experience exacerbation of aggression after 1-3 months of treatment.

Clonidine, especially when combined with stimulants, has been used successfully with some "hyperaroused" ADHD patients. One special population for which clonidine has demonstrated effectiveness is for very young children, preschoolers and primary grade students, who are extraordinarily aggressive and hyperactive.

This presentation will discuss pharmacological interventions for ADDs with aggression in the context of a neurobiological model of brain function in various subtypes of ADDs.

MEDICATIONS FOR ADDs WITH COMORBID ANXIETY DISORDERS &/OR LEARNING DISORDERS. Rosemary Tannock, Department of Psychiatric Research, Hospital for Sick Children, Toronto, Ontario, Canada.

Epidemiological studies indicate that anxiety disorders occur cormorbidly with ADDs at rates of approximately 25%, much greater than what would be statistically predicted from base rates of both disorders in the general population. Yet several studies indicate that this syndrome seems not to respond to conventional stimulant treatment so fully as do other subtypes of ADD. This presentation will review data on treatments for ADDs with comorbid anxiety disorders with stimulants and with alternative medications.

Learning disorders in combination with ADDs also constitute a major problem in childhood which frequently persists into adolescence and adulthood. The degree of overlap between ADHD and LD far exceeds chance rates even in those studies using stringent criteria for defining ADHD and LD, but the nature of the relationship is unclear.

Treatment responses of comorbid ADHD-LD to stimulant medications have not been well-studied. Yet many of the symptoms of some learning disorders overlap with symptoms of ADDs which have been found responsive to stimulants.

Some studies suggest that the effects of stimulants on information processing are global rather than specific. This suggests that stimulants may generally improve cognitive functioning of any ADD patient, including those with comorbid learning disorders, in ways that may enhance the patient's capacity to perform academic tasks and to respond to instruction.

This presentation will review aspects of the overlap between ADDs and learning disorders which may be responsive to available medications. It will also suggest some unresolved issues for future research.

MEDICATIONS FOR ADDs WITH COMORBID MOOD DISORDERS &/OR SUBSTANCE ABUSE. Thomas J. Spencer, Department of Psychiatry, Harvard University, Massachusetts General Hospital, Boston, MA.

In both clinical and epidemiological studies, reported rates of comorbidity between ADD + mood disorders (dysthymia, major depressive disorders, bipolar disorders) range from 15-75%. Pharmacological treatment of these comorbid combinations may require concurrent use of combined medications. This presentation will review clinical symptoms of this comorbid combination and will present research regarding efficacy, risks and benefits of various medication options to be considered. The role of psychoeducation and other multi-modal interventions will also be discussed.

Recent studies have also reported high rates of comorbidity between ADDs and substance abuse. Longterm outcome studies indicate that adults identified as having ADHD in childhood have 15-40% lifetime rates for alcohol abuse and 10-30% lifetime rates for drug abuse. This presentation will review data about comorbid ADHD and substance abuse and will offer guidelines for use of medications in treating persons with this comorbid combination. Special considerations, risks and benefits of various medications and other treatment options for recovering persons with ADDs will be discussed.

SYMPOSIUM

Effective Interventions for Homeless: Outcomes for Substance Abuse, Employment, Homelessness.

Chair: *Jesse B. Milby*, VA Medical Center, Birmingham, AL.

Discussant: *Robert Huebner*, National Institute on Alcohol and Alcoholism, Washington, DC.

EFFICACY OF DAY TREATMENT AND WORK THERAPY FOR HOMELESS SUBSTANCE ABUSERS. Jesse B. Milby, VA Medical Center, Birmingham, AL.

Cocaine abusing homeless are difficult to treat and retain. This study's purpose was to compare efficacy of two interventions.

Subjects were 176 homeless persons, 81% males, 92% African and 8% European Americans, average age 36, average education 12.1 years, 34% veterans.

Assessments for major outcomes were: Personal History Form (homelessness), Addiction Severity Index, and EMIT urine toxicologies.

The following procedure was followed: Subjects were randomly assigned to two interventions conducted in separate facilities after screening to define homelessness, substance abuse, and rule out psychotic disorders. Assessments were administered at baseline, two, six, and 12 months by interviewers, "blind" to subjects' assignment.

Usual care involved: medical evaluation, treatment and/or referral; referrals for housing and vocational services; AIDS education provided in both interventions; and weekly individual and group counseling. Counselors served as case managers.

Day treatment involved: transportation to and from shelters and lunch; group oriented interventions and individual counseling. After two months treatment, subjects had four months work therapy, where, contingent on drug-free urines, they refurbished dilapidated houses for program use as managed housing. Wages were used to rent managed housing and occupancy was contingent on drug-free urines. The building contractor provided supervision, training, tools, etc. and work references for subjects who attempted regular employment.

Eighty-nine completed 12 months. Significant differences favoring day treatment obtained in two of three major outcomes. Percent cocaine positive urine toxicologies after baseline, was significantly less ($p = .003$). Unemployment was not significantly different, but the within group difference for day treatment was ($p < .01$). Days homeless over the last 60 days, showed a significant reduction ($p = .026$).

This is one of the first demonstrations that homeless co-

PAPER SESSION I
Behavioral Pharmacology: Laboratory Studies.
Chair: *Linda A. Parker*, Wilfrid Laurier University, Waterloo, Ontario, Canada

THC-INDUCED CONDITIONED PLACE AVERSIONS IN SPRAGUE-DAWLEY AND LEWIS RATS. Linda A. Parker and Todd Gilles. Wilfrid Laurier University, Waterloo, Ontario.

