

High-caffeine-consuming boys get greater rush from caffeine than girls

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Among the many differences between girls and boys, add the effects from caffeine -- physiological, behavioral and subjective -- to the list.

Results of a double-blind, placebo-controlled, dose-response study of the response of youth to [caffeine](#) found that, in general, [boys](#) get a greater rush and more energy from caffeine than girls.

Boys also reported they felt that caffeine had a positive effect on their [athletic performance](#). Girls didn't report on this issue.

The study, conducted by Jennifer L. Temple, PhD, a neurobiologist and assistant professor of exercise and nutrition sciences at the University at Buffalo, appears in the current (December 2010) issue of *Experimental and Clinical Psychopharmacology*.

It is the first study to demonstrate [gender differences](#) in physiological response to acute caffeine in adolescents. Temple's initial paper on this research was published in the December 2009 issue of *Behavioural Pharmacology*.

"Our findings from this study and from our previous study suggest that boys and girls respond differently to caffeine," Temple says. "We are hoping that our findings from our studies on caffeine will help us to determine why males and females differ in susceptibility to drug abuse and respond differently to treatment."

The study involved 26 boys and 26 girls between the ages of 12 and 17. To take part in the research, the teenagers were required to have previous experience with caffeine but no adverse reactions, and not using hormone-based [contraceptives](#), not smoking, not on any medication that could have adverse interactions with caffeine (e.g., methylphenidate) and were willing to visit the laboratory four times for 90 minutes each.

Participants were instructed not to drink caffeine 24 hours before each visit and to eat nothing or drink nothing but water for two hours before each visit.

On the first visit, participants completed a 24-hour dietary and [physical activity](#) recall, including how many caffeinated drinks they consumed, while parents completed a demographic questionnaire. Teens provided a three-millimeter saliva sample analyzed to make sure they had abstained from caffeine as required and weren't taking steroid hormones.

After researchers took baseline [heart rate](#) and blood pressure, participants drank a beverage containing 50 mg, 100 mg or 200 mg of caffeine, or one with no caffeine that served as a placebo. The order was randomized across the four visits for each participant.

Blood pressure and heart rate measurements were taken every 10 minutes during the first hour. The teens completed the behavioral checklist again and munched on snack food. After the fourth session, participants had their height and weight measured, and were debriefed about the study.

In addition to the general findings, the study revealed several differences in response to caffeine between girls and boys. Diastolic blood pressure increased and heart rate decreased as percentage of caffeine increased in males, but not in females. In addition, boys who were regular "high

consumers" of caffeine showed greater increases in blood pressure than low-consuming boys.

"Caffeine is known to increase [blood pressure](#), but the fact that it caused an exaggerated response in high-consuming males was a surprise, since at the time of measurement the amount of caffeine consumed by boys and girls was the same," says Temple.

"We would have predicted that high consumers would have developed some tolerance to the effects of caffeine and would have reduced responses."

When researchers examined eating behavior as a function of chronic and acute caffeine use, they found that high consumers of caffeine consumed more calories, protein and fat in their typical diet, and ate more high-sugar snack foods in the laboratory, compared with low-caffeine consumers.

The third and perhaps the most important question in this investigation focuses on the effect of caffeine consumption during adolescence on later use of legal or illegal drugs. That paper currently is in preparation.

Provided by University at Buffalo

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