relationships between patterns of substance use (in adolescence and young adulthood) and measures used to assess the personality and perceived environment systems of problem behavior theory. Data were obtained from a sample of 765 respondents (298 males, 467 females) who completed questionnaires at the 1974, 1980, and 1986 waves of a longitudinal study designed to examine the social psychology of nonmedical drug use. Analyses were carried out separately for males and females. Results indicate that the patterns of substance use established in 1974, when respondents were aged 15–18, remained stable through young adulthood (i.e., when respondents were 27–30 years of age). In addition, adolescent measures of problem behavior theory provided a reasonable account of substance use in both adolescence and young adulthood. On the other hand, measures of personality and perceived environment were not as successful in accounting for substance use in either 1980 or 1986. Implications for problem behavior theory are evident from results presented in the longitudinal structural model.

DRUG USE, AGENCY AND COMMUNALITY: CAUSES AND CONSEQUENCES AMONG ADULTS. Michael D. Newcomb and Lisa E. Jack. University of Southern California, Los Angeles, CA.

Causes and consequences of drug use in the third decade of life may be quite different and distinct from those during adolescence. Although stereotypic and perhaps in transition, generally young adult men must prepare for being wage earners and family providers (an instrumental or agentic orientation towards life), whereas young adult women prepare themselves for family responsibilities and childrearing (a relational or communal orientation to life). Based on these gender difference expectations for young adult development, four predictions are made regarding how drug use may be influenced by or generated from the degree to which accomplishment of these life tasks occur. For men, if they are not achieving their goal of agentic success, they may increase their drug use to self-medicate the pain of their failure. Similarly women who have difficulty accomplishing their communal role may increase their drug use to relieve and assuage their frustrations. On the other hand, drug use may interfere with the attainment of these goals for men and women. Specifically, earlier drug use may impede the development of agentic skills for men and communal skills for women.

These hypotheses are tested in prospective data with repeated multiple assessment of drug use, agency, and communality. Data were from community samples of men and women assessed four years apart, first in young adulthood (average age 21) and then in adulthood (average age 25). Latent-variable models were used to test for both standard (construct-to-construct) and specific effects (those not strictly limited to between constructs; involving residual variances).

Results for the women revealed that early success and communality reduced polydrug use four years later, whereas only one small effect was found for the reversed associations. However, two significant effects were found that earlier polydrug use reduced satisfaction with future and work (two indicators of agency). For the men, three specific effects were found whereby indicators of earlier agency reduced later types of drug use, whereas four specific effects were found for earlier types of drug use reducing later measures of agency. Although there were no effects from early communality to later drug use for men, there were five specific effects relating types of earlier drug use to reduced types of communality four years later.

In conclusion, all four hypotheses received at least some support, some more strongly than others. In addition, several unanticipated findings emerged. For instance, early drug use severely affected later indicators of communality for men, but less so for women. On the other hand, early drug use reduced two types of agency for women. These results reflect findings predicted for the opposite gender.

PAPER SESSION

Behavioral Pharmacology: Laboratory Studies.

Chair: *Chris-Ellyn Johanson*, NIDA Addiction Research Center, Baltimore, MD.

CONTINGENT TOLERANCE TO MIDAZOLAM-INDUCED ELEVATION OF OPERANT RESPONSE FORCE. Stephen C. Fowler, Scott E. Bowen, John Stanford and Mary J. Kallman. University of Mississippi, University, MS.

Rats learned an operant force-band task in which responses having peak forces falling within specified lower and upper limits were reinforced with water. Acute doses of midazolam (0.3 to 30.0 mg/kg, orally) increased peak force of response in a dose-related manner and concomitantly reduced the proportion of reinforced responses. For 30 days, half of the rats received 10.0 mg/kg midazolam before operant sessions, and the other rats were treated after sessions with the same dose. Redetermination of dose–effect functions for peak force of response indicated that the chronic presession dosing produced greater tolerance than the postsession drug (i.e., contingent tolerance was observed). The midazolam-related increase in peak force of response was discussed in terms of the benzodiazepines' putative disinhibiting effects on behavior. Contingent tolerance phenomena were viewed within the context of the reinforcement loss hypothesis as modified to include a role for effort-to-reward ratio in addition to time rate of reinforcement. (Supported by DA05253.)

VALIDATION OF THE MULTIPLE-CHOICE PROCEDURE AS AN EFFICIENT APPROACH FOR ASSESSING DRUG REINFORCEMENT IN HUMANS. Roland R. Griffiths and Craig R. Rush. The Johns Hopkins University, Baltimore, MD.

This study was conducted to further validate a novel multiple-choice procedure which has been proposed as an efficient procedure for assessing drug reinforcement in humans (*Behav. Pharm.*, in press). Regular cigarette smokers participated in up to 40 trials per day. Each trial consisted of completing a multiple-choice form involving a series of choices between receiving money or cigarettes; one choice was randomly reinforced. One experiment examined the effect of extinction in five subjects. Another experiment examined magnitude of reinforcer manipulation in four subjects. The maximum monetary value at which subjects chose the "item" over money decreased under the extinction condition and showed magnitude-related increases in the second experiment.

DISCRIMINATIVE STIMULUS EFFECTS OF *d*-AMPHETAMINE, CAFFEINE, AND MAZINDOL IN HUMANS. Stephen J. Heishman,* Richard C. Taylor,* Melissa

L. Goodman,* Suzette M. Evans† and Jack E. Henningfield.* *NIDA Addiction Research Center, Baltimore, MD, and † Columbia University School of Medicine, New York, NY.

