

The Trouble with Caffeine

Too much of that ever-popular wake-up, stay-up, keep-alert stimulant could cause you problems.

By DIANNE BYSTROM



Caffeine — that stimulating component of coffee, tea, chocolate, many soft drinks and numerous over-the-counter drugs — can help those who imbibe to wake up in the morning, get through the day and stay up at night.

But caffeine consumption also is related to depression, anxiety, physical and psychological disorders and lower academic performance, according to a study conducted by a University of Oklahoma psychologist.

"People who consume caffeine are taking a domesticated drug that we still do not know a lot about," insists Kirby Gilliland, OU assistant professor of psychology who recently studied the effects of caffeine on 159 students. "One researcher has suggested that if caffeine were a drug synthesized by a chemist today, it would be on the controlled drug list."

Caffeine is a central nervous system stimulant that also increases muscle tension. "Some people feel jittery when they consume caffeine," he explains. "It literally has their neurons dancing." The amount of caffeine required to produce this effect, however, varies greatly among consumers.

A benefit of caffeine is that it does tend to make people alert. "Caffeine helps you stay awake, and it perks you up in the morning," Gilliland admits. "When used with moderation and some degree of thoughtfulness as to consumption pattern, caffeine may add a little perk to people's lives."

Gilliland contends that the problem with caffeine is that people often don't understand the effects of the drug. "Because caffeine has become so ingrained in our culture, people tend not to be concerned about it — and that's unfortunate. Some people abuse caffeine and don't even realize it."

Caffeine also is an addicting drug. "People habituate themselves to caffeine and, as a result, begin to consume it at higher and higher levels," Gilliland says. "They begin a slow, insidious process of becoming involved with a drug."

Researchers just are beginning to understand the effects of caffeine abuse, known as *caffeinism*. Although clinically-oriented studies have not provided much information about the effects of *caffeinism*, the OU

psychologist finds a few studies very provocative.

"Studies suggest that a small number of people who abuse caffeine develop physiological and psychological symptoms indistinguishable from anxiety neurosis," he says. "Further research has confirmed a significant relationship between excessive caffeine consumption and high levels of anxiety and depression."

To determine the implications of caffeine on the health and physical makeup of individuals, Gilliland, who became interested in the effects of caffeine as a doctoral student at Northwestern University, initiated his own study in 1978 with the help of OU graduate student Dara Andress. Contrary to most other caffeine studies which have been conducted in health

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institutions, the OU researchers looked at a group of so-called "normals" — the 1,500 students enrolled that fall in introductory psychology classes.

Through questionnaires, the OU students were surveyed on their intake of all sources of caffeine — coffee, tea, chocolate, cola beverages and over-the-counter drugs. Caffeine-containing drugs — which include some aspirins, many menstrual cramp medications, cold and sinus tablets, "stay awake" pills and diet aids — were later omitted from the survey data since "they add such a small amount of caffeine," Gilliland explains.

The questionnaires weighted the various sources of caffeine in coffee cup equivalents, assuming that an average cup of coffee contains 74 milligrams of caffeine. One cup of coffee equaled one cup; one cup of tea, .5 cup; cola beverages, .55, and hot cocoa and chocolate, .25.

Although average caffeine amounts were determined for the various sources, Gilliland points out that the

exact amount of caffeine contained in a particular product can vary greatly. "Tea and coffee vary with the way they are brewed and with the amount of other substances — such as cream and sugar — which are added."

Caffeine is found in both regular and diet soft drinks. "The sugar in regular soft drinks actually slows down the absorption rate of caffeine," Gilliland explains. Besides colas, many other soft drinks list caffeine in their ingredients.

Through the questionnaires, Gilliland and Andress randomly selected four groups of students to represent caffeine consumption levels: abstainers; low caffeine consumers, those who ingest less caffeine than the equivalent of one cup of coffee per day; moderate consumers, one to four coffee cups equivalent daily, and high consumers, five or more cups per day.

Because the researchers also wanted to learn if caffeine affected the sexes differently, 20 men and 20 women were chosen for each group except the high caffeine consumers, since only 19 men of those surveyed were found to be in the high consumption group.

In a laboratory setting, the selected students completed two standardized tests covering anxiety and depression and two questionnaires constructed by the researchers to measure psychophysiological disorders — physical disorders whose causes are at least partially psychological — and the good and bad effects which those surveyed attributed to caffeine.

"Students were asked to indicate the frequency with which they experienced a list of psychophysiological disorders — such as backache, gastrointestinal disorder, migraine headaches and skin reactions — during the past few years," Gilliland explains. "These types of disorders often are reported by people who consume a lot of caffeine."

