

Linda Spear, PhD — Developmental Psychopharmacologist

A DANGER BEYOND DRUNK DRIVING

Most people would agree that alcohol and adolescence are a dangerous combination.

Car crashes are the leading cause of death for teens, and about a quarter involve an underage drinking driver, according to the National Highway Traffic Safety Administration. But psychologist Linda Spear is concerned about more than the risk of drunk driving accidents among adolescent drinkers. As director of the Developmental Exposure Alcohol Research Center at Binghamton University, she studies the effects of alcohol on brain development and has found that alcohol changes the young brain in ways that may cause problems later in life.

Spear is part of a consortium of scientists who are examining the long-term effects of large quantities of alcohol — a kind of binge drinking — on the brains and behavior of adolescent laboratory rats. As mammals, rats share many traits with humans and are often used in research.

"We've found that after repeated alcohol exposure in adolescence, adult animals are socially anxious," she says. This social anxiety is reduced by alcohol exposure. Spear has theorized that when human adolescent drinkers become adults, they may be motivated to continue to consistently use alcohol in part to alleviate social anxiety.

Another reason why alcohol and adolescence don't mix is young people's brains are not fully developed and, as a result, they are less attuned to the signals that tell more mature drinkers when they've had enough.

"In our animal studies, we have found that adolescents are less sensitive to the undesired intoxicating effects of ethanol ... than are adults," she says. "Adolescents are at the same time more sensitive to ethanol's social stimulating and rewarding effects."

In human adolescents, that combination — being less aware of the intoxicating effects of alcohol and drinking because it makes them feel good — can be magnified if an adolescent has a family history of alcoholism and is living under stressful conditions. And while testing the same variables over long periods of time has just recently begun, Spear says, "basic research in laboratory animals in our lab and others has already begun to characterize lasting alterations in neural, cognitive and behavioral function after repeated adolescent alcohol use."

PRACTICAL APPLICATIONS

Many of the questions that Spear is pursuing are difficult or impossible to study in human adolescents, given that it would be unethical to test the effects of alcohol, cigarettes and illicit drugs on underage individuals. Using animal models is the next best solution, although "it is always important to consider the extent to which studies in rats relate to human behavior," Spear says. "Certainly, the complexity of human behavior cannot be fully modeled in rats. Yet when comparable data are available across species, there often seems to be a surprising concordance of results."

The basic research findings in Spear's area are just beginning to be applied to real-life situations.

"One issue that I am particularly concerned about is that many people, including college students, think that individuals who can 'hold their liquor' and who don't act particularly inebriated after a night of drinking are relatively protected from later alcohol problems when compared with those who become intoxicated more quickly," she says. "The opposite is actually the case. This is an important message that is just beginning to be disseminated." Also, some parents and other adults actually condone under-age drinking — something Spear hopes that her work and that of her colleagues will change as it provides evidence of the potential lifelong effects.



"One issue that I am particularly concerned about is that many people, including college students, think that some individuals can 'hold their liquor' ... The opposite is actually the case. This is an important message that is just beginning to be disseminated."

EXPERIMENTAL PSYCHOLOGY

Experimental psychologists use empirical research methods to better understand behavior. They study a wide range of behavioral topics among humans and animals, including sensation, perception, attention, memory, cognition, emotion and more.

Find out where psychology can take you at WWW.PSYCHSCIENCEACTION.ORG.

Linda Spear, PhD — Developmental Psychopharmacologist, continued

THE ROUTE TO SPEAR'S LAB

Spear's route to becoming a psychologist was unplanned — but not that unusual. "During my junior year in college, I walked out of a final in advanced calculus, decided that I was done being a math major, and changed my major to the most interesting course I had that quarter: psychology," she says.

She started out looking at the behavioral response to psychoactive drugs during development but she kept finding unexpected age differences, with adolescents often differing a lot from both younger and adult animals in their sensitivity to drugs. "My interest in alcohol arose largely because it is the most commonly used potential drug of abuse during adolescence," she says.

Find out where psychology can take you at WWW.PSYCHSCIENCEACTION.ORG.