Delta-9-tetrahydrocannabinol (THC) has been reported to be relatively ineffective in promoting drug self-administration, but has been demonstrated to reduce the threshold for brain stimulation reward in Lewis strain rats. The following experiment assessed the ability of THC (.2, .4, .75, 1.5 mg/kg, ip) to produce place conditioning. The results revealed that THC produced an aversion to a place with which it was paired on 3 occasions in both strains, although the Lewis strain appeared to be more sensitive to the aversive properties of THC than the Sprague–Dawley strain.

THE ATYPICAL ANTIPSYCHOTIC CLOZAPINE SLOWS LICK RHYTHM MORE THAN HALOPERIDOL. Stephen C. Fowler and Shyamal Das. University of Mississippi, University, MS.

Low doses of clozapine and haloperidol, antipsychotics with low and high extrapyramidal side effect liabilities, respectively, were compared in rats trained to lick water from a force-sensing disk. Number of licks, peak force of individual tongue contacts, and force-time waveforms were recorded. The latter were subjected to Fourier analysis as a means of quantifying the rhythm of licking. Both clozapine and haloperidol dose-dependently reduced number of licks and peak force of tongue protrusions, but only clozapine substantially slowed the rhythm of the tongue oscillations. These differences in effects on tongue dynamics were discussed in relation to clozapine's effects on a broad spectrum of neurotransmitter systems with special emphasis on the neurotransmitters that influence the hypoglossal nucleus. Supported by MH43429.

NALOXONE AND OPERANT RESPONDING FOR FOOD: EFFECTS OF DEPRIVATION LEVEL. Jeffrey M. Rudski,* Charles J. Billington,† and Allen S. Levine.* *University of Minnesota, Minneapolis, MN, †VAMC, Minneapolis, MN.

Naloxone does not decrease operant responding in chronically deprived rats. We examined the effect of naloxone (0, 0.1, 0.3, 1.0, 3.0, 10.0 mg/kg) on FR 80 (1st) - FR 3 (subsequent pellets) or PR 2 responding in chronically deprived (90%), restricted access (22 g) and free feeding rats. Naloxone decreased responding under both operant schedules more effectively and at lower doses when rats were less deprived (free-access > restricted access > chronic deprivation). Thus, naloxone's effect on operant responding is dependent upon deprivation state.

COGNITIVE EFFICIENCY AND CONTROL UNDER THE INFLUENCE OF ALCOHOL. William M. Lapp, R. Lorraine Collins, and William H. Zywiak. Research Institute on Addictions, Buffalo, NY.

The theory of alcohol myopia assumes that both the efficiency and control of cognitive processing decrease as a function of the pharmacological dose of alcohol, and are not affected by the expected dose. Unfortunately, this claim has been difficult to test due to procedural and data analytic limitations of the original Balanced Placebo Design (BPD). In the present study, an extended version of the BPD was used to study the expected and pharmacological effects of alcohol within the range thought to be relevant for testing the theory of alcohol myopia. Support for the theory of alcohol myopia was observed with respect to both the efficiency and control of cognitive processing. Some support was also observed for Expectancy theory, but it was limited to the efficiency of cognitive processing. The results suggest that the theory of alcohol myopia rests on two very sound theoretical assumptions about how alcohol affects cognitive processing, but could be improved by incorporating aspects of Expectancy theory.

NEW INSTRUMENTS TO ASSESS HUMAN DRUG CRAVING. Edward G. Singleton,* Stephen T. Tiffany,† Jack E. Henningfield,* Charles A. Haertzen,* Laurie Fields.* *NIH NIDA Addiction Research Center, Baltimore, MD, †Purdue University, West Lafayette, IN.

No consensus has been reached regarding the meaning of *drug craving*. Significant discoveries have been hampered by not having a reliable instrument that has been scientifically evaluated to use in the measurement and operational definition of this concept. New instruments were developed to assess craving for cocaine, heroin, and alcohol. Results indicate that drug craving is multidimensional. For each of the three drug types it consisted of an amalgam of five theoretical dimensions of drug use: 1) irresistible urges and desires, 2) intent to use, 3) relief from negative outcome, 4) anticipation of positive outcomes, and 5) lack of control over use. The patterns found here would not have been identified by traditional craving measures. Researchers may begin to address the complex issues that have limited our understanding of what constitutes craving and how it operates, as well as what physiological and psychological mechanisms account for its existence.

PAPER SESSION II
Human Behavioral Pharmacology: Clinical Issues.
Chair: *Timothy A. Roehrs*, Henry Ford Hospital Sleep Disorders and Research Center, Detroit, MI.

TYPE I AND TYPE II ALCOHOLISM IN A TREATMENT SAMPLE. Kevin L. Elliott,* William T. Bailey,† and William G. Kirk.† *University of Illinois, Urbana, IL, †Eastern Illinois University, Charleston, IL.

A promising approach to the identification of distinct alcoholic types is the Type I/Type II model of alcoholism (Cloninger, Sigvardsson, von Knorring & Bohman, 1988). The present study examined Type I and Type II characteristics in a treatment population. Subjects (n = 108) were differentiated by sex and categorized into types by age of onset. Significant differences were found between sexes and between types on the basis of social consequences and family history. The typology was supported to some degree; but, unexpectedly, there was evidence of Type II alcoholism in females. It is possible that the treatment sample represented a population that has been inadequately studied in the past.