels whiskeys, and Smirnoff malt beverages.

Our previous study of type- and brand-specific alcohol consumption among youth did not assess binge drinking (Siegel, et al., 2013). The increased risk associated with binge drinking warranted this study, and our results specific to binge drinking and binge drinkers differed in several important respects compared with the previous study of general alcohol consumption among youth. For example, while beer was the most popular beverage type consumed among all youth drinkers, spirits were most likely to be consumed during binge drinking. In this study, the top 25 binge brands (out of approximately 900 assessed brands) accounted for 46.2% of all binge reports, while for overall youth consumption the 25 leading brands accounted for 41.8% of youth consumption. This suggests that youth binge drinking is similarly or slightly more brand-concentrated compared with youth drinking generally. In terms of brand-level consumption, since overall market share affects the availability of alcohol for use in binge drinking, it was also important to use measures to identify brands that were disproportionately likely to be consumed during binge drinking. Although there was overlap between brands that were most commonly consumed generally versus during binge drinking (e.g., Bud Light), some brands that were popular with youth binge drinkers were not among the most popular among youth generally (e.g., E&J Gallo brandy), and others that were very disproportionately consumed during binge drinking relative to their youth market share (e.g., Patron tequilas).

Although being a “binge brand” may also be a function of a brand having a high market share among adults (since most alcohol consumed by youth is obtained from adults), we also identified a number of leading youth binge brands that are rarely consumed by adults (e.g. Four Loko). While low price may be a factor accounting for the high rate of binge drinking for some brands (e.g., Keystone Light, UV vodka), some of the leading binge brands are relatively expensive (e.g., Jack Daniels bourbon whiskey, Hennessy cognac). Future research can examine which consumer- and product-specific factors, including alcohol marketing, may account for youth brand preferences generally and binge drinking in particular.

Assessing alcohol consumption by type, in addition to brand, is also important since beer, spirits and wine are subject to different policies in terms of taxation, distribution, hours of sale, and marketing self-regulation (National Institute of Alcohol Abuse and Alcoholism, 2013). This study demonstrated that the increased youth consumption of spirits noted over the past decade (Cremeens, et al., 2009; Roeber & al., 2007; Siegel, et al., 2011) also applies to binge drinking. As a result, the binge drinking prevalence for spirits was approximately equal to that of beer, and spirits accounted for the largest proportion of binge drinking reports, had the highest binge reports/market share ratio, and had the greatest number of brands represented in the top 25 youth binge brands.

Although findings from this study pertain primarily to the U.S., the findings may be applicable in other countries as well, particularly given the consolidation of alcohol producers and resulting international conglomerates that are likely to engage in similar transnational marketing and pricing strategies. To reduce binge drinking and related

problems among youth, policy makers in the U.S. should consider preferentially raising taxes on spirits and/or alcohol products with high alcohol content, since spirits account for most binge drinking among youth in the U.S.. Furthermore, stronger policies and surveillance efforts pertaining to alcohol marketing practices that can increase consumption among youth (i.e., the placement of advertisements in media venues with large numbers of proportions of underage audiences, advertising content that promotes binge drinking) are warranted in the U.S. and elsewhere (Babor et al., 2010).

Flavored alcoholic beverages (FABs), another other type of alcohol with emerging popularity among youth (Center on Alcohol Marketing and Youth, 2006; Siegel, et al., 2011), were well-represented in the list of binge brands. About one-quarter of youth reported binge drinking with an FAB during the past 30 days, and FABs accounted for five of the top 25 brands for both binge drinking prevalence and binge reports. The fact the adjusted odds of binge drinking with FABs were not higher among males and older youth (as was the case with other beverage types) emphasizes that FAB flavorings – which are often sweet and based on fruit flavors -- are particularly appealing to novice drinkers such as girls and younger adolescents. The finding that three of the five most popular FAB products were linked by name to spirits brands, which were also among the top 25 brands, does underscore concerns that FAB products are marketed to foster parent brand loyalty that can carry over when youth transition to consuming more spirits as they age (Center on Alcohol Marketing and Youth, 2007; The Center on Alcohol Marketing and Youth, 2010).

