



Request # 36658721

SEP 26, 2014

Email (PDF) To: lib-illmed@health.ufl.edu

University of Florida

Health Science Center Library

Document Delivery Department

1600 SW Archer Rd.

Gainesville, FL 32610-0206



DOCLINE: Journal Copy EFTS Participant

Title: Journal of studies on alcohol and drugs
Title Abbrev: J Stud Alcohol Drugs
Citation: 2014 Sep;75(5):753-7
Article: Use of alcohol mixed with energy drinks as a predictor of al
Author: Patrick M;Evans-Polce R;Maggs J
NLM Unique ID: 101295847 Verify: PubMed
PubMed UI: 25208192
ISSN: 1937-1888 (Print) 1938-4114 (Electronic)
Fill from: **Any format**
Publisher: Alcohol Research Documentation, Inc., Rutgers, The State
Uni, Piscataway, NJ :
Copyright: Copyright Compliance Guidelines
Authorization: tucc0002
Need By: N/A
Maximum Cost: **\$25.00**
Patron Name: Striley, Catherine - TN: 820874
Referral Reason: Lacking
Library Groups: **CONBLS**
Phone: 1.352.273-8447
Fax: 1.352.392-6803
Email: lib-illmed@health.ufl.edu
Odyssey: 206.107.42.23/FUH
Alt Delivery: Email(PDF),Fax,Mail,Odyssey,Web(PDF)
Comments: **Conbls, refer on; No HTML copy; We no longer use Ariel.**
Routing Reason: Routed to SCUSCR in Serial Routing - cell 2
Received: Sep 26, 2014 (08:41 AM ET)
Lender: University of South Carolina/ Columbia/ SC USA (SCUSCR)

This material may be protected by copyright law (TITLE 17,U.S. CODE)

Bill to: FLUFLO

University of Florida

Health Science Center Library/Document Delivery Dept

PO Box 100206 / 1600 SW Archer Rd.

Gainesville, FL 32610-0206

Use of Alcohol Mixed With Energy Drinks as a Predictor of Alcohol-Related Consequences Two Years Later

MEGAN E. PATRICK, PH.D.,^{a,*} REBECCA J. EVANS-POLCE, PH.D.,^b AND JENNIFER L. MAGGS, PH.D.^c

^a*Institute for Social Research, University of Michigan, Ann Arbor, Michigan*

^b*Methodology Center and Prevention Research Center, Pennsylvania State University, State College, Pennsylvania*

^c*Department of Human Development and Family Studies, and Prevention Research Center, Pennsylvania State University, University Park, Pennsylvania*

ABSTRACT. Objective: This study examines the use of alcohol mixed with energy drinks (AmED) as a predictor of alcohol problems and alcohol-related consequences and accidents two years later in a college student sample. **Method:** Longitudinal data on AmED use, alcohol consequences, and alcohol problems were collected from the fall of students' second year of college to the fall of their fourth year ($N = 620$, 49% male). **Results:** After we controlled for demographic indicators and heavy episodic drinking, AmED use was a consistent predictor of negative alcohol-related outcomes 2 years later. Compared with no AmED use, both infrequent (i.e., one to three times per month) and frequent

(i.e., one or more times per week) AmED use were associated with an increased risk of negative alcohol consequences and harmful/hazardous alcohol use (≥ 8 on Alcohol Use Disorders Identification Test [AUDIT]). Frequent AmED use was also associated with serious alcohol problems (≥ 16 on AUDIT) and an increased risk of alcohol-related accidents in the subsequent 2 years. **Conclusions:** Prospective risks of alcohol consequences related to AmED use suggest a continued need for research and policy to address the surveillance, etiology, and prevention of AmED use. (*J. Stud. Alcohol Drugs*, 75, 753–757, 2014)

