

dependent population. (Supported by R18DA06113.)

ADHD AND UADD: DIFFERENTIAL TREATMENT EFFECTS OF STIMULANT MEDICATION. Richard A. Campbell. University of Texas Southwestern Medical Center, Dallas, TX; Sebastian Striefel. Utah State University, Logan, UT; Dennis Odell. Developmental Center for Handicapped Persons, Logan, UT; Phyllis Cole. Utah State University, Logan, UT; Sunita Steward. University of Texas Southwestern Medical Center, Dallas, TX.

This study investigates the treatment effects of methylphenidate in Attention Deficit-Hyperactivity Disorder (ADHD) and Undifferentiated Attention Deficit Disorder (UADD) using a pretest-posttest experimental design. Twelve children diagnosed as ADHD and 12 children diagnosed as UADD were compared on measures of self-reported depression and self-esteem and parent and teacher ratings of problem behavior before and after a 3-month trial of methylphenidate. Significant improvement was found in self-reported depression and self-esteem and inattention/hyperactivity in both groups following a trial of stimulant medication. Significant improvement was found in anxiety, depression, and uncommunicative behavior in the UADD group but not in the ADHD group. Significant improvement was found in aggressive problem behavior in the UADD group. Stimulant medication does not reduce the aggressive behavior of ADHD children, suggesting a multimodal treatment approach for ADHD children with aggressive problem behavior.

SEVERITY OF DRUG WITHDRAWAL EFFECTS IS ALTERED BY BEHAVIORAL ECONOMIC VARIABLES. Marilyn E. Carroll. University of Minnesota, Minneapolis, MN.

Phencyclidine (PCP) withdrawal was studied under several different economic conditions. Withdrawal effects were measured by disruptions in food-reinforced responding. In the first experiment, the cost of food or fixed-ratio (FR) value was varied over a wide range. The severity of PCP withdrawal disruptions increased as the cost of food increased. In the second experiment the availability of food was altered such that the monkeys had to earn all their food (closed economy) or the earned food was supplemented by the experimenter (open economy). When earned food was supplemented, the same amount of food was earned, but the effects of PCP withdrawal on the amount of earned food was markedly greater than when only earned food was available. In the third series of experiments the combined effect of PCP and caffeine withdrawal and PCP and ethanol withdrawal was compared to that of each drug alone. Results indicated that the withdrawal of drug combinations was more severe than that of either drug alone.

COCAINE DIFFERENTIALLY AFFECTS ENRICHED AND ISOLATED RATS' ATTENTIONAL PERFORMANCE. J. Michael Chase and Stephen C. Fowler. University of Mississippi, University, MS.

At 220 days of age rats reared/housed in an enriched condition (EC) or isolated condition (IC) were divided into 3 EC and 3 identical IC chronic cocaine dosing groups (0.0, 2.5, or 7.5 mg/kg, IP, daily, 10 min pre-session). These six groups were trained to perform a Sustained Attention Task, receiving daily injections of cocaine for 53 sessions until the task was learned. Doses of cocaine (0.0, 0.63, 1.25, 2.5, 5.0, 10.0, and 20.0 mg/

kg, IP, 10 min pre-session) were tested for their ability to enhance performance. Rate of head insertion was dose-dependently disrupted, while time on task and reinforcements received showed enhancement at low doses. Effects may be due to rate-dependency and deficiency compensation. (Supported by DA05310.)

DEFEATED HUMANS SHOW ANALGESIA: ENDOGENOUS OPIOIDS IMPLICATED. Desmond J. Coen. Workers Compensation Board of British Columbia, Vancouver, BC.

The effects of victory and defeat in human competition upon cutaneous sensitivity were studied. Defeat increased sensation and pain perception thresholds to electrical stimulation, while victory decreased pain perception threshold. This pattern of results was seen in highly competitive karate, wrestling, and chess, but not in recreational sports where the intensity of competition was low. Social defeat analgesia and social dominance hyperalgesia were prevented in wrestlers by administration of 50 mg of the opiate antagonist naltrexone. These findings suggest that winning or losing can respectively sensitize or inhibit pain control systems through opioid activity.

