COLLEGE ON PROBLEMS OF DRUG DEPENDENCE

Focus on Women & Gender Differences

Mini-Program

June 12-17, 2004
Caribe Hilton San Juan
San Juan, Puerto Rico

NIDA NATIONAL INSTITUTE ON DRUG ABUSE

National Institutes of Health – U.S. Department of Health & Human Services

PREFACE

Accumulating evidence suggests that the antecedents, consequences, and mechanisms of drug abuse and addiction are not identical in males and females and that gender is an important variable in treatment and prevention. To foster research on women and gender differences in all areas of drug abuse research (both human and animal), since 1999, the National Institute on Drug Abuse (NIDA) has encouraged the submission of College on Problems of Drug Dependence (CPDD) abstracts on this topic for the annual meeting. The response has been very gratifying as evidenced by the numerous presentations on this topic in this year's CPDD program. NIDA is pleased to provide you with this special version of the CPDD program that highlights the program schedule for presentations related to women, gender differences and drug use. Additionally, at the end of this "mini-program," we have provided the abstracts for these presentations. We hope that this mini-program will be useful for those conducting research in this area, and for those who have not become involved in gender-based research, we hope that this mini-program will suggest ways in which incorporating this perspective can advance your research program.

To support junior investigators pursuing research careers on women and gender differences, special NIDA Travel Awards have been granted annually since 1999. Each year these competitive travel awards have been given to up to 30 junior investigators (students and investigators who are less than five years past the doctoral degree or residency) conducting research on this topic whose CPDD abstract is accepted for either a poster or oral session. NIDA congratulates this year's travel awardees. A listing of the awardees along with the title of their presentation is found on the following pages.

To those of you who are junior investigators and engage in research in the area of women and gender differences, or are interested in pursuing research in this important area, NIDA will again sponsor the CPDD Women & Gender Junior Investigator Travel Awards for the 2005 CPDD meeting in Orlando, Florida, June 18-23, and we encourage you to apply (see the announcement on the last page).

For additional information on NIDA's research program on women's health and gender differences, contact Dr. Cora Lee Wetherington at telephone 301-443-1263 or at wetherington@nih.gov.

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Declan T. Barry
Yale University School of Medicine

Courtney Breen
The University of New South Wales

Wilma J. Calvert
Washington University School of Medicine

Joy E. Chudzynski
FRI, *Inc.* Los Angeles, CA

Stephanie L. Collins
University of Miami School of Medicine

Charles D. Cook
Virginia Commonwealth University

Katherine O. Courtney
Texas Christian University

Karin M. Eyrich
University of Pennsylvania School of Medicine

Anita F. Fernander
University of Kentucky

Leah J. Floyd
Johns Hopkins University

Kate E. Fothergill
Johns Hopkins University

Nancy A. Haug
University of California, San Francisco

Scott M. Hyman
Yale University

Martha A. Jessup
University of California, San Francisco

Matthew W. Johnson
University of Vermont

Lynne M. Kemen
Hunter College, CUNY

Daniel D. Langleben
University of Pennsylvania

Chiang-Shan R. Li
Yale University

Nikeea Linder
Danya International, *Inc.*

Lisa M. Lomas
University of North Carolina at Chapel Hill

M. Maldonado-Molina
The Pennsylvania State University

Jesse Mason
University of Minnesota

Sean E. McCabe
University of Michigan

Nena P. Messina
University of California, Los Angeles

Susan Mikulich-Gilbertson
University of Colorado

Michael H. Mohammadi
Wayne State University

Arbi Nazarian
Hunter College, CUNY

Vicki A. Nejtek
University of Texas

Bronson E. Oosterhuis
The Rockefeller University

Jennifer L. Perry
University of Minnesota

Rajeev Ramchand
Johns Hopkins University

Punita K. Sunder
University of Texas

Annelyn Torres-Reverón
SUNY Downstate

Lei-nei Wan
Chinese University of Hong Kong

Yan Wang
Morgan State University

Catherine Woodstock-Striley
Washington University School of Medicine

Mansoo Yu
Washington University

CPDD 2004 Women & Gender Junior Investigator Travel Awardees' Research Presentations

CPDD 2004 Women & Gender Junior Investigator Travel Awardees' Research Presentations

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Sunday, June 13, 2004

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(No abstracts are available for these presentations)

1:00 – 2:15 PM

PREVALENCE, CORRELATES, COMORBIDITY AND CONSEQUENCES OF SUBSTANCE USE DISORDERS AMONG 4 GROUPS OF US LATINOS: RESULTS OF THE NATIONAL LATINO AND ASIAN AMERICAN STUDY (NLAAS)

Chairs: Hortensia Amaro

1:00 *The prevalence and correlates of substance use/abuse/dependence among Latinos in the US: Results of the National Latino and Asian American Study (NLAAS)*
Glorisa Camino
Medical Science Campus, Behavioral Sciences Research Institute, San Juan, PR

1:25 *Co-occurring alcohol, drug and other psychiatric disorders among Latinos in the United States*
William Vega
Robert Wood Johnson Medical School, University of Medicine and Dentistry of New Jersey, Piscataway, NJ

1:50 *The consequences of substance use disorders among Latinos in the United States*
Margarita Alegria
Center for Multicultural Mental Health Research, Somerville, MA

Oral Communications I

Ballroom C

(No abstracts are available for these presentations)

1:00 – 2:15 PM

DEPENDENCE AND WITHDRAWAL

Chairs: Roland R. Griffiths and Yuan Li

1:30 *Females have less physiological dependence to alcohol than men*
C. Woodstock Striley, L. Cottler and A. Ben Abdallah
Washington University School of Medicine, St. Louis, MO

Symposium II

Ballroom B

(No abstracts are available for these presentations)

2:30 – 5:00 PM

PSYCHOSTIMULANTS: FROM BIRTH TO ADOLESCENCE AND BEYOND

Chairs: Ellen M. Unterwald and Diana Dow-Edwards

2:55 *Interactions between stimulant drugs in adult and adolescent rats: Age and sex differences*
Sari Izenwasser
University of Miami School of Medicine, Miami, FL

Sunday, June 13, 2004

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T.Kuba, E.D. Festa, A. Nazarian, A. Akhavan, C.E. Inturrisi and V. Quinones-Jenab
Hunter College and The Graduate Center of the City University of New York, and Weill Medical College of Cornell University, New York, NY

3:00 *Comparison of the antinoceptive response to morphine and codeine in female and male Sprague-Dawley rats*
E.M. Lapoczka and J.R. Traynor
University of Michigan, Ann Arbor, MI

3:15 *Sex differences in chronic pain*
C.D. Cook
Virginia Commonwealth University, Richmond, VA

3:30 *Opioid-induced antinoception and place conditioning in maternally separated male and female rats*
A.C. Harmon, D.A. White, K.W. Easterling and S.G. Holtzman
Emory University School of Medicine, Atlanta, GA

Monday, June 14, 2004

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Expo Center
7:30 – 9:30 AM

Odd-numbered posters manned first hour;
Even-numbered, second hour

Set up time begins Sunday 1:00 P.M.
Must be removed by Monday 12:00 P.M.

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UCLA Integrated Substance Abuse Programs, Los Angeles, CA

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R.M. Craft
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5:30 *Chronic nicotine differentially alters amphetamine-induced locomotor activity in male vs. female adolescent and adult rats*
S.L. Collins, R. Montano, S. Izenwasser
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5:45 *Gender differences in delay discounting: Heavy, light, and nonsmokers*

M.W. Johnson, W.K. Bickel and F. Baker
University of Vermont, Burlington, VT

6:00 *Male, but not female, tobacco smokers more likely to be depressed in a sample of African American college seniors*
Y. Wang, F.A. Wagner and D.C. Browne
Drug Abuse Research Program/Morgan-Hopkins Center for Health Disparities Solutions, Morgan State University, Baltimore, MD

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Yale University School of Medicine, New Haven, CT

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San Cristobal
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(No abstract is available for this presentation)

EARLY LIFE STRESS AND DRUG ABUSE: IS THERE A CONNECTION?

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Therese A. Kosten
Yale University School of Medicine, New Haven, CT

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Chairs: Steven L. Batki and Arthur J. Siegel

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NIDA Intramural Research Program, Baltimore, MD

Workshop

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SEX, DRUGS, & NO ROCK N ROLL!

Chairs: Rachel L. Peltier and Therese Kosten

Tuesday, June 15, 2004

POSTER SESSION II (Breakfast)

Expo Center
8:00 – 10:00 AM

Odd-numbered posters manned first hour;
Even-numbered, second hour

Set up time begins Sunday 1:00 P.M.
Must be removed by Monday 12:30 P.M.

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S.E. McCabe, J.R. Knight, C.J. Teter and H. Wechsler
University of Michigan Substance Abuse Research Center, Ann Arbor, MI and Harvard Medical School and Harvard School of Public Health, Boston, MA

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University of Valencia, Fundación de Ayuda Contra la Drogadicción, and Generalitat Valenciana, Valencia, Spain

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153 *Correlates of recidivism for women parolees from prison-based treatment in California*
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Virginia Commonwealth University, Richmond, VA

Oral Communications XII

Ballroom A
10:00 – 11:15 AM

GENETIC POLYMORPHISMS

Chairs: Mary Jeanne Kreek and Rachel F. Tyndale

10:15 *Association study of monoamine oxidase A and catechol-O-methyltransferase polymorphisms and club drugs use in the Chinese population*
A. Stadlin, L.N. Wan, B.K.L. Cheung, N. Tam, S. Lui, J.S.K. Lee, and F.Y.K. Leung, Chinese University of Hong Kong and Kwai Chung Hospital, Hong Kong

Tuesday, June 15, 2004

Oral Communications XIII

Ballroom A
11:20 AM – 12:35 PM

AND NOW, A FEW WORDS FROM OUR HOSTS: SUBSTANCE ABUSE IN PUERTO RICO

Chairs: Willian W. Latimer and Rafaela R. Robles

11:50 *Drugs and sex: A cross-cultural comparison of HIV-risk behaviors among school based females in the U.S., Puerto Rico, and Mexico*
L.J. Floyd and W. Latimer
Johns Hopkins University, Baltimore, MD

Oral Communications XIV

Ballroom C
10:00 – 11:15 AM

ADOLESCENT ANIMALS

Chairs: Yossef Itzhak and Jenny Wiley

10:00 *Periadolescent chronic treatment with the cannabinoid agonist CP 55,940 and morphine self-administration behavior in adult male and female rats*
M. Biscaia, B, Fernández, S. Martín, E.M. Marco, M. Rubio, C. Guaza, C. Garcia-Lecumberri, M.P. Viveros and E. Ambrosio
Universidad Nacional de Educacion a Distancia, Universidad Complutense de Madrid and Instituto Cajal, Madrid, Spain

11:00 *Sensitization to the abused inhalant toluene in adolescent rats*
J.L. Wiley
Virginia Commonwealth University, Richmond, VA

Oral Communications XVI

San Cristobal
10:00 AM – 12:30 PM

HIV/AIDS: FROM SINGLE CELLS TO JAIL CELLS

Chairs: Karen S. Ingersoll and James L. Sorensen

10:30 *Found guilty? Psychosocial and HIV risk behaviors in pregnant drug-dependent women with and without criminal justice system involvement*
J. Draper, S. Douglass, D. Langhorst, L. Keyser-Marcus, D. Miles, H. Jones and D. Svikis
Virginia Commonwealth University, Richmond, VA and Johns Hopkins University School of Medicine, Baltimore, MD

10:45 *Substance use during physical and sexual assault in HIV-infected persons*
C.H. Chuang, J.M. Liebschutz, D.M. Cheng, A. Raj and J.H. Samet
Boston University School of Medicine and Boston University School of Public Health, Boston, MA

Wednesday, June 16, 2004

POSTER SESSION III (Breakfast)

Expo Center
8:00 – 10:00 AM

Odd-numbered posters manned first hour;
Even-numbered, second hour

Set up time begins Tuesday 1:00 P.M.
Must be removed by Wednesday 12:30 P.M.

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Wayne State University, Detroit, MI

29 *Use of tranquilizers: Who is becoming dependent?*
G. Mazzotti, M.S. O'Brien and J.C. Anthony
Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD and Michigan State University College of Human Medicine, East Lansing, MI

NICOTINE: ANIMAL STUDIES

40 *Comparison of cotinine levels in Sprague-Dawley and Fischer-344 female and male rats*
J. James, J. Rosecrans, A. Pehrson, S. Philbin, R. Vann and S. Robinson
Virginia Commonwealth University, Richmond, VA

41 *Nicotine pretreatment reduces behavioral despair precipitated by stress: Sex differences*
E. Koylu, A. Bar_n, S. Yedekcioglu, H. Dogan, H. Erdemir, E. Yildirim, O. Gozen, L. Kanit, S. Pogun
Ege University Center for Brain Research and Department of Physiology, Izmir, Turkey

Wednesday, June 16, 2004

STIMULANTS IN ANIMALS: PHARMACHOLOGY AND BEHAVIOR

(No abstract is available for this presentation)

58 *Wheel-running exposure cross-sensitizes female rats to the locomotor-activating effects of cocaine*
E.B. Larson and M.E. Carroll
University of Minnesota, Minneapolis, MN

IMAGING

72 *Sex difference in plasma nitric oxide end product levels in cocaine dependence*
M.J. Kaufman, C.C. Streeter, T.L. Barros, O. Sarid-Segal, H. Tian, E.D. Rouse, K.K. Baumgarner, C.A. Archambault, P.F. Renshaw and D.A. Ciraulo
Brain Imaging Center, McLean Hospital, Belmont, and Boston University School of Medicine, Boston, MA

73 *Sex differences in brain activitation during stress in cocaine-dependent individuals – preliminary results from an fMRI study*
C.-S. Li, T. R. Kosten and R. Sinha
Yale University School of Medicine, New Haven, CT

85 *Gender differences in brain activity during heroin-related cues in opiate-dependent subjects: A perfusion functional magnetic resonance imaging study*
D.D. Langleben, S. Busch, N. Sciortino, J. Detre, J. Wang, J. Listerud, C.P. O'Brien and A.R. Childress
University of Pennsylvania and Philadelphia VA Medical Center, Philadelphia, PA

GENDER

86 *Gender-specific associations between types of childhood maltreatment and drug use variables in cocaine-dependent individuals*
S.M. Hyman, M. Garcia and R. Sinha
Yale University School of Medicine, New Haven, CT

87 *Substance abuse and mental health issues among abused women*
M. Yu and T. Edmond
Washington University and Comorbidity Addiction Center, St. Louis, MO

88 *Gender differences in the course of antisocial behavior among injection drug users*
S.K. Mikulich-Gilbertson, S. Salomonsen-Sautel and R.E. Booth
University of Colorado School of Medicine, Denver, CO

89 *Gender and the assessment of liability and exposure to substance use and antisocial behavior*
A.R. Miller and T.A. Ridenour
Pennsylvania State University, University Park, PA

Wednesday, June 16, 2004

90 *Gender differences in ectasy abuse and dependence criteria and diagnoses*
S. McCrary, S. Bradford and L.B. Cottler
Washington University School of Medicine, St. Louis, MO

91 *The intersection of problem gambling, depression, suicidality, and violence among out-of-treatment female substance users*
R.M. Cunningham-Williams, A. Ben Abdallah, C.C. Meeks and L.B. Cottler
Washington University School of Medicine, St. Louis, MO

92 *Gender differences, overt and relational victimization, and urban adolescent drug use*
T.N. Sullivan, W. Kliewer and A.D. Farrell
Virginia Commonwealth University, Richmond, VA

93 *Gender differences in specific cocaine-related abstinence symptoms as measured by the Cocaine Selective Severity Assessment*
K. Kemp, H.C. Fox and R. Sinha
Yale University School of Medicine, New Haven, CT

94 *Distress tolerance and borderline symptom severity in female inner-city drug users*
N.J. Wolf, C.W. Lejuez, S.B. Daughters, D. Kosson and T.R. Lynch
University of Maryland, College Park, MD and Finch University/Chicago Medical School, Chicago, IL; Duke University Medical Center, Durham, NC

95 *Gender differences among injecting drug users in Sydney, Australia, 1996-2003*
A. Roxburgh, C. Breen and L. Degenhardt,
National Drug and Alcohol Research Centre, University of New South Wales, Sydney, Australia

96 *A profile of cocaine and amphetamine users in Los Angeles County*
D.A. Crevecoeur and R. Rawson
University of California, Los Angeles, CA

97 *Gender-specific effects of social relationships on crack use among out-of-treatment users*
K.S. Riehman, W.M. Wechsberg, W. Zule, W.K. Lam, G. Bobashev and B. Levine
RTI International, Research Triangle Park, NC

98 *Specialized versus standard chemical dependency treatment for women with children: Attending to heterogeneity in a retrospective multisite study*
R.G. Orwin, W.B. Kissin, R.E. Claus, C.E. Grella and T. Williams
Westat, Rockville, MD and University of California, Los Angeles, CA

99 *Gender differences in baseline characteristics of stimulant abusers enrolled in methadone vs. outpatient psychosocial treatment*
M.L. Copersino, J.M. Peirce, N.M. Petry, G.E. Bigelow and M.L. Stitzer
Johns Hopkins University School of Medicine, Baltimore, MD and University of Connecticut, Storrs, CT

100 *An investigation of gender differences using the TCU Client Problem Profile index*
G.A. Rowan-Szal, G.W. Joe, J.M. Greener, K.O. Courtney and D.D. Simpson
Institute of Behavioral Research, Texas Christian University, Fort Worth, TX

101 *Changes in perceived employment barriers for women and men as a function of drug use*
J.M. Webster, M. Staton and C.G. Leukefeld,
University of Kentucky Center on Drug and Alcohol Research, Lexington, KY

SPIRITUALITY

105 *The protective effect of religion in adolescent females' use of illicit drugs*
W.J. Calvert, A.C. Heath and K.K. Bucholz
Washington University School of Medicine, St. Louis, MO

COMORBIDITY I

111 *A comparison of psychiatric and demographic characteristics of female and male treatment-seeking, methamphetamine-dependent individuals*
J.E. Chudzynski, P. Mercado, E. Moynier and J.M. Roll
FRI, Inc., Los Angeles, CA

125 *The unfairness of sex: Gender, but not incarceration history, predicted long-term housing and employment outcomes among treated homeless substance abusers*
A. Compton, D. Wallace, J.E. Schumacher, J. Milby, and S.G. Kertesz
University of Alabama and Rho Federal Systems, Inc., Birmingham, AL

ADOLESCENT DRUG ABUSE: TREATMENT AND PREVENTION

136 *Sex differences and opiate abuse trends in dual-diagnosed adolescents*
J.M. Rodolico, M. Chatman, R. Shostak and S.E. Lukas
McLean Hospital, Belmont, MA

137 *Gender differences in substance use, mental health, and criminal justice involment of adolescents at treatment entry and at 3-, 6-, 12-, and 30-month follow up*
S.J. Stevens, B. Murphy, K. McKnight and B. Estrada
University of Arizona, Southwest Institute for Research on Women, Tucson, AZ

145 *The influence of main sex partner's drug use on the African American adolescent girls' drug use*
P.A. Matson, H.D. Chilcoat and J.M. Ellen
Johns Hopkins Bloomerang School of Public Health and Johns Hopkins School of Medicine, Baltimore, MD

Oral Communications XVII

Ballroom A
10:00 AM – 12:30 PM

USE AND ABUSE IN UTERO

Chairs: Claire D. Coles and Loretta P. Finnegan

10:00 *In utero marijuana exposure effects on the mRNA expression of striatal opioid neuropeptides, prodynorphin and proenkephalin in the human fetal brain*
X. Wang, D. Dow-Edwards, V. Anderson and Y.L. Hurd,
Karolinska Institute, Stockholm, Sweden; State University of New York and Downstate Medical Center, Brooklyn, NY

10:15 *Mother-child interactions at ages 3 and 5 years: Impact of maternal cocaine use during pregnancy*
E.S. Bandstra, C.E. Morrow, V.H. Accornero, R. Sljussar, A.L. Johnson, L. Xue and J.C. Anthony
Johns Hopkins University, Baltimore, MD and Michigan State University, East Lansing,

10:30 *Prenatal cocaine exposure: 8-year-olds' arousal to social and cognitive challenges*
C.D. Coles, J.A. Kable, M.E. Lynch and K.A. Platzman
Emory University School of Medicine, Atlanta, GA

10:45 *Risk-taking and delayed discounting in prenatally cocaine-exposed 13-year-olds*
M.R. MacDougall, R.N. Ehrman, C.W. Lejuez, H. Hurt, A. Weissman, J.T. Vietri and A.R. Childress
University of Pennsylvania School of Medicine, Children's Hospital of Philadelphia, and University of Pennsylvania, Philadelphia, PA; University of Maryland, College Park, MD

11:00 *A randomized controlled study of buprenorphine and methadone in pregnant opioid-dependent patients: Their effect on the neonatal abstinence syndrome*
H. Jones, R. Johnson, D. Jasinski, K. O'Grady, C. Chisholm, R. Choo, M. Crocetti, R. Dudas, C. Harrow, M. Huestis, L. Jansson, M. Lantz, B. Lester and L. Milio
Johns Hopkins University and NIDA Intramural Research Program, Baltimore, and University of Maryland, College Park, MD and Brown University, Providence, RI

11:15 *A prospective study of 259 pregnant women treated with either buprenorphine or*

methadone through delivery, and neonatal parameters of their 260 children
L. Gourarier, C. Lejeune, S. Aubisson, L. Simmat-Durant and E. Peyret
Centre Monte Cristo Hôpital Européen Georges Pompidou Paris and Groupe d'étude "Grossesse et Addictions", Paris, France

11:30 *Double-dummy, double-blind comparison of buprenorphine and methadone in pregnant opioid-dependent women*
A. Primorac, R. Ortner, R. Jagsch, K. Rohrmeister, M. Langer and G. Fischer
Medical University Vienna and University of Vienna, Vienna, Austria

11:45 *Characterizing nicotine withdrawal and craving in pregnant cigarette smokers*
S.H. Heil and S.T. Higgins
University of Vermont, Burlington, VT

12:00 *Comparing the construct and predictive validity of the ASI and GAIN measures of change after treatment for pregnant and postpartum women*
R. Funk, M.L. Dennis and S. Godley
Chestnut Health Systems, Bloomington, IL

12:15 *Relationship between maternal substance use and depression in pregnant women*
K. Reid-Quinones, D. Svikis and J. Draper
Virginia Commonwealth University, Richmond, VA

Oral Communications XVIII

Ballroom B
10:00 AM – 12:30 PM

EPIDEMIOLOGY-THAT'S WHAT COUNTS

Chairs: Kathleen K. Bucholz and Robin A. Pollini

10:00 *Gender differences in HIV risk among Caribbean drug users*
H.L. Surratt and J.A. Inciardi
University of Delaware

11:30 *Connectedness is associated with depression among female substance abusers*
C.E. Mennes, C.C. Meeks, C. Ostella, A. Ben Abdallah and L.B. Cottler
Washington University School of Medicine, St. Louis, MO

12:00 *Who buys it, who grows it and who gets it for free? Marijuana procurement patterns in the US population*
R. Ramchand and H.D. Chilcoat
Johns Hopkins Bloomerang School of Public Health, Baltimore, MD

Thursday, June 17, 2004

POSTER SESSION IV (Breakfast)

EXPO CENTER
8:00 – 10:00 AM

Odd-numbered posters manned first hour;
Even-numbered, second hour

Set up time begins Wesnesday 1:00 P.M.
Must be removed by Thursday 12:30 P.M.

