College Students’ Attitudes Towards Alcoholic Energy Drinks

By: Emily Butler, Meg Hayes, Doug Heckmann, Christopher Peter Makris & Thomas Todd

A:

This problem is interesting because it is extremely relevant to college students of multiple demographics. Specifically, we would like to examine the responses of students from The University of Pittsburgh versus Carnegie Mellon University. Because combined alcoholic energy drinks are new products in the beverage market, there is little research and understanding of its effects. Many college students do not even know the actual health risks associated with these types of drinks, just that they are the center of a growing health controversy.

Our primary goal would be to understand undergraduate college students’ attitudes towards alcoholic energy drinks. Specifically, we want to see how these opinions may be similar or different for students attending public and private universities. Although the alcoholic energy drink issue has been present for some time, we are motivated to study this now based on the recent controversy over the banning of energy stimulants from the original alcoholic beverage Four Loko. It was not until this specific brand of alcoholic energy drink became popular and was subsequently banned from use that this controversy has been highlighted. Our survey is not aimed at either promoting or deterring individuals from purchasing and consuming the Four Loko beverage; however, we believe the coverage of this specific story has been heard by many college students. Therefore, our survey is primarily about alcoholic energy drinks in general, but may use the Four Loko story as an agent to elicit survey question answers.

In theory, we hope that this project would be relevant to individuals on both sides of the alcoholic energy drink debate. Namely, our findings may be interesting to the Food & Drug Administration or to various alcoholic energy drink companies for very different reasons. For example, since there has not been any formal study about consumer interest on the alcoholic energy drink industry, our survey may uncover information that may be useful for either the FDA or various alcoholic energy drink companies. Whether or not our study finds that the recent controversy has had an effect on students’ perception of this type of drink, this information may be useful to the FDA for educational purposes. On the other hand, the alcoholic energy drink companies may like to know the results of our survey for future advertising purposes. Also, our survey may potentially be of interest to university Health Services. For example, if our survey finds that the recent controversy has not changed students’ views of combining the consumption of alcohol and energy beverages, the university Health Services may want to promote an effort to educate their students on the possible physical ramifications of this type of substance abuse.

B:

In recent years there has been an ongoing debate concerning the health repercussions of combining alcohol and energy drinks. This debate has been brought to the forefront of the media with the recent events surrounding Four Loko, an alcoholic energy drink, which has had increased popularity since the summer of 2010. We would like to understand college student attitudes towards alcohol and energy drinks in general. Some questions that we would like answers to include, but are not limited to: what are the differences in attitudes about alcoholic energy drinks between students at Carnegie Mellon University and the University of Pittsburgh? Are attitudes regarding alcoholic energy drinks different for different demographic groups? How has the media affected students’ attitudes and habits regarding these types of beverages?  How has students’ attitudes and patterns of use of Four Loko been affected by the release of a new non-caffeinated product? Has the recent media coverage of health problems associated with mixing alcohol and energy drinks changed students’ habits of manually mixing these two types of drinks?

C.

Jonathan Strong; November 27, 2010; “Is Four Loko Dangerous? The FDA Doesn’t Say”; appeared online at:<http://dailycaller.com/2010/11/19/is-four-loko-dangerous-the-fda-doesnt-say/>

Summary: This article attempts to discredit the FDA’s banning of caffeine from Four Loko by claiming that the studies used to support the argument did not use pre-mixed alcoholic energy drinks. The article also claims that the FDA has not conducted any of its own research on the drink and therefore the ban is unreasonable.

Team Member: Meg Hayes

Steve Wood; November 10, 2010; “Four Loko energy drink raises health concerns among youth”;  appeared online at:

<http://www.usatoday.com/yourlife/parenting-family/teen-ya/2010-11-10-alcoholic-energy-drinks_N.htm?csp=34news>

Summary: This article is a compilation of individual accounts of experiences with Four Loko and studies conducted with regards to the effects of consuming alcoholic energy drinks. It also describes aspects of Four Loko that make it specifically attractive to college students, like its low cost.

Team Member: Doug Heckmann

Nina Mandell; November 25th, 2010; “Caffeinated Four Loko will be off shelves across the country by Dec. 13”; appeared online at:

<http://www.nydailynews.com/news/national/2010/11/25/2010-11-25_caffeinated_four_loko_will_be_off_shelves_across_the_country_by_dec_13_fda.html>

Summary: This article addresses the FDA’s ban of Four Loko and similar caffeinated alcoholic beverages. It describes how many people are stocking up in anticipation of the ban and are also throwing Four Loko “vigil” or “goodbye” parties. The article concludes with individuals’ opinions of the ban on Four Loko.

