operant responding. Neuroleptic pretreatment (0.1, 0.2, 0.4 mg/kg of alpha-flupenthixol) produced only dose-dependent decreases in responding thereby interfering with the animals' ability to behaviorally maintain their internal core temperature. In an additional test paradigm requiring far less effort on the part of the subjects, alpha-flupenthixol did not alter the animals' preferred environmental temperature, nor did it disrupt the animals' behavioral thermoregulatory ability. These data suggest that at least part of the behavioral deficit observed during neuroleptic treatment is due to a disruption in the performance capabilities of the subjects.

LOW-DOSE AMPHETAMINE EFFECTS: TIME RANGE PATTERN ANALYSIS SUPPORTS BEHAVIORAL THEORY. Melvin Lyon. Psychological Laboratory, Copenhagen University, Copenhagen S., Denmark.

Testing predictions from the Lyon-Robbins theory of amphetamine effects, rats (N=10) received low doses of d-amphetamine, (0.02–1.0 mg/kg), in a counterbalanced NaCL—Amph.—NaCl sequence with 10–20 day intertrial intervals. Controls (N=6) received NaCl only. Behavior was videotaped, scored 'blind' into 16 categories and subjected to time range pattern analysis ($p=0.0005$) using Magnusson's THEME method. All doses produced effects different from NaCl, even including increased resting and grooming. Dose-related increases occurred, both in percentage of predrug NaCl patterns subsequently seen under Amph., and in percentage transferring from Amph. to postdrug NaCl. The results strongly support theoretical predictions.

ACTION OF PHENYLETHYLAMINE AND AMPHETAMINE ON AUDITORY STARTLE. Charles L. Kutscher and Bret Ingerman. Syracuse University, NY.

Phenylethylamine (PEA), an analogue of amphetamine, is found in the brain of humans and rats. Like amphetamine, it causes release of brain norepinephrine and dopamine. PEA and amphetamine were injected into male and female rats over a wide dosage range with auditory startle tested for 50 trials beginning either 0 or 30 min after injection. The action of both amphetamine and PEA was a function of these procedural variables. In males PEA and amphetamine potentiated or inhibited startle depending upon dosage and delay. PEA action was biphasic over the dosage range; high dosages which produced stereotypy inhibited startle. In females only, potentiation was seen.

NEUROBIOLOGICAL FACTORS INVOLVED IN THE BEHAVIORAL EFFECTS OF DRUGS. Steven I. Dworkin and Nick E. Goeders. Departments of Psychiatry and Pharmacology, Louisiana State University Medical Center, School of Medicine in Shreveport, LA.

6-Hydroxydopamine (6-OHDA) lesions of the nucleus accumbens (NA) have been shown to decrease cocaine self-administration. The decrease in responding produced by the lesion has been suggested to demonstrate a decrease in the reinforcing efficacy of cocaine, thereby implicating the involvement of the neurons affected in the central mechanisms of reinforcement. However, drugs have multiple effects on behavior and a specific neurobiological manipulation may alter effects other than the reinforcing properties. Six male Fischer rats were trained on a multiple fixed interval 2-min, fixed-ratio 5 schedule of food presentation. Six additional subjects were trained to discriminate the effect of 10 mg/kg cocaine from saline in a standard drug discrimination procedure. The effects of several doses of cocaine were determined before and after 6-OHDA lesions. These lesions altered several of the behavioral effects of cocaine.

EFFECTS OF SOMAN ON SCHEDULE-CONTROLLED BEHAVIOR IN RATS. Norman Hymowitz and Henry E. Brezenoff. Department of Psychiatry and Pharmacology, University of Medicine and Dentistry of New Jersey, New Jersey Medical School, Newark, NJ.

The behavior of rats was studied under a multiple fixed-interval 50-sec fixed ratio 25 (mult FI50-sec FR 25) schedule of food reinforcement. Presession administration of 30 and 40 μg/kg soman (IP) completely suppressed response rates, while doses of 5, 10, and 20 μg/kg suppressed responses under each schedule to a lesser degree. When the dose of soman was gradually increased, much higher levels of soman were required to suppress response rates.