THE CONSUMPTION OF ALCOHOL MIXED WITH energy drinks (AmED) has received increased public and research attention as AmED use has become more prevalent in recent years, particularly among young people (Reissig et al., 2009). About one quarter of college students reported use of AmED in the past month (Brache and Stockwell, 2011; Miller, 2008; O'Brien et al., 2008). Public health concern centers on the potentially dangerous consequences of combining highly caffeinated energy drinks with alcoholic beverages, leading to immediate risks such as alcohol-related injury, and delayed, chronic risks such as substance dependence (Reissig et al., 2009). Amid growing concern, the U.S. Food and Drug Administration (FDA) took action against sales of premixed AmED in November 2010, labeling caffeine, when added to malt alcoholic beverages, an "unsafe food additive" and in violation of the Federal Food, Drug, and Cosmetic Act (U.S. FDA, 2010). The FDA effectively prohibited the sale of premixed AmED (Arria and O'Brien, 2011), although premixed drinks represent a small portion of AmED consumption. AmED use continues (Arria

and O'Brien, 2011; Howland et al., 2011), and drinkers can order them in bars (Rossheim and Thombs, 2011) and mix their own privately.

Evidence from laboratory experiments and survey research supports the concern about adding energy drinks to alcohol. AmED users may partially mask the perceived depressive effect of alcohol with the stimulant effect of highly concentrated caffeine, so that users with the same blood alcohol concentration report subjectively less intoxication (Ferreira et al., 2006; Marczyński and Fillmore, 2006; Marczyński et al., 2011). Survey research has shown that AmED use is associated with consuming greater quantities of alcohol (Arria et al., 2011; O'Brien et al., 2008; Patrick and Maggs, 2014), drinking for longer periods (Thombs et al., 2010), and intending to drive home after drinking (Thombs et al., 2010). Therefore, AmED use has the potential to lead to negative public health consequences above and beyond those associated with heavy alcohol consumption for individuals (e.g., blacking out, alcohol poisoning) and communities (e.g., exposing the public to impaired driving).

Long-term consequences of AmED consumption may include negative impact on school, work, and social relationships; increased risk of hazardous drinking and symptoms of alcohol abuse and dependence; and physical consequences such as accidents. Caffeine intake and caffeine dependence are associated with dependence on other substances, and further research is needed to determine whether caffeine acts as a gateway to long-term alcohol problems (see Reissig et al., 2009, for a review). Cross-sectional survey research has demonstrated concurrent links between AmED use and greater alcohol use and consequences among college stu-

Received: February 27, 2014. Revision: May 8, 2014.

Grants from the National Institute on Alcohol Abuse and Alcoholism and the National Institute on Drug Abuse funded the data collection (R01 AA019606 to Jennifer L. Maggs) and the preparation of this manuscript (R21 AA021426 to Megan E. Patrick, T32 DA017629 to Mark T. Greenberg, and P50DA010075 to Linda M. Collins). The content here is solely the responsibility of the authors and does not necessarily represent the official views of the sponsors.

*Correspondence may be sent to Megan E. Patrick at the Institute for Social Research, University of Michigan, 426 Thompson St., Ann Arbor, Michigan 48106-1248, or via email at: meganpat@umich.edu.

dents (Brache and Stockwell, 2011; O'Brien et al., 2008; Price et al., 2010; Velazquez et al., 2012). Longitudinal studies are needed to test more rigorously whether consuming AmED predicts subsequent alcohol consequences (Arria et al., 2011; Miller, 2008). One survey found that patterns of AmED use and positive attitudes toward AmED were associated with greater alcohol use and consequences the following semester (Varvil-Weld et al., 2013). Links between energy drink use and symptoms of alcohol dependence have also been documented (Arria et al., 2011), although that study did not examine AmED use. Understanding the extent to which AmED use prospectively predicts alcohol-related problems is a necessary step toward developing potential prevention and intervention strategies and regulations governing the marketing and contents of energy drinks.

Current study

The current study prospectively examined alcohol-related outcomes associated with AmED use among college students. The primary aim was to investigate the extent to which AmED use in the past month was associated with alcohol-related consequences, symptoms of alcohol-related problems, and alcohol-related accidents over the following 2 years.