Team Member: Thomas Todd

New York State Office of Alcoholism and Substance Abuse Services;  November 17, 2010; “NYS OASAS and HYSDOH Health Advisory: Caffeinated Alcoholic Beverages”; appeared online at:

<http://nyhealth.gov/community/youth/development/docs/2010-12-02_oasas_doh_cab_health_advisory.pdf>

Summary: In this article, the Health Advisory highlights the recent controversy over caffeinated alcoholic beverages (CABs). It includes the consumption patterns of CABs  among young adults, and points to the negative effects, such as binge drinking, that have been associated with their consumption.

Team Member: Christopher Peter Makris

Abby Goodnough; October 26, 2010; “Caffeine and Alcohol Drink Is Potent Mix for Young”; appeared online at:<http://www.nytimes.com/2010/10/27/us/27drink.html>

Summary: This article focuses on specific instances of alcohol abuse involving Four Loko. It illustrates the perceived danger surrounding Four Loko, and lists the responses of State Attorney Generals and college administrators.

Team Member: Emily Butler

D:

Sampling Frame:

We would like to have a comprehensive random sample of students from both Carnegie Mellon University and the University of Pittsburgh (i.e. we want to survey as many different types of students as possible). For Carnegie Mellon, we first would like to stratify our sample in an effort to get all demographics of college: we assume surveying outside near Doherty Hall would give us a good mix of primarily Science, Engineering, and Humanities & Social Science students, the cafe Taza de Oro in the Gates-Hillman Center would help cover primarily Computer Science and Mathematics students, and the Zebra Cafe in the College of Fine Arts would help cover Art and Design students. Furthermore, we would like to survey near general areas of traffic like Kirr Commons and the corner of Forbes and Morewood where we expect to receive sufficient cover of students of all demographics including, but not limited to: age, gender, and Greek life orientation.

Likewise, our plan for surveying the students of the University of Pittsburgh is very similar. We believe students of all classes and Greek life orientation are commonly located at Schenley Commons, Soldiers and Sailors Hall, and the campus Starbucks. Therefore, these are areas where we plan to solicit survey responses. Additionally, by surveying students near the Petersen Events Center we assume we will also cover students enrolled in the university honors program. In general, we believe these specific areas of the University of Pittsburgh campus may cover all demographics of students sufficiently.

Sampling Population:

Our sampling population consists of a stratified random sample of Carnegie Mellon University and the University of Pittsburgh undergraduate students who have presumably experimented with the consumption of alcohol.

E:

Target Population:

Our target population is all undergraduate students at The University of Pittsburgh and Carnegie Mellon who have experimented with the consumption of alcohol.

We may experience coverage error due to the times we conduct our survey. Depending on what time we are out surveying, we may miss students of particular majors or fields of study because of when certain classes occur. We also may experience this error if we do not survey near a building where all or most of the classes of a particular major take place. We tried to choose locations on both campuses that are main meeting points where we expect a large variety of students will pass through. We will also attempt to conduct our survey on different days in order to counteract possible non-response error. For example, we may run into this problem is certain types of classes occur only on Tuesdays and Thursdays versus the other days of the week.

Because the specific days and times we choose to survey individuals may have implications on who responds to our survey, we may also encounter non-response error. For example, certain majors may have a required class at a certain time, or there may be sporting events or other campus events that day that draw a specific demographic of students away from our survey location, etc. To mitigate this problem, we will sample at multiple times on different dates at these locations.

Furthermore, we may experience measurement error because the terminology in our questions could potentially have various interpretations. For example, students may have a different interpretation of the definition of a “blackout.” Also, students may have varying levels of familiarity with the coverage of the physical effects of alcoholic energy drinks. To account for this, we plan to include definitions of certain potentially confusing words and have the option to read a small unbiased paragraph of background information so all respondents will be on common ground. We also will ask for an honest disclosure of answers and will try to ensure anonymity of survey answers. This is further described in the following section.

F:

Because we do not have easy access to a contact book of email addresses or telephone numbers for both campuses, we will be soliciting responses in person. By using the CMU C-Book and the University of Pittsburgh’s equivalent student lookup as a reference, we assume we will be able to determine the approximate true population percentages for school demographics. This will help allow us to make sure our sample is representative of these populations. This tactic can be done in a common manner for both campuses by having the survey be self-administered on paper. In the locations and the manner described above, we will randomly ask students (e.g. every third student that passes by) if they would take a minute to fill out our survey. We will provide them with the necessary items to fill out the survey (e.g. a writing utensil, something to lean on). We may also consider providing an unbiased, short, and optional reading and background information on the subject for each possible subject to consider before filling out the survey. In an effort to ensure anonymity of our subjects’ answers, when the individuals are finished, we will have them fold up their papers and put them in a box where we will keep all of the completed surveys.