SUPPRESSION OF DRUG-REINFORCED BEHAVIOR BY PRESENTATION OF AN ALTERNATIVE REINFORCER. Marilyn E. Carroll. University of Minnesota, MI

Six monkeys self-administered orally-delivered phencyclidine and saccharin under concurrent fixed ratio 16 schedules during daily three hour sessions. Three saccharin concentrations (0.003%, 0.03% and 0.3%, wt/vol) were tested in a nonsystematic order. For each saccharin concentration, the following series of phencyclidine concentrations was presented: 0.25, 0.5, 1, 0.25 (retest), 0.125, 0.0625, 0.0312, 0.25 (retest) and 0 (water with stimuli signalling phencyclidine). As the saccharin concentration increased, the phencyclidine concentration-response functions were lower and the peaks were shifted to the right. The two higher saccharin concentrations maintained behavior far in excess of phencyclidine, but saccharin deliveries decreased as phencyclidine concentration and intake (mg/kg) increased. The time course and patterns of phencyclidine-reinforced responding were also altered when saccharin was concurrently available. The results are discussed in terms of strategies to reduce drug-reinforced behavior, and measures of reinforcing efficacy.

INTRAVENOUS SELF-ADMINISTRATION OF PENTOBARBITAL AND ETHANOL IN RATS. Victor J. DeNoble, Paul C. Mele and Joseph H. Porter. Virginia Commonwealth University, VA.

Unlimited access to intravenous doses of ethanol (30, 60, 90, 180 and 360 mg/kg/infusion) failed to initiate and maintain lever pressing that resulted in its delivery. When pentobarbital was substituted (0.5 mg/kg/infusion) for ethanol, lever pressing increased. There were three indications of the positive reinforcing effects of pentobarbital: (1) a greater number of lever presses occurred when pentobarbital was response-contingent than when saline was available; (2) a greater number of responses were made on the pentobarbital lever than on a control "activity" lever, and (3) systematic changes in lever pressing were a function of pentobarbital dose. Following the pentobarbital self-administration regimen, changes in the ethanol dose effect function were studied

EFFECTS OF CESSATION OF ALCOHOL DURING PREGNANCY IN RATS. I. I. Lenzer,* C. L. Ryan and C. M. Hourihan. *Saint Mary's University and Carleton University, Canada.

Female rats were fed a diet containing 35% ethanol-derived calories for 20 days or for 14 days of gestation; the latter group received for the last six days of gestation a control diet with an isocaloric amount of sucrose. A third group was pair-fed the control diet throughout gestation. All animals were sacrificed on day-20 of gestation. Offspring of day-20 animals, compared to pair-fed controls, had significantly reduced values for crown-rump length, brain weight, pairs of ribs and number of skull bones ossified. The brain weight of offspring of day-20 animals was significantly lower than that of day-14 animals.

EMOTIONAL REACTIVITY AND ALCOHOL INTAKE.† K. Paul Satinder. Lakehead University, Canada.

The relationship between open-field emotional reactivity and alcohol intake was investigated in the Maudsley and Roman genetic crosses of rats. No significant differences were found in any of the behaviors between the respective reciprocal crosses. The MR × RHA cross followed by the MR × RLA, MNR × RHA and MNR × RLA crosses showed relative correspondence between open-field defecation (OFD) and proportional choice intake of alcohol. Findings confirmed a prediction for the relationship between OFD and alcohol intake in these genetic crosses. It is concluded that emotional reactivity is a mediating process related independently to both OFD and alcohol intake but related to each other in genetic crosses due to possible genetic overlap between the genetic mechanisms mediating these two behaviors.

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ETHANOL AND NALOXONE EFFECTS ON DELAYED MATCHING PIGEONS. Mary Knopp and Stephen A. Daniel. Mercy College, NY.

