



# Caffeinated Kids

UB researchers study how the stimulant affects youth

BY  
LOIS  
BAKER

CAFFEINE IS A STIMULANT DRUG, and adults use it widely to perk themselves up: Being “addicted” to caffeine is considered perfectly normal.

**B**UT HOW STRONG is caffeine’s appeal in young people who consume an abundance of soft drinks? What impact does acute and chronic caffeine consumption have on their blood pressure, heart rate and hand tremor?

Furthermore, does consuming caffeinated drinks during adolescence contribute to later use of legal or illicit drugs?

Neurobiologist Jennifer L. Temple, PhD, assistant professor of exercise and nutrition sciences at UB and director of its Nutrition and Health Research Labora-

tory, is looking for answers to these three questions through a four-year, \$800,000 study funded by the National Institutes of Health.

Her paper addressing the first question appeared in the December 2009 issue of *Behavioural Pharmacology*, and is thought to be the first study to show a gender effect in the appeal of caffeinated soda in young people.

Given the effects of caffeine in adults, the researchers expected to see a difference between those who habitually consumed a lot of soft drinks and those who

consumed few. Results showed that the difference, however, was between boys and girls: The boys in the study worked harder and longer on a computer-based exercise to obtain caffeinated drinks.

Temple and colleagues now have completed the second part of the study—a double-blind, placebo-controlled, dose-response study of the effects of caffeine on the teenagers’ blood pressure, heart rate and hand tremor. Two papers currently are being written reporting the results.

The third and perhaps most important question in the study, focusing on the effect of caffeine consumption during adolescence on later use of legal or illegal drugs, is under way.

Temple’s primary research interest is a behavior called food reinforcement. She became intrigued with caffeine consumption in children after conducting a small study in 8- to 12-year-olds.

“WE HAD A LOT OF KIDS WHO WERE DRINKING NOT ONLY SODA, BUT COFFEE. I HAD 12-YEAR-OLD GIRLS WHO SAID THAT ALL THEY HAD THAT MORNING WAS A CUP OF COFFEE. I STARTED THINKING, ‘THIS CAN’T BE GOOD.’”  
—JENNIFER L. TEMPLE, PHD

“We had a lot of kids who were drinking not only soda, but coffee,” she relates. “I had 12-year-old girls who said that all they had that morning was a cup of coffee. I started thinking, ‘This can’t be good.’”

These findings led Temple to study how hard a person will work to obtain a particular food, or in this case, a caffeine drink, and how food reinforcement mimics drug addiction. She is trying to understand the mechanisms that underlie such reinforcement, and if it can be redirected to a more healthy habit.

The December 2009 study on the reinforcing value of caffeine involved 26 boys and 23 girls ages 12 to 17.

Temple says the difference in the reinforcing potential of caffeine between males and females—but not between high and low consumers—was surprising. “These data are novel and they

add to the small, but growing, body of literature on caffeine use in children and adolescents.”

She speculates these sex differences could be based on the effect of circulating hormones at the time of the test, although this was not measured, and the possibility that females are less sensitive to the effects of caffeine.

To learn more about this study and its methodology, visit the UB News-Center web site at [www.buffalo.edu/news/](http://www.buffalo.edu/news/) and search “caffeine.”

BP



# MS Symptoms More Severe in Blacks Study shows blacks decline faster than whites

WHILE FEWER AFRICAN-AMERICANS than Caucasians develop multiple sclerosis (MS), a new study by UB neurologists has shown that their disease progresses more rapidly.

MAGNETIC RESONANCE IMAGES (MRI) of a cohort of 567 consecutive MS patients showed that blacks with MS had more damage to brain tissue and had less normal white and gray matter compared to whites with the disease.

Bianca Weinstock-Guttman, MD, associate professor of neurology, is first author on the study, which was published in the February 16, 2010, issue of *Neurology*.

“Black patients showed more brain tissue damage and accumulated brain lesions faster than whites, along with rapid clinical deterioration,” confirms Weinstock-Guttman, who directs the Baird Multiple Sclerosis Center in Kaleida Health’s Buffalo General Hospital.

“The results provide further support that black patients experience a more severe disease, calling for individualized

therapeutic interventions for this group of MS patients.”

