

Behavior

Bruce Bower reports from New Orleans at the annual meeting of the American Psychiatric Association

Psychiatric smoke signals

Compared with nonsmokers, cigarette smokers report a higher lifetime frequency of substance abuse, severe depression, anxiety disorders, and personality disorders involving aggressive or antisocial behavior, according to a new study.

The investigators, led by Mark Zimmerman of the Medical College of Pennsylvania in Philadelphia, say the association between smoking and psychiatric disorders emerged most strongly in young adults and held for both men and women.

The factors underlying these results remain unclear. The researchers speculate that individuals with certain mental disorders may be more likely to engage in socially disapproved behaviors, including cigarette smoking, and some may smoke in an attempt to ease disturbing moods. In addition, they say, the link might reflect a biological predisposition to both smoking and psychiatric problems.

The team interviewed 1,057 parents and siblings of the same number of psychiatric patients and healthy controls. Inclusion of the patients' relatives increased the number of reported lifetime psychiatric disorders, since close relatives of the mentally ill run a higher-than-average risk of a variety of such disturbances. While the sample did not yield accurate population-wide prevalence rates for psychiatric disorders, it clearly illustrates an association between smoking and mental disturbances, the investigators say.

Slightly less than half the participants had smoked cigarettes daily for at least one month at some point in their lives. Nearly 54 percent of the smokers — compared with 35 percent of the nonsmokers — reported suffering a psychiatric disorder sometime during their lives. Among smokers, alcohol and drug abuse occurred three times as often and depression occurred twice as often. Although participants in their 20s and 30s smoked less than their older counterparts, young adults displayed the strongest link between smoking and psychiatric disorders, particularly alcohol and drug abuse. Among volunteers between 18 and 28 years old, 57 of 99 smokers reported abuse of or dependence on alcohol or illicit drugs, compared with 32 of 170 nonsmokers. The scientists say further studies are needed to examine whether smoking serves as a behavioral marker for substance abuse in young adults.

Prior studies revealed elevated smoking levels among hospitalized psychiatric patients. And a 1988 study showed that two-thirds of the participants in a smoking-cessation experiment had at some point experienced severe depression.

Proposed alcoholism gene fails again

Last year, researchers reported that a specific dopamine-receptor gene apparently predisposes its bearers to alcoholism. Although two-thirds of the alcoholics in that study carried the gene, an independent team of scientists subsequently found the same gene in only about one-third of both alcoholics and nonalcoholics (SN: 1/12/91, p.29). Now, a third study casts further doubt on the alleged alcoholism gene.

Joel Gelernter of the Veterans Administration Medical Center in West Haven, Conn., and his colleagues isolated DNA from 44 alcoholics and 68 healthy individuals. A chemical probe revealed, once again, that about one-third of each group possessed the dopamine-receptor gene. Moreover, the analysis showed no surplus of the gene in alcoholics with family histories of alcoholism or in alcoholics with histories of violent and criminal behavior.

Before launching the alcoholism study, Gelernter's team had looked in vain for an excess of the same dopamine-receptor gene among people with either schizophrenia or Tourette's syndrome — disorders that may involve irregularities in dopamine transmission. Dopamine normally functions as an important chemical messenger in the brain.

Earth Science

Shakedown for quake-resistant building

Inside a cavernous laboratory in San Diego, engineers and architects will construct a five-story building this fall and then try to shake it apart. The simulated earthquake will test how new building practices might hold up during the real thing, says co-principal investigator Nigel Priestly, an engineer at the University of California, San Diego.

The experiment will cap a six-year joint project in which U.S. and Japanese investigators are examining reinforced masonry structures. This type of construction, often seen in hotels and apartment buildings, uses concrete blocks or other masonry units strengthened by steel rods.

The researchers will replicate quakes in slow motion by pushing on the building with hydraulic pistons. As the system mimics larger and larger tremors, sensors within the building will monitor the stresses that rip apart joints and crack walls and floors. The strongest of the shocks will simulate the shaking that might occur during a magnitude 8 earthquake. If all goes according to plan, Priestly says, the structure should emerge bruised but not destroyed.

Ring around the K-T crater?

Charles E. Duller and his colleagues didn't know what to make of their find. While surveying satellite images of Mexico's Yucatán peninsula in the mid-1980s, these remote-sensing experts noticed a strange semicircle of sink-hole lakes, called cenotes by local residents. From high above, it looked like a set of teeth marks from an animal with jaws the size of New Jersey.



The researchers now believe they have linked the cenotes to the disappearance of the dinosaurs. In the May 9 NATURE, they report that the semicircle of lakes sits atop an area recently fingered as a possible crater left over from a meteorite impact 65 million years ago.

Many scientists believe a meteorite wiped out a large fraction of life on Earth at the end of the Cretaceous period, or K-T boundary, and geologists have searched the world over for the scar from such a catastrophe. Last year, they began focusing on a circular structure buried by about 1,100 meters of rock in the northern Yucatán. Scientists suspect the structure is a crater because holes drilled into it have pierced glassy rocks that could have formed from the tremendous heat of an impact (SN: 11/17/90, p.319).

Because the edge of the buried structure lies below the semicircle of lakes, the cenotes provide a surface marker that outlines the crater's rim, suggests Duller, of the NASA Ames Research Center in Mountain View, Calif. He and his co-workers believe the cenote pattern formed as the crater rim collapsed over millions of years, causing cracks to develop in the overlying limestone rock. As groundwater flowed through the cracks, it created a string of sinkholes around the crater.

The cenotes add to a growing body of evidence pointing to the Yucatán structure as the K-T crater. At the Lunar and Planetary Science Conference last March, Alan R. Hildebrand and his colleagues at the University of Arizona in Tucson reported finding pieces of pressure-shocked quartz in drill cores from the buried structure. Scientists believe such fracturing of mineral grains could result from the pressure waves of an impact. Researchers are now trying to date the structure to find out whether it did indeed form at the K-T boundary.