COMORBIDITY II

4 *Drug use, depression, and hypogonadism in a community-based cohort (SHINE Study)*
E.T. Golub, E. Pilibosian, J. Cofrancesco Jr., S.A. Strathdee and A. Dobs
Johns Hopkins University, Schools of Public Health and Medicine, Baltimore, MD

17 *Neurocognitive sex differences in bipolar disorder with stimulant dependence*
V.A. Nejtek, L.A. Chen, S. Mahbobian, E.J.Nestler and A.J. Rush
The University of Texas Southwestern Medical Center, Dallas, TX

SEX DIFFERENCES/NEUROENDOCRINE EFFECTS

19 *Sex differences in the modulation of cocaine and amphetamine-regulated transcript expression in the arcuate and paraventricular nuclei of the rat*
B. Balkan, O. Gozen, G. Yararbas, E. Koylu, M.J. Kuhar and S. Pogun
Ege University, Izmir, Turkey and Emory University, Yerkes Regional Primate Center, Atlanta, GA

20 *D1 and D2 receptor activation, mRNA, and binding levels are differentially affected by acute cocaine administration in male and female rats*
E.D. Festa, S. Jenab, J. Weiner, T. Niyomchai, S.J. Russo, L.M. Kemen, A. Nazarian, H.B.K. Wu and V. Quinones-Jenab
Hunter College, City University of New York, New York, NY

21 *Significant association between neurobiological and cognitive responses to stress and cocaine relapse*
R. Sinha, M. Talih, R.M. Malison, G. Anderson and M.J. Kreek
Yale University School of Medicine, New Haven, CT and Rockefeller University, New York, NY

22 *Chronic amphetamine enhancements in locomotion, impairments in visual memory and changes in synaptic protein in female rats are differentially altered by chronic stress*
V.N. Luine, V. Bisagno, C.A. Grillo, G.G. Piroli, P. Giraldo and B.S. McEwen
Hunter College of City University of New York and Rockefeller University, New York, NY

23 *A distinct neurochemical profile for WKY rats at baseline and in response to acute stress: Implications for altered reward in animal models of anxiety and depression*
J.J. Mahoney, III, E. Pedrosa and R. De La Garza II
Albert Einstein College of Medicine, Bronx, NY

24 *Genomic regions controlling rat corticosterone levels*
M.N. Potenza, E.S. Brodkin, B. Joe, X. Luo, E.F. Remmers, R.L. Wilder, E.J. Nestler and J. Gelernter
Yale University, New Haven, CT

25 *Gender differences in response to stress after prenatal cocaine exposure*
S.T. Cunningham, Z.O. Waldon, L.F. Shaw and M.T. Bardo
University of Massachusetts, Boston, MA

26 *Gender differences in response to cues in cocaine dependence*
A.L. McRae, K.T. Brady, H. Upadhyaya, M.E. Saladin, E.M. Ferrell and M.A. Timmerman
Medical University of South Carolina, Charleston, SC

27 *Comparison of the effects of cortisol and cocaine administration on plasma prolactin and growth hormone levels in individuals with cocaine dependence*
I. Elman and S.E. Lukas
McLean Hospital, Belmont, MA

28 *Nalmefene-induced elevation in serum prolactin in normal human volunteers: A partial agonist at kappa-opioid receptors?*
G. Bart, J. Schluger, L. Borg, A. Ho and M.J. Kreek
The Rockefeller University, New York, NY

34 *Gender differences in basal HPA functioning and craving in cocaine-dependent individuals*
H. Fox, M.J. Kreek and R. Sinha
Yale University School of Medicine, New Haven, CT and Rockefeller University, New York, NY

35 *Effects of nalbuphine on anterior pituitary and adrenal hormones and subjective responses in men*
N. Goletiani, J.H. Mendelson, M.B. Sholar, A.J. Siegel, A. Skupny and N.K. Mello
McLean Hospital, Belmont, MA

36 *Comparison of the effects of cigarette smoking on the hypothalamic-pituitary-adrenal axis and prolactin in follicular-phase women and men*
J.H. Mendelson, M.B. Sholar, N. Goletiani, A.J. Siegel and N.K. Mello
McLean Hospital, Belmont, MA

37 *Effects of testosterone on cocaine-induced locomotor activity in male rats*
R. Menéndez Delmestre, R. Seijo and A.C. Segarra
University of Puerto Rico, San Juan, PR

38 *Progesterone blocks acquisition and expression of cocaine-induced CPP in intact female rats*
S.J. Russo, A. Nazarian, A. Akhavan, E.D. Festa, K. Weierstall, T. Niyomchai, S. Jenab and V. Quinones-Jenab
Hunter College and Graduate School Center of City University of New York, New York, NY

39 *Acute effects of estradiol and progesterone on cocaine self-administration by rhesus monkeys*
N.K. Mello, J.H. Mendelson, S.S. Negus, K. Rheaume, I. Knudson and M. Kelly
McLean Hospital, Belmont, MA

40 *Role of estrogen in cocaine self-administration under a 24-hr access discrete trial procedure*
W.J. Lynch and J.R. Taylor
Yale University School of Medicine, New Haven, CT

41 *Reinstatement of i.v. cocaine self-administration in female rats: Effects of estrogen*
M.E. Roth, E.B. Larson, J.J. Anker and M.E. Carroll
University of Minnesota, Minneapolis, MN

42 *Gender differences in cue reactivity among nicotine-dependent individuals*
H. Upadhyaya, S.D. LaRowe, M. Saladin, K.T. Brady and D.J. Drobes
Medical University of South Carolina, Charleston, SC and University of South Florida, Tampa, FL

CLUB DRUGS

60 *Who is becoming dependent on hallucinogens shortly after initiation of use*
A.L. Stone and J.C. Anthony
Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD and Michigan State University, East Lansing, MI

81 *Poly-substance abuse patterns among young MDMA/ecstasy users: A latent class analysis*
R.G. Carlson, J. Wang, R.S. Falck and H.A. Siegal
Wright State University School of Medicine, Dayton, OH

82 *Profiling problem behaviors among young, female ecstasy users of low income*
H.Z. Wu, C. Holzer, J. Grady and A. Berenson
The University of Texas Medical Branch, Galveston, TX

88 *The association of personality traits with club drug use in Chinese youth*
L.N. Wan, B.K.L. Cheung, F.Y.K. Leung, N. Tam, S. Lui, J.S.K. Lee and A. Stadlin
Chinese University of Hong Kong and Kwai Chung Hospital, Hong Kong

DRUG ABUSE IN ADOLESCENTS: BEHAVIORAL STUDIES

90 *Response to cocaine after methylphenidate pre-treatment: Gender and age effects in locomotion and stereotyped behaviors*
A. Torres-Reveron, S.M. Melnick, and D.L. Dow-Edwards
State University of New York Downstate, Brooklyn, NY

91 *Treatment with nicotine during adolescence but not adulthood produces long-term increases in cocaine self-administration*
S. Izenwasser, R. Montano and S.L. Collins
University of Miami School of Medicine, Miami, FL

97 *Antecedents of drug abuse and dependence: A longitudinal study*
K.E. Fothergill and M. Ensminger
Johns Hopkins University School of Public Health, Baltimore, MD

98 *Abuse types, psychopathology, and physical health in adolescent onset substance use disorder and normal control young women: A longitudinal study*
A. Mezzich, K. Pajer, B.S. Day and M. Swaney
University of Pittsburgh, Pittsburgh, PA and Ohio State University, Columbus, OH

BEHAVIOR: ANIMAL AND HUMAN

102 *Behavioral economic analysis of drug reinforcement using Multiple Choice Procedure data*
M.K. Greenwald
Wayne State University School of Medicine, Detroit, MI

113 *Cocaine's effects on baboons' perception of species-specific affiliative calls differing in vocalizer sex*
R.D. Hienz and E.M. Weerts
The Johns Hopkins University School of Medicine, Baltimore, MD

120 *Classical and emotional Stroop performance and treatment response*
M. Mouratidis, J. Poling, M. Sofuoglu, A. Oliveto and T. Kosten
Yale University School of Medicine and VA Connecticut Healthcare System, West Haven, CT

124 *Growth curve analysis of methamphetamine use trajectories from initiation to treatment*
M.-L. Brecht
UCLA Integrated Substance Abuse Programs, Los Angeles, CA

131 *Chemical submission: Study of case reports*
S. Djezzar, F. Questel, H. Gourlain, D. Fompeydie, N. Richard, C. Gatignol and S. Dally
CEIP Paris, Hôpital Hôtel-Dieu, Hôpital F. Widal and Afssaps, Paris, France

139 *Duration of most recent abstinence attempt and prospective treatment drop-out as a function of distress tolerance in residential treatment-seeking inner-city drug users*
S.B. Daughters, R.A. Brown, D.R. Strong, C.W. Kahler, M.A. Bornovalova, N.J. Wolf, G. Hernandez, B. Simmons, K. Dreaper and C.W. Lejuez
University of Maryland, College Park, MD; Brown Medical School and Butler Hospital, Brown University Center for Alcohol and Addiction Studies, Providence, RI

LITERATURE REVIEW

161 *Management of chronic pain in substance abusers*
I. Maany
University of Pennsylvania, Philadelphia, PA

Oral Communications XXI

Ballroom B
10:00 AM – 12:30 PM

TRAUMA, STRESS, AND DURESS

Chairs: Scott F. Coffey and Aimee L. McRae

11:00 *Trauma history and PTSD among youths in treatment for alcohol and other substance use disorders*
J.M. Hawke, J. Ford, R. Haberek and Y. Kaminer
The National Development and Research Institutes, Inc., New York, NY, and the University of Connecticut Health Center, Farmington, CT

11:15 *Traumatic events related to cocaine dependence: Family and community factors*
S.E. Afful, J.R. Kleinheider, L. Cottler, A. Stiffman and L.J. Bierut
Washington University School of Medicine, Saint Louis, MO

11:45 *Traumatic event exposure and psychiatric outcomes*
E.C. Nelson, A.C. Heath, P.A.F. Madden, M.T. Lynskey, A.L. Glowinski and K.K. Bucholz
Washington University School of Medicine, St. Louis, MO

12:15 *Characteristics of women with sexual abuse histories at follow-up for methadone*

treatment
K.O. Courtney, N.G. Bartholomew, G.A. Rowan-Szal and D.D. Simpson
Texas Christian University, Fort Worth, TX

Oral Communications XXII

Ballroom A
10:00 AM – 12:30 PM

OPIATES AND OPERANTS

Chairs: Stevens Negus and Anthony L. Riley

10:45 *The effects of cross-fostering on morphine-induced conditioned taste aversions, in Fischer and Lewis rats*
M.A. Gomez-Serrano, J.R. Glowa and A.L. Riley
American University, Washington, DC and Pfizer Global Research and Development, Groton, CT

Oral Communications XXIII

San Cristobal
10:00 AM – 12:30 PM

RISK BUSINESS AMONG ADOLESCENTS: PREVENTION AND TREATMENT

Chairs: Michelle K. White and Murat Yucell

10:45 *Predicting residential placement, relapse and recidivism among adolescents with the GAIN*
M. White, M.L. Dennis and R. Funk
Chestnut Health Systems, Bloomington, IL

11:45 *Genetic and environmental interactions for tobacco, alcohol and illicit drug use in adolescent female twins*
D.R. Miles, J.L. Silberg, R.W. Pickens and L.J. Eaves
Virginia Commonwealth University, Richmond, VA

12:00 *Structural brain correlates of age of first alcohol and cannabis use: A magnetic resonance imaging study in healthy males*
M. Yücel, A.L. Condello, D.I. Lubman, S.J. Wood, W.J. Brewer, D. Velakoulis, M.T. Wong and C. Pantelis
ORYGEN Research, University of Melbourne, and Mental Health Research Institute, Melbourne, Australia

12:15 *The effects of adolescent drug use on adult role functioning: A longitudinal study examining gender differences*
K.M. Green and M. Ensminger
Johns Hopkins University School of Public Health, Baltimore, MD

Thursday, June 17, 2004

Oral Communications XXV

Ballroom C
11:20 AM – 12:35 PM

ABUSE.COM

Chairs: Carol J. Boyd and John W. Hopper

11:50 *Anabolic-androgenic steroid users: results of a Web-based survey*
J. Langenbucher, T. Hildebrandt, S. Carr, S. Roth and S. Park
Rutgers University, Piscataway, NJ

12:05 *Gender differences in the temporal relationship between prescribed anti-depressants and prior drug and alcohol use*
C.J. Boyd, S.E. McCabe and C.J. Teter
University of Michigan, Ann Arbor, MI

Oral Communications XXVII

Ballroom A
3:20 – 4:35 PM

NICO-TEEN

Chairs: Eric T. Moolchan and Himanshu P. Upadhyaya

3:50 *Adolescent female smokers: Gender-specific-prevalence, risk and protective factors*
P.S. Meszaros, J.R. Koch and A. Huebner
Virginia Polytechnic Institute and State University, Blacksburg, and Virginia Commonwealth University, Richmond, VA

4:05 *Examining gender differences in the relation between dieting and smoking behaviors among adolescents*
M.M. Maldonado-Molina, L.M. Collins and T.A. Ridenour
Pennsylvania State University, University Park, PA

ABSTRACTS

Traumatic events related to cocaine dependence: Family and community factors
S.E. Afful, J.R. Kleinheider, L.B. Cottler, A. Stiffman and L.J. Bierut
Washington University School of Medicine, Saint Louis, MO

Higher levels of exposure to traumatic events are often found in substance dependent individuals. The frequencies of exposure to many extreme traumatic stressors in cocaine dependent individuals, their siblings and community based controls were compared as part of the Family Study of Cocaine Dependence. Individuals who met criteria for DSM-IV cocaine dependence were recruited from treatment centers and near age siblings were enrolled as a high risk population for developing substance dependence and other psychiatric disorders. Community based controls were recruited for comparison. All subjects were examined using the Cocaine Interview, a semi-structured assessment of substance dependence and other psychiatric disorders. 389 cocaine dependent probands, 382 siblings of probands, and 262 community based controls were recruited to participate in the study. Analyses revealed that cocaine probands reported the most traumatic events which differed significantly from the community based controls ($F(2,240) = 4.965$, $p<.01$). Cocaine dependent participants reported the highest frequencies of traumatic events, followed by siblings and controls on many of the events. In particular, cocaine probands were significantly the highest on seeing someone killed (probands 48.1%, 33.3%, controls 30.9%, x_ (2, N=243) = 5.06, $p<.05$), being threatened with a weapon (69.1%, 56.8%, 50.6% respectively, x_ (2, N=243) = 5.78, $p<.05$), and being shot (21.0%, 11.1%, 7.4% respectively, x_ (2, N=243) = 6.13, $p<.05$). Men experienced more traumatic events than women ($F(1, 241)=11.043$, $p<.001$) and African-American participants reported more events than Caucasian participants ($F(1, 241)=6.108$, $p<.05$). Hence, there exists a relationship between cocaine dependence and exposure to traumatic events. Family members of cocaine dependent individuals are also at risk for experiencing traumatic events, and the communities where these individuals live have high baseline rates of violence.

The multivariate relationship between licit and illicit drugs in female twins
A. Agrawal, M.C. Neale, K.C. Jacobson, C.A. Prescott, L.J. Eaves, and K.S. Kendler
Virginia Commonwealth University, Richmond, VA

The use and abuse/dependence of multiple licit or illicit psychoactive substances is a significant source of public health concern. Twin studies have examined the multivariate genetic relationship between alcohol, nicotine and caffeine and across a variety of illicit drugs. However, most multi-drug habits include a combination of licit and illicit psychoactive substances. Therefore, the genetic and environmental relationship, jointly across licit substances and illicit drugs has not been formally addressed. We sought to examine this association in a sample of 1943 female same sex twin pairs from the Virginia Twin Registry. The total variance for each drug was partitioned into additive genetic (A), shared environmental (C) and unique environmental (E) influences. Multivariate genetic models were fit to data on regular alcohol, regular nicotine, regular caffeine, lifetime cannabis and lifetime cocaine use, employing the structural equation modeling software, Mx. A comparison of model-fit was performed using the Akaike's Information Criteria (AIC). Our best-fitting model allowed for two independent genetic factors, two independent shared environmental factors, a single unique environmental factor and drug-specific environmental influences. The first genetic factor loaded on regular alcohol use, lifetime cannabis use and lifetime cocaine use while the second genetic factor loaded on regular nicotine and regular caffeine use. The second shared environmental factor was exclusive to regular caffeine use. Overall, drug-specific unique environmental influences accounted for 10-41% of the total variance. The preliminary findings of this study suggest the role of genetic factors that encompass licit and illicit drugs (alcohol, cannabis and cocaine) for drug use. This supports a drug propensity common factor model whereby individuals using multiple substances do so because of a common predisposition to multiple substance use. The role of caffeine as a relatively unique psychoactive substance was also observed. Future analyses will attempt to assess the same relationship for abuse/dependence of these drugs. Analyses will also be performed in male twins and sex differences will be examined.

Estimated differences between prenatally cocaine-exposed and non-exposed children on continuous performance tests

A.J. Amado, C.E. Morrow, V.H. Accornero, J.C. Anthony, and E.S. Bandstra
University of Miami, Miami, FL; Johns Hopkins University, Baltimore, MD; Michigan State University, East Lansing, MI

This longitudinal investigation compared children prenatally cocaine-exposed with non-cocaine-exposed controls. The main aim is to estimate possible cocaine-associated deficits in a multivariate profile of continuous performance test (CPT). This study builds from our previously reported evidence of a cocaine-associated increase in sustained attention, as reflected by increased omission errors on CPT. Methods: The baseline sample included 253 cocaine-exposed and 223 non-cocaine-exposed African-American children enrolled prospectively at birth and followed at 5 and 7 years of age in the Miami Prenatal Cocaine Study. Prenatal cocaine use was assessed via maternal self-report and bioassays. A multivariate profile analysis method based on the general linear model and generalized estimating equations was used to estimate the magnitude of cocaine-associated deficits while holding constant potentially confounding covariates. Results: Complementing our prior results of elevated omission errors associated with prenatal cocaine exposure, the initial analyses from the current study reveal (1) no cocaine-associated deficits with respect to commission errors; (2) cocaine-associated increases in mean response times for target tasks (ms) at age 7 but not age 5, and (3) cocaine-associated increases in response time consistency at both ages. The estimates did not change markedly with statistical adjustment for child sex and age at testing, mother's age and level of education, and prenatal exposure to tobacco, alcohol, and/or marijuana, with all p values <0.05, except for response time consistency at age 5 ($p>0.10$) and commission errors at both ages ($p>0.10$). Conclusions: Evidence from this multivariate response profile analysis confirms previously reported cocaine-associated omission errors, and adds new evidence on possible cocaine-associated deficits in relation to attentional processing. We found no cocaine-associated deficits in relation to commission errors. Support: NIDA †R01DA06556; *T32DA07292; Health Foundation of South Florida.