Method

Sample

Participants were part of the University Life Study, a web-based, longitudinal study of undergraduate students at a large public university (e.g., Patrick and Maggs, 2011, 2014). Eligible participants were first-year, first-time, full-time students who had graduated from high school the previous spring, were U.S. citizens or permanent residents, and lived within 25 miles of campus. Stratified random sampling was used to achieve a diverse sample of students with respect to gender (49% male) and race/ethnicity (25% Hispanic, 23% Asian/Pacific Islander non-Hispanic, 16% Black non-Hispanic, 27% White non-Hispanic, and 9% non-Hispanic and more than one race). During the first week of the first semester of classes, recruitment letters with a pen and \$5 were sent to selected students. Email invitations followed with a secure link to the web-based survey. Baseline surveys were completed in fall 2007 when participants were in their first semester of their first year of college, with additional surveys each subsequent semester of college until fall 2010 (i.e., their fourth year). Questions regarding AmED use were added at the third semester (hereafter, fall 2008). Of the 744 students who gave informed consent and completed a baseline survey (66% response rate), 87% ($n = 649$) were followed up in fall 2008, 83% ($n = 620$) in fall 2009, and 82% ($n = 608$) in fall 2010.

The current analyses included individuals with complete data on modeled variables; sample sizes varied because of missing data on outcome variables (analytic sample $ns = 544-620$). In fall 2008, the mean age was 19.49 ($SD = 0.43$) years, and 13% participated in a fraternity or sorority. The study was approved by the university's institutional review board and protected by a federal Certificate of Confidentiality.

Measures

Use of alcohol mixed with energy drinks. In fall 2008, all individuals who reported any alcohol use in the past 30 days were asked, "During the last 30 days (1 month), how often did you have a high-energy drink with alcohol (e.g., Red Bull + vodka, or a pre-mixed drink)?" with response options on a 9-point scale from *never in my life* to *every day*. Responses were categorized into three AmED groups: never, including alcohol abstainers; infrequent AmED use, defined as one to three times in the past month; or frequent AmED use, defined as one or more times per week.

Alcohol consequences. In fall 2010, the Rutgers Alcohol Problem Index (RAPI; White and Labouvie, 1989) was used to assess drinking consequences. Students were asked to report the frequency of various problems with drinking in the past 12 months (e.g., "caused shame or embarrassment to someone," "kept drinking when you promised yourself not to"). Each of the 18 items was dichotomized into never (score of 0) versus one or more times (score of 1) and these scores were summed, similar to summing in other studies demonstrating good construct validity (Cohn et al., 2011; Neal et al., 2006). Those who did not report consuming any alcohol in the past 12 months were coded as having 0 alcohol consequences. Internal consistency was strong ($\alpha = .90$). A cutoff score of ≥ 8 distinguished those with problematic alcohol use (Neal et al., 2006).

Harmful/hazardous alcohol use and serious alcohol problems. In fall 2010, the Alcohol Use Disorders Identification Test (AUDIT) was used to assess harmful/hazardous alcohol use (Babor et al., 2001). The AUDIT is a 10-item questionnaire developed by the World Health Organization with responses to each question ranging from *never* (0) to ≥ 4 *times per week* (4); responses were summed. A cutoff score of ≥ 8 was used for harmful/hazardous use and ≥ 16 for serious alcohol problems (Babor et al., 1989, 2001).

Alcohol-related accidents. In fall 2009, spring 2010, and fall 2010, participants indicated whether they had experienced any of six accidents/events in the past 12 months ("been in a car accident [as a passenger or driver]," "had a minor injury," "had a serious injury," "been hospitalized," "had surgery," or "had problems with the police") and, if yes, whether alcohol was involved. Based on response patterns at the three waves, individuals were dichotomized into those who reported any accident involving alcohol in the 2 years before fall 2010 versus none.