TIME COURSE OF BUCCAL NICOTINE ABSORPTION. Caroline Cohen, Aleksandras Radzius, Eric Simmons and Jack E. Henningfield. Addiction Research Center, National Institute on Drug Abuse, Baltimore, MD.

Nicotine polacrilex gum can be a useful adjunct in treating tobacco dependence if adequate dosing levels are achieved. Factors such as salivary pH and chew rate affect nicotine absorption from the polacrilex. In addition, an experiment with smokeless tobacco suggested that the length of time saliva remains in the mouth is a determinant of nicotine absorption. The present study was conducted to determine effect of varying the time nicotine from polacrilex is held in the mouth. Rather than have the subjects swallow their saliva at various intervals we instructed them to spit at intervals of 6, 12, 24, 48, or 96 seconds while chewing 4 mg nicotine polacrilex. A preliminary analysis of data from the first 3 subjects indicates that at all spitting rates, a significant increase in serum nicotine is achieved when measured 20 and 35 minutes after start of chewing. At 20 minutes after start of chewing, there appears to be an orderly increase in serum nicotine from pregum levels at 6-, 12- and 24-second spitting rates and a leveling off after the 24-second spitting rate. At 35 minutes after start of chewing, there is little difference in change of serum nicotine levels from pregum levels across spitting rates. Our current findings suggest that a patient should keep saliva resulting from chewing nicotine polacrilex gum in the mouth for at least 12 to 24 seconds to achieve maximal buccal nicotine absorption.

SECOBARBITAL EFFECTS ON HUMANS' LEVER PRESSING SUPPRESSED BY RESPONSE CONTINGENT POINT LOSS. Mark Egli and Don R. Cherek. University of Texas Health Sciences Center, Houston, TX.

Two adult male human volunteers lever pressed for points (worth 10 cents each) under a variable interval schedule. Responding was suppressed by response contingent point subtraction in one component, and by a tandem interresponse time 2 second condition in the other. Secobarbital (50, 100, and 200 mg/70 kg), administered 20 minutes prior to the first component, increased lever press rates from low placebo baseline rates and

decreased lever press rates from higher placebo rates independent of whether behavior was suppressed by punishment (point loss) or an interresponse time requirement. These results are not consistent with the antipunishment effects of barbiturates observed in nonhuman species where electric shock presentation is the punisher. Functional differences between positive and negative punishers may account for this discrepancy.

CHARACTERIZING NEUROBEHAVIORAL DEVELOPMENT IN MONKEYS USING MODIFIED BAYLEY AND BRAZELTON SCALES. Jane E. Ellis, C. Anne Patterson-Barnett and Larry D. Byrd. Yerkes Regional Primate Research Center, Emory University, Atlanta, GA.

The ability to assess the state of an infant's nervous system via measures of observable behavior has contributed significantly to studies of human development. Interest in the effects of in utero risks has increased the need for an effective and reliable means of characterizing neurobehavioral development in nonhuman primates, as well. In the present study, a test battery consisting of items modeled after those in the Brazelton Neonatal Behavioral Assessment Scale and the Bayley Infant Development Scale were used to assess postnatal development in infant rhesus monkeys (*Macaca mulatta*). Groups of neonates differing in prenatal experience served as subjects. Exposure to cocaine in utero was accomplished by implanting in the maternal animal an osmotic pump that released 0.3 mg/kg/h cocaine continuously. Other pregnant monkeys were exposed to decreased oxygenation (17%) during 20-min periods for several days prior to delivery. The cocaine-exposed infants showed a significantly longer retention of the rooting reflex, higher levels of distractibility during testing, and more frequent vocalizations. No statistically significant differences were found in physical growth measures for any group. The data derived from this study provide evidence that modified Brazelton and Bayley Scales can characterize and quantify development in nonhuman primates. (Supported by USPHS Grants DA-06264, DA-01161 and RR-00165 to the Yerkes Center from the Division of Research Resources, NIH.)

PROTECTIVE AND RISK FACTORS FOR DRUG USE: A LONGITUDINAL ANALYSIS. Maria Felix-Ortiz. University of California; Michael D. Newcomb. University of Southern California, Los Angeles, CA.