Sex differences in the modulation of cocaine and amphetamine-regulated transcript expression in the arcuate and paraventricular nuclei of the rat

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Recent work from our laboratories has suggested the modulation of CART positive neurons and CART mRNA by adrenalectomy (ADX) and corticosterone (CORT) replacement in hypothalamic nuclei of male rat brain. ADX lowered CART mRNA levels only in the arcuate (ARC), but not in the paraventricular nucleus (PVN) while CART expression was reduced in both nuclei; CART mRNA levels were restored in the ARC by CORT replacement. The current study aimed to evaluate the effects of acute and chronic restraint stress on CART expression in the ARC and PVN in male and female Sprague Dawley rats. Rats were exposed to one hour restraint stress either once (acute) or for 15 days (chronic). Trunk blood was collected for hormone level determinations (ACTH and CORT) or rats were perfused for immunohistochemistry to assess CART peptide expression. ACTH and CORT levels were different between different treatment groups. Acute stress increased CORT more prominently in females and chronic stress lowered the elevated hormone levels in both sexes. Basal levels of CART expression were similar in males and females. In males, acute stress did not change CART expression in either nuclei while chronic stress lowered CART-positive cells relative to acute treatment in the ARC. In females, the effect of stress was opposite in the two nuclei studied: Acute stress lowered CART expression in the PVN but increased it in the ARC. Chronic stress lowered CART positive cells in the ARC while PVN was not affected. Since both chronic stress and ADX lowers CORT levels, it seems probable that CORT modulates CART expression more profoundly in the ARC. However, in females only, elevated CORT levels have an early effect (acute) on CART expression in both nuclei, but in opposite directions. Our results suggest differential and sexually dimorphic modulation of CART expression in the PVN and ARC by stress. Supported by subcontract under NIH Grant No. 3 R01 DA010732-05S1.

Mother-child interactions at ages 3 and 5 years: Impact of maternal cocaine use during pregnancy
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The objective is to assess the effect of maternal cocaine use during pregnancy on mother-child interactions at ages 3 and 5 years. This study builds from prior evidence in this cohort of cocaine-associated disturbances in various facets of mother-child interactions at age 3 (Johnson et al. J Dev Behav Pediatr, 2002). Methods: The sample included full-term prenatally cocaine-exposed and non-cocaine-exposed African-American children enrolled prospectively at birth, residing with their biological mothers, and participating in the following study. Prenatal drug exposure was measured by maternal self-report and bioassays. Subsequent maternal drug use was determined by self-report. Videotaped dyadic play sessions at age 3 and structured dyadic teaching tasks at age 5 were coded by a modified Egeland Teaching Tasks Coding Scheme to examine 14 facets of mother-child interaction. Multivariate response models were used to probe for independent disturbances in mother-child interaction through age 5. Results: Evidence from this study indicates that mothers who used cocaine prenatally pregnancy (bioassay and self-report), and with no subsequent cocaine use (self-report), are more likely to be intrusive during mother-child interactions at ages 3 and 5 ($p<0.05$) and more hostile at age 3 ($p<0.05$). Without respect to subsequent maternal cocaine use, the following additional deficits were associated with prenatal cocaine use (all $p<0.05$): maternal hostility (age 5), quality of instruction (ages 3 and 5), and boundary dissolution (ages 3 and 5). Holding constant other pregnancy characteristics (e.g., use of alcohol, tobacco, marijuana) yielded little attenuation of the observed estimates. Conclusions: Maternal cocaine use leads to specific deficits in mother-child interaction during early childhood. These dynamics should be considered in the interpretation of clinical evidence about the potential association between prenatal cocaine exposure and child cognitive, behavioral, and academic outcomes. NIDA †R01DA06556; *T32DA07292; ‡K05DA015799; †Health Foundation of South Florida; †State of Florida Healthy Start Program.

Predictors of treatment response among cocaine-dependent mothers
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This study examines possible predictors of treatment response among cocaine dependent pregnant women or women with young children (N=145) who enrolled in a 2x2 randomized clinical trial comparing Community Reinforcement Approach (CRA) and 12-Step Facilitation (TSF) counseling and Vouched Based Reward Therapy (VBRT) and yoked, non-contingent Voucher Control (VC). Experienced, trained clinicians who received weekly supervision implemented manual-guided CRA and TSF. Participants earned vouchers for providing cocaine negative urine samples and attending semi-weekly group counseling. Demographics, psychosocial functioning, cocaine use and dependence, and other substance use information were collected at baseline. Stepwise regression was used to examine significant predictors of weeks of continuous cocaine abstinence during treatment while controlling for treatment assignment. Variables with univariate p values <.20 were included in the overall model. Although women reported high severity depressive symptoms on the CESD prior to treatment (M 21.0, SD 10.9), depressive symptoms was not a significant predictor of outcome. An initial cocaine negative urine toxicology screen at intake ($p = .03$), fewer days of cocaine use in the 30 days prior to treatment ($p = .02$), and absence of external pressure to seek treatment, including court-referral, family pressure, and treatment referral following positive urine toxicology at prenatal visit or delivery ($p = .04$) were associated with more weeks of continuous cocaine abstinence during treatment, $F(3,132) = 5.69$, $p = .001$, $R2 = .11$. Similar to previous studies of cocaine treatment response in other populations, an initial cocaine negative urine toxicology screen and fewer days of cocaine use in the 30 days prior to treatment were significantly associated with more weeks of continuous cocaine abstinence during treatment. Contrary to findings in other settings, absence of external pressure to seek treatment was significantly associated with abstinence from cocaine use during treatment. These findings suggest that future studies should consider using treatment matching and/or possible blocking factors with this population. Supported by the following grants from NIDA: DA06915 & DA09803.

Nalmefene-induced elevation in serum prolactin in normal human volunteers: A partial agonist at kappa-opioid receptors?

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The Laboratory of the Biology of Addictive Diseases, The Rockefeller University Our laboratory has shown that, in humans, mu- and kappa- opioid agonists cause elevations in serum prolactin and do so through the mechanism of reducing tuberoinfundibular dopamine (TIDA), which tonically inhibits prolactin release. Serum prolactin is, therefore, a useful biomarker for TIDA. Nalmefene is an opioid receptor antagonist with relative binding selectivity for mu- and kappa- opioid receptors and has been evaluated for the treatment of alcoholism and other disorders. We have previously demonstrated in healthy volunteers that nalmefene stimulates the hypothalamic-pituitary-adrenal (HPA) axis. The current study evaluated the previously observed and unexpected finding that nalmefene can increase serum prolactin. Thirty-six healthy human volunteers (17 female) with no history psychiatric, substance abuse, or substance dependence diagnoses were admitted to the stress-minimized environment of the Rockefeller University Hospital GCRC for double blind testing with placebo, nalmefene 3mg, and nalmefene 10mg. Study drugs were administered on separate days via 2-minute intravenous infusion beginning between 9AM-10AM. Serial blood specimens were obtained for evaluation of serum levels of prolactin. Compared to placebo, both the 3mg and 10mg doses of nalmefene caused significant elevations in serum prolactin. There was no difference in prolactin response between the 3mg and 10mg doses. Male and female subjects did not differ in baseline or nalmefene stimulated levels of serum prolactin. Previous cellular binding studies have demonstrated that nalmefene is a highly opioid-specific mu-opioid receptor preferring antagonist with modest effect at kappa-opioid receptors. Elevations in serum prolactin following nalmefene in this study may indicate a partial agonist effect at kappa-opioid receptors. Because agonist activity at the kappa-opioid receptor can lower dopamine in brain regions important to the persistence of alcohol and cocaine dependence, this effect may contribute to nalmefene's potential as a therapeutic agent for selected addictive diseases. Supported in part by grants DA-P60-05130, DA00049 and M01-RR00102.

Dose-dependent impairment of watermaze reversal learning following maternal toluene abuse

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Prenatal exposure to abuse levels of commonly abused inhalants results in a constellation of symptoms labeled Fetal Solvent Syndrome (FSS) and includes growth restriction and CNS dysfunction. In a preclinical model of the abuse of inhalants during pregnancy, timed-pregnant Sprague-Dawley rats were given 15-min exposures twice daily to 8,000 parts per million (ppm) toluene, 12,000 ppm toluene, or air (0 ppm) from gestation day 8 (GD8) through GD20. Beginning on postnatal day 70 (PN70), offspring were tested in a Morris maze with 3 trials/day for 5 days with the goal platform in the same position for each trial. An inter-trial interval of 60 minutes was used. A trial ended when the rat located the underwater platform, or when a latency of 90 sec. was reached. Twelve days later, the rats were tested for 3 trials in a "reversal task" with the platform moved to the opposite quadrant. A 3x2x5x3 (Dose by Sex by Day by Trial) repeated measures ANOVA was run on acquisition data, and a 3x2x3 (Dose by Sex by Trial) repeated measures ANOVA was run on the reversal data. The Greenhouse-Geisser correction was used to correct for inflated estimates of significance. Throughout acquisition, offspring from all exposure conditions were able to locate the platform in approximately the same amount of time. However, a probe trial run on day five of acquisition demonstrated that both groups of toluene-exposed offspring spent significantly less time in the goal quadrant than did control offspring indicating that the toluene-exposed animals had not learned where the platform was located. A sex effect was also noted, with toluene-exposed females spending less time in the goal quadrant than toluene-exposed males. During reversal testing, the toluene-exposed offspring took significantly longer to locate the platform in the new location. These results demonstrate that brief, repeated, high-concentration toluene exposures in rats that mimic patterns of organic solvent abuse in pregnant women produce long-lasting cognitive deficits in offspring. Supported in part by NIDA grant No. DA015951-01 to S.E.B.

Periadolescent chronic treatment with the cannabinoid agonist CP 55,940 and morphine self-administration behavior in adult male and female rats

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It has been suggested that the use of cannabinoids during the adolescence might facilitate the dependence of other drugs of abuse. Despite the increasing use of cannabinoids in human adolescents, there are not animal studies on the long-term effects of periadolescent chronic cannabinoid treatment on opiate self-administration in the adulthood. The aim of this work has been to study the effect of a chronic treatment with the cannabinoid receptor agonist CP 55,940 (CP) during a juvenile period on i.v. morphine self-administration of male and female adult Wistar rats (n=6-8 in each group). CP (0.4 mg/kg i.p.) or its corresponding vehicle (VEH) was administered once daily, from day 35 to day 45 postnatal. In the adulthood, animals of both sexes were trained for i.v. morphine self-administration (1 mg/kg) under a fixed ratio 1 (FR1) for a week, and a progressive ratio (PR) schedule of reinforcement for an additional week. Preliminary results indicate that the number of morphine injections self-administered in CP subjects was higher than in VEH animals, particularly in males, under the FR1 schedule. However, under the PR schedule female VEH rats reached higher breaking points than female CP and male rats. These preliminary results suggest that periadolescent chronic cannabinoid treatment might influence on opiate self-administration behavior in the adulthood, and that this effect might be different as a function of gender and schedule of reinforcement. (Supported by the Ministerio de Ciencia y Tecnología (BFI2000-0611); Comunidad Autónoma de Madrid (CAM 08.8-10.1-2003) and FIS (01-05-01); Spain.

Gender differences in the temporal relationship between prescribed anti-depressants and prior drug and alcohol use

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The self-medication theory stipulates that substance abuse represents a form of self-treatment, a desire to alleviate symptoms of mental illness by self-medicating with mood altering substances. Using a self-medication model to guide hypothesis development, we surveyed a random sample of more than 9,000 undergraduates attending a large university in 2003. Fifty-six percent of the sample was women; 68% was White, 14% Asian, 6% African American and 4% Hispanic. The survey was self-administered on the Web. In this study, we aimed to determine gender differences in the temporal relationship between the first use of prescribed anti-depressants and the first use of mood altering substances (e.g. alcohol, marijuana, etc.). Consistent with trends in the general population, undergraduate women in our sample were significantly more likely than undergraduate men to use prescribed anti-depressant medication (Women: 12% lifetime and 9% past 12 months; Men: 7% lifetime and 4% past 12 months). Of the students with a history of anti-depressant use, fifty-two percent of the undergraduates initiated prescription anti-depressant use in college, 39% in high school and 9% initiated use in middle school or before. Undergraduates who were prescribed anti-depressant medication during college had significantly higher rates of alcohol, tobacco and illicit drug use before college when compared to their peers who were not prescribed anti-depressants. There were several notable gender differences. For instance, women who initiated use of anti-depressant medication during high school were significantly more likely than their peers who were not prescribed medication to have smoked cigarettes and used illicit drugs before beginning high school. These differences were not apparent among men. Since drug use preceded the antidepressants in these women, data provide preliminary support for the self-medication explanation of women's substance abuse.

Growth curve analysis of methamphetamine use trajectories from initiation to treatment

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This analysis examined patterns of methamphetamine (MA) use from initiation to treatment and selected correlates of those patterns. Data were from Natural History Interviews of 342 MA users treated in publicly-funded outpatient or residential programs in Los Angeles County. The analysis sample was 44%

female and 47% non-Hispanic white, 30% Hispanic, 17% African-American, and 6% other ethnicity. For this analysis, MA use was measured in terms of number of days of use for each month from MA initiation to first treatment for MA. Potential correlates were selected from domains of demographics, background vulnerability, lifestyle, and early substance use histories. Growth curve analysis was done using multilevel models (SAS Proc Mixed). In a parsimonious model controlling for significant covariates, results indicated significant positive linear and quadratic effects, with initial use averaging 13 days per month. Significant predictors of pattern characteristics included gender, ethnicity, early physical abuse (before age 15), early arrest history, MA initiation before age 16, and same-sex sex-partner lifestyle. For example, females with early abuse and arrest histories had the highest initial level of MA use followed by a relatively flat trajectory, whereas gay males had lower initial frequency of use followed by steeper initial increases, leveling out later in the trajectory. Some variables found in other studies to be related to development of alcohol use patterns (e.g. education, family drug use background, age of first substance use) were not significantly related to MA-use patterns in this sample of treated MA users. Results suggest particularly vulnerable subgroups for targeting prevention and early intervention efforts. (Supported by NIDA grant #DA-11020)

Sex-risk behaviors among women methamphetamine users

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The CSAT MTP is the largest randomized trial of treatments for methamphetamine (MA) dependence to date, having provided treatment for 978 MA-dependent persons. This paper focuses on the women in the sample (n=562) and explores relationships between sex-risk behaviors (here defined as having more than one partner in the past 30 days and/or as having had sex without a condom in the past 30 days) and psychosocial variables. At baseline, the average age of women was 32.4 years (SD=7.8); 58% were Caucasian, 17% were Hispanic, 2% were African American, and 23% were other; 68% of the women had family incomes of under $15,000; and 74% had a high school diploma or higher. Eleven percent of women had more than one partner, and 66% reported at least one episode of sex without a condom. Among those with at least one sex partner, there was no association between number of sex partners and condom use: 88% with one sex partner reported having at least one episode of sex with no condom, and only slightly more (93%) of those with more than one partner reported sex with no condom. Women who had more than one partner were significantly more likely ($p<.05$) to have used MA for more days (15.7; SD=10.1) within 30 days; they were also more likely ($p<.05$) to have used marijuana and more than one substance. Similarly, women who had sex without a condom were significantly more likely to have used MA for more days (13.4; SD=10.2); they were also more likely ($p<.05$) to have used marijuana and to have used more than one substance ($p<.01$). In terms of abuse history, women who had had more than one sex partner were significantly more likely ($p<.05$) to report on the ASI a history of emotional abuse during their lifetime, a history of sexual abuse ($p<.01$), and physical abuse in the past 30 days ($p<.01$). Women who had had sex without a condom were also significantly more likely ($p<.05$) to have reported physical abuse in the past 30 days and a history of physical abuse ($p<.05$). Data from this study indicates that women MA users' sex-risk behaviors may be linked to severity of methamphetamine use, polydrug use, and to experiences of sexual abuse and physical violence.

Methadone and male sexual dysfunction

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Purpose: This study reports the prevalence and types of sexual dysfunction in a sample of men on methadone maintenance for opiate dependence, and describes factors which may contribute to sexual dysfunction. Methods: 92 opioid dependent men were recruited from a methadone maintenance clinic and completed two questionnaires, a research interview and laboratory measures. Results: Fourteen percent reported some sexual dysfunction. Erectile dysfunction ($r=0.24$, $p=0.020$), libido dysfunction ($r=0.30$, $p=0.003$), and global dysfunction ($r=0.26$, $p=0.013$) increased with increasing age of the patient. Methadone dose showed a significant direct correlation with increased orgasm dysfunction, both before and after adjusting for duration of treatment ($p=0.012$). None of the sexual dysfunction subscales or global dysfunction were associated with serum testosterone or serum prolactin levels. Conclusions: The rate of

global sexual dysfunction in methadone treated men is similar to general population studies and should be evaluated using general population guidelines. Orgasm dysfunction is a special case and may respond to methadone dose reduction. global sexual dysfunction in methadone treated men is similar to general population studies and should be evaluated using general population guidelines. Orgasm dysfunction is a special case and may respond to methadone dose reduction.

The protective effect of religion in adolescent females' use of illicit drugs
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Research on adolescents' use of illicit drugs typically focuses on risk identification, and usually on such behaviors in adolescent males. Higher levels of religiosity and attendance at religious services have been theorized to decrease illicit drug use by adolescents. Focusing on religion and religious beliefs, this study uses a protective factors framework to predict adolescent females' drug use. Outcomes included never having used illicit drugs, any marijuana (MJ) use, and any use of other illicit drugs (OID). Predictors of religiosity included frequency of attending religious services. Telephone and mailed questionnaire data from a sample of female same sex adolescent twins ascertained from state birth records were analyzed using multivariate statistics. Controlling for ethnicity and age, more frequent attendance at religious services consistently emerged as protective for all three outcomes for the total sample. Ongoing analyses indicate the odds for never using illicit drugs were 30% greater for those who reported more frequent attendance at religious services ($p<.01$). This was also significant for those reporting never using MJ ($p<.01$) or OID ($p<.01$). We conducted separate analyses for African Americans (AA) and those of European and other ancestry (EOA). For the EOAs the association between more frequent attendance at religious services maintained its statistical significance for all three outcomes. More frequent attendance continued to be protective for never using drugs and no MJ use in the AAs, yet failed to achieve statistical significance. Results of this research provide support for the protective effect of attendance at religious services, but not always statistically significant. Supported by NIDA (T32 DA07313), NIAAA (AA09022), NIAAA (AA12640) and (NIAAA) AA11998

Poly-substance abuse patterns among young MDMA/ecstasy users: A latent class analysis
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The purpose of this study was to describe the poly-substance abuse patterns among 402 recent Ecstasy users. Participants were recruited in central Ohio using respondent-driven sampling methods. After participants completed an informed consent, interviewers administered a structured questionnaire covering substance use behaviors and other domains. About 64% of the participants were men, 81.6% were white, and the mean age was 20.9 years. About 50% were currently taking college classes. Age of first Ecstasy use ranged from 12-30 years; mean 18.5 years. Lifetime occasions of Ecstasy use ranged from 1 to 1000; median 11.5 times; lifetime tablets consumed ranged from 1-10,000; median 18 tablets. Latent class analysis was used to identify subgroups of Ecstasy users who had similar substance use patterns during the preceding six months. Cocaine, opioids, amphetamines, tranquilizers, marijuana, inhalants, alcohol, and hallucinogens were used for clustering. The three-class model was found preferable. The three groups generally reflect light, moderate, and heavy substance abuse behaviors, excluding Ecstasy use. For example, the conditional probability of using opioids during the previous six months in Group I was .31, Group II, .68, and Group III, .98. Similarly, for daily marijuana use, the probabilities were .29 for Group I, .41 for Group II, and .76 for Group III. Other substances followed similar patterns. Predictors of class membership were examined in a latent multinomial logit model in which Group I was treated as the reference group. White and younger Ecstasy users, as well as those who reported more than 10 occasions of Ecstasy use, were more likely to be in Group 2, compared to Group 1. Sociodemographic characteristics did not predict the likelihood of being classified into Group 3. However, people who reported more than 50 lifetime occasions of Ecstasy use has a much higher odds of being classified into Group 3. Understanding variability in substance abuse patterns can inform prevention and treatment initiatives.