The effects of acute administration of ethanol (PO) and naloxone hydrochloride (IM) on delayed matching to sample in pigeons (N=8) were investigated. Subjects were tested on a color matching task at delays of 0, 2 and 8 seconds. In experiment I, ethanol (0–1.50 g/kg) was administered and produced decreases in accuracy related to dose and delay. In experiment II, subjects were tested on the delayed matching task following a 17 day retention interval. Naloxone (2 mg/kg) or saline was given prior to the retention test. Subjects given naloxone showed superior performance on the two second delay.

EFFECTS OF ANTI-DEPRESSANT DRUGS UPON ASSOCIATIVE LEARNING. Pamela Clift Scavio, Joseph C. Marshall, Randall Scheibel and Michael J. Scavio. Department of Psychology, California State University, Fullerton, Fullerton, CA.

The purpose of the study was to investigate whether anti-depressants influence associative learning as measured by the classical conditioning of the rabbit's nictitating membrane response (NMR). The findings indicated that trazodone and maprotiline were equally effective in facilitating NMR conditioning. However, imipramine did not alter conditioning. The results may be related to drug actions. Trazodone and maprotiline respectively increase the function of serotonin and norepinephrine. Thus, each of these neurotransmitters appears to regulate learning. In contrast, imipramine has joint effects upon serotonin and norepinephrine. Consequently, the failure of imipramine to determine conditioning may have been due to a competitive antagonism between the neurotransmitters.

INTRACEREBROVENTRICULAR MORPHINE, NALTREXONE AND QUATERNARY NALTREXONE IN THE PIGEON. Charles P. France. University of Michigan, MI.

Pigeons trained to peck a single key, on a variable-interval 30 second schedule of food reinforcement, were stereotaxically implanted with a chronic intracerebroventricular (ICV) cannula. The cannula patency was periodically assessed by radiographic procedures. The opiate agonist morphine and antagonist quaternary naltrexone, were 90 and >280 times more potent in suppressing responding when administered ICV; 100.0 μg quaternary naltrexone suppressed responding for longer than 24 hr. Naltrexone (tertiary) did not markedly affect responding up to a dose of 178.0 μg (ICV). However, as an antagonist of morphine's rate-suppressing effects, naltrexone was equipotent when administered ICV or IM. Quaternary naltrexone (ICV) failed to display any antagonist actions against morphine.

PHARMACOLOGICAL MODIFICATION OF THE DISCRIMINATIVE STIMULUS PROPERTIES OF MORPHINE. Alice M. Young and Changiz Geula, Wayne State University, Detroit, MI.

The sensitivity of a morphine stimulus to alteration by ketamine or amphetamine was examined under a drug discrimination procedure. Saline and one of two doses of morphine (3.2 or 5.6 mg/kg) were established as discriminative stimuli for food-reinforced responses in Sprague Dawley rats. Neither ketamine nor amphetamine exerted morphine-like stimulus control in any subject. However, the concomitant administration of either drug modified the morphine stimulus. In subjects trained with 3.2 mg/kg morphine, moderate ketamine doses enhanced morphine's stimulus potency. In contrast, moderate amphetamine doses attenuated morphine's stimulus effects, producing a loss of stimulus control by 3.2 mg/kg morphine. Increasing the morphine training dose to 5.6 mg/kg appeared to diminish the sensitivity of the morphine stimulus to alteration by amphetamine.

THE EFFECT OF ENVIRONMENTAL CUES ON CONSUMPTION OF MORPHINE SOLUTION. Riley E. Hinson, C. X. Poulos and W. L. Thomas. Addiction Research Foundation, Toronto, Canada.

The effect of environmental stimuli on morphine consumption in rats was examined. Rats were first trained to consume a morphine solution (increased from 0.5 mg/ml to 1.2 mg/ml). Then, a period of abstinence was given. Next, rats received injections of morphine in one environment and injections of saline in a distinctively different environment (30 injections of morphine, dose increased from 5 mg/kg to 40 mg/kg). Finally, the effects of the different environments on consumption of morphine were determined. In a two-bottle test, there was almost no consumption of the morphine solution, regardless of environment. In a one-bottle test, significantly more morphine was consumed in the drug environment than in the saline environment.