Our findings also affirm that binge drinking remains the predominant pattern of youth drinking. In our study, we found that two-thirds of all youth drinks were consumed during binge drinking occasions. Among youth drinkers, slightly more than half reported binge drinking with at least one brand, and on average, among youth who consumed any particular brand, over one-third reported binge drinking with it at least once. On a per capita basis, youth drinkers reported binge drinking with approximately two brands; binge drinkers alone did so with approximately four brands.

Several limitations of the study should be noted. Since youth were not asked about how many times they binge drank with a particular brand, we were unable to assess the exact proportion of drinking episodes that involved binge drinking. For this reason, the “binge reports” measure generated from our sample refers to the *number of youth* who reported binge drinking with a particular brand, rather than the *number of binge drinking episodes* attributable to that brand. This means that the ratio of binge drinking reports to youth market share could differ from the ratio of binge drinking episodes to youth market share. Even though this is the largest survey of youth brand consumption to date, the limited sample size of youth who consumed any particular brand means that findings for any particular brand should be interpreted with caution. The response rate of the survey or its mode of delivery (via the internet) introduces the possibility of bias relative to all youth who consume alcohol. However, while this may affect point estimates for the amount of alcohol consumed or the frequency of binge drinking among respondents, there is no evidence to suggest a bias related to brand preference. Finally, our definition of binge drinking is conservative in terms of estimating when youth drink to the point of legal intoxication, since youth have lower

body masses compared with adults and may drink more rapidly than typical adults (Bonnie & O'Connell, 2004).

CONCLUSION

Despite these limitations, this report affirms the ascendance of spirits in youth binge drinking, demonstrates that youth binge drinking is concentrated among a relatively small number brands, and shows that particular alcohol brands are disproportionately consumed during binge drinking occasions, even after accounting for their overall consumption prevalence or their youth market share. Determining what factors account for the beverage- and brand-specific variability in binge drinking will be a focus of future research.

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Table 1Binge drinking¹ by alcoholic beverage type and category, past 30 days, Youth Alcohol Brand Survey, 2012

Alcoholic Beverage Type, Category	Binge Prevalence, All Youth ² (95% CI)	Binge Prevalence, Product Consumers ³	Proportion of Binge Reports ⁴ (%)	Binge Reports: Market Share Ratio ⁵
Any brand	50.9 (45.9–55.9)	36.5	100.0	1.00
Any Beer brand	37.8 (32.9–42.9)	35.0	31.4	0.74
Any FAB brand	24.5 (20.2–28.8)	36.3	18.6	1.16
Any Spirits brand	36.4 (31.4–41.4)	38.4	43.8	1.22
Any Wine brand	10.8 (7.6–14.0)	32.5	6.2	1.09
<i><u>Spirits Category</u></i>				
AEDs	4.4 (2.5–6.4)	35.3	2.2	0.67
Bourbon whiskey	10.1 (6.9–13.4)	50.6	5.6	1.24
Brandy	4.3 (1.9–6.6)	65.3	2.4	2.18
Cognac	3.3 (1.5–5.2)	36.7	1.6	2.00
Cordials, Liqueurs	3.5 (2.1–4.9)	24.1	2.0	0.83
Gin	3.3 (2.1–4.6)	27.5	1.6	1.60
Grain alcohol	2.4 (1.0–3.7)	35.1	1.2	1.59
Rum	12.4 (9.1–15.8)	42.2	7.6	1.46
Scotch whiskey	1.8(0.7–2.8)	31.5	0.9	1.29
Tequila	10.3 (7.3–13.3)	39.5	5.4	1.50
Vodka	18.8 (14.7–22.9)	35.8	11.7	1.05
Whiskey, other	2.8 (1.3–4.2)	35.6	1.7	1.21
<i><u>Wine Category</u></i>				
Table wine	10.3 (7.1–13.5)	32.3	5.3	1.02
Fortified wine	1.9 (0.9–2.9)	33.5	0.9	1.80

Notes:

¹ Binge drinking (heavy episodic drinking) was defined having had 5 or more drinks (males) or 4 or more drinks (females) at least once in the past 30 days.

² Percent of the entire youth sample who reported binge drinking at least once with any brand within a particular alcohol type (e.g., spirits) or category (e.g., whiskey), weighted by the number of youth who consumed each brand.

³ Percent of youth who consumed any brand within a particular alcohol type (e.g. spirits) or category (e.g., whiskey) who reported binge drinking, weighted by the number of youth who consumed each brand.