Reducing alcohol-exposed pregnancy risk in college women: 4-month outcomes
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Sexually active college women frequently engage in binge drinking, which increases risk of inadequate contraception, a combination that can result in an alcohol-exposed pregnancy (AEP). Project BALANCE is a randomized trial of a one-session motivational intervention targeting risky drinking and ineffective contraception in young women attending a mid-size, urban, public university in the Mid-Atlantic. Participants are moderate to heavy female drinkers who are sexually active, not pregnant or desiring pregnancy, and not adequately using contraception. 228 students completed an assessment battery with half randomized to a one session motivational interviewing-based intervention focused on providing feedback on target behaviors and personality factors, and the other half provided a brochure on women's health promotion. Four-month follow-ups have been collected for 163 participants with final numbers available by April 2004. At 4-month outcome, significantly more women in the intervention condition were no longer at risk for AEP than women in the control condition (X2=4.07; p=.043), mostly due to more effective contraception behavior. That is, although women in both groups improved their contraception behaviors, a higher proportion in the intervention group used effective contraception (X2=3.55;p=.059). Women who received the intervention reduced their highest number of drinks per day to 5.8 compared to controls with 8.2 (t=1.85; p=.068). While 5.8 still represents a binge (defined as 5 or more drinks in one day), it is a significant reduction from baseline with intervention women showing a significantly larger change score than control women (t=-2.27; p=.025). To examine the explanatory factors for this change in risk, we conducted a multivariate logistic regression analysis using all significant univariate predictors. The analysis was significant (p=.02) with assignment to control group (OR2.4) the only independent predictor. In summary, this one-session motivational intervention to prevent alcohol-exposed pregnancy was effective at four-month follow-up.

Club drugs use amongst Chinese youths in Hong Kong
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This study aims to identify the patterns of club drug use among the Chinese youths in Hong Kong. A structured-interview was conducted amongst club drug users recruited from various social service agencies. 331 cases with a mean age of 18.2°”2.5 years (72% males and 28% female) showed that the most common club drug used were ketamine (86.1%), ecstasy (76.1%), marijuana (81.8%) and °ßice°® (27.6%). 74% were poly-drug users with the majority reporting ketamine and ecstasy as the combination that were regularly consumed. More than half of the subjects have taken drugs outside Hong Kong with Shenzhen being the place they most frequently visit. The frequency of ketamine and marijuana use was 2 times per week and 1.7 times per week for ecstasy use. Females use higher amounts of ketamine and ecstasy and more frequently when compared to males. Drugs were mainly acquired through friends. The most popular venues for drug use are rave parties followed by friend’s house. 44.7% of the users were unemployed while 20.2% were still in school and about 70% live with both parents in public housing. The majority of cases felt under stress in life citing the most popular reasons for drug use were to help them feel euphoric (69%) and to enjoy the company of friends (76.2%). Common symptoms include appetite loss, (69.9%), hallucination (55.2%) poor physical coordination (53.8%), memory loss (51.4%) and amnesia (50.2%). About half of the drug users found they needed to increase the dose by 50% to get a °ßhigh°®. In conclusion, ketamine, marijuana and ecstasy are currently the most popular drug of abuse amongst the youths of Hong Kong.

Substance use during physical and sexual assault in HIV-infected persons
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Drug and alcohol use has been reported among both victims and perpetrators during episodes of assault, but not specifically among HIV-infected assault victims and their perpetrators. We examined the prevalence of substance use at the time of physical and sexual assault among a cohort of HIV-infected persons with alcohol problems. The HIV-Alcohol Longitudinal Cohort (HIV-ALC) study recruited HIV-infected

subjects with >1 positive CAGE response, a lifetime alcohol abuse and dependence screening questionnaire. At study entry, in-person interviews assessed demographic data, histories of physical and sexual assault, and use of drugs or alcohol by subjects or their assailants at the time of assault episodes. Of the 349 subjects (20% women), 47% reported substance use in the past 30 days (42% alcohol, 24% cocaine, and 11% heroin); 76% reported a lifetime history of physical assault and 40% reported a lifetime history of sexual assault. Of the subjects who had been physically assaulted, 66% reported using drugs or alcohol during at least some cases of physical assault, and 85% reported their assailants were using drugs or alcohol during at least some cases of physical assault. Frequency of substance use during physical assault was similar for women and men. Of the subjects who had been sexually assaulted, frequency of substance use during sexual assault differed by gender. Women were more likely than men to report using drugs or alcohol during at least some cases of sexual assault (51% vs. 19%, p=0.0001). Women were also more likely than men to report that the person who sexually assaulted them was using drugs or alcohol during at least some cases of sexual assault (88% vs. 58%, p=0.003). Drug and alcohol use during physical and sexual assault was high in this cohort of HIV-infected persons with the gender specific differences noted. The inter-relatedness of violence and substance use should be emphasized when informing HIV-infected patients about behaviors and health risks. Prevention of violence and its consequences is an appropriate focus of drug and alcohol treatment programs for the HIV-infected.

A comparison of psychiatric and demographic characteristics of female and male treatment-seeking, methamphetamine-dependent individuals

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This presentation reports differences observed at time of baseline assessment for 93 treatment-seeking methamphetamine-dependent individuals. Data from the entire sample will be presented and gender differences will be highlighted. The sample was 40 % female, predominantly Caucasian and Hispanic, and had a mean age of 33. As part of baseline assessment for a number of trials, participants were interviewed by a trained clinician with the SCID and a number of demographic variables were collected. Results indicated that females were less likely than males to have problems with alcohol, cannabis, opiods or hallucinogens. Females tended to be more likely to have subthreshold panic and major depressive disorders, as well as bulimia nervosa. Females were less likely to have antisocial personality disorder. Females reported more previous treatment episodes for psychiatric ailments. Females were less likely than males to have dependent children living with them. Females were more likely to be homeless than males. Females were less likely than males to have a felony conviction, but if they did have a felony conviction, it had occurred more recently, on average, than for males. Females were less likely than males to be married and, in general, had received a poorer education than males. These results suggest that there are important, and sometimes subtle, difference between men and women seeking treatment for their methamphetamine dependence. Clinicians and researcher share the goal of finding novel ways to address these differences in the treatment of this debilitating disorder.

Sex differences in opioid receptor populations

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The purpose of the present studies was to use pA2 analyses to ascertain whether similar opiate receptor profiles – binding or post–receptor signal transduction processes – are involved in male and female responses to opioid induced antinociception. We have also examined whether the organizational or activational effects of sex steroids mediated changes in opiate receptor profiles. We found that the pA2 values in normal males and females were significantly different suggesting that different opiate receptor populations are involved in morphine-induced antinociception. In addition, we found that the nature of these differences was determined by sex steroids in early post-natal life. Thus, it appears that the differences in opiate receptor profiles observed in adult normal male and female rats are due to fundamental gender differences in the organization of the endogenous opioid pathways mediating antinociception. Thus our data suggest that the now well-established gender differences in male and female rats in the pharmacology of the opiates may be mediated by sex steroid dependent changes in opiate

receptor profiles. Whether these changes reflect different binding proportions or G-activated proteins remains to be determined as does the generality of the effects we have observed.

Prenatal cocaine exposure: 8-year-olds' arousal to social and cognitive challenges
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Arousal regulation problems are found more often than other outcomes in studies of developmental effects of prenatal cocaine exposure during infancy and early childhood. Arousal regulation in prenatally exposed (n=89) children at 8-years in response to "mild" and "severe" cognitive and social stressors was studied using physiological responses (heart rate (HR), skin conductance level (SCL), and skin conductance response (SCR)). Contrast groups included unexposed controls (n=48) (CON) and a community group (n=31) with diagnosed behavioral disturbance (BD). Mild challenges included social conversation with the examiner and the Nepsy Tower, and severe were, an "Impossible Maze", and overhearing an adult argument. Four 30 second epochs were used to monitor HR, SCL, and SCR. Significant multivariate effects were found for group ($F=2.97$, $p < .0071$) but not for different stressor. As expected, the BD group had significantly higher HR overall ($F=2.97$, $p < .0071$) followed by the prenatal cocaine group (COC) and the no-exposure group. An epoch by group interaction was found on SCL ($F=3.81$, $p < .0005$). Post-hocs indicated that controls had significantly higher levels of SCR across epochs compared to both other groups. The BD and COC differed on epochs 1 and 4 only with the BD group higher on epoch 1 and the COC group on epoch 4. These results suggest both that this procedure identifies children with arousal problems and that prenatal cocaine exposure is associated with persistent problems in regulation of physiological response to all kinds of environmental challenges.

Chronic nicotine differentially alters amphetamine-induced locomotor activity in male vs. female adolescent and adult rats
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Studies show that a significant number of youths smoke cigarettes and it has long been questioned whether nicotine use in adolescence leads to the use of other psychostimulant drugs. To better understand the effects of drug use in adolescence, we examined the effects of nicotine on amphetamine-induced behavior in male and female adolescent rats compared to adult rats. In the current study, periadolescent and adult male and female rats were treated with nicotine for 7 days. One day or 30 days after this treatment, the effects of amphetamine on locomotor activity were studied. Sensitization to nicotine occurred in periadolescent female and adult male and female rats, but not in periadolescent male rats over the course of the 7-day treatment period. On day 8 (one day after treatment with nicotine ended) or day 37 (30 days after treatment with nicotine ended), nicotine-pretreated periadolescent male rats were sensitized to the locomotor-activating effects of amphetamine. The response to amphetamine of periadolescent female and adult male and female rats was unchanged at either time point after nicotine pretreatment. These data suggest that adolescent males are more sensitive than adults or females to the stimulant effects of amphetamine after exposure to nicotine, and that this effect is long-lasting. Thus, there are differential adaptations to chronic nicotine treatment in male vs. female and adolescent vs. adult rats. In addition, nicotine use during adolescence appears to carry a greater risk than during adulthood and male adolescents may be particularly vulnerable to the risk of stimulant abuse after nicotine use. Supported by NIDA grants DA15947 (SLC), DA 13936 (SI), and DA 15119 (SI).

The unfairness of sex: Gender, but not incarceration history, predicted long-term housing and employment outcomes among treated homeless substance abusers
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INTRODUCTION: Promising treatment models have been developed for homeless substance abusers. Prior legal entanglement, however, has the potential to limit long-term residential and employment opportunities. Using data from a treatment trial, we hypothesized that a history of incarceration would predict worse long-term employment and housing outcomes. Secondarily, we assessed gender's impact on

these outcomes. METHODS: All subjects (n=195) received 6 months of day treatment, job training and housing per trial protocol. The main predictor was Months Incarcerated (lifetime) before trial entry. Separate logistic regressions modeled outcomes of Good Employment (GE, employed >20 days in prior 60) and Good Housing (GH, housed >30 days in prior 60) at 12 months' follow-up, including gender, age, race, treatment attendance, and trial arm as covariates. RESULTS: At baseline, 90% of subjects had a lifetime history of incarceration (median Months Incarcerated=12). Of 120 subjects available at 1 year, 39% achieved GE and 43% achieved GH. In multivariable analyses, Months Incarcerated was not significantly associated with GE (p=.44) or GH (p=.38). Compared to males, females were less likely to attain GE (OR 0.27, 95%CI 0.08-0.93, p=.04) but more likely to attain GH (OR 2.5, 95%CI 0.96-6.5, p=.06). IMPORTANCE OF FINDINGS: For this homeless treatment sample, baseline incarceration history was not associated with long-term employment or housing, but gender-specific associations varied by outcome. The small number of subjects with clean legal histories probably limited our power to assess the effect of incarceration. Better housing, but poorer employment outcomes among women could be due to treatment program design, access to different types of resources after treatment and/or different priorities among male and female subjects. We speculate that the rehabilitation of homeless substance abusers requires greater attention to gender-specific needs.

Sex differences in chronic pain

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The administration of Complete Freund's Adjuvant (CFA) in the base of the tail of rats results in a polyarthritic state that is characterized by mechanical hyperalgesia in the hindpaws as well as an increased sensitivity to the pain relieving effects of morphine. The present study is designed to examine sex differences in CFA-induced hyperalgesia as well as sex differences in opioid-induced antinociception in CFA-treated Lewis rats. Hormonally intact and gonadectomized male and female rats were injected with CFA or vehicle (VEH) into the base of the tail. Changes in body weight as well as the day on which at one of the hindpaws exhibited inflammation were recorded. Pain sensitivity (e.g., mechanical hyperalgesia) and responsiveness to opioid antinociception were assessed at various time points. All CFA-treated rats weighed less than their VEH-treated counterparts. Hormonally intact females developed inflammation and hyperalgesia at a faster rate and exhibited greater peak hyperalgesia than hormonally intact male rats. Castration increased the rate of inflammation onset and resulted in a 25% increase in the magnitude of hyperalgesia compared to hormonally intact males. Ovariectomy did not alter the rate of inflammation onset or the magnitude of hyperalgesia in females. The potency of morphine was increased in both male and female CFA-treated rats compared to respective VEH-treated rats. Castration eliminated the increase in the potency of morphine in CFA-treated males, whereas the magnitude of the CFA-induced increase in the potency of morphine remained unchanged in ovariectomized rats. Tests with other opioid analgesics are currently underway. These data demonstrate that sex hormones are important mediators of the magnitude of hyperalgesia and the potency of morphine to produce antinociception in CFA-treated male and female rats. (Supported by NIDA grant K12-DA14041 and the VCU Institute for Drug and Alcohol Studies).

Gender differences in baseline characteristics of stimulant abusers enrolled in methadone vs. outpatient psychosocial treatment

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The present study sought to identify differential service needs of female vs. male substance abusers. Research participants were stimulant abusers enrolled in one of two parallel studies conducted within the NIDA Clinical Trials Network -- one at methadone maintenance (MM) and the other at outpatient psychosocial (OP) programs. Only mixed-gender programs were included in the present analyses (7 OP and 6 MM clinics). Across both modalities, females (n=335) presented to treatment with greater psychiatric problem severity than their male (n=402) counterparts (with 63% vs. 49% reporting psychiatric problems and 28% vs. 7% being treated with psychotropic medications in the past 30 days respectively). In the OP modality only, women (n=163) were younger (21% between ages of 18-25 vs. 10%), more likely to be single (50% vs. 39%), more likely to be a high-school drop-out (42% vs. 25%), more likely to be unemployed (82% vs. 54%), and more likely to be cigarette smokers (87% vs. 77%) than men (n=185); all

p's < .02. Contrary to previous research, females in the OP modality were equally as likely as males to be referred to treatment by the criminal justice system. The data suggest some differential treatment needs of female drug abusers including the need for psychiatric treatment in all modalities, and educational and employment services in the OP modality. Data also suggest a narrowing of the traditional gender gap in legal problem severity. That certain gender differences were seen in the OP but not MM is interesting but unexplained at present.

Characteristics of women with sexual abuse histories at follow-up for methadone treatment
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Women who enter substance abuse treatment with a history of sexual abuse often report greater indicators of psychopathology (e.g., depression, anxiety, PTSD) that hold implications for treatment providers. This study investigates follow-up differences and time (admission to follow-up) by abuse interactions between female clients with and without a history of sexual abuse who entered outpatient methadone treatment in Texas between 1995 and 1998. In a sample of 105 women, 39% (N=41) reported a history of sexual abuse, based on screening questions contained in the intake interview. Analysis of variance (ANOVA) was used to examine primary areas of interest such as sociodemographics, family relations, substance abuse, psychological functioning, and health. Sexual abuse clients were more likely to have experienced past physical and emotional abuse. At follow-up, compared to those with no sexual abuse history, sexual abuse clients reported more depression, anxiety, more thoughts of suicide, and more trouble concentrating and controlling violent behavior. Time by abuse interactions were found for reported physical abuse and attempted suicide. Results support the importance of screening for sexual abuse history during intake in order to assure adequate treatment planning.

NMDA antagonist modulation of morphine antinociception in female vs. male rats
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NMDA antagonists are of clinical interest because they have been shown to prevent the development of opioid analgesic tolerance; they may also enhance the acute analgesic effects of opioids, although this finding is less consistently reported. These conclusions are based on data obtained primarily from male subjects, despite the fact that sex differences in opioid antinociception (and in motoric effects of NMDA antagonists) have been reported. The present study was conducted to compare the modulatory effects of three NMDA antagonists (MK801, dextromethorphan, LY235959) on acute morphine antinociception in adult Sprague-Dawley female vs. male rats. When given alone, MK801 (0.005, 0.01, 0.02 mg/kg s.c.) slightly increased hotplate latencies and did not affect tail withdrawal latencies, in both sexes. When given in combination with morphine (1.8, 3.2, 5.6 mg/kg s.c.), MK801 either increased, decreased or did not change morphine antinociception, depending on dose of each drug, time post-injection, sex of subject, and nociceptive test. When given alone, dextromethorphan (5, 10, 20 mg/kg s.c.) did not significantly alter hotplate or tail withdrawal latencies in rats of either sex. Similar to MK801, dextromethorphan's modulation of morphine antinociception depended on dose of each drug, time post-injection, sex of subject, and nociceptive test. When given alone, LY235959 (0.25, 0.5, 1.0 mg/kg s.c.) slightly increased response latencies on the hotplate test (both sexes) and on the tail withdrawal test (males only). When given in combination with morphine, LY235959 primarily potentiated morphine's antinociceptive effects in males, whereas its modulation of morphine antinociception was more variable in females. The complexity of NMDA antagonist modulation of acute morphine antinociception, even in males, suggests that multiple mechanisms are involved (e.g., spinal and supraspinal). Additionally, there appear to be sex differences in some NMDA antagonist effects, suggesting that gonadal steroid hormones modulate these drug interactions.

A profile of cocaine and amphetamine users in Los Angeles County
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In Los Angeles County, 26.3% of those in alcohol and drug treatment report cocaine as their primary

problem, an additional 18.7% report amphetamine use as their primary problem. The current research examines these two groups in terms of their gender, treatment type (outpatient/residential), and drug use prior to treatment admission and discharge to ascertain if there are significant treatment outcome differences. The current sample (n = 4261) was obtained from a large evaluation of the Los Angeles County alcohol and other drug treatment system. The mean age of the cocaine users was 40.5 years, were primarily male (55%), and the primary route of administration of cocaine was through smoking. The mean age of the amphetamine users was 33.7 years, the majority were female (57%), and the primary route of administration was also smoking (60.2%), however 24.5 % reported inhalation (snorting) and an additional 13% reportedly injected the drug. Pearson chi-square illustrated that for the treatment of amphetamine abuse, intensive outpatient counseling produced the best outcomes when compared to residential and outpatient counseling. On the other hand, primary cocaine users in residential services had better outcomes when compared to outpatient counseling (regardless of the intensity). Furthermore, men were more likely to report needle use than women. Women were more likely than men to report that they had not used cocaine or amphetamines during the 30 days prior to discharge. These results indicate that there may be justification in using very specific treatment practices for different demographic groups, depending on their addiction.

Smokers are dopers: Smoking and drug use among female prisoners

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A high prevalence of both smoking and drug use has been documented among incarcerated populations. However, the relationship between smoking and other drug use has never been investigated within a prisoner population sample. The goal of the present study was to investigate the relationship between substance use and smoking among female prisoners at a state prison in Virginia. The sample was comprised of 283 adult incarcerated women with a mean age of 34.8 years. 47.7% were Caucasian, 48.4% had never been married, and 73.2% had at least a high school or GED education. Participants completed the drug abuse section of the ASI as well as demographic and smoking history questions. 71.8% identified themselves as current smokers, 11.1% as ex-smokers, and 17.1% as never smokers. Almost all women (94%) had tried alcohol, with 61.7% reporting regular alcohol use, and 54.1% reporting drinking alcohol to intoxication. About a quarter of women had tried heroin, with 15.8% reporting regular use. Almost half (46.7%) reported ever using opiates, with 36.2% reporting regular use. 60.9% reported trying cocaine and half reported regular use. Smokers and ex-smokers reported both higher regular use of alcohol (67% and 63.3%) and drinking to intoxication (60.5% and 55.2%) than non-smokers (37% and 24.4%; both p's <.001). Smokers and ex-smokers were also more likely to have tried heroin (31.3% and 19.4%) and used heroin regularly (20.1% and 9.7%) than non-smokers (6.4% and 2.1%; both p's <.01). Further, smokers reported higher rates of cocaine use (61.3%) than ex-smokers (37.9%) and never smokers (12.8%, p <.001). Finally, smokers reported more IV drug use (33.1%) than ex-smokers (19%) and non-smokers (7.1%), although this finding only approached significance (p =.067). Smoking appears to be a marker for drug use initiation, regular drug use, and more severe drug use, even in a population with high rates of smoking and drug use. Supported by K23DA15774-01.