G:

Gender, age, year in school, Greek-affiliation? Do you drink? (y/n) Frequency of drinking? Do you drink energy drinks in conjunction with alcohol (for instance, Four Loko, Red Bull & Vodka, Jager Bombs, etc)? Have you ever consumed Four Loko? If so, before or after it was pulled from the market (November 1st, 2010)? Have you ever experienced a blackout? (experienced complete memory loss after a night of drinking) If so, was the blackout due to an alcoholic energy drink (Four Loko, Red Bull & Vodka, etc)? Will you continue to drink Four Loko despite the removal of caffeine and energy stimulants? If you have not consumed Four Loko, will you consider drinking it since the alterations have been made? Have the recent findings concerning the health risks associated with alcoholic energy drinks influenced your decision to continue to drinking them?

I:

 See attached IRB application.

J:

Sampling Plan

Our goal is to obtain a comprehensive stratified random sample of students from both Carnegie Mellon University and the University of Pittsburgh (i.e. we want to survey as many different types of students as possible). For Carnegie Mellon, we first would like to stratify our sample in an effort to get all demographics of college: we assume surveying outside near Doherty Hall (standing by the clock) would give us a good mix of primarily Science, Engineering, and Humanities & Social Science students, the cafe Taza de Oro (to the right of the “helix”) in the Gates-Hillman Center would help cover primarily Computer Science and Mathematics students, and the Zebra Cafe (to the right of the entrance door) in the College of Fine Arts would help cover Art and Design students. Furthermore, we would like to survey near general areas of traffic like Kirr Commons (by the revolving doors near Student Activities) and the corner of Forbes and Morewood (on the Carnegie Mellon side, at the stairs near the base of Walking to the Sky) where we expect to receive sufficient cover of students of all demographics including, but not limited to: age, gender, and Greek life orientation.

Once we are situated at our sampling locations, we will approach every third person that passes us on our right side. Likewise, our plan for surveying the students at the University of Pittsburgh is very similar. We believe students of all classes and Greek life orientation are commonly located at Schenley Commons (to the left of the entrance on the Fifth Avenue Side), Soldiers and Sailors Hall (at the base of the center stairs, between the cannons), and the campus Starbucks (outside on the right side of the door). Because we believe these areas cover our population quite well, we plan to solicit survey responses near these areas. Additionally, by surveying students near the Petersen Events Center (to the right of the main center stairs) we assume we will also cover students enrolled in the university honors program. Again, once are at our sampling locations, we will approach every third person that passes us on our right side. In general, we believe these specific areas of the University of Pittsburgh campus may cover all demographics of students sufficiently.

For both campuses, we plan to survey the locations at multiple times on different days, at various times during the day. By doing so, we hope to increase the chances of covering a sufficient portion of our population’s demographics. In this manner, we hope to obtain a stratified random sample that is representative of our target population. Because we do not have easy access to a contact book of email addresses or telephone numbers for both campuses, we will be soliciting responses in person. We will use the Carnegie Mellon University C-Book and the University of Pittsburgh’s equivalent contact book as reference material of the population percentages for school demographics. This will allow us to make sure our sample is representative of demographic sub-populations. This tactic can be done in a common manner for both campuses by having the survey be self-administered on paper. In the locations and the manner described above, we will randomly ask students (e.g. every third student that passes by on our right) if they would take a minute to fill out our survey. We will provide them with the necessary items to fill out the survey (e.g. a writing utensil, something to write on). We may also consider providing an unbiased, short, and optional reading with background information on the subject of alcoholic energy drinks for each possible subject to consider before filling out the survey. In an effort to ensure anonymity of our subjects’ answers, when the individuals are finished, we will have them fold up their papers and put them in a box where we will keep all of the completed surveys.

Nonresponse Plan

For our study, the difficulty with tracking nonresponders is that we do not have any information on those individuals who choose to not fill out our survey. Therefore, we have no way of contacting individuals for a follow-up evaluation. Also, our survey is designed to be anonymous, so there is no way of knowing who has or has not participated.

Because our survey involves approaching people randomly at selected locations, we will not be able to follow-up with nonresponders. This is further confounded because we will not be consistently sampling at the same location, time, or day of week.

If we believe our sample is not representative of the target population, we will adjust our sampling plan to survey the underrepresented population. For example, suppose the Carnegie Mellon University undergraduate population consists of 60% male students and 40% female students. If our sample from Carnegie Mellon consists of 30% male students and 70% female students, we can alter our sampling plan to select every third male that passes us on our right at the selected locations in order to correct for the underrepresentation of male students.