⁴ Each youth who reported binge drinking one or more times with a particular brand constituted a binge drinking report; youth could report binge drinking with multiple brands. The proportion of binge reports is the number of binge reports for a beverage type or category divided by the total number of binge drinking reports for the entire youth sample.

⁵ This ratio is the proportion of binge reports accounted for by a particular alcohol type (e.g., spirits) or category (e.g., whiskey) divided by its overall market share (i.e., percent of all drinks consumed) among the entire youth sample. A ratio of > 1.0 means that for a particular alcohol type or category the number of binge drinking reports is disproportionately large relative to its market share.

Table 2

Binge drinking¹ characteristics among top 25 youth alcohol brands based on binge drinking prevalence, past 30 days, Youth Alcohol Brand Survey, 2012

Rank/Brand	Type of Alcohol	Binge Prevalence, All Youth ² (95% CI)	Binge Prevalence, Product Consumers ³	Proportion of Binge Reports ⁴ (%)	Binge Reports: Market Share Ratio ⁵
1. Bud Light	Beer	13.5 (10.1–17.0)	48.6	6.0	0.94
2. Jack Daniel's bourbons	Bourbon	7.0 (3.9–10.0)	60.9	3.1	1.94
3. Smimoff malt beverages	FAB	6.8 (4.0–9.5)	40.0	3.0	1.00
4. Budweiser	Beer	6.5 (4.0–9.0)	44.4	2.9	0.97
5. Coors Light	Beer	6.1 (3.3–8.9)	48.0	2.7	1.35
6. Smimoff vodkas	Vodka	5.6 (3.2–8.1)	44.2	2.5	1.79
7. Corona Extra	Beer	5.0 (2.8–7.2)	44.1	2.2	1.10
8. Captain Morgan rums	Rum	4.5 (2.2–6.8)	43.2	2.0	1.43
9. Heineken	Beer	4.5 (2.2–6.8)	46.0	2.0	1.11
10. Bacardi rums	Rum	4.4 (2.3–6.5)	47.3	2.0	1.54
11. Four Loko	FAB	3.5 (2.0–5.0)	57.8	1.6	1.78
12. Mike's	FAB	3.4 (1.9–5.0)	31.8	1.5	0.79
13. Keystone Light	Beer	3.3 (1.1–5.5)	55.2	1.5	0.75
14. Grey Goose vodkas	Vodka	3.0 (1.1–4.8)	43.9	1.3	0.72
15. UV vodkas	Vodka	3.0 (1.5–4.4)	57.9	1.3	1.63
16. Miller Lite	Beer	2.8 (1.4–4.1)	36.9	1.2	0.52
17. Jose Cuervo tequilas	Tequila	2.7 (1.5–3.9)	33.7	1.2	1.33
18. Patron tequilas	Tequila	2.7 (0.9–4.5)	48.8	1.2	2.00
19. Bacardi malt beverages	FAB	2.6 (1.2–4.0)	32.4	1.2	1.33
20. Natural Light	Beer	2.3 (0.4–4.3)	58.5	1.0	0.48
21. Barefoot wines	Wine	2.3 (0.8–3.7)	51.6	1.0	0.77
22. Hennessy cognac	Cognac	2.2 (0.6–3.8)	38.7	1.0	2.50
23. E & J Gallo brandy	Brandy	2.2 (0.5–3.8)	77.1	1.0	2.50
24. Jack Daniel's cocktails	FAB	2.1 (0.9–3.3)	47.9	0.9	0.90
25. Malibu rums	Rum	2.1 (0.6–3.6)	33.7	0.9	1.29

Notes:

¹ Binge drinking (heavy episodic drinking) was defined having had 5 or more drinks (males) or 4 or more drinks (females) at least once in the past 30 days.

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² The percent of the entire youth sample who reported binge drinking at least once with a particular brand.

³ Percent of youth who consumed a particular brand who reported binge drinking with it.

⁴ Each youth who reported binge drinking one or more times with a particular brand constituted a binge drinking report; youth could report binge drinking with multiple brands. The proportion of binge reports is the number of binge reports for a brand divided by the total number of binge reports for the entire youth sample.

⁵ This ratio is the proportion of binge reports accounted for by a particular brand divided by its overall market share (i.e., percent of all drinks consumed) among the entire youth sample. A ratio of > 1.0 means that for a particular brand the number of binge drinking reports is disproportionately large relative to that brand's market share.