Controls. Gender, age (in years), and race/ethnicity were included as demographic control variables. Five race/ethnicity categories were used for analyses: Hispanic, Asian/non-Hispanic, Black/non-Hispanic, White/non-Hispanic (reference group), and multiracial/non-Hispanic. Sorority/fraternity involvement indicated whether individuals participated in sorority/fraternity activities that semester. Participants were asked whether they consumed any alcohol in the past 30 days and their frequency of consuming five (four if female) or more drinks in a 2-hour period in the past 30 days (Wechsler and Austin, 1998; Wechsler and Nelson, 2001). Responses from these two questions were used to categorize participants into three heavy episodic drinking groups: nondrinkers, non-heavy episodic drinkers, or heavy episodic drinkers. Stata 12 was used for all statistical analyses (StataCorp, 2011).

Results

Descriptive statistics. In fall 2008, when the sample was in the second year of college, more than half (58%) reported heavy episodic drinking, one sixth (16%) drank alcohol but did not engage in heavy episodic drinking, and about one fourth (26%) did not drink, each in the prior 30 days. Approximately one fourth (26%) reported some AmED use in the prior 30 days. Among students who used AmED in the past month, 29% reported frequent use. Among heavy episodic drinkers, 58% did not use AmED, 30% used AmED infrequently, and 13% used AmED frequently in the past month. In fall 2010 (fourth year), significant negative alco-

hol consequences as indicated by a RAPI score of ≥ 8 were reported by 10% of participants; almost half (46%) met criteria for harmful/hazardous alcohol use with an AUDIT score ≥ 8 , and about 7% met criteria for more serious alcohol problems with a score ≥ 16 . Last, 10% of students reported having an alcohol-related accident between their second and fourth years of college.

Alcohol consequences (RAPI). As shown in Table 1, infrequent and frequent AmED use, compared with nonuse, were associated with significantly higher odds of reporting negative consequences on the RAPI (score of ≥ 8). There were no differences based on gender, race/ethnicity, age, sorority/fraternity involvement, or heavy episodic drinking.

Harmful/hazardous use and serious alcohol problems (AUDIT). Infrequent and frequent AmED use, compared with nonuse, were associated with greater odds of harmful/hazardous alcohol use (AUDIT ≥ 8), and frequent AmED use was also associated with greater odds of serious problems (AUDIT ≥ 16). Infrequent AmED use did not predict serious problems. Control variables indicated that men were more likely to report harmful/hazardous use and serious problems than women were. Students who identified as Asian (compared with White) were less likely to report harmful/hazardous use. Those with sorority/fraternity involvement (compared with noninvolvement) were more likely to report harmful/hazardous use but not more likely to report serious alcohol problems. Heavy episodic drinkers (but not non-heavy episodic drinkers) were more likely than nondrinkers to experience harmful/hazardous use and serious alcohol problems.

TABLE 1. Predicting alcohol consequences, harmful/hazardous drinking, serious alcohol problems, and alcohol-related accidents 2 years later: Logistic regression