“White matter” refers to the parts of the brain that contain nerve fibers sheathed in a white fatty insulating protein called myelin. The white matter is responsible for communication between the various gray matter regions, where nerve cells are concentrated and where cognitive processing occurs.

BY  
LOIS  
BAKER

“Initially, multiple sclerosis was considered primarily a white-matter disease,” says Weinstock-Guttman, “but today we know that the gray matter may be more affected than white matter.”

In general, black MS patients tend to have more severe and more frequent attacks, followed by an incomplete recovery even after the first episode. Studies on signs and symptoms of MS among populations have shown that blacks experience gait problems sooner after their diagnosis, show faster cognitive decline than whites

with MS and become dependent on a wheelchair sooner, she notes.

The study’s MRI scans were conducted at the Buffalo Neuroimaging Analysis Center (BNAC), part of the Jacobs Neurological Institute/UB Department of Neurology. Robert Zivadinov, MD, PhD, a UB associate professor of neurology, is director of the center.

Seventy-nine black patients and 488 white patients were entered in the study. Participants were older than 18 and had been scanned within 90 days of their most recent clinical visit. Black participants were significantly younger, and their disease was more severe than white patients, despite having MS for a shorter amount of time.

“Results of the MRI scans showed that the aggressive disease process in blacks appears to be associated with increased macroscopic and microscopic tissue damage, as measured by specific MRI parameters,” says Weinstock-Guttman.

“Based on our MRI findings, a plausible hypothesis that would explain the more aggressive disease in blacks compared to whites with MS may be that blacks have a reduced capacity for remyelination, the brain’s ability to repair the protective myelin sheath. However, to confirm this hypothesis, we will need to conduct more longitudinal studies.” BP





By  
LOIS  
BAKER

# The Price Is Slight

Taxing junk food could stem obesity



ONE WAY TO STEM the rising rates of obesity may be to mimic the successful approach used to decrease smoking: taxes.

**A** LABORATORY EXPERIMENT conducted in UB's Division of Behavioral Medicine showed that lowering the price of healthy foods did not result in "shoppers" improving the nutritional content of the foods they purchased.

While study participants did select more of the healthier options when they were less expensive, the shoppers used the money they saved on less-expensive healthier foods to buy more of the less-healthy options, results showed.

But when the researchers increased the price of such foods as hot dogs, potato chips and Ritz Bits Peanut Butter Sandwich Crackers by adding a 12.5 percent to 25 percent tax, the shoppers reduced pur-

chases of these foods and spent a larger portion of their budget on healthier choices like bananas, tuna and chicken noodle soup.

"Taxing high-calorie-for-nutrient [HCFN] foods had the dual benefit of reducing purchases of these foods while increasing purchases of low-calorie-for-nutrient foods [LCFN] with lower energy density," says the study's

**“ TAXING HIGH-CALORIE-FOR-NUTRIENT [HCFN] FOODS HAD THE DUAL BENEFIT OF REDUCING PURCHASES OF THESE FOODS WHILE INCREASING PURCHASES OF LOW-CALORIE-FOR-NUTRIENT FOODS [LCFN] WITH LOWER ENERGY DENSITY. ”**

—LEONARD H. EPSTEIN, PHD

first author, Leonard H. Epstein, PhD, UB Distinguished Professor of Pediatrics and head of the Division of Behavioral Medicine.

"From a public-policy standpoint, this strategy had the additional benefit of generating significant tax revenue. If policy-makers aim to reduce consumption of HCFN foods to control rising rates of obesity, then taxing these foods may be more effective than subsidizing LCFN foods.

"In our experiment, a tax that increased the price of foods by 12.5 percent reduced the total calories purchased by 6.5 percent," adds Epstein. "This resulted in a 12.8 percent reduction in fat calories and a 6.2 percent reduction in calories from carbohydrates."

The study, which was published in the March 2010 issue of *Psychological Science*, involved 42 lean and overweight mothers, divided 20-to-22 between those with family incomes below and above \$50,000 per year, respectively. UB's Division of Behavioral Medicine laboratory was set up to simulate a grocery store. Cards with pictures of more-healthy and less-healthy

food and beverage items were arranged in sections according to food category, and prices and nutrient values were printed on the cards.

The participants were given a study income of \$22.50 per family member to go on a two-hour grocery shopping trip. Told to imagine she had no food in the house, each participant set about selecting a week's groceries for her family by selecting the food cards. Research staff

collected the cards and recorded the prices and nutritional values.

Each participant went food shopping five times. Research staff set the prices of each item before each task. During one experiment, prices were set based on current prices at a local supermarket. During two tasks, prices on the LCFN foods were lowered, described as subsidies, by 12.5 percent and 25 percent, while HCFN prices remained constant. During another two tasks, prices of HCFN were raised by 10 and 25 percent, respectively.

Selections from each shopping task were analyzed for nutrient values and costs of the chosen foods. Analysis showed that "taxing" less healthy food is a potential strategy to lower consumption of those products.

"The results of this study suggest that the goal would be to develop a strategy that simultaneously reduces purchases of less healthy foods while increasing the purchase of healthier options," says Epstein. "Public health initiatives aimed at modifying food purchasing by manipulating prices may be an important addition to clinical interventions to prevent or treat obesity." **BP**

# Friends Instead of Food

By  
LOIS  
BAKER

Opportunities to socialize may substitute for eating

**PARENTS ARE ACUTELY AWARE** of the influence of friends on their children's behavior, from how they dress to how they wear their hair and whether they drink or smoke.

**A** NEW LABORATORY-BASED STUDY has shown that friends also may influence how much adolescents eat. "Consider a person who usually comes home alone after school and eats out of boredom," says Sarah-Jeanne Salvy, PhD, assistant professor of pediatrics in UB's Division of Behavioral Medicine and first author on the study.

"But on this day, she has a play date with a friend and socializes instead of eating. In this case, socializing is acting as a substitute for eating. Identifying substitutes provides a potential way to reduce behavior.

"Our findings underscore the importance of considering the child's social network in studying youths' motivation to eat," says Salvy.

"Previous attempts to find substitutes for food and eating have not been very successful. To our knowledge, no research has studied whether social interactions can be a substitute for food in children."

The study—which was published in the January 6, 2010, online issue of *Annals of Behavioral Medicine*—involved 54 overweight and non-overweight youth (24 boys and 30 girls) between the ages of 9 and 11. Each was assigned randomly to bring a friend or to be paired with an unfamiliar peer.

Study participants worked on a computer game to earn points exchangeable for food or time to spend with their friend or with an unfamiliar peer.

"The task got increasingly harder and the food and social points became more

difficult to earn as a way to measure how hard youth were willing to work for food or for play time with their friend or with an unfamiliar peer," Salvy notes.

In the study, participants matched with an unfamiliar peer showed that when working for food became difficult, they switched to earn time with the unfamiliar peer, and when working for peer activity

became harder, they switched to earn food.

However, participants assigned to the friend condition continued to work for time with their friends instead of working for food.

"Peer rejection and ostracism are obvious costs imposed on social interactions," says Salvy. "Even the unavailability of one's peers or friends can limit youth's access to social settings and situations.

As a result, children may choose to engage in eating and sedentary activities when social alternatives are unavailable.

"There is emerging evidence that a youth's social network may be uniquely relevant and influential to eating behavior and choice of activities," she continues.

"Individuals are influenced by the eating and activity norms set by those around them, and the results of the present study suggest that friendship can provide an alternative to eating.

"These findings, and the work of others, imply that decreasing sedentary behavior and increasing active leisure activities may require meaningful relationships with friends, as friendship may help to promote or 'socialize' active lifestyles."

Lauren A. Nitecki, senior research support specialist in the UB Department of Pediatrics, and Leonard H. Epstein, PhD, UB professor of pediatrics and social and preventive medicine, contributed to the study.

The research was supported by a grant to Salvy from the National Institute of Child Health and Human Development. **BP**



OUR FINDINGS

UNDERSCORE

THE IMPORTANCE

OF CONSIDERING

THE CHILD'S SOCIAL

NETWORK IN

STUDYING YOUTHS'

MOTIVATION

TO EAT.

—SARAH-JEANNE  
SALVY, PHD