Gender differences in response to stress after prenatal cocaine exposure

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Clinical studies have shown that prenatal exposure to cocaine causes children and adults to show difficulties coping with unstructured settings and stressors (Eisen et al., 1999; Hawley et al., 1995). Preclinical research has demonstrated that the mesoprefrontal stress system is compromised following prenatal cocaine exposure, with most of those studies using only males (Elsworth et al., 2001). To further investigate the brain mechanisms underlying the altered stress response, and to evaluate if the effects of prenatal cocaine may differ between males and females, the present study was undertaken. Subjects were twenty-six aged male and female offspring (postnatal day 120-130) of pregnant Long-Evans dams injected (gestational day 8-20) with equivalent amounts of cocaine HCl (40 mg/kg/3ml, s.c.) or saline. On a given test day, rats received no drug, saline, and the following GABA agents picrotoxin (2.0 mg/kg/ml, i.p.) and muscimol (3.0 mg/kg/ml, i.p.). After initial handling and/or systemic injection, animals were stressed by a

forced swim and placed in an open field (OF) apparatus (5 min each). A two-way ANOVA revealed that baseline OF behavior was significantly different for prenatal cocaine (PCOC) males; a main effect of prenatal treatment ($F[1,22]=6.14$, $P<0.05$) and a gender X prenatal treatment interaction effect ($F[1,22]=9.62$, $P<0.01$) were obtained. Following GABA drug challenges, a similar profile was found whereby PCOC males were more sensitive to the effects of both muscimol and picrotoxin. A significant three-way interaction effect was revealed ($F[4,88])=6.18$, $P<0.001$). Histological analyses were performed to investigate the ultrastructure of GABA-containing neurons in the mesoprefrontal area. Standard Vectastain procedures for parvalbumin-like immunoreactivity (which labels GABA neurons) demonstrated that while all PCOC animals displayed less dendritic sprouting, PCOC males showed even less dendritic development than their female counterparts. The results are interpreted as evidence for gender differences in long-term effects of gestational cocaine on stress responding that may result from altered GABAergic neuronal integrity.

The intersection of problem gambling, depression, suicidality, and violence among out-of-treatment female substance users

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Previous investigations have found that female substance users who experienced a tripartite of drug use, violence, and depression were at a higher risk for HIV infection (Johnson, Cunningham-Williams, Cottler 2003). Gambling may serve as an "escape" from the tripartite. Thus, we explored associations between problem gambling (i.e., 1+ DSM-IV pathological gambling criteria) and current depression, suicidality, and violence exposure among a high-risk sample of out-of-treatment, heavy drinking (NIAAA #12111) and drug using women (NIDA #11622) enrolled in HIV prevention (n=837). This sample was 82% African-American, young (mean age 35.7); 34% married; 80% mothers; 55% jobless; and currently dependent on alcohol (55%), cocaine (74%) or opiates (37%). Three groups were evaluated: PG (problem gamblers with 1+ gambling criteria; n=180; 21%), NPG (gamblers with 0 criteria; n=425;51%) and NON (non-gamblers; n=232; 28%). Baseline data indicate significant, oftentimes linear associations of gambling status with current depression ($x2=23.6$; $p<.0001$), suicidality [e.g. thoughts of death ($x2=11.2$, $p=004$); suicidal thoughts ($x2=8.1$, $p=.02$); worthlessness ($x2=14.8;p=.001$)]; violent tendencies [e.g. irritability or aggressiveness ($x2=42.97;p<.0001$); recklessness ($x2=21.3$; $p<.0001$); lacking remorse ($x2=21.3;p<.0001$);carrying guns ($x2=36.5;p,.0001$), using drugs before a fight ($x2=10.0;p=.01$); victimization [e.g. emotional abuse ($x2=15.9;p=.000$); hit with objects ($x2=24.6;p<.0001$); childhood sexual assault ($x2=7.4;p=.02$); rape ($x2=6.97;p=.03$);]; and perpetration [e.g. arguments escalating to pushing/shoving ($x2=14.8$; $p=.001$), slapping ($x2=9.89;p=.01$), beatings ($x2=11.4$; $p=00$)]. Alternative explanations to the "escape" hypothesis of problem gambling will be explored in a multivariate framework. Implications of these findings for women substance users with co-occurring problem gambling will be offered.

Duration of most recent abstinence attempt and prospective treatment drop-out as a function of distress tolerance in residential treatment-seeking inner-city drug users

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The current study investigated the relationship between duration of most recent substance use abstinence attempt and psychological distress tolerance, as indexed by persistence on a mental arithmetic task in 56 men and 33 women at an inner-city residential substance abuse treatment facility. Results indicated that most recent abstinence duration was related to persistence on the psychological stressor ($r = .25$; $p = .02$), with this relationship persisting after controlling for demographics, substance use level, and negative affect. These findings extend previous work (Brown, Lejuez, Kahler, & Strong, 2002; Brandon et al., 2003) reporting significant relationships between persistence on laboratory challenge procedures and length of abstinence following a quit attempt in smokers, suggesting common processes accounting for relapse across addictions. Additionally, we will provide pilot data from a prospective study examining psychological distress tolerance as a predictor of 30-day residential substance abuse treatment drop-out in

men and women using two psychological stressor tasks (mental arithmetic and mirror-tracing). Initial results (n = 36) suggest that individuals who dropped-out of the program evidenced less persistence than individuals who completed the program on both the mental arithmetic (M for drop-outs = 70 sec; M for completers = 219 sec) and mirror-tracing (M for drop-outs = 35 sec; M for completers = 195 sec). Considering these data together, implications for better understanding addictions treatment failure will be discussed, including suggestions for the development of adjunct strategies for current treatments.

Chemical submission: Study of case reports

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Beside the entertaining context, the misue of psycho-active substances may deserve a criminal use leading to ingestion of these substances by the victimes without their knowledge. We propose an evaluation of clinical reports, in 2001 and 2002, notified to the Center of Evaluation and Information on Pharmacodependence of Paris (CEIP : national network in drug dependence monitoring), among which 91% were subject of complaint. Fifty three (53) observations of submission concerning 33 women and 20 men, who were in average 30 and 34 year-old respectively. The victims underwent a sexual agression in 57% of the cases and a theft in 28% of the cases. Various psycho-active substances were ingested without their knowledge, and often hidded in an alcoholic drink which moreover can potentiate the psycho-active effects of these substances. Benzodiazepines were the most frequently detected (33%), followed by various psychostimulants (18%), antihistamines and sedatives (9%), hallucinogens (9%), and anaesthetic drugs (6%). The detected substances are mainly those consumed for an entertaining use. Sodium gamma-hydroxybutyrate, classically known to be (the " rape drug ") used for submission purposes, is only found in 2 cases. This result is probably related to the very short elimination half-life of this substance.

Found guilty? Psychosocial and HIV risk behaviors in pregnant drug-dependent women with and without criminal justice system involvement

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Involvement with the criminal justice system (CJS) is associated with an increased risk for a variety of adverse health outcomes, including HIV infection (Barkauskas, 2002). For substance abusing women of reproductive age, rates of involvement with CJS continue to escalate, suggesting pregnancies for such women may be of particularly high risk and may require more intensive medical and psychosocial management (Beck,2002). The present study examined the relationship between CJS involvement and substance use severity in a sample of pregnant drug dependent women. Participants were opiate and/or cocaine dependent women admitted to a comprehensive perinatal drug treatment program. All women provided informed consent as part of a larger behavioral treatment research program. Measures of psychiatric, substance use and HIV risk behaviors were compared for women with (CJS+, N=122) and without (CJS-, N=278) CJS involvement, which was defined as a history of conviction for a criminal offense. CJS+ women reported higher lifetime rates of regular alcohol and tobacco use than CJS- women (all.01< p<.05). CJS+ women also had higher HIV risk assessment scores than CJS- women, and they were two times more likely than CJS- women to report intravenous (IV) use of heroin and cocaine (both p<.05). While frequency of recent (past month) heroin and cocaine use did not differ on admission to treatment, CJS+ women reported spending nearly twice as much money daily for cocaine than CJS- women (p<.05). These data suggest that CJS involvement is associated with greater severity of substance dependence and increased risk for HIV infection. Study findings have implications for treatment and prevention in this high-risk population of pregnant drug dependent women.

Comparison of the effects of cortisol and cocaine administration on plasma prolactin and growth hormone levels in individuals with cocaine dependence

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In rodents, a stress hormone, corticosterone (cortisol in humans) facilitates cocaine self-administration

purportedly via enhancement of dopaminergic activity in the brain. Controlled trials failed, however, to extend this facilitatory cortisol's action to humans. In the present clinical study we used peripheral neuroendocrine indices to assess central dopaminergic effects of cortisol administration and to compare them to those of cocaine. Twelve cocaine-dependent individuals (9 males and 3 females) received an intravenous bolus of cortisol (0.5 and 0.2 mg/kg; N=6 for each dose) and cocaine (0.2 mg/kg) in a double-blind randomized placebo-controlled and counterbalanced fashion. Plasma cortisol, ACTH, prolactin and growth hormone (GH) levels were assayed over the next 120 minutes. Cortisol produced mild and short-lived, albeit significant increases in craving, while cocaine resulted in significant and sustained elevations in both euphoria and craving (Elman et al, Psychopharmacology Bulletin, 2003). Cortisol produced significant increases in plasma cortisol and GH and decreases in ACTH levels. Cocaine resulted in significant increases in both ACTH and cortisol and decreases in prolactin. Placebo administration was associated with gradual declines in cortisol and prolactin level, perhaps due to carryover effects and circadian rhythm changes. The plasma prolactin levels at 90 ($p=0.05$) and 120 ($p=0.02$) minute timepoints were significantly lower after cocaine- than after placebo infusion. These different neuroendocrine response profiles point to important differences between cortisol and cocaine neuroendocrine effects and call for further research aimed at understanding the distinctive features of cortisol's dopaminergic effects in humans vis-a-vis those of cocaine and their role in the mechanisms underlying cocaine dependence. Supported by grants DA#14410 and DA#00343 from the National Institute on Drug Abuse.

Impact of negative affect by sex and reproductive status on abstinence in a controlled clinical trial for nicotine addiction

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Background: The goal of this study was to examine the impact of negative affect, sex and reproductive status (pre or postmenopause) on ability to obtain abstinence in a sub-group of male and female smokers participating in a 6-week, double-blind, placebo controlled study of naltrexone augmentation of nicotine patch. Methods: Subjects maintained daily records of mood and menstruation (as appropriate) for 7-21 days prior to their scheduled quit day in the above clinical trial. All subjects were without psychiatric disorder according to structured clinical interview. Individuals were characterized as having "negative affect" if greater than 50 percent of their daily ratings revealed at least mild symptoms on two or more of the following: low mood, hopelessness/worthlessness, anxiety/tension, anger/irritability. Smoking abstinence during the clinical trial was confirmed by the time line follow-back method. Results: Out of 20 menstruating women, 10 (50 percent) were found to have negative affect, while only 20 percent of men (N=29) and postmenopausal women (N=19) were characterized as such. Those with negative affect were less likely to attain complete abstinence during the study regardless of sex, menstrual cycle phase or menopausal status. When considering only those who completed the study, the disparity in abstinence between those with negative affect and those without was greatest in males (70 percent versus 33percent), but also quite apparent in both groups of women: premenopause (62 percent versus 33percent) and postmenopause (50 percent versus 25 percent). Conclusions: While the relatively small size of this dataset suggests that cautious interpretation is warranted, these findings are intriguing and provide further indication that negative affect, in addition to sex, mediates smoking recitivism.

Potential barriers to improved substance abuse treatment outcomes for women receiving welfare

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Research has demonstrated that many women receiving welfare experience barriers (e.g., education, literacy, job skills, work experience, transportation, childcare, housing, psychiatric and health problems, and domestic violence) to obtaining and maintaining employment. Gutman et al. (2003) have shown that the presence of multiple barriers (not any one in particular) is associated with lower rates of employment. This study's purpose was to test this barriers model with substance abuse (SA) treatment (Tx) outcomes for two reasons: 1) the model predicted employment outcomes well and 2) the literature is unclear as to what client conditions predict SA Tx outcomes. It was hypothesized that positive relationships would be detected between subjects' number of barriers (at baseline and 6-months) and their alcohol and drug use severity outcomes at 12 months. This study used the same dataset Gutman et al. used in their employment outcomes

study. Ten demonstration sites in 9 states provided IOP SA Tx, work services, case management, and individualized, wrap-around services in hopes of decreasing female subjects' (n=366) SA, other barriers to employment, and rate of welfare receipt and increasing their rate of employment. Planned duration of Tx was 12 months; average was 6. Measures included the ASI and Welfare-to-Work Addendum. T-tests and linear regression analyses were conducted. Presence of major depression and generalized anxiety disorder (GAD) were weakly associated with worse alcohol composite scores. Low work experience and presence of major depression and GAD were weakly associated with worse drug composite scores. Controlling for baseline and 6-month scores, total number of barriers was not associated with alcohol composite scores. Total number of barriers at baseline was marginally associated with worse drug composite scores; when using total number of 6-month barriers, no association was detected. This barrier model does not appear to work well for predicting SA Tx outcomes. Perhaps a different set of barriers apply to these outcomes than to employment outcomes.

A stress and coping view of nicotine dependence in African American women
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Studies have shown that African American women who report high levels of stress are more likely to smoke. It has also been posited that African American women experience greater stress, due to racism. However, the association between the psychosocial stressor of racism, coping style, and nicotine dependence among African American women has not been examined. This study explored the association between race-related stress, (using the Index of Race-Related Stress [IRRS]), coping (using the John Henry Scale for Active Coping [JHAC12]) and socioeconomic status (education and income) on nicotine dependence (using carbon monoxide [CO] levels and the Fagerström Test for Nicotine Dependence [FTND]) in 72 African American women in the South. The majority of the subjects had a high school diploma (79%), an income of $24,999 or less (70%), and were not married (83%). Mean nicotine dependence scores were: CO=11.75(8.1), FTND=3.7(2.6). Average scores on the IRRS, PSS (Perceived Stress Scale) and JHAC12 were 43.8(20.0), 19.6(6.5) and 45.6(4.7), respectively. A multiple regression approach to the general linear model was used to examine the influence of race-related stress, coping, and socioeconomic status on nicotine dependence (CO and FTND, separately). Independent variables controlled in the model were age of smoking initiation, education, income, JHAC12, IRRS, and PSS. Interaction terms controlled for in the model included JHAC12 x Income, Income x Education, and IRRS x PSS. The interaction term of IRRS x JHAC12 x Education was significant for nicotine dependence as assessed by carbon monoxide levels, but not by the FTND (p=.02 and p=.50, respectively). More specifically, race-related stress was associated with high carbon monoxide levels in all groups except among highly educated nonactive copers. These findings reveal the importance of considering the influence of ethno-culturally relevant psychosocial factors in the development of cessation interventions in this population.

D1 and D2 receptor activation, mRNA, and binding levels are differentially affected by acute cocaine administration in male and female rats
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Cocaine has been shown to increase locomotor behaviors in rats by altering monoaminergic tranmission. It has been previously demonstrated that female rats have a more robust behavioral response to cocaine administration. Neurobiological mechanisms underlying these differences remain unclear. The purpose of the present study was to determine whether dopamine (DA) receptor activation, mRNA, and ligand binding levels influence sex differences in cocaine-induced behaviors. Male and female Fischer rats were administered the D1 antagonist SCH-23390 (0, 0.05, 0.1, and 0.25 mg/kg, i.p.) or the D2 antagonist eticlopride (0, 0.03, 0.1 mg/kg, i.p.) followed by acute cocaine (20 mg/kg, i.p.) or saline administration. Activation of the D1, but not the D2, receptor in female rats mediates cocaine's motor effects, consistent with previous reports in male rats. However, the potency of SCH-23390 differed between sexes suggesting that D1 receptor activation may play an important role in sex differences to cocaine-induced activity. Although there were no sex differences in baseline D1and D2 receptor mRNA and binding levels, a

significant reduction of D1 mRNA and binding levels was observed in male rats only following an acute injection of cocaine. Taken together these results suggest that intracellular signaling pathways induced by acute cocaine are sexually disparate. This work was supported by PS-CUNY, RCMI RR-03037, NIDA DA12136, SCORE 506-GM60654 and SNRP NF.

Drugs and sex: A cross-cultural comparison of HIV-risk behaviors among school-based females in the U.S., Puerto Rico, and Mexico

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Worldwide females are becoming increasingly affected by HIV/AIDS. Many are thought to have contracted the virus during adolescence. Employing confidential survey methods, the International Longitudinal Survey of Adolescent Health was administered to 1928 school-based females in the U.S., Puerto Rico, and Mexico. The mean age was 15 years (SD=1.7). Multiple logistic regression analyses were employed to examine the relationship between lifetime substance use and sexual behavior. Lifetime substance use rates and sexual intercourse rates were highest among youths in the U.S. Substance use increased the likelihood of initiating sexual intercourse. Although the use of alcohol and other drugs significantly increased the likelihood of initiating sexual intercourse among females in the U.S., lifetime marijuana use had the greatest impact (OR= 5.58). Females in Mexico who reported alcohol use were 4 times more likely to have initiated sexual intercourse. Alcohol and marijuana use increased the likelihood of having initiated sexual intercourse 3.5 and 4.2 times, respectively, among Puerto Rican females. Alcohol use increased the likelihood of having multiple partners for all females. Risk increased between 2.5 and 3 times. Marijuana use was a risk factor for multiple sex partners among U.S females only (OR = 1.54). Likewise, the use of other drugs increased the likelihood of having multiple partners for females in the U.S. (OR = 2.04). There was no relationship between substance use and recent condom use. In conclusion, a smaller proportion of females in Mexico and Puerto Rico engaged in HIV-risk behaviors compared to females in the U.S. Yet, Hispanic females in the U.S., many of whom immigrate from Mexico and Puerto Rico, are disproportionately affected by HIV/AIDS. Acculturation is a possible explanation for this disparity. Still, the findings suggest the need for early HIV risk interventions with an emphasis on preventing alcohol and marijuana use, delaying the onset of sexual intercourse, and understanding the potentially deadly consequences of mixing drugs and sex.

Antecedents of drug abuse and dependence: A longitudinal study

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Although much has been learned about the antecedents of initiation and experimentation, less is understood about the etiology of drug abuse and dependence. We hypothesize that specific individual and social factors in childhood and adolescence increase the risk for substance abuse problems in adulthood (age 32). The data are from the Woodlawn study, which followed for more than 25 years an African American population (n=1242) in Chicago. In 1966-67, when the children were in the first grade, mothers and teachers were interviewed. Mothers and children were interviewed during adolescence. The “children” were again followed as adults at age 32-34 (n=952). Using structural equation modeling, this study examined the impact of classroom adaptability and socioeconomic disadvantage in first grade; school bonds, parental supervision, and drug use in adolescence; and educational attainment by age 32 on drug abuse and dependence in adulthood. Drug abuse problems were measured using the CIDI. Findings show different trajectories to drug abuse problems for males and females. For males, the combination of shyness and aggression in first grade, drug use in adolescence, and lifetime educational attainment directly increase the risk for drug abuse problems. For females, only educational attainment has a direct effect on the outcome. For both, several factors have indirect effects through mediators. These findings suggest that early childhood and adolescent factors are important for the etiology of drug abuse and dependence in adulthood, especially for males.

Gender differences in basal HPA functioning and craving in cocaine-dependent individuals
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Prior research has reported significant gender differences in baseline Hypothalamic-pituitary-adrenal (HPA) axis markers of normal healthy volunteers. Stress has been found to increase susceptibility to drug-seeking and relapse in laboratory animals and drug-dependent individuals. HPA axis functioning may mediate these associations. However, potential gender effects on these associations have not been examined. Blood samples were drawn from 71 treatment-seeking cocaine abusers (45 Males; 26 Females). All cocaine users were taking part in an ongoing study, conducted over three days, to assess the effects of cocaine use on stress and drug-cue reactivity. Following IV insertion and a 65 minute relaxation period, blood draws were taken and participants were requested to indicate their level of craving on a scale of 0 (none at all) to 10 (more than ever). Repeated measures Analyses of Variance (ANOVA) indicated that compared with males, females showed significantly lower baseline levels of both ACTH ($p < 0.0001$) and cortisol ($p < 0.0001$) and significantly higher levels of prolactin ($p = 0.02$) across all three days. Females also showed a tendency to report lower baseline cocaine craving ($p < 0.09$). These gender differences are consistent with previous findings in both normal and cocaine dependent volunteers. Sex differences in HPA function alongside potential craving differences may contribute to gender-specific variation in vulnerability to drug-seeking. (Supported by ROIDA1107, P50-DA16556 to Yale University and P50-DA05130 to Rockefeller University).

Early life maternal separation in rodents: What about moms?
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Stress has been demonstrated to exacerbate a number of unhealthy behaviors and disorders including vulnerability to drug induced sensitization as well as alcohol consumption. One animal model commonly employed to investigate the development of the stress response is the neonatal 'Handling' or 'Maternal Separation' paradigm. In these studies newborn rats pups are separated from their dams for varying amounts of time, daily, for the first 2 weeks of life. In adulthood these same animals demonstrate differences in locomotor activity, stress reactivity along with differences in neurotransmitter profiles. The relationship between early life events and adult phenotypes can be modulated by variations in the quality of maternal care. In the current experiment we generated animals across five different groups which varied in the nature of their maternal separation. The maternal separations were conducted between PND2-14 and animals were weaned from their dams at PND 21. On PND 22 the dams were then tested using the Porsolt swim test, which measures immobility under forced-swim conditions. This test has been classically used to model depression in rodents. Interestingly, rat dams subjected to different separation conditions while rearing pups performed significantly differently on this task. Mothers who experienced the briefest separations spent significantly more time swimming when compared to mothers subjected to the longest separations and animal-facility reared control mothers. These results suggest that long periods of maternal separation may induce postnatal depression, which may subsequently alter the quality of care received by the offspring. The quality of parenting early in life may ultimately contribute to the large individual variability evidenced in the vulnerability to behaviors as complex as alcoholism and drug abuse. Supported By: RR00165 and DA00418.

