

**BEHAVIORAL PHARMACOLOGY AND THE SEARCH FOR AN AMETHYSTIC AGENT** Mark Galizio Department of Psychology, University of North Carolina at Wilmington

The quest to discover an "amethystic drug," a specific antagonist for the central nervous system effects of alcohol, has been an important part of contemporary research on alcohol pharmacology. In recent years a number of agents have been proposed to reverse alcohol's actions including naloxone, picrotoxin, thyrotropin-releasing hormone, and most currently benzodiazepine inverse agonists such as RO 15-4513. The techniques of behavioral pharmacology have played an important role in the evaluation of the interaction of these drugs with alcohol, and these techniques are reviewed along with the outcomes of such studies.

**MARIJUANA AND BEHAVIORAL CONTINGENCIES** R. W. Foltin Department of Psychiatry and Behavioral Sciences, The Johns Hopkins University School of Medicine

Twenty-four adult male research volunteers, in eight groups of three subjects each, lived continuously in a residential laboratory for up to 25 days. Under contingency conditions, time spent engaging in a low-probability activity earned time that could be spent engaging in a higher probability activity. When contingency requirements were imposed on private work activities, smoked marijuana significantly *increased* the amount of time spent engaging in the low-probability activity compared to placebo conditions. In contrast, when contingency requirements were imposed on recreational activities, smoked marijuana significantly *decreased* the amount of time spent engaging in low-probability activity. Smoking marijuana had no effect on the amount of time spent engaging in the contingent work or recreational activity.

**INTEGRATION OF BEHAVIORAL AND BIOLOGICAL FACTORS IN SMOKING: A PEEK INSIDE THE BLACK BOX** Ovide F. Pomerleau Behavioral Medicine Program, University of Michigan School of Medicine

Cigarette smoking is a highly efficient method for nicotine self-administration. The persistence of such a behavior in the face of serious health consequences and societal disapproval constitutes a major challenge for applied behavior analysis. A strictly pharmacological explanation (smoking as relief of nicotine withdrawal) is not fully satisfactory, as most cigarettes are smoked in the absence of observable withdrawal signs. Similarly, strictly psychological explanations (smoking as a compelling habit) seem incomplete, as, depending on conditions and nicotine dose, smoking behavior produces widely varying reinforcing consequences. An examination of the neuroregulatory impact of nicotine, with effects on cholinergic, catecholaminergic, and endorphinergic activity, may help resolve the problem. The resulting integration of biological and behavioral factors provides a more comprehensive and satisfactory explanation than is possible with unidimensional models.

**TRANSITIONS IN CONCURRENT RESPONDING: EFFECTS OF d-AMPHETAMINE** J. M. Ziriax University of Rochester, Department of Biophysics

d-Amphetamine altered response patterns during concurrent schedule transitions in monkeys. Both schedule compo-

nents were stochastic reinforcement of waiting schedules. Steady-state performance was characterized by visits of 5 to 10 seconds on the SRW 80s and 15 to 35 seconds on the SRW 20s. An un signaled exchange of the schedule values occurred 15 minutes into a transition session. During control transitions, long visit durations were rapidly replaced by short visits, the shift from short to long visits developed more slowly. Amphetamine increased interresponse times and visit durations, and accelerated the development of long visits within the transition session.

**THE REINFORCING FUNCTIONS OF DRUGS AND ASSESSMENT OF ABUSE LIABILITY** J. V. Brady The Johns Hopkins University School of Medicine

The contributions of behavioral pharmacology to the assessment of drugs for dependence potential and abuse liability have complemented traditional biochemical/physiological procedures for characterizing structure-activity relationships and provided a more comprehensive basis for evaluating a drug's functional properties. The resulting advances in knowledge of drug actions, and particularly in research technology, have made possible an operational approach to pharmacological assessment of abused drugs and called attention to the need for reappraisal of traditional concepts and definitions in the field. The development of a unifying conceptual framework must encompass the data base that focuses upon the analysis of behavior advantaged by the strong empirical influence of the experimental laboratory. The most important point of contact between the experimental analysis of behavior and substance abuse is the demonstrated relationship between the pharmacological properties of drugs and their stimulus functions in behavioral interactions.

**THE BEHAVIORAL EFFECTS OF CHLORDIAZEPOXIDE, BUSPIRONE, GEPIRONE AND BCCE ON RESPONDING MAINTAINED BY INTRAMUSCULAR COCAINE INJECTION OR FOOD PRESENTATION IN THE SQUIRREL MONKEY** M. A. Nader and J. E. Barrett Department of Psychiatry, Uniformed Services University of Health Sciences

Lever pressing of squirrel monkeys was maintained under a second-order schedule [FR10(F13' S)] of either food presentation or intramuscular cocaine injection. Chlordiazepoxide (0.3-5.6 mg/kg), increased responding maintained by food at doses that had no effect on or decreased responding maintained by cocaine, BCCE (0.003-0.03 mg/kg), an inverse agonist at benzodiazepine receptors, decreased responding in all subjects irrespective of the maintaining event. The novel anxiolytic buspirone and its analogue gepirone (both at 0.003-0.03 mg/kg), compounds active at 5-HT<sub>1A</sub> receptors, increased cocaine-maintained responding but only decreased responding maintained by food. These results show that the effects of buspirone and gepirone can depend upon the maintaining event and suggest the involvement of serotonin in cocaine-maintained behavior. (Supported by PHS Grant DA-02873.)

**OPERANT BEHAVIOR MODELS OF LEARNING AND MEMORY: DRUG EFFECTS** D. M. Thompson Georgetown University Medical Center

Repeated acquisition is an operant technique that has been used to study drug effects on "learning" in individual