Variable	Alcohol consequences (RAPI ≥ 8) (<i>n</i> = 544)		Harmful/hazardous alcohol use (AUDIT ≥ 8) (<i>n</i> = 571)		Serious alcohol problems (AUDIT ≥ 16) (<i>n</i> = 571)		Alcohol-related accidents (<i>n</i> = 620)	
	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]
AmED use (past 30 days)								
None	Ref.		Ref.		Ref.		Ref.	
Infrequent, 1–3 times/month	2.51*	[1.24, 5.11]	2.24**	[1.31, 3.81]	1.77	[0.79, 4.00]	1.49	[0.76, 2.94]
Frequent, ≥ 1 times/week	3.20*	[1.32, 7.76]	2.22*	[1.03, 4.78]	3.40*	[1.27, 9.14]	3.35**	[1.49, 7.53]
Male gender	1.15	[0.63, 2.12]	1.66*	[1.11, 2.47]	2.61*	[1.22, 5.99]	1.42	[0.80, 2.51]
Race/ethnicity								
White non-Hispanic	Ref.		Ref.		Ref.		Ref.	
Black non-Hispanic	1.35	[0.50, 3.67]	0.60	[0.32, 1.13]	0.19	[0.02, 1.54]	1.19	[0.45, 3.09]
Hispanic	0.99	[0.45, 2.19]	0.80	[0.47, 1.34]	0.96	[0.41, 2.24]	1.46	[0.71, 2.98]
Asian/HPI non-Hispanic	1.31	[0.57, 2.99]	0.29**	[0.16, 0.51]	0.85	[0.32, 2.24]	0.70	[0.29, 1.70]
Multiracial non-Hispanic	0.62	[0.16, 2.32]	0.93	[0.45, 1.93]	0.47	[0.10, 2.25]	0.97	[0.33, 2.85]
Age in years	1.05	[0.51, 2.13]	0.85	[0.53, 1.38]	0.58	[0.24, 1.43]	0.84	[0.42, 1.68]
Sorority/fraternity involvement	2.00	[0.96, 4.18]	1.93*	[1.02, 3.64]	1.34	[0.57, 3.16]	1.03	[0.48, 2.21]
Alcohol use (past 30 days)								
Nondrinker	Ref.		Ref.		Ref.		Ref.	
Non-heavy episodic drinker	1.68	[0.51, 5.52]	1.58	[0.83, 3.00]	0.92	[0.08, 10.61]	1.26	[0.37, 4.32]
Heavy episodic drinker	2.33	[0.86, 6.30]	5.43**	[3.19, 9.23]	5.76*	[1.24, 26.73]	2.87*	[1.11, 7.42]

Notes: RAPI = Rutgers Alcohol Problem Index; AUDIT = Alcohol Use Disorders Identification Test; AmED = alcohol mixed with energy drinks; OR = odds ratio; CI = confidence interval; ref. = reference group; HPI = Hawaiian or Pacific Islander.

p* < .05; *p* < .01.

Alcohol-related accidents. Frequent AmED use, compared with nonuse, was associated with greater odds of having an alcohol-related accident in the subsequent 2 years. Infrequent AmED use was not associated with accidents. There were no differences by gender, race/ethnicity, age, or fraternity/sorority involvement. Heavy episodic drinkers, but not non-heavy episodic drinkers, were more likely than nondrinkers to have had an alcohol-related accident.

Discussion

The emergence of new products that—when consumed with alcohol—potentially increase the risk for negative alcohol-related consequences is troubling (Reissig et al., 2009). AmED rates observed in this college sample corroborate previous findings, indicating that approximately one quarter of U.S. college students report AmED use during the prior 30 days (Brache and Stockwell, 2011; Miller, 2008; O'Brien et al., 2008). In addition, we document prospective associations between AmED use and alcohol consequences, alcohol problems, and accidents over 2 years. Both frequent and infrequent AmED users had a greater likelihood of experiencing negative alcohol-related consequences and of reaching thresholds for harmful/hazardous alcohol use. Frequent AmED users were also more likely to report serious alcohol problems and alcohol-related accidents.

Questions about underlying mechanisms, which should be addressed in future studies, are important because distinct causes or processes linking AmED use and subsequent problems might have distinct implications for policy. First, consuming caffeine with alcohol may alter the subjective rewards experienced by the drinker (Peacock et al., 2012), thus increasing alcohol use both in the moment and across time. Second, the observed links may reflect preexisting differences among people (Howland and Rohsenow, 2013; Peacock et al., 2012). Heavier drug users are different from lighter drug users and nonusers in many ways, including sensation seeking, deviance proneness, coping motivations, and other characteristics (Hawkins et al., 1992). It is possible that the increased likelihood of negative outcomes results, at least in part, from tendencies for risk taking or other third variables. Third, the causal links between alcohol use, caffeine consumption, and consequences may be reciprocal or mutually reinforcing; these potential links between caffeine and alcohol dependence require additional research (Reissig et al., 2009). AmED use is associated with consuming higher quantities of alcohol and spending longer periods of time drinking (Arria et al., 2011; O'Brien et al., 2008; Patrick and Maggs, 2014; Thombs et al., 2010), which may also directly increase the likelihood of alcohol tolerance and dependence.