Perfusion fMRI of gender differences in cue-induced cigarette craving
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It is imperative to discover viable therapies for smoking cessation for men and women. The need in women is particularly acute as they suffer greater health risks from smoking than men. Additionally, women may experience less success with NRT (the current standard treatment for smoking cessation), and have more difficulty quitting. These differences may reflect enhanced sensitivity to cues compared to males, who may be influenced, to a greater degree, by nicotine itself. Arterial spin-labeled (ASL) perfusion fMRI is ideally suited to examine low frequency changes that occur slowly over time, such as craving. We used this imaging tool to examine the CNS regions associated with cigarette craving, initiated by watching videos of

smoking-related cues in nicotine dependent subjects, with respect to sex (Males = 4, Females = 5). Data were analyzed using statistical parametric mapping software. Bilateral amygdalar and posterior cingulate perfusion was significantly enhanced during the smoking video in comparison to the neutral video in females ($p < 0.05$ corrected, cluster size > 300 voxels). The same regions were similarly activated in male smokers exposed to visual smoking cues, however the effect was not significant at the strict threshold imposed on the female data. These results suggest that female smokers are more reactive to smoking-related stimuli. This increased cue reactivity may be partially responsible for the increased difficulty that females experience when attempting to quit smoking. Medications and therapies aimed at dampening the effects of cues may be a critical component of treatment for women who wish to quit smoking.

Comparing the construct and predictive validity of the ASI and GAIN measures of change after treatment for pregnant and postpartum women

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The Addiction Severity Index's (ASI) alcohol and drug composite scores are two of the most widely used measures of change used to evaluate substance abuse treatment. However, concerns are often raised about the extent to which the ASI's other composite scores (medical, legal, employment, family/social, and psychiatric) have only moderate to low internal consistency and may be insensitive to change. A recent alternative measure that has been proposed for addressing this problem is the Global Appraisal of Individual Needs (GAIN). Like the ASI, the GAIN has composite scores related to both substance use (frequency of use, substance abuse/dependence, current withdrawal) as well as other areas of functioning (physical health, illegal activity, recovery environment, emotional problems). Both measures were collected at intake and 6 months later on 100 pregnant and postpartum women presenting for residential treatment at two Fayette Company facilities in Peoria, IL. The GAIN measures had equal or higher internal consistency than the ASI measures. Construct and discriminate analysis suggests good agreement between the ASI and GAIN measures that should be related. Both measures were similarly related to a variety of other measures and change over time – though the GAIN measures' correlations were equal or higher. This suggests that while the ASI and GAIN are measuring similar constructs, the GAIN was relatively more sensitive to the changes that occurred. (Supported by NIDA R01 DA11323).

Development of an affect-congruent Go-NoGo task to screen for functional brain deficits in inner-city adolescents at risk for drug dependence

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Chronic cocaine users have demonstrable deficits (hypoactivity and hypodensity of grey matter) in prefrontal regions critical for inhibitory control. They also show inhibitory deficits in performance on Go-NoGo tasks which require inhibition of prepotent responses. Our eventual goal is to determine whether these deficits predate, and/or potentially predispose, cocaine use. We are studying a cohort of inner city adolescents 11 to 14 years of age, some of whom were exposed to cocaine prenatally. Over 90% of the cohort show low average IQ scores. Thus, our goal was to develop a Go-NoGo task that is simple and engaging for this population, by using "affectively-congruent" stimuli (Go stimuli: "positive", e.g. flowers, sweets, baby animals; NoGo stimuli: "negative", e.g. bugs, snakes, scorpions). We used a graded ratio of Go to NoGo stimuli which resulted in 3 levels of task difficulty. After testing 18 subjects, we demonstrated that the 12.5% ratio (NoGo to Go) was the most difficult (mean errors of commission =10, S.D.=3.24), the 33% ratio was least difficult (mean errors of commission =7.4, S.D.=3.9), and the 25% condition was of moderate difficulty (mean errors of commission=8.5, S.D.=3.17). There was a significant difference in errors of commission between the 12.5% and 33% conditions (paired sample t-test, p=0.005), supporting the validity of our task design. This "affect-congruent" Go-NoGo task was also well received by our population of disadvantaged, urban adolescents. This task will be featured in our upcoming neuroimaging studies characterizing the inhibitory deficits of adolescents at risk for substance abuse.

Effects of nalbuphine on anterior pituitary and adrenal hormones and subjective responses in men
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Relatively little is known about the effects of nalbuphine, a mixed mu-kappa agonist, on anterior pituitary and adrenal hormones. We examined the effects of two analgesic doses of nalbuphine on plasma levels of LH, prolactin, ACTH and cortisol in 10 healthy male volunteers (18-35 years of age) with a history of current cocaine abuse (DSM-IV, 305.6). Subjects provided informed consent for participation in these studies. Nalbuphine was administered i.v. to 7 subjects at a dose of 5 mg/70 kg and to 3 subjects at 10 mg/70 kg. Heart rate and blood pressure were monitored throughout the study. A baseline blood sample was collected 30 min before nalbuphine infusion, and 13 blood samples were collected over the next 2 hr. Nalbuphine produced a significant dose-related increase in prolactin within 23 min (P=0.04). Peak prolactin levels of 22.1 ± 7.1 ng/ml and 54.1 ± 11.3 were measured at 60 min after low and high dose nalbuphine administration, respectively. ACTH, cortisol and LH levels did not change significantly after administration of either dose of nalbuphine. Subjective effects were measured on a Visual Analog Scale (VAS). Reports of "sick," "bad" and "dizzy" were significantly higher after 10 mg/70 kg than after 5 mg/70 kg nalbuphine (P=.05-.0001). Increases in prolactin were significantly correlated with ratings of "sick" and "dizzy" after both low and high doses of nalbuphine (P=.05-.0003). Thus analgesic doses of nalbuphine may perturb prolactin with correlated changes in some subjective effect measures. This research was supported in part by grants T32-DA07252, P01-DA14528, K05-DA00064 and K05-DA00101 from the National Institute on Drug Abuse, NIH.

Drug use, depression, and hypogonadism in a community-based cohort (SHINE Study)
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Objective: To investigate the relationship between drug use, depression, and hypogonadism in a population of drug users and non-users in Baltimore, Maryland. Methods: Study participants completed drug use, risk behavior, and medical history questionnaires and underwent measurement of serum sex hormones. Depression was assessed via the CES-D, and was defined as having a CES-D score of _23, per recent studies of CES-D cutoffs among IDUs. Drug use categories were never, occasional (used <3 times/week in past 6 months), heavy (used _ 3 times/week), and methadone treatment (within past 3 months). The Kruskal-Wallis test, chi-square, and logistic regression were used to investigate hormone levels and correlates of hypogonadism. Post-menopausal women were excluded. Results: The study sample comprised 262 participants, ages 19 to 59 years (mean=41.9±6.7); they were 41.6% female, 90.4% African-American, and 49.0% HIV-infected. Among women, estradiol levels ranged from <20 pg/mL (hypogonadal) to 252 pg/mL (median=43). The prevalence of hypogonadism was high (25.2%), and did not differ by drug use status (p=0.940). Similarly, testosterone, FSH, LH, and prolactin did not differ by drug use (p >0.05). Among men, testosterone levels ranged from 5 to 1,886 ng/dL (median=566); the proportion hypogonadal (testosterone <300) was 12.8%. A higher proportion of men in methadone treatment were hypogonadal compared to occasional (p=0.030) or never users (p=0.008). Additionally, men in methadone treatment had significantly lower estradiol than occasional users (p=0.002). FSH, LH, and prolactin did not differ by drug use (p >0.05). The prevalence of depression in this cohort was 36.3% and was significantly higher (p=0.032) among women. Controlling for depression, HIV, and age, men in methadone treatment were 10 times more likely to be hypogonadal than never users (aOR=10.08; 95% CI: 1.8-55.3). Conclusions: Controlling for depression, methadone treatment was significantly associated with hypogonadal levels of testosterone among men in this cohort. The association between

Social construction of alcoholism in women in a rehabilitation process
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The aim of this qualitative study was to understand the key cultural meanings of the relationship between alcoholic women and their social context as it affects their prognosis for treatment success. The analysis focuses on describing the identity and social norms that impact alcoholic women, based on gender identity,

the social construction of the meaning of women in treatment, and the cultural meaning of alcohol abuse. These cultural understandings of gender and alcoholism are compared with the contrasting views of professionals involved in alcohol treatment. The data is based on the qualitative narratives collected from 15 in-depth life stories from women in a formal rehabilitation process in Valencia (Spain) and 6 in depth interviews from health and social workers involved in the same rehabilitation programs. A grounded theory based analysis was conducted. Results show that gender differences in patient views about alcohol use and abuse provoke corresponding social judgements that affect women differently from men, and affect the rehabilitation process. Women have a negative self perception, and they respond by hiding drinking behaviour, which subsequently only appears as pathology when something is wrong at home. An alcoholic woman can encounter more difficult treatment problems, related to the marginality of women as drinkers (stigmatization) and a worse prognosis for success, compared with men. Sociocultural changes in the theories and models of alcohol treatment in Spain have not produced the expected modifications in the social construction of the roles and status of women in treatment programs. Recent epidemiological data indicates that the drinking profile of alcoholic woman has changed in the recent past. However, these changes are not reflected in changing models for treatment programs.

The effects of cross-fostering on morphine-induced conditioned taste aversions, in Fischer and Lewis rats

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Inbred Fisher (F344) and Lewis (LEW) rats differ on a number of physiological and behavioral indices, some of which have been reported to be affected by maternal experience. To assess whether epigenetic factors contribute to their differential behavioral responses to drugs, the effect of cross-fostering on morphine-induced conditioned taste aversion was examined in the present experiment. Specifically, at birth 66 LEW pups were cross-fostered to F344 dams, while 60 LEW pups were raised by LEW dams (in-fostered). Similarly, 60 F344 pups were cross-fostered to LEW dams, while 51 F344 pups were raised by F344 dams (in-fostered). None of the pups was raised by its own dam. Every fourth day for four conditioning cycles, all animals were presented with a novel saccharin solution and then injected with one of three doses of morphine (0, 10 and 32 mg/kg). A final aversion test was administered following the final conditioning cycle. In-fostered male and female F344 rats rapidly acquired morphine-induced taste aversions, while in-fostered LEW rats failed to do so. At 10 mg/kg morphine, male cross-fostered LEW rats displayed significantly stronger aversions than in-fostered ones on Trials 2, 3, 4 and on the final aversion test. At 32 mg/kg morphine, male cross-fostered LEW rats displayed significantly stronger aversions than in-fostered ones on Trials 3 and 4. At 10 mg/kg and 32 mg/kg morphine, female cross-fostered LEW rats displayed significantly stronger aversions than in-fostered ones on Trial 4 and on the final test. There were no consistent significant differences for either gender between in-fostered and cross-fostered F344 rats. These results suggest that maternal rearing affects the sensitivity to morphine in these two strains and epigenetic factors may be important in their affective responses to drugs. Supported in part by a grant from the Mellon Foundation to ALR.

Buprenorphine and methadone in pregnancy: Effects on the mother and fetus/neonate

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Buprenorphine maintenance is increasingly being used to treat illicit opiate dependence. Limited data on pregnancy progression and the effects on the fetus and newborn currently restrict the use of buprenorphine during pregnancy. As a partial agonist buprenorphine may offer significant advantages over methadone maintenance treatment in regard to reduced withdrawal severity in the newborn. The aim of this ongoing study is to assess the efficacy and safety of buprenorphine in regard to pregnancy progression and outcome and the incidence and severity of Neonatal Abstinence Syndrome (NAS) compared to methadone exposed and non-opioid exposed control infants. It is hypothesised that the incidence and severity of NAS will follow in the order of control < buprenorphine < methadone. This trial is a non-randomised, open label, flexible dosing study. Twenty-four women maintained on methadone, 17 maintained on buprenorphine and 12 non-opioid using control mothers have so far been recruited. A Modified Finnegan Withdrawal Scale

has been used to assess neonatal withdrawal. To date, preliminary results have confirmed that infants born to methadone maintained mothers experienced more severe NAS compared with non-opioid exposed control infants when analysing the peak Modified Finnegan score ($p<0.05$). The extent of NAS was severe enough in the majority of methadone exposed infants that morphine sulphate was required to control withdrawal symptoms for the entire 4 week follow up period. In addition, emerging trends have shown buprenorphine exposed infants have lower withdrawal scores and require less total morphine to control NAS compared to methadone exposed infants over the 4 week follow up period. Results for buprenorphine exposed infants will be compared to both methadone exposed infants and control infants for the above-mentioned parameters along with gestational age and APGAR scores at birth and body weight and size.

Internet as dealer: Knowledge of the internet as a source of illicit drugs by patients in residential treatment for drug dependence

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Hypothesis: The Internet has become a source of information and sales for illicit drugs and drug-related activity. We are not aware of research that has identified the prevalence of the Internet for this purpose. This semi-structured interview surveys adult drug-dependent patients at a residential treatment center to increase understanding of the prevalence and characteristics of drug-dependent individuals who obtain drugs from the Internet. Methods: Concern about not spreading information about the Internet as a drug source led us to ask participants open-ended questions about drug sources they may or may not have used. Individuals also were asked if they own a variety of communication devices, including a computer with Internet access, and were queried about criteria important to them regarding drug sources. Results: From July through December 2003, 50 adult (m=31.96 +10.33 years), mainly white (88%) patients participated in the interview. We expect to complete the study in April 2004 with a total of 100 patients. Thus far, the sample is 65% male; 48% are employed fulltime, 58% have some college or higher education, and 90% have access to a computer with Internet access. 28% knew about the Internet as a source of drugs, and 14% reported they had used it to purchase drugs. The most commonly identified drugs purchased on the Internet were prescription drugs. No differences were found in knowledge of the Internet by age group, gender, access to the Internet, or criteria for drug source. Implications: The number of individuals who use the Internet as a drug source is expected to increase over time, and treatment programs must develop strategies to reduce drug purchase on the Internet for patient populations with easy access to it.

A prospective study of 259 pregnant women treated with either buprenorphine or methadone trough delivery, and neonatal parameters of their 260 children

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In 1994, France developed a global healthcare strategy for management of pregnant opiate abusers that increased the level of healthcare and the collection of scientific data. During a one year period, a national study was conducted on pregnant opiate addicts in France. Women were studied from 35 maternal healthcare units representing most of the French national territory. The aims of the study were to collect data concerning pregnancy and delivery of the mothers and neonatal parameters of the children. There were 38 (%) in the methadone-treated group and 62 (%) in the buprenorphine -treated group. The women in the methadone group were poorer and less educated than those in the buprenorphine group. They were more likely to live in an urban area and receive care in a public institution such as a drug treatment program. The methadone group was remarkably homogenous and similar to other methadone women we had previously studied. Members of the buprenorphine group were likely to receive treatment from a general practitioner. These differences appear to reflect the preferred pharmacotherapy for institutional versus that general practitioner settings. There were surprisingly few differences between the methadone-treated (MT) and the buprenorphine-treated (BT) groups. Focusing on adverses effects on mother during pregnancy there where no major differences recorded between Methadone and Buprenorphine. There was a (or almost) significant difference in the rate of premature birth (16% in MT vs 10% in BT; p=0,04) and in delay for maximal neonatal abstinence syndrome (NAS) onset (average of 81,08h hours in MT vs 66,42h in BT ; p=0,05). The intensity and duration for NAS were not linked with the type nor the daily dose of substitution treatment.

There were no "mother and child healthcare" reasons to prefer one treatment to the other. In general adverse events for early mother and child development appeared in better agreement with social and demographic factors than with parameters of drug abuse. The frequency of intra uterine growth retardation (IUGR) was 35% and was probably due to co-addiction with nicotine (only ten "non-smokers") and alcohol. There was a low prevalence for premature birth (12%) and legally enforced foster care (4%). There was no significant differences between MT and BT for these three items.

The effects of adolescent drugs use on adult role functioning: alongitudinal study examining gender differences

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Findings from a study on the effects of adolescent drug use on young adulthood social role functioning are presented. Gender differences in consequences are given particular attention. Based on Life Course Theory, the study focuses on effects of beer or wine, hard alcohol, and marijuana on marriage and family formation, education and employment, and criminal involvement. The study analyzes longitudinal data collected primarily through interviews with a cohort of first graders in the Woodlawn community of Chicago who were followed from age 6 to age 32. Participants are all African American (N=1,242). Logistic regression and structural equation modeling results show that adolescent drug use has long-term effects for both males and females. After controlling early demographic and behavioral variables, adolescent marijuana was associated with teen parenthood, premarital pregnancy, divorce, poor educational attainment and adult involvement in criminal activities. For males only, adolescent marijuana use was also related to poorer job status. Consequences of adolescent beer or wine use were similar to those seen with marijuana use but to a lesser extent. Additional gender differences were found for adolescent beer and wine use. Few effects were seen for adolescent hard alcohol use. Concurrent drug use and educational attainment only partially explained these findings. Health status did not mediate these effects. Findings suggest that effects of early drug use carryover into adulthood. Consequences and gender differences found have implications for prevention, treatment, and policy development.

Behavioral economic analysis of drug reinforcement using multiple choice procedure data

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The Multiple Choice Procedure (MCP; Griffiths et al. 1993) has been used in human behavioral pharmacology studies to evaluate a drug's reinforcing efficacy. Subjects make choices between a particular drug dose (after experiencing its effects) and a set of money choices. The MCP yields an apparent estimate of a dose's value (price), where subjects switch ("cross over") from choosing drug to money. To date, no study has addressed the compatibility of MCP crossover point data with behavioral economic analysis of drug reinforcement. Demand curve analysis was used to re-analyze MCP data obtained with IV fentanyl (0.25, 0.75 and 1.5 mg; Greenwald & Roehrs, under review) and IM hydromorphone (4, 8 and 16 mg; Greenwald et al. 1999) in opioid-dependent subjects, and oral d-amphetamine (5, 10 and 20 mg; Alessi et al. 2003) and smoked marijuana (3, 9 and 18 puffs from 3.5% Δ9-THC cigarettes; Greenwald & Stitzer 2000) in recreational drug users. In each study, the crossover point was translated into its unit price (UP) equivalent (i.e. MCP questionnaire money value ÷ drug dose). Because the crossover value is the point at which the drug dose ceases to function as a reinforcer, "0" was entered for this and higher UPs to reflect lack of "consumption utility" (CU), a binary measure of the dose's reinforcing potential. For all lower UPs, the dose functions as a reinforcer and "1" was entered to reflect its CU. This was repeated for each drug dose, generating a UP vs. CU curve. Data were averaged across subjects and plotted on log-log coordinates; demand curves were fitted to group average data (rs > .86 for all curves). CU of d amphetamine (UPs, 0.01–4.0) was more demand-elastic than marijuana (UPs, 0.01–3.0). CU of hydromorphone (UPs, 0.01–5.0) was lower for outpatient subjects who abstained from heroin than subjects who kept using heroin while buprenorphine- maintained. CU of fentanyl (UPs, 0.33–100) in methadone-maintained volunteers was the highest of all drugs examined. This re-analysis shows that MCP data (at least, at the group-average level) can be integrated with behavioral economic analysis, thereby extending the utility of each approach. Future studies are underway to directly compare results from the MCP and behavioral-economic measures

of demand. (Supported by NIH/NIDA R01 DA15462 and Joseph Young, Sr. Funds from the State of Michigan).

Domestic violence and risky sexual behaviors among college students
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An anonymous survey assessing domestic violence, drinking game participation, patterns of alcohol and drug use, and risky sexual behaviors was administered "at-random" to 371 students between the fall of 2001 and the fall of 2003. A 2 (Gender) x 2 (Domestic Violence) x 2 (Drinking Game Participation) Factorial ANOVA was performed on risky sexual behaviors and alcohol and drug use. Students with a history of domestic violence who abstained from game playing were more likely to have a one-night stand, awoke unsure if had sex, and engage in a relationship with someone who drinks or uses drugs. Students who participated in game playing without a history of domestic violence were more likely to drink and use drugs. The results from this study indicate that domestic violence may be a precipitating factor for risky sexual behaviors but not necessarily alcohol and drug abuse.