Humans were trained to discriminate between *d*-amphetamine (30 mg), caffeine (400 mg), and placebo. Daily experimental sessions tested one drug dose or placebo. Subjects learned the discrimination and reported increased subjective ratings of drug-liking, drug strength, and good drug effects after administration of *d*-amphetamine, but not caffeine. Generalization testing involved determining dose-response curves for: *d*-amphetamine (0, 7.5, 15, 30 mg), caffeine (5, 100, 200, 400 mg), and mazindol (0, 1.5, 3, 6 mg). Doses of *d*-amphetamine and caffeine produced dose-related increases in drug-appropriate responding. The highest dose of mazindol (6 mg) partially substituted for *d*-amphetamine (57%), and lower doses of mazindol engendered a mixture of *d*-amphetamine, caffeine, and placebo responding. These results suggest that a three-choice paradigm may allow a more detailed analysis of the discriminative stimulus effects of various stimulant drugs in humans.

OPIOID-ANTAGONIST EFFECTS OF NALTREXONE AND NALTRINDOLE. Anthony Liguori and Jack Bergman. Harvard Medical School, Southborough, MA.

In rhesus monkeys responding under a 30-response fixed-ratio schedule of food presentation, cumulative-dosing procedures were used to determine the rate-decreasing effects of levorphanol (μ-selective), U50,488 (κ-selective), an BW373 (δ-selective) alone and after doses of the opioid antagonists naltrexone (0.01–3.0 mg/kg) and naltrindole (0.1–10.0 mg/kg). Naltrexone most potently and extensively antagonized the effects of levorphanol, whereas naltrindole most potently and extensively antagonized the effects of BW373. These results are consistent with the chracterization of naltrexone and naltrindole as μ-selective and δ-selective opioid antagonists, respectively.

REWARDING AND AVERSIVE PROPERTIES OF IP AND SC COCAINE: ASSESSMENT BY PLACE AND TASTE CONDITIONING. Linda A. Parker and Lori A. Mayer. Wilfrid Laurier University, Waterloo, Ontario, Canada.

Three experiments were conducted to compare the effectiveness of intraperitoneally (IP-administered or subcutaneously (SC)-administered cocaine to produce place and or taste conditioning after four conditioning trials. In experiment 1, a taste was presented for 15 min prior to an injection (IP or SC) of cocaine. Five minutes later the rats were placed in one side of a three-choice (drug-paired, saline-paired, and novel chambers) place-conditioning apparatus for a 15-min period. Experiment 1 demonstrated that IP cocaine (20 mg/kg) produced a conditioned place preference, but no conditioned taste avoidance; however, SC cocaine (20 mg/kg) produced conditioned taste avoidance, but no conditioned place preference. Experiment 2 assessed the ability of a range of doses of IP (5–15 mg/kg) and SC (0.5–15 mg/kg) cocaine administered 5 min prior to a 15-min conditioning trial to produce place conditioning. Across the doses tested, a place preference was established with IP but not SC cocaine. Experiment 3 demonstrated that IP cocaine produced a place preference with conditioning trial durations of 30–120 min, but SC cocaine did not produce place conditioning at any conditioning trial duration. Within the present parameters, IP cocaine appears to be a more effective rewarding stimulus than SC cocaine.

COMPARING THE EFFECTS OF SEVERAL MU OPIATES IN HEALTHY VOLUNTEERS. James P. Zacny. University of Chicago, Chicago, IL.

In three separate placebo-controlled, double-blind crossover trials using healthy volunteers, the subjective, behavioral, and physiological effects of different doses of fentanyl, dezocine, and meperidine were studied. There were several similarities between the opiates in that all of them increased LSD ("Dysphoria") and PCAG ("Sedation") scores on the Addiction Research Center Inventory (ARCI). Dezocine's subjective effects, unlike the other two opiates, 1) tended not to be dose-related and 2) included increased scores on the MBG ("Euphoria") scale of the ARCI. Psychomotor impairment was least apparent with meperidine. We conclude that there are some differences in how healthy volunteers respond to opiates of the mu class.

PAPER SESSION

Human Behavioral Pharmacology: Clinical Issues II.

Chair: *Linda S. Grossman*, University of Illinois, Chicago, IL.

SEXUAL DYSFUNCTION AND CONDOM ATTITUDES AMONG METHADONE PATIENTS. Brenda Chabon. Albert Einstein College of Medicine, Bronx, NY.

The relationship between sexual dysfunction, condom attitudes, and condom use was studied in a sample of 48 male and female intravenous drug users in an inner city methadone clinic. Ninety-one percent of the sample was found to be sexually dysfunctional on the Derogatis Sexual Functioning Inventory (DSFI). Condom attitudes were significantly related to sexual dysfunction, psychological symptoms, and length of time in methadone treatment.

Psychologists designing AIDS risk reduction programs must be familiar with the psychophysiological effects of chronic drug use on sexual functioning.

MEDICATION NONCOMPLIANCE AMONG STATE-HOSPITALIZED PSYCHIATRIC INPATIENTS. Linda S. Grossman,* Thomas W. Haywood,† Christopher G. Fichtner,‡ John M. Davis,§ James L. Cavanaugh, Jr.¶ and Dan A. Lewis.# *University of Illinois, Chicago, IL, †Rush-Presbyterian, Chicago, IL, ‡Loyola University, Nines, IL, §Illinois State Psychiatric Institute, Chicago, IL, ¶Rush-Presbyterian, Chicago, IL, and #Northwestern University, Evanston, IL.

To provide information about factors associated with medication noncompliance, we assessed 241 psychiatric inpatients with standardized interviews inquiring about medications, side effects, symptoms, and psychosocial functioning. *Results:* 1) There were high rates of noncompliance among patients taking neuroleptics (67%) and anxiolytics (68%). 2) Frequency of taking medications was significantly associated with noncompliance ($p < .02$) 3) Sixty-six percent of patients report-