Future research should strategically examine these and other potential underlying mechanisms explaining observed links between AmED use and alcohol-related consequences. Research could expand our understanding of AmED use by

investigating the age and sequence of initiation for energy drinks and their consumption with alcohol, as well as motivations and subjective rewards (e.g., taste, alertness, lower subjective intoxication) for combining them. In addition, public health research could address the effects of advertising, risk perceptions, and personal experience on building intentions to use over time.

The contribution of this study should be considered in light of its strengths and limitations. Strengths include the longitudinal data following a multiethnic college sample across 2 years. Limitations include the single-cohort study from one university, which limits generalizability. In addition, the AmED measure did not account for consuming energy drinks and alcohol in separate containers but on the same occasion, nor did we collect information on full dietary intake, including other types of caffeine consumption.

These findings raise numerous implications for research and policy. They suggest that assessing AmED use may have clinical utility as a part of screening measures to detect risk for future alcohol problems. Given the increased risk of alcohol-related problems and accidents, more epidemiological and experimental research on the predictors and consequences of pairing high-caffeine and alcoholic beverages is clearly warranted (see also Howland and Rohsenow, 2013). Strategies to reduce AmED use in licensed establishments could include regulations or agreements to not offer bar specials that combine caffeine with alcohol, limit AmED sales per person, or avoid all recipes that combine these substances. Students, adolescents, parents, teachers, physicians, and others require basic information about the potential dangers of mixing alcohol with energy drinks. Educational efforts, although rarely sufficient for behavior change, may be boosted by improved labeling regarding caffeine content of beverages, as is required for over-the-counter products containing caffeine (Reissig et al., 2009). Finally, already efficacious skills-based and motivational feedback intervention programs for reducing problem alcohol use among college students could be augmented to address AmED use (e.g., Larimer and Currence, 2007).

References

- Arria, A. M., Caldeira, K. M., Kasperski, S. J., Vincent, K. B., Griffiths, R. R., & O'Grady, K. E. (2011). Energy drink consumption and increased risk for alcohol dependence. *Alcoholism: Clinical and Experimental Research*, 35, 365–375.
- Arria, A. M., & O'Brien, M. C. (2011). The "high" risk of energy drinks. *Journal of the American Medical Association*, 305, 600–601.
- Babor, T. F., De la Fuente, J. R., Saunders, J. B., & Grant, M. (1989). *AUDIT—The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care*. Geneva, Switzerland: World Health Organization.
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for use in primary care* (2nd ed.). Geneva, Switzerland: World Health Organization.

