Rats at a Rave

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*Science*NOW Daily News
16 February 2006

Cranking up the music can exacerbate the club drug ecstasy's deleterious effects on the brain, according to a new study. When scientists simulated a dance party for rats in the lab, the rodents suffered from reduced brain activity 5 times longer than their counterparts who took the drug in peace and quiet. The findings suggest environment may play a significant role in the harmful effects of the drug among humans.

Otherwise known as ecstasy, 3, 4-methylenedioxymethamphetamine (MDMA), is commonly used as a recreational drug in the dance hall scene. Users report an amplification of sensory experiences and heightened pleasure. After multiple uses, however, ecstasy can damage cells that release serotonin, a neurotransmitter associated with memory. Increased body temperature and muscular activity--both likely results of a night on the dance floor--potentially increase the drug's toxicity. Yet little research has addressed the effect of one of the most common environmental factors associated with ecstasy use: loud music.

To see how sound impacts the effects of ecstasy, Michelangelo Iannone, a neurologist at the Institute of Neurological Science in Catanzaro, Italy, and colleagues gave relatively low and high doses of the drug to 20 rats. The team then placed half of the rodents in a cage blasted with white noise and half in a sound-proof metal box, while **monitoring their brain activity with a device called an electrocorticograph (ECoG).**

Turning the volume up appears to turn brain function down. **Among rats given the high dose of ecstasy, those exposed to 95 decibels--the maximum noise legally allowed in Italian nightclubs--had ECoG readings half as high as rats not exposed to sound.** Brain activity for rats left to trip quietly returned to normal after 1 day, but **raving rats' brain activity stayed low for 5 days**. Rats given low doses of ecstasy also had low ECoG readings after sound exposure, but their readings returned to normal after just 1 day. Those given saline instead of ecstasy experienced no drop in ECoG reading, the team reports online today in *BMC Neuroscience*.

The results indicate that relatively common environmental factors can have big impacts on the harmful effects of high-dose drug use, says John Mendelson, a physician and clinical scientist at California Pacific Medical Center's Addiction Pharmacology Research Laboratory in San Francisco. Yet, he notes that the rats were given higher doses of ecstasy than would be seen in humans, so the results may not translate directly to people. **And Linda Cottler, an epidemiologist at the Washington University School of Medicine in St. Louis, Missouri, points out that ecstasy users often use the drug in venues other than raves, and therefore background noise is probably not as detrimental as on-going abuse**.