K. Sampling Scheme

        Since we will be conducting a “man on the street” survey, it will be difficult to collect a completely random sample. Therefore, we plan to collect a pseudo-random sample by attempting to sample every fifth person that passes by. We will also be implementing stratification to try to gain a demographically accurate sample of our target population. This stratification will be done by soliciting survey responses in different locations where we expect certain demographic groups to be commonly located. By using this method of stratification, we hope that the demographics of our sample population will be representative of our target population. Variables we plan to stratify upon are what university students attend, their gender, and whether or not they are affiliated with Greek life.

L. Proposed Questions

 Before individuals take our survey, we will ask them whether or not they are an undergraduate student. If they are an undergraduate student, we will ask them to fill out our survey. We believe that by doing so our coverage error will be reduced since we completely eliminate receiving responses from non-undergraduate students who are all outside the scope of our target population. Therefore, we consider the question “Are you an undergraduate student?” an initial question that is not technically part of our survey.

1. (Verbally) Are you an undergraduate student?

-If response is “yes,” offer the individual a survey to complete.

1. Do you consume alcoholic beverages?

-If response is “no,” please stop this survey and return it to your surveyor.

1. What university do you attend? Please choose one:

-Carnegie Mellon University

-The University of Pittsburgh

-Other \_\_\_\_\_\_\_\_\_\_\_\_

1. What is your age? \_\_\_\_\_\_\_\_
2. What is your gender?

-Male

-Female

1. Are you affiliated with Greek life your University?

-Yes

-No

1. On average, how frequently do you consume at least one alcoholic beverage? Please choose one:

-Less than 1 time per week

-From 1 to 2 times per week

-From 3 to 5 times per week

-Greater than 5 times per week

1. Have you ever experienced complete or partial memory loss (i.e. a “blackout”) while drinking?

-Yes

-No

1. Do you mix energy drinks and alcohol?

-Yes

-No

1. Were you drinking alcoholic energy drinks when you “blacked out”?

-Yes

-No

-N/a

1. Why do you drink alcoholic energy drinks? Choose all that apply:

-Price

-Taste

-Alcoholic content

-Availability

For the caffeine

-Other\_\_\_\_\_\_\_\_\_\_

1. Have you ever heard of Four Loko?

-Yes

-No

1. Have you ever drank Four Loko?

-Yes

-No

1. The caffeine was removed from Four Loko by January 1, 2011. When did you drink Four Loko?

-Before January 1, 2011

 Would you consider drinking Four Loko since the removal of caffeine?

 -Yes

 -No

-After January 1, 2011

-Both before & after January 1, 2011

1. Do you know the health risks associated with drinking alcoholic energy drinks?

-Yes

-No

1. Will you consider drinking alcoholic energy drinks in the future?

-Yes

-No

1. Did the risks associated with drinking alcoholic energy drinks affect your answer to 19?

-Yes

-No

-N/a

M. Initial Sample Size Calculation

 Because our survey consists of primarily “yes” or “no” answers, we consider most of our parameters to be from a Bernoulli distribution. Therefore, we will consider our standard deviation to be of the worst case scenario, by setting *p* = .5:

$$SD\_{Worst Case Scenario}= \sqrt{(.5)(1-.5)}= .5$$

 It may be difficult to receive a large sample size since there are many groups conducting surveys within our class. Therefore, we will allow our margin of error to be up to 5%, allowing for a 90% confidence interval. We can calculate $n\_{0}$ as follows:

$$n\_{0}=\frac{(z\_{α/2})^{2} (SD)^{2}}{(ME)^{2}}$$

$$n\_{0}= \frac{\left(1.645\right)^{2}(.5)^{2}}{(.05)^{2}}$$

$$n\_{0}= 270.6025$$

 Overall, the total number of undergraduate students attending both Carnegie Mellon University and the University of Pittsburgh is approximately 25,000. Because we are under the assumption that we are taking a random sample without replacement, we must make the following adjustment to our calculation above:

$$n \geq \frac{Nn\_{0}}{N+ n\_{0}}$$

$$n \geq \frac{(25,000)(270.6025)}{(25,000)+(270.6025)}$$

$$n \geq 267.7048361$$

 Therefore, to make inferences about our population concerning the questions we plan to ask with a margin of error of 5%, we must sample at least 268 total individuals.

 Since we are conducting a “face to face” survey, with practice we may be able to get a response rate up to 70% (as noted in the lecture slides). Therefore, for the worst case scenario we will consider our response rate to be approximately 50%. If we take our response rate into account, we may need to physically ask more individuals for their participation in our survey. Specifically:

$$n\_{With .5 Response Rate} \geq \frac{267.7048361}{.5}$$

$$n\_{With .5 Response Rate} \geq 535.4096722$$

 Thus, for a worst case scenario calculation, we need to ask approximately 536 individuals to take our survey, but only have approximately 268 of those individuals completely fill out our survey, to be able to make inferences with a 5% margin of error.