

Evaluation of the abuse potential of MDPV and methylone, two common synthetic cathinones found in “bath salts”

Lucas R. Watterson, Peter R. Kufahl, Natali E. Nemirovsky, Kaveish Sewalia, Megan Grabenauer, Brian F. Thomas, Julie A. Marusich, Scott Wegner and M. Foster Olive
Arizona State University, USA

Synthetic cathinones, a class of designer drugs commonly sold as “bath salts”, have emerged in recent years as popular “legal high” alternatives to illicit drugs such as cocaine, methamphetamine, and MDMA (ecstasy). Despite widespread abuse, their potential for compulsive use has not been scientifically established. The present studies sought to assess the addiction potential of methylenedioxypyrovalerone (MDPV) and methylone, two common “bath salts” drugs. In Experiment 1, three groups of rats (0.05, 0.1, and 0.2 mg/kg/infusion MDPV) successfully discriminated between active vs. inactive levers by day 5 of ten 2 hr/day (short access, ShA) intravenous self-administration (IVSA) sessions. Rats also displayed significant dose-dependent effects of reinforcer efficacy during progressive ratio (PR) testing, and showed escalated intake across ten 6 hr/day (long access, LgA) IVSA sessions. In Experiment 2, rats placed into a discrete-trials current threshold ICSS procedure displayed significant reductions in ICSS thresholds following MDPV treatment (vehicle, 0.1, 0.5, 1.0, and 2.0 mg/kg i.p.). In Experiment 3, three groups of rats (0.05, 0.1, and 0.2 mg/kg/infusion methylone) displayed discrimination between active vs. inactive levers by day 8 of ten ShA daily IVSA sessions. However, PR testing did not reveal significant dose-effects and LgA did not lead to escalated intake across sessions. These experiments revealed that both MDPV and methylone function as reinforcers. However, only MDPV revealed patterns of escalated intake predictive of compulsive use in humans. These findings have significant implications for researchers, treatment specialists, and policy makers regarding synthetic cathinone abuse and addiction.

Biography

Lucas Watterson completed his Master's degree in psychology at the University of North Carolina – Wilmington and is currently a Ph.D. candidate in the Behavioral Neuroscience area of the graduate program in the Department of Psychology at Arizona State University.

lrwatter@asu.edu