We test new approaches that overcome the problem of attempting to identify single causes of drug use by considering a wide range of factors in indices of risk, protection, and their interaction. From data on a sample of teenagers, bivariate, multiple regression, and latent-variable structural equation analyses revealed how psychosocial vulnerability is associated with frequency and quantity of drug use (cigarettes, alcohol, cannabis, cocaine, and hard drugs) in adolescence and later drug use: Vulnerability indirectly increased frequency of cannabis and cocaine use four years later.

COCAINE QUICKENS THE HIGH-SPEED FORELIMB MOVEMENTS OF ENRICHED RATS. Stephen C. Fowler, Patrick H. Hopkins, J. Michael Chase, Mary J. Kallman and Candice Murphy-Farmer. University of Mississippi, University, MS.

In an effort to demonstrate cocaine's putative capacity to enhance psychomotor performance, rats reared and housed in en-

riched environments were compared in their response to cocaine with rats reared and housed in isolation. Animals were trained to strike a force transducer with the forelimb on either a high-force or low-force fixed ratio 24 schedule of sweetened milk reinforcement. Analysis of interresponse times for responses emitted during the ratio run were shortened by 10.0 mg/kg cocaine, with the effect being most consistent in the enriched rats responding on the high-force schedule. This effect does not appear to be rate dependent, and is analogous to enhancement of athletic performance by dopaminergic stimulants. (Supported by DA 05310.)

GENERALIZATION OF AN ECOLOGICALLY RELEVANT STIMULUS TO THE PENTYLENETETRAZOLE CUE. David V. Gauvin and Frank A. Holloway. University of Oklahoma Health Sciences Center, Oklahoma City, OK.

Rats previously trained in a two-choice drug discrimination task using 15 mg/kg pentylenetetrazole and saline were exposed for 20 min to the presence of a domestic cat. No physical contact was possible between predator and prey. Rats were then placed into operant chambers and tested in a 2-min reinforced test session. Ten out of 12 rats responded, resulting in 91% pentylenetetrazole-appropriate responding. Similar to Blanchard et al. (JCPP 88:81-88; 1975), specific environmental variables were required to produce PTZ-appropriate responding. These data suggest that the interoceptive defensive reactions to environmental ecologically relevant stimuli were similar to the 15 mg/kg pentylenetetrazole training stimulus.

HISTORICAL AND ENVIRONMENTAL FACTORS IN THE DEVELOPMENT OF ETOH CONDITIONED PLACE PREFERENCE (CPP). David V. Gauvin and Frank A. Holloway. University of Oklahoma Health Sciences Center, Oklahoma City, OK.

The effects of drug/behavioral history (hx) on the development of ethanol (ETOH) CPP was examined in rats previously trained in either: 1) a drug discrimination (DD) task using 1.5 g/kg ETOH (IP) and saline, or 2) an oral self-administration (SA) task. The CPP Control and DD groups received 2 g/kg ETOH (IP). The SA group drank ETOH (E) or water (W) and were sequestered (Seq.) or nonsequestered (Nonseq.) during trials. The control group developed a conditioned *aversion*; the DD hx group showed no preference or aversion. Only the SA/EW-Seq. conditioning produced *preference* ($p < 0.001$). The EW-Nonseq., WW-Seq., and EE-Seq. produced neither preference or aversion. These data suggest that drug exposure alone does not necessarily contribute to learning rewarding aspects of ETOH; ETOH-SA can produce CPP; and cues learned under DD and SA may not be identical.

AN INVESTIGATION OF METHADONE MAINTENANCE DETOXIFICATION FEAR COMPONENTS. Mary A. Gentile and Jesse B. Milby. University of Alabama, Birmingham, AL.

This study sought to enhance the DFSS-14 by exploring three additional underlying fear components. Samples from two populations of methadone maintenance clients ($N = 226$) were used in the scale development analysis where 31 items and three factors (fear of relapse, fear of AIDS, and fear of withdrawal symptoms) emerged. A test validation sample ($N = 159$) yielded the final scale of 27 items that best discriminated between interview diagnosed detoxification fear (91.8% correctly classified) and