- Brache, K., & Stockwell, T. (2011). Drinking patterns and risk behaviors associated with combined alcohol and energy drink consumption in college drinkers. *Addictive Behaviors, 36*, 1133–1140.
- Cohn, A. M., Hagman, B. T., Graff, F. S., & Noel, N. E. (2011). Modeling the severity of drinking consequences in first-year college women: An item response theory analysis of the Rutgers Alcohol Problem Index. *Journal of Studies on Alcohol and Drugs, 72*, 981–990.
- Ferreira, S. E., de Mello, M. T., Pompéia, S., & de Souza-Formigoni, M. L. (2006). Effects of energy drink ingestion on alcohol intoxication. *Alcoholism: Clinical and Experimental Research, 30*, 598–605.
- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*, 64–105.
- Howland, J., & Rohsenow, D. J. (2013). Risks of energy drinks mixed with alcohol. *Journal of the American Medical Association, 309*, 245–246.
- Howland, J., Rohsenow, D. J., Arnedt, J. T., Bliss, C. A., Hunt, S. K., Calise, T. V., . . . Gottlieb, D. J. (2011). The acute effects of caffeinated versus non-caffeinated alcoholic beverage on driving performance and attention/reaction time. *Addiction, 106*, 335–341.
- Larimer, M. E., & Cronce, J. M. (2007). Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999–2006. *Addictive Behaviors, 32*, 2439–2468.
- Marczinski, C. A., & Fillmore, M. T. (2006). Clubgoers and their trendy cocktails: Implications of mixing caffeine into alcohol on information processing and subjective reports of intoxication. *Experimental and Clinical Psychopharmacology, 14*, 450–458.
- Marczinski, C. A., Fillmore, M. T., Bardgett, M. E., & Howard, M. A. (2011). Effects of energy drinks mixed with alcohol on behavioral control: Risks for college students consuming trendy cocktails. *Alcoholism: Clinical and Experimental Research, 35*, 1282–1292.
- Miller, K. E. (2008). Energy drinks, race, and problem behaviors among college students. *Journal of Adolescent Health, 43*, 490–497.
- Neal, D. J., Corbin, W. R., & Fromme, K. (2006). Measurement of alcohol-related consequences among high school and college students: Application of item response models to the Rutgers Alcohol Problem Index. *Psychological Assessment, 18*, 402–414.
- O'Brien, M. C., McCoy, T. P., Rhodes, S. D., Wagoner, A., & Wolfson, M. (2008). Caffeinated cocktails: Energy drink consumption, high-risk drinking, and alcohol-related consequences among college students. *Academic Emergency Medicine, 15*, 453–460.
- Patrick, M. E., & Maggs, J. L. (2011). College students' evaluations of alcohol consequences as positive and negative. *Addictive Behaviors, 36*, 1148–1153.
- Patrick, M. E., & Maggs, J. L. (2014). Energy drinks and alcohol: Links to alcohol behaviors and consequences across 56 days. *Journal of Adolescent Health, 54*, 454–459.
- Peacock, A., Bruno, R., & Martin, F. H. (2012). The subjective physiological, psychological, and behavioral risk-taking consequences of alcohol and energy drink co-ingestion. *Alcoholism: Clinical and Experimental Research, 36*, 2008–2015.
- Price, S. R., Hilchey, C. A., Darredeau, C., Fulton, H. G., & Barrett, S. P. (2010). Energy drink co-administration is associated with increased reported alcohol ingestion. *Drug and Alcohol Review, 29*, 331–333.
- Reissig, C. J., Strain, E. C., & Griffiths, R. R. (2009). Caffeinated energy drinks—a growing problem. *Drug and Alcohol Dependence, 99*, 1–10.
- Rosshiem, M. E., & Thombs, D. L. (2011). Artificial sweeteners, caffeine, and alcohol intoxication in bar patrons. *Alcoholism: Clinical and Experimental Research, 35*, 1891–1896.
- StataCorp. (2011). *Stata statistical software: Release 12*. College Station, TX: StataCorp LP.
- Thombs, D. L., O'Mara, R. J., Tsukamoto, M., Rosshiem, M. E., Weiler, R. M., Merves, M. L., & Goldberger, B. A. (2010). Event-level analyses of energy drink consumption and alcohol intoxication in bar patrons. *Addictive Behaviors, 35*, 325–330.
- U.S. Food and Drug Administration. (2010, November 17). *FDA news release: FDA warning letters issued to four makers of caffeinated alcoholic beverages*. Retrieved from <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm234109.htm>
- Varvil-Weld, L., Marzell, M., Turrissi, R., Mallett, K. A., & Cleveland, M. J. (2013). Examining the relationship between alcohol-energy drink risk profiles and high-risk drinking behaviors. *Alcoholism: Clinical and Experimental Research, 37*, 1410–1416.
- Velazquez, C. E., Poulos, N. S., Latimer, L. A., & Pasch, K. E. (2012). Associations between energy drink consumption and alcohol use behaviors among college students. *Drug and Alcohol Dependence, 123*, 167–172.
- Wechsler, H., & Austin, S. B. (1998). Binge drinking: The five/four measure [Letter to the Editor]. *Journal of Studies on Alcohol, 59*, 122–124.
- Wechsler, H., & Nelson, T. F. (2001). Binge drinking and the American college student: What's five drinks? *Psychology of Addictive Behaviors, 15*, 287–291.
- White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol, 50*, 30–37.