The purpose of the caffeine questionnaire was to measure to what degree people could identify changes that occur in their lives as a result of consuming caffeine. Included on the list were alertness, irritability, warm and cold sensations, sleeplessness and nightmares.

According to the results of the tests, both moderate and high caffeine consumers reported significantly higher

deleterious — harmful — effects of caffeine in such areas as mood, tension, sleep disturbances and intellectual functioning than the abstainers. The high consumers also reported a significantly higher evidence of psychophysiological disorders than the abstainers.

While the moderate caffeine consumers reported more anxiety than the high caffeine group, both groups reported more anxiety than the low consumers or abstainers.

In addition to these findings, the researchers discovered that women tend to report higher levels of anxiety and depression and a greater number of psychophysiological disorders. "We shouldn't be surprised by this finding," Gilliland adds. "Because of learned sex biases, women are more willing to report this information."

The researchers also were interested in the relationship between caffeine intake and academic performance," Gilliland explains. So, after completing the battery of tests, the students were asked to sign forms releasing their academic records for grade point averages and introductory psychology course grades.

"While grade point averages are difficult to use as a routine yardstick of performance since coursework varies dramatically between students, the psychology course grade was common to all the students," Gilliland says.

High and moderate caffeine consumers also took the vast majority — 71 per cent — of all incompletes for the class, he notes.

Besides caffeine consumption, the researchers also statistically controlled for smoking habits and age but found that these variables were not a factor in the results.

"Our study is wholly consistent with everything found in literature," says Gilliland, who repeated the 1978 study about a year later. "We're just analyzing the data now, but the descriptive statistics are nearly exactly the same as our first study."

But Gilliland cautions that the results of the study must be viewed in light of naturalistic relationships. "We can't say from this study that caffeine causes the detrimental psychological and physiological effects. But, our study does show that there is a significant relationship be-

tween caffeine and the things going on in people's lives."

Gilliland, who joined the OU faculty in 1976, presented the findings at a spring 1979 meeting of the Southwestern Psychological Association. The OU study also was included in the April 1981 issue of the *American Journal of Psychiatry* and a short synopsis was featured in the August *Psychology Today*.

Although several studies exploring the effects of caffeine have been published recently, there remains a "tremendous amount of work to be done," Gilliland says. "It's still an 'unresearched' area."

Few studies, for example, have looked at the effect of caffeine on chil-



dren and pregnant women. "Because of their size, children are more susceptible to the effects of caffeine in comparable doses," he notes. "We don't have very good data on the effects of caffeine consumption on pregnancy outcome. The preliminary data, however, is very pessimistic. It appears that there is a detrimental effect on birth outcomes for women who consume caffeine at very high levels."

Based on these few studies, the "government has issued carefully worded statements cautioning women about drinking coffee during pregnancy," Gilliland adds. "I think this caution should be extended to those women who are thinking about becoming pregnant to ease off — or eliminate — coffee."

Women who breast-feed their babies also should diminish their caffeine intake, Gilliland says. "Mothers

who lay off of caffeine when they are pregnant but resume after they deliver the baby are not getting around the problem if they are breast-feeding. The breast-feeding infant receives about the same concentration of caffeine as the mother consumes."

The effect of caffeine on a person is a "very individualistic thing," Gilliland emphasizes. "Some people develop problems drinking one to two cups of coffee a day while others can drink 20 strong cups of coffee each day, and it doesn't seem to bother them. It's the individual sensitivity involved that matters."

Individuals must learn how much caffeine they can tolerate without experiencing harmful effects, he says. "If you can't get up in the morning without coffee, if you can't make it through the day without caffeine, or if you feel depressed or anxious, the first thing I would suggest is to taper off on your caffeine consumption."

"It's not always best to go cold turkey," Gilliland warns. "Cut your caffeine consumption in half for a day or two, then cut down again, and then go off caffeine completely and see what happens."

As with other drugs, withdrawal symptoms will be felt, he says. "Headaches are the most profound effects of caffeine withdrawal. A jittery feeling, nervousness and irritability also may last for a day or two."

While Gilliland is concerned about the harmful effects of caffeine, he insists that he is not on a mission to condemn the use of a drug. "What I'm really saying is that this whole line of research seems to show that there is a small segment of caffeine consumers who get themselves in danger, and they're not even aware of it. The message I like to give people about caffeine is that a measured use is more appropriate than indiscriminate use."

Finally, what about Gilliland — does he drink coffee?

"Reporters always ask me that," he laughs. "I drink very little coffee, but not necessarily because of the caffeine. I love the taste of it, but it tends to upset my stomach. So, it's a drink I try to avoid."

Gilliland does drink tea and cola beverages. "I'm probably in the low caffeine consumption group," he says. "Just like a large number of people are." 