Opioid-induced antinociception and place conditioning in maternally separated male and female rats
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Previous studies from our laboratory have shown that maternally separated male rats exhibit greater anxiety-like behavior and altered sensitivity to opioids compared to non-handled offspring. The aims of the present study were:1) to determine whether maternal separation alters sensitivity to opioid-induced antinociception in female offspring 2) to assess the effects of maternal separation on conditioned place avoidance (CPA) resulting from acute opioid withdrawal in both male and female offspring. Following parturition, mixed-sex litters of Long-Evans rats were subjected to one of three handling conditions (15- or 180-min daily separation or no separation from dams) during the first two weeks. Testing occurred during adulthood. Dose-response curves were constructed in the tail-flick and hot-plate tests by injecting s.c. cumulative doses of morphine (0.5-12 mg/kg) or buprenorphine (0.025-0.4 mg/kg), and time courses were determined following the last injection of a drug. For CPA, on day 1, rats were given free access (15 min) to a biased apparatus consisting of two chambers with different visual and tactile cues. On day 2, rats were given (s.c.) either saline or 10 mg/kg morphine followed 3.75 hr later by naltrexone (0.03 or 0.3 mg/kg), then were immediately confined to one side of the apparatus for 30 min. On day 3, rats received the alternative treatment and were confined to the opposite chamber. A third group received only saline. On day 4, rats were given free access to the apparatus for 15 min. Antinociception was dose-dependent and time-dependent, except for the tail flick time course following the last injection of buprenorphine. Depending on the test and parameter measured, there were a number of significant sex- and group-related effects and several significant interactions. For CPA, single injections of morphine followed by naltrexone conditioned place avoidance, but there were no significant effects of dose, sex, or group. Despite relatively modest differences, our data suggest that early environmental experience affects the plasticity of endogenous opioid systems mediating antinociception. (Supported by Grants KO5 DA00008, DA14122)

Assessing the reinforcing effects of oral THC in humans
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Oral THC (Marinol®) is FDA-approved for the treatment of nausea secondary to cancer chemotherapy and for wasting syndromes related to AIDS. Yet, the abuse potential of oral THC is not well known. The objective of this study was to characterize the reinforcing effects of oral THC in human research participants under controlled laboratory conditions. Ten healthy male research volunteers completed this 17-day residential study. On days 2, 6, 10, and 14, at 0900 hrs, participants received a "sample" oral dose of THC (0, 10, 20 mg) that would be available for the next three days and they also received an alternative reinforcer, a $2 voucher (redeemable for cash at study's end). Over a three-day period, volunteers participated in an eleven-trial choice procedure, during which they had the opportunity to self-administer either the most recently sampled dose of THC or to receive the $2 voucher. Participants' choice to self-

administer THC significantly increased when active THC (10 mg and 20 mg) was available compared to placebo. No difference in choice behavior was observed between the active doses of THC. Both active THC doses produced significant increases in positive subjective effect ratings and daily total caloric intake, relative to the placebo conditions. These data demonstrate that oral THC has reinforcing effects in experienced marijuana smokers. Supported by NIDA grant DA-03746.

Gender differences among HIV-positive methadone maintenance patients enrolled in a voucher reinforcement trial

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Previous research has reported lower antiretroviral adherence and higher depression in females compared to males. Depression and illicit drug use have also been associated with poor adherence to HIV treatment. The present study examined baseline gender differences among patients enrolled in a voucher reinforcement trial for medication adherence. Participants were 65 opioid-dependent patients receiving antiretroviral medications in two methadone maintenance clinics. The sample had a mean age of 43.4 (SD=7.5) and was ethnically diverse: 35% Caucasian; 32% African-American; 12% Latino; 21% other. Fifty-four percent were male, 40% female and 6% identified as male-to-female transgender. Major Depressive Disorder was diagnosed in 49% of subjects on the C-DIS. Baseline gender comparisons (excluding transgenders) showed that women had higher ASI medical composite scores, and lower Medical Outcomes Study (MOS SF-36) physical functioning and role-emotional scale scores than men ($p < .025$). In contrast, men were more likely than women to have positive toxicology screens at intake for benzodiazepines (28% vs. 4%, respectively; $p < .02$) and to self-report injection drug use ($p < .02$) and methamphetamine use in the past month ($p < .05$). No gender differences were found on HIV RNA viral load, CD4+ count, Depressive diagnosis, BDI scores, or other ASI measures. Despite greater medical problems among women and higher drug use behaviors among men, no gender differences were found in medication adherence, using MEMS cap on-time openings as the primary adherence measure. Contrary to previous research, female gender was not associated with poorer antiretroviral adherence or higher depression among methadone maintenance patients. Findings have implications for interventions that target improving adherence to antiretroviral medication regimens among drug abusers.

Trauma history and PTSD among youths in treatment for alcohol and other substance use disorders

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Clinical and epidemiological research links adolescent AOSUD use to greater risk for exposure to traumatic life experiences, in particular physical or sexual abuse (e.g., Clark, Lesnick & Hegedus, 1997; Hawke, Jainchill, & DeLeon, 2000; Rounds-Bryant, Kristiansen, Fairbank & Hubbard, 1998). However, there is a notable scarcity of research on the psychological trauma among youths in AOSUD treatment. The current paper extends the literature by examining the relationships among trauma histories and diagnoses of partial or full PTSD among 106 youths in outpatient drug treatment. The average age of participants was 15.96 years (sd=1.19). The majority were Caucasians (72.3%) and 31.9% were females. Clients were assessed for trauma exposure, psychopathology and suicide ideation using the Trauma Events Screening Inventory (TESI; Ford & Rogers, 1997), the Diagnostic interview Scale for Children (DISC-2.4; Fisher et al., 1993), and the Suicide Ideation Questionnaire (SIQ; Reynolds, 1988). Over 70% of youths reported histories of trauma histories and 12.8% had obtained a partial-full PTSD diagnosis. Logistic regression analyses indicated that sexual abuse history, attention deficit symptoms, and suicide ideation were correlated with partial-full PTSD diagnoses. Gender and ethnic differences were observed. Two-thirds of the males who had partial-full PTSD were minorities who tended to report exposure to trauma due to severe accidents and their own serious injury as opposed to sexual abuse. The findings underscore the importance of addressing trauma and violent victimization within the context of treatment. This study was supported by NIAAA grant # AA012187-01A2 and K24 AA013442-02 (Y. Kaminer).

Characterizing nicotine withdrawal and craving in pregnant cigarette smokers
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Maternal smoking is the most important preventable cause of poor pregnancy outcomes in the U.S. and a leading cause of pediatric morbidity and mortality. There is a growing interest in the use of nicotine replacement therapies with pregnant and recently postpartum smokers, the implication being that withdrawal and craving adversely influence smoking cessation outcomes in this population. The signs and symptoms of withdrawal and craving are well characterized in non-pregnant smokers, but there has been only one report during pregnancy, and that was a retrospective study (Albrecht et al., 1999). We are currently conducting a randomized clinical trial testing the efficacy of voucher-based incentives for promoting smoking cessation in pregnant and recently postpartum cigarette smokers. As part of this trial, withdrawal and craving, measured by the Minnesota Nicotine Withdrawal Scale (MNWS), and biochemical-verification of smoking status are assessed daily to bi-weekly throughout the antepartum period and for the initial 6 months postpartum. In preliminary analyses to rigorously characterize nicotine withdrawal and craving in this population, we have examined the validity, incidence, and magnitude of the eight items that comprise the MNWS in 8 abstinent and 7 nonabstinent pregnant smokers during the first 48 hours of the cessation effort. Even with this small sample, two symptoms were significantly greater in abstinent smokers: desire to smoke (our measure of craving) and difficulty concentrating. The incidence of each of these symptoms among the 8 abstinent smokers was 57% and peak magnitude was 82% and 46% above baseline levels, respectively. These preliminary results suggest that craving and difficulty concentrating are valid in pregnant cigarette smokers and that the incidence and magnitude for these symptoms are similar to those reported by non-pregnant smokers. The number of women included in these analyses will be increased to 100 by the June meeting and we will examine a longer time course antepartum and the initial 6 month postpartum. This information could aid in the development of more targeted cessation and relapse prevention strategies in the pregnant smoker population.

Cocaine's effects on baboons' perception of species-specific affiliative calls differing in vocalizer sex
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A previous study (Hienz et al., CPDD, 2001) demonstrated the usefulness of using species-specific vocalizations when studying the effects of drugs on perception, and showed that cocaine affects the discrimination of baboon grunt vocalizations more so than the discrimination of similar human vowel sounds. Since evidence indicates that non-human primates are also responsive to sexual identity cues in their vocalizations, the present study examined whether cocaine might also differentially affect discriminations of the vocalizer sex of baboon calls. To this end, the effects of cocaine were examined in 3 baboons trained to discriminate among a number of affiliative grunt calls recorded in the wild from different individual male and female baboons. Each baboon was trained to press a lever to produce a repeating grunt sound (a "standard" grunt), and release the lever only when that sound changed from the standard grunt to one of four "comparison" grunts. Dose-effect functions were determined under conditions where either male or female calls were used as standard grunts, and where both male and female calls were used as comparison grunts. Response accuracy was compared following i.m. administration of saline and cocaine. When baboons were discriminating male and female grunts from a standard male grunt, greater impairments in discrimination accuracy were observed for the male comparison stimuli. Conversely, when baboons were discriminating male and female grunts from a standard female grunt, greater impairments in discrimination accuracy were observed for the female comparison stimuli. These results suggest that cocaine reduced accuracy more so for those grunts that were similar to the standard grunt, and highlight the effectiveness of varying perceptual discrimination difficulty when studying the effects of drugs on perception. Supported by NIDA grant DA 12139.

Gender-specific associations between types of childhood maltreatment and drug use variables in cocaine-dependent individuals
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Research indicates that individuals who experience child abuse and neglect are at a greater risk of developing substance use disorders. However, the gender specific effects of various forms of childhood maltreatment on the development of substance use disorders have not been fully examined. This study examined gender differences in the associations between the different forms of childhood maltreatment and drug use variables in cocaine dependent men and women. Fifty-six men and 33 women in inpatient treatment for cocaine dependence were administered the Childhood Trauma Questionnaire (CTQ) that assesses physical, sexual and emotional abuse as well as physical and emotional neglect in childhood. Psychiatric diagnoses and drug use history assessments were also conducted. Results indicated sex differences in reports of sexual abuse as well as in age of onset of nicotine use and regular alcohol use. Furthermore, childhood sexual abuse and emotional neglect significantly predicted severity of cocaine problems in women but not in men. While sexual abuse was significantly associated with the onset of alcohol use and emotional neglect with regular use of alcohol in women, emotional abuse was associated with the age of onset of alcohol use and physical abuse with regular use of alcohol in men. Findings suggest that the various forms of childhood maltreatment differentially impact the course of substance use disorders in men and women. Gender differences should be taken into account when assessing and treating substance use in survivors of childhood maltreatment. (Supported by NIH grants: R01DA11077 and P50-DA16556)

Treatment with nicotine during adolescence but not adulthood produces long-term increases in cocaine self-administration

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Many smokers begin smoking during adolescence and it has long been questioned whether nicotine use in adolescence may lead to increased use of other psychostimulant drugs. We have shown previously that treatment with nicotine produces sensitization to the locomotor-activating effects of cocaine in adolescent but not in adult male rats. The present study was done to determine whether this effect lasts into adulthood and whether there are long-term alterations in the reinforcing effects of cocaine. Male rats were treated for seven days with nicotine either during adolescence or as adults. Thirty days later, the effects of cocaine on locomotor activity, and the self-administration of multiple doses of cocaine were examined. Sensitization to the stimulation of locomotor activity by cocaine was still evident in the rats treated with nicotine as adolescents, with no change in the cocaine dose-effect curve in the rats treated as adults. In addition, the rats treated as adolescents with nicotine self-administered more cocaine than rats treated with vehicle, as shown by a shift upward in the cocaine dose-response curve. No changes were seen in cocaine self-administration in the adult rats. Thus, it may be that nicotine use during adolescence carries a greater risk than during adulthood and that male adolescents may be particularly vulnerable to the risk of cocaine abuse after nicotine use. Supported by : NIDA grants DA 13936, DA 15119, and DA 15947.

Comparison of cotinine levels in Sprague-Dawley and Fischer-344 female and male rats

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Analysis of strain differences is an effective tool in determining potential genetic factors influencing behavioral outcomes. We hypothesized that different strains of rats separated by activity levels would metabolize nicotine at different rates resulting in differing cotinine levels. We evaluated cotinine levels in 32 Fischer-344 (F-344) and 32 Sprague-Dawley (SD) rats after a 28 day twice daily nicotine injection regimen (0.8 mg/kg/injection, sc). Prior to nicotine administration rats were separated into high (HA) and low (LA) activity groups. Additional activity data was collected on days 1, 14 and 28 during the injection regimen. SD (HA) females had significantly higher cotinine levels then SD (HA) males (57.0 vs 11.3 ng/ml; $t(12)=8.25$, $p<0.01$). SD (LA) males had significantly higher cotinine levels then SD (HA) males (36.1 vs 11.3 ng/ml; $t(12)=6.16$, $p<0.01$). SD (LA) females had significantly higher cotinine levels then SD (LA) males (49.3 vs 36.1 ng/ml; $t(14)=2.65$, $p<0.01$). F-344 (LA) females had significantly higher cotinine levels then F-344 (HA) females (25.7 vs 18.7 ng/ml; $t(13)=2.53$, $p<0.01$). F-344 (HA) males had significantly higher cotinine levels then F-344 (LA) males (24.6 vs 17.3 ng/ml; $t(14)=1.75$, $p<0.05$). F-344 (LA) females had significantly higher cotinine levels then F-344 (LA) males (25.7 vs 17.3 ng/ml; $t(13)=2.82$, $p<0.01$). The SD results suggest that males metabolize nicotine faster than females. Male (HA)

rats metabolize nicotine faster then male (LA) rats. Results for the F-344 rats suggest nearly opposite metabolism with male (LA) metabolizing nicotine faster than male (HA). Desensitization of nicotinic acetylcholinergic neuronal receptors may play a role in the explanation for the differences seen between SD and F-344 rats.

Maternal methadone administration and fetal neurobehavior
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Methadone offers great benefits to the population of pregnant opioid dependent women, and is currently the only approved medication for treatment of this group in the U.S. However, maternal methadone administration has significant consequences for the infant. Sixty to 90% of infants undergo Neonatal Abstinence Syndrome, resulting in significant morbidity. Though methadone is generally considered "safe" for use in pregnancy, there is a paucity of information of the direct effects of methadone on the developing fetus. This project seeks to determine how methadone affects fetal neurobehavior, using a fetal actocardiograph and computerized data collection. Forty-two methadone maintained women (dose range 40 – 115 mg. daily) underwent 60-minute maternal/fetal monitoring sessions at peak and trough maternal methadone levels on one day in their 36th week of gestation. Two women were excluded from analysis for positive urine toxicologies for opiates and cocaine at the time of testing. There were no significant differences in maternal heart rate, vagal tone, skin conductance or respiratory tidal volumes, but there was a mildly significant difference in maternal respiratory period ($p=.04$), with longer respiratory period (slower respiratory rate) at peak methadone. In contrast, there were robust differences in all fetal measures at peak vs trough. Fetuses displayed significantly slower fetal heart rate, reduced variability and accelerations, and were less active at peak maternal methadone. Coupling between fetal heart rate and motor activity, an indicator of fetal nervous system integrity, was also significantly attenuated at peak. Results indicate that maternal methadone administration generates profound changes in fetal neurobehavioral function.
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Perinatal nicotine treatment: Organizational change and clinical practice
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Perinatal smoking presents serious health risks to the mother, fetus, newborn and child. In California's 270+ perinatal drug abuse treatment programs, the majority of women (38,000/yr.) are believed to be nicotine dependent. Of these, 3% are pregnant and the remainder has young children; yet, it is believed that less than 1% of perinatal programs address nicotine dependence. This qualitative pilot study examined organizational change in a perinatal residential treatment program that in 1999 converted to smoke-free, and in 2002, began providing nicotine treatment. Study aims: 1) to describe organizational characteristics associated with policy and clinical practice change and 2) to examine perinatal-specific motivators for change. Methods: Eight semi-structured one-time audio taped interviews of staff were conducted. Data analysis utilized coding, memos, and identification of themes informed by the Organizational Readiness for Change (ORC) Model. Results: Preliminary data analysis has identified factors influential in the process of organizational change that include 1) staff attributes: leadership, role diversity, philosophical cohesion, and commitment to nicotine treatment and 2) perinatal-specific motivators for change: tobacco related morbidity; prioritization of maternal-child interaction; and intention to demonstrate positive role modeling. Discussion: Organizational change regarding treatment of nicotine dependence in this perinatal program is related to the program's focus on the health and emotional needs of in-residence children and staff intent to infuse findings from tobacco research into program policy and clinical services. Staff tolerance for change and process of innovation also contributed to program change. Implications for perinatal programs and maternal and child health will also be discussed.
This work was supported by the National Institute on Drug Abuse (P50 DAO9253 & T32 DAO7250).

Gender differences in delay discounting: Heavy, light, and nonsmokers
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Delay discounting was examined between genders in three groups of humans: heavy smokers, light smokers, and never smokers, each consisting of 17 males and 13 females, for a total of 90 participants. Outcomes studied were money rewards and loses ($10, $100, and $1000), health rewards and losses (durations of improved and impoverished health subjectively equivalent to $1000), and cigarette rewards and losses (subjectively equivalent to $1000; heavy and light smokers only). A computer task presented choices between smaller immediate and larger delayed outcomes. This program adjusted the immediate amount to find an indifference point. We hypothesized that women would discount less (i.e., less impulsively; higher indifference points) than men across all conditions, and that heavy smokers would discount most, never smokers least, and light smokers intermediate, across all conditions. Further, we hypothesized that rewards would be discounted more than losses, and smaller magnitudes would be discounted more than larger magnitudes. A series of ANOVAs compared indifference point ranks across genders, smoking status groups, and conditions. Results revealed that women discounted less than men for the monetary gain and loss conditions; however, no gender differences were found for health or cigarettes. Discounting significantly differed across the three smoking status groups. Heavy smokers discounted most, never smokers discounted least, and the light smokers were intermediate. No group differences were detected between the three smoking status groups for the health rewards and losses. No differences were detected between heavy and light smokers for the cigarette reward and loss conditions. Small magnitudes were discounted more than large magnitudes for money and cigarettes, and rewards were discounted more than losses for all conditions. The finding that light smokers discounted money more than never smokers indicates that increased discounting is present not only at extreme levels of dependence, but also at intermediate levels. The lower discounting among women for money may help to explain the decreased prevalence of drug dependence among women.

A randomized controlled study of buprenorphine and methadone in pregnant opioid-dependent patients: Their effect on the neonatal abstinence syndrome

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Introduction. Methadone, a Food and Drug Administration (FDA) category B medication, is recommended by NIDA for the treatment of opioid-dependent pregnant women. Buprenorphine is classified as a FDA category C medication with limited perinatal data. A NAS often requiring medical intervention is observed in a majority of methadone exposed neonates. Withdrawal data collected from controlled clinical trials with adults and mostly non-controlled reports of neonates exposed to buprenorphine in utero provides preliminary evidence that buprenorphine may reduce the incidence and/or severity of NAS. Objective. To determine under controlled conditions if fetal exposure to buprenorphine vs. methadone results in reduced incidence and/or severity of NAS and need for hospitalization in the neonate. Methods. Twenty-one opioid-dependent pregnant women were randomized to receive flexible dosing of either methadone (30-100 mg, p.o.) or buprenorphine (12-24 mg, sl.) using a double-blind, parallel group, double-dummy (2 dosage forms received) design. Four primary a priori outcomes measures included: 1) number of neonates treated for NAS, 2) peak NAS score, 3) amount of opioid agonist medication (AOAM) used to treat NAS, and 4) length of neonatal hospitalization (LONH). Results. Five of 11 (45.5%) methadone and two of ten (20%) (p=.23) buprenorphine exposed neonates were treated for NAS. Peak NAS score (p=.25) and AOAM used to treat NAS (p=.13) were not significantly different between groups. LONH was significantly shorter for buprenorphine exposed neonates (p=.021). Conclusions. Buprenorphine and methadone are equally safe and efficacious for use during pregnancy; and the NAS following buprenorphine exposure may be different and less than methadone. Supported by R01 DA12220.

Recovery of function: Arousal modulation after stressors in 8-year-olds with prenatal cocaine exposure

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Prenatal cocaine exposure has been associated with arousal regulation problems during early childhood but little evidence has been gathered on these skills among school-age children. The recovery of function was

examined after presenting several environmental challenges (social conversation, the Nepsy Tower, auditory and visual vigilance tasks, an Impossible Maze, and overhearing an adult argument) by comparing measures of physiological arousal collected during baseline periods at the beginning and end of the session. Physiological responses were monitored across four 30 sec epochs, including heart rate (HR), skin conductance level (SCL), and skin conductance response (SCR) for each of these baseline conditions. Contrast groups included a group recruited from the same birth hospital (CON, n=48) and a group recruited from the community with identified behavioral disturbance (BD, n=31). A multivariate repeated measures analysis of variance was used. No significant multivariate effects for group were found but a significant univariate group effect was found on HR. The BD group had higher levels of HR across epochs ($F=4.19$, $p < .02$) followed by the prenatal cocaine group (COC, n=89) and then the no exposure group. An epoch by group interaction was found on skin conductance response ($F=2.11$, $p < .05$). Post-hoc comparisons indicated COC and CON groups returned to baseline levels by epoch 4 but the BD group did not. CON demonstrated significantly higher levels of SCR on epoch 2 when compared to both BD and COC, suggesting CON was recovering more quickly. These results suggest a history of prenatal cocaine exposure is associated with arousal regulation problems in school-age children but that these differences are not of the same magnitude of those seen in children with a history of behavioral disturbance.returned to baseline levels by epoch 4 but the BD group did not. CON demonstrated significantly higher levels of SCR on epoch 2 when compared to both BD and COC, suggesting CON was recovering more quickly. These results suggest a history of prenatal cocaine exposure is associated with arousal regulation problems in school-age children but that these differences are not of the same magnitude of those seen in children with a history of behavioral disturbance.

Sex difference in plasma nitric oxide end product levels in cocaine dependence

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Nitric oxide (NO) is produced by vascular endothelial cells and, by reducing vascular smooth muscle tone, plays a central role in maintaining adequate tissue blood flow. Animal and human studies have documented abnormal vascular reactivity and reduced blood flow following chronic cocaine exposures. Accordingly, we measured plasma NO end product levels in cocaine-dependent subjects entering a medication treatment trial. As cocaine has been associated with fewer brain vascular abnormalities in women than men, we hypothesized that plasma NO end product levels would be higher in women than men. Venous plasma samples from 12 women (44 ± 6 years old, mean ± SD) and 24 men (43 ± 8 years old) were analyzed with a Sievers 280i Nitric Oxide Analysis system in a blind manner. The intra-assay coefficient of variation (CV) at 10.0 umol/l nitrate averaged 3.3% and inter-assay CVs were 7.4%, 4.4% and 3.8% for nitrate levels of 10, 25 and 50 umol/l, respectively. Plasma NO end product levels averaged 22.5 ± 8.5 and 13.0 ± 9.8 umol/l in women and men, respectively ($z = -2.85$, $P < 0.005$). By contrast, mean plasma NO end product levels in healthy age-matched women and men were statistically equivalent (19 and 20 umol/l, respectively, Diaz et al., Clinical Biochem. 31:513, 1998). This suggests that vascular NO turnover is abnormal in cocaine-dependent men. Reduced NO levels may decrease vascular elasticity and/or enhance pro-atherogenic processes including vascular smooth muscle proliferation, blood cell adhesion, and lipid peroxidation. Any of these effects could increase men's vulnerability to vascular, brain, or other organ system damage either by subsequent cocaine exposure or other vasoactive stimuli. Supported by NIH grants DA014674, DA09448, DA015116, DA050038, AA013149, and gifts from John and Virginia M. Taplin.

Estrogen and progesterone effects on delta-, mu-, kappa-opioid agonists in ovariectomized rats

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Estrogen (E) and progesterone (P) regulate neurotransmitter and receptor levels of the opioid systems. However, very little is known about the mechanisms by which gonadal hormones regulate female responses to pain. This study aims to determine if E and P affect d-,m-,k- opioid receptor regulated nociceptive responses in females. To this end, OVX rats received cholesterol (vehicle), E (10%), P (100%), or E+P replacements via SILASTIC capsule one week before testing. SNC80 (0, 2.5,5,10 mg/k), U50, 488

(0,1,3,10 mg/kg) or morphine (0,1,3,9 mg/kg) were administered s.c. 1 hour before a tail flick test (TF) (48, 50,52.5°C). For SNC80 and U50488, all hormonal replacement increased TF latencies at all temperatures tested. At 48°C, only in control rats, SNC80 effects on TF latencies were dose dependent. Similarly, P replacement at 50°C and E+P replacement at 52.5°C produced dose dependent effects. For U50, 488 dose dependent effects were affected by the hormonal replacement paradigm. For example, while E administration produced an inverse curve, E+P replacements had an opposite dose response curve. At 52.5°C, all treatments with the exception of E replacement had similar responses. Morphine had a ceiling effect at lower temperatures, regardless of hormonal replacement. Delta and kappa opioid receptor mediated responses are modulated by hormone replacement, whereas mu-opioid mediated responses are not. These preliminary results suggest that E,P and the opioids interact to modulate tonic pain responses. Supported by 1454-NS41073 (VQJ & CI), DA00198; DA 07274 to CI; RR 03037, DA 12136, GM 60654 to VQJ.

Gender differences in specific cocaine-related abstinence symptoms as measured by the cocaine selective severity assessment

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Gender differences in withdrawal symptomatology have frequently been reported in nicotine and alcohol dependent individuals. Furthermore, the nature and severity of early abstinence symptoms have often been associated with treatment outcome. Less is known about such problems in crack cocaine users. Understanding the nature of gender-specific early abstinence symptoms in cocaine users may help identify differences in vulnerability to treatment failure, drug-seeking behavior and relapse. The Cocaine Selective Severity Assessment (CSSA) was administered to 54 treatment-seeking cocaine abusers (30 Males; 24 Females) upon entry into a 2 week inpatient treatment program. High scores on the scale have previously been shown to be a reliable predictor of poor treatment outcome in both cocaine and alcohol using populations. T-test analyses indicated that females showed a tendency to produce higher total severity symptom scores compared with males on the first day of abstinence. Further analysis also indicated that this was due to females scoring significantly higher than males on an anxiety sub-scale which comprised items associated with craving, anxiety, inability to sleep and irritability ($p < 0.04$). Increased anxiety-related early abstinence symptoms may render females at higher risk of not completing treatment. Findings emphasize the importance of investigating treatment outcomes and drug-seeking behavior in cocaine users separately by gender. (Supported by NIH Grants: ROI-DA 11077 and P50-DA16556).

The therapeutic workplace: a partial failure to engage

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The Therapeutic Workplace is an employment-based treatment for drug addiction that uses salary for work to reinforce drug abstinence. Participants are hired and paid to work, but are required to provide drug-free urine samples to gain daily workplace access. The Therapeutic Workplace was shown effective in promoting abstinence from heroin and cocaine in treatment-resistant mothers in methadone treatment. This study was an attempt to replicate that effect in crack cocaine users recruited from community-based methadone programs who were cocaine dependent and provided a cocaine-positive urine sample at intake. Participants were randomly assigned to a Therapeutic Workplace (n=22) or usual care control (n=25) group. Therapeutic Workplace participants were invited to work in the workplace and earn vouchers every workday for 9 months. Analyses of the monthly urine samples collected from both groups did not detect significant differences between Therapeutic Workplace participants and usual care participants in the percentage of urine samples that were negative for cocaine (22.3% vs. 21.8%), opiates (56.1% vs. 47.1%), or cocaine and opiate samples (25.8% vs. 17.3%). Analysis of the daily attendance and urinalysis results of Therapeutic Workplace participants showed that only 7 of the 22 participants initiated sustained periods of abstinence and workplace attendance. Eight of the participants attempted to gain access to the workplace during the first 3 weeks, but never provided a drug-free urine sample following the initial positive sample at intake and thus never had the opportunity to work and earn salary. Insensitivity of qualitative urinalysis testing to detect recent abstinence may have contributed to this failure, since it can require several days from last use for abstinence to be reflected in urinalysis results. Procedures that increase contact with the

Therapeutic Workplace and its reinforcement contingencies might increase the likelihood of these individuals being successful in the treatment program. Shaping drug abstinence by reinforcing decreases in urinary drug concentrations might be particularly useful in achieving this goal. Supported by NIDA grant R01 DA13107.

Nicotine pretreatment reduces behavioral despair precipitated by stress: Sex differences
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Two experiments were performed on male and female adult Sprague Dawley rats to study the interaction between nicotine and stress. Experiment 1 aimed to study the effects of chronic nicotine on behavioral despair compared to fluoxetine. Rats received nicotine (0.4 mg/kg), fluoxetine (5 mg/kg) or saline for 15 days before forced swim tests. Sex and treatment emerged as significant main effects in freeze duration and swimming parameters implying greater behavioral despair in male rats than females; while fluoxetine prevented despair, nicotine was not effective. Experiment 2 aimed to study the effect of chronic nicotine and stress exposure on despair (animal model for smokers exposed to stress). Rats were treated with nicotine or saline for 30 days and were stressed (restraint) for 15 days starting the 16th day of injections. After the treatments, forced swim tests were performed. Nicotine prevented behavioral despair induced by stress (freeze duration decreased and struggling increased) compared to controls. Post-hoc tests depicted significantly reduced freeze duration in males and increased struggling in females. Experiment 2 also involved postmortem measurements of NO metabolites in amygdala, hippocampus and striatum. Stress elevated NO metabolite levels and significant sex x nicotine interactions were observed; while nicotine decreased NO metabolites in females, an opposite effect was observed in males. Nicotine also reduced weight gain, and there was a significant sex interaction: saline treated females gained less weight than male counterparts. Our results suggest that nicotine pre-treatment reduces behavioral despair precipitated by stress, that the responses are sexually dimorphic and involve NO.

African American mother-daughter drug-using patterns
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Overwhelming evidence exists on familial association between parental history of substance use and the risk of substance abuse in offspring; however, little data exists on the female adult offspring of mothers with a history of heavy alcohol use as well as family history among minority women. This analysis examines the effects of mothers' heavy alcohol use on out-of-treatment drug using women in our ongoing NIDA funded HIV prevention project. A sample of 418 women who provided information on their mother's history was stratified into two groups based on a Family History Screener: those whose mothers had a positive history of heavy alcohol use, and those whose mothers did not. Respondents' drinking behavior and substance abuse treatment history were ascertained using the CIDI-SAM and WU-RBA. Respondents were predominantly African American (86%). History of maternal heavy drinking compared to no history was associated with respondents not living their mother before age 15 (47% vs 22%); an earlier age of onset of drinking (15.5 yrs vs 16.7 yrs); binging for several days in a row (43% vs 30%); endorsing abuse criteria and more alcohol detox attempts (21% vs 11%). Additionally, daughters of mothers with a heavy drinking history reported more sex trading than their counterparts. These data are among the first to report the selective effects of mother's heavy drinking on daughters' patterns of alcohol use and other behaviors. Drug use behaviors will also be examined to determine their association with maternal heavy drinking. Implications for screening for family history among out-of-treatment substance abusers will be discussed. (DA11622; Cottler, PI)

The effects of estrogen and progesterone co-administration on formalin-induced pain responses in OVX female rats
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Clinical pain conditions including migraine, temporomandibular disorders, neuropathic pain and some

forms of arthritis and fibromyalgia, are more prevalent in females than males. The complex endocrinological profile of females is the likely cause of the observed differences in comparison to males in the perception of both acute and chronic pain. Previous results from our group have demonstrated that estrogen (E) and progesterone (P) affect formalin-induced pain responses in a dose-dependent manner. However, the extent to which interactions between both hormones affect responses to nociceptive stimulation are poorly understood. To this end, ovariectomized rats received subcutaneous injections of either estrogen (20mg; 48 hrs before formalin), progesterone (50 or 500 mg; 4 hrs before formalin) or E + P (N=16/group). Using a computerized formalin model, the number of paw flinches was measured for 60 minutes. While both estrogen and 500 mg progesterone individually decreased the flinching response, co-administration of 20mg (E) and 50mg (P) had no effect on the flinching response as compared to controls. However, 20 mg estrogen and 500 mg progesterone combinations statistically reduced both the phase I [F=3.11; P = .01] and II [F = 3.64; P = .00] flinching response. This result suggests that hormonal fluctuations during the estrous cycle modulate pain responses, and progesterone either inhibits or has no effect on estrogen's actions. Supported By: PS-CUNY, RR-03037, NIDA DA 12136, SCORE 506-GM60654, and SNRP NS41073.

Anabolic-androgenic steroid users: Results of a web-based survey

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There is a dearth of information regarding the basic drug use behavior patterns of anabolic-androgenic steroid (AAS) users, much less information on motivation/goals for use, positive/negative outcomes, and associated features. The current study used a web-based survey of 336 males consisting mostly of American and Canadian users of AAS discussion boards to describe overall patterns of use. Mean age of respondents was 28.4(+8.0). They had been training in sport for 9.2(+6.9) years and principally identified themselves as bodybuilders (66.3%), recreational weightlifters (18.7%) and powerlifters (6.6%). These are large, well-conditioned and powerful men, similar in stature to professional baseball players, averaging 213.3(+32.9) lbs at 5'11.2", 12.9% body-fat, fat-free mass index of 30.0(+5.46). 98.8% of subjects had used anabolic steroids, beginning at 24.6(+7.4) years, and 86.3% had used ergo/thermogenics. The men were experienced AAS users, averaging 5.2 (+3.3) past "cycles." During a "usual" cycle, the men used weekly an average of 242.1 (+33.0) mg of oral anabolics and 863.3(+547.6)mg of injectible anabolics, keeping 11.3 (+5.3) lbs of new muscle. The most typically used injectibles were mixed- and single-ester testosterone, and two veterinary compounds, boldenone undecylenate and trenbolone acetate. Subjects spent US$510.5 (+950.1) per year on AAS and ancillaries. Most common side effects were testicular shrinkage (49.1%), insomnia (39.0%), and increased BP (32.1%). Most common benefits were increased self-esteem (78.6%), energy (66.4%), and libido (65.5%). 34.9% would continue using AAS despite risk of severe health problems. If offered the chance to use drugs that shorten life but enable athletes to excel very quickly, 68.9% would do so at an average cost of 4.8(+5.6) years of life. 3.3% will not use AAS again, but the majority (55.3%) expect to use at least another 10 years, and 36.0% expect to use for the rest of their lives. Additional features of the sample, the largest yet collected, are described.

Gender differences in brain activity during heroin-related cues in opiate-dependent subjects: A perfusion functional magnetic resonance imaging study

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Multiple lines of evidence indicate gender differences in the brain response to drug-related cues. Studies with substances other than opiates indicate gender differences in the physiological response to drug-related cues. Functional brain mapping studies of opiate dependent subjects report increased regional cerebral blood flow (rCBF) in the inferior and orbito-frontal cortices and the extended limbic system in response to opiate-related cues (Daglish et al., 2001; 2003; Sell et al., 2000). We used perfusion-weighted fMRI to compare brain activity associated with visual heroin related cues in methadone-maintained. A 4-Tesla MRI scanner was used to measure the rCBF changes in 15 male and 5 female methadone maintained subjects and 7 male and 2 female controls. The imaging session consisted of a 5-minute baseline imaging period, followed by a 10-minute active baseline (neutral) video and a 10-minute video depicting the use of heroin.

Subjective craving was assessed before and after each video segment. fMRI data was analyzed using SPM99 to contrast MRI signal differences during drug vs. neutral cue in the male and female patient and control groups. Each functional run was subdivided into 10 one-minute epochs for within-session analysis of local perfusion. Results were displayed with a voxel threshold of T = 3.2, P _ 0.005, uncorrected for multiple comparisons. In the female opiate group only, there was an increased signal in the brainstem, extending to the parahippocampal gyri (BA 21/34/28) and the left amygdala. Additional regions of increased signal were seen in the left medial frontal cortex, visual and superior temporal cortices. The findings in the left brainstem and the visual cortex were statistically significant and while others were a trend. In the male group, there were no differences at the same or lower ($p < 0.01$) levels of significance. These findings indicate that some of the neuroanatomical correlates of cue induced drug craving are more prominent or unique to females. Further analysis will explore the correlation between craving and activation. The findings are preliminary and are to be confirmed and replicated. Supported by NIDA RO1 DA 12162-01 and K23 DA015746-

Comparison of the antinociceptive response to morphine and codeine in female and male Sprague-Dawley rats

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Sex differences in response to morphine antinociception are observed in the rat with males more sensitive to morphine than females. Sex differences in response to other mu opioids have been reported, but these are not consistent. Codeine differs from morphine by a methyl substitution on the phenolic hydroxyl and may exert its action by metabolism to morphine. Consequently, it can be hypothesized that robust sex differences should be seen with codeine-mediated antinociception. However, no significant difference was observed between male and female rats in response to s.c. codeine in the warm water tail withdrawal assay at 50oC. Codeine was fully efficacious in both males and females with EC50 values of 56.8 mg/kg (95% confidence limits, 37.5 - 86.0 mg/kg) in males, compared with 29.1 mg/kg (95% confidence limits, 18.1-46.7 mg/kg) in females. In contrast, male rats were significantly more sensitive to s.c. morphine (EC50 = 2.4 mg/kg, 95% confidence limits, 2.03-2.81 mg/kg) than females (EC50 = 6.0 mg/kg, 95% confidence limits, 5.21-6.92 mg/kg). Thus, compared to morphine, codeine was 24-times less effective in males but only 4-times less effective in females. The female rats were not controlled for stage of estrous cycle but no relationship was observed between plasma levels of estrogen and antinociception. Difference in antinociceptive responsiveness to mu agonists between male and female rats appears to be drug specific and may indicate that in the rat codeine antinociception is not fully due to conversion to morphine. Supported by DA07267 to the University of Michigan Substance Abuse Research Center (EML, JRT) and DA00254 (JHW)

Cocaine-induced G1 arrest in a central nervous system progenitor cell line is associated with changes in cyclin A2 and c-myc expression.

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Abuse of cocaine during pregnancy leads to prenatal exposure of several hundred thousand infants to cocaine per year in the U.S.. Neonatal exposure to cocaine is associated with a variety of morphologic and neurobehavioral alterations in the developing brain. The mechanisms through which in utero to cocaine exposure alters fetal brain development are not clear. Our previous studies have shown that cocaine inhibits proliferation in a rat AF5 CNS progenitor cell line. This study explores the mechanism of this growth retardation. The effect of cocaine on cell cycle progression in AF5 cells was examined by FACS. Exposure of AF5 cells to 10 and 100 uM cocaine resulted in a dose-dependent increase in the percentage of cells in the G1 phase of the cell cycle, and a reduction in the percentage of cells in the S phase, suggesting that cocaine causes arrest in the G1 phase. Gene expression profiles in cocaine-treated AF5 cells were analyzed using a mouse developmental cDNA microarray containing 15k clones derived from early embryonic cDNA libraries. Cocaine down regulated the expression of cyclin A2 and c-myc, which have been associated with the G1-to-S transition. Therefore cocaine may impair CNS development in part through inhibition of the cell cycle in CNS progenitor cells. The ability of cocaine to inhibit the proliferation of the AF5 CNS progenitor cell line may be related to suppression of cyclin A2 and c-myc gene expression.

Sex differences in brain activation during stress in cocaine-dependent individuals - preliminary results from an fMRI study

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As stress is an important factor mediating drug seeking and relapse, and sex differences have been observed in stress and in the development of cocaine addiction, this study employed fMRI to examine the effect of gender on stress responses in recently abstinent cocaine dependent subjects. Nine male and 4 female cocaine dependent subjects participated in an fMRI session, in which they were exposed to audiotaped scripts of their personally relevant neutral or stress situations (3 neutral and 3 stress situations). Each of the runs was divided in 3 time periods: baseline (1.5 min), imagery (2.5 min of script-driven imagery) and recovery (1.0 min). Brain volumes were acquired coronally with an echo planar gradient echo sequence in a 1.5T GE scanner (TR=1.5 sec, TE=45ms, FA=85 , FOV=200mm, Matrix=64x64, slice thickness=6mm, gap=1mm, 220 images per run). Data were analyzed with SPM2. Brain activation during each of the stress and neutral imagery and recovery periods relative to baseline, was examined in individual subjects. The results showed that stress exposure activated specific middle and inferior frontal areas and striatal-thalamic circuits. In the second-level analysis, we contrasted stress imagery and recovery responses between female and male subjects. The results demonstrated more left hemisphere activation (at p=0.01, uncorrected) in female as compared to male subjects, in Brodman Area 46 and middle frontal cortex during stress imagery. Moreover, in the recovery period, more activation was located in the left middle frontal cortex and insula in female, as compared to male subjects. These preliminary results indicating greater left dorsolateral prefrontal and limbic activity during stress in women could be suggestive of women showing a greater involvement of verbal cognitive strategies during stress processing as compared to men. Further examination of these gender differences as they relate to drug craving and relapse may provide a greater understanding of sex-specific brain mechanisms underlying drug-seeking behavior. (Supported by NIH grants: R01-DA11077 and P50-DA16556)

Evaluation of a substance abuse and HIV risk assessment tool for women

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Women who are addicted to drugs and women who are sexual partners of drug abusers are at particularly high risk for acquiring HIV. Female drug users are more likely to have multiple sexual partners and lower rates of condom use than non-drug users. Women who are addicted to drugs are more likely to engage in sex trade to support their drug use than are male drug addicts. In addition, research indicates that many unplanned and unsafe sexual acts occur when the individuals involved are under the influence of substances. On average, drug-using women visit primary care providers four times per year. However, primary care providers lack appropriate tools to assess high-risk women for HIV in a primary care setting. The Women's Interactive