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'Less Is More,' When It Comes to Sugary, High-Caffeine Energy Drinks, Researchers Say

Moderate consumption of so-called energy drinks can improve people's response time on a lab test measuring behavioral control, but those benefits disappear as people drink more of the beverage, according to a study published by the American Psychological Association.

With the growing popularity of energy drinks such as Red Bull, Monster, Burn and RockStar, especially among high school and college students, psychologists have been studying the effects of sugary, highly caffeinated drinks on young people. College students in particular have been using these drinks to stay awake, help them study and cut the intoxicating effects of alcohol. The latter use has sent several young people to hospital emergency rooms, leading a handful of state liquor control boards recently to ban the drink Four Loko, which combined caffeine and alcohol.

"Several aspects of cognitive performance that show improvement under the influence of caffeine are attention, reaction time, visual search, psychomotor speed, memory, vigilance and verbal reasoning," said Cecile A. Marcinski, PhD, of Northern Kentucky University and co-author of the study "Acute Effects of a Glucose Energy Drink on Behavioral Control." "The results of the current study illustrate that energy drinks can increase stimulation and decrease mental fatigue, suggesting that they may be used with alcohol to counteract the sedation associated with drinking."

The study, published in the December issue of the APA journal *Experimental and Clinical Psychopharmacology*, included 80 college students (34 men and 46 women) between the ages of 18 and 40. Some were given Red Bull 7, while others were given lower amounts of caffeine added to Squirt, a lemon-flavored decaffeinated soda that looks and tastes like Red Bull. Others were given plain Squirt as a placebo. A half-hour after finishing the drinks, participants took a computerized "go/no-go" test in which they had to respond quickly to targets on a screen. They were instructed to hit the forward slash key when a green target appeared and do nothing when a blue target appeared.

Participants were also asked how stimulated and mentally fatigued they felt after the drinks. The students who were given Red Bull reported feeling more stimulated and less tired than the other participants, but their response rates were slower.

"This finding is of interest given that energy drinks are frequently mixed with alcohol and the acute effects of alcohol impair response inhibition," Marcinski said. "Since regulation of energy drinks is lax in the United States in regard to content labeling and possible health warnings, especially mixed with alcohol, having a better understanding of the acute subjective and objective effects of these beverages is warranted."

In a second study reported in the same journal, Jennifer L. Temple, PhD, and colleagues at the University at Buffalo found boys and girls respond differently physiologically to caffeine. In this experiment, 26 boys and 26 girls between the ages of 12 and 17 drank flattened Sprite containing caffeine at three concentrations: 50 mg, 100 mg or 200 mg. Flat Sprite with no caffeine was included as a placebo. The youngsters were then tested for changes in their blood pressure and heart rate every 10 minutes for one hour. At the end of the hour, they were given a questionnaire and an opportunity to eat all they wanted of the following junk food: Skittles and Smarties (high sugar/low fat); potato chips and Doritos (low sugar/high fat); and M&Ms and Twix (high sugar/high fat).

Among boys, high caffeine consumers showed greater increases in their diastolic blood pressure (the lower number) than boys who ingested less caffeine. There was no relationship between blood pressure and caffeine consumption in girls. In addition, those participants who ingested the most caffeine ate more high-sugar snack foods in the laboratory compared to low-caffeine consumers.

Boys and girls also had different reasons for consuming caffeine, the researchers found. Boys were more likely than girls to say they consumed caffeine "to get energy," "to get a rush" and for "athletic performance."

"Adolescents are among the fastest growing consumers of caffeine and yet very few empirical studies have focused on this population," Temple said. "It is imperative that we understand the impact of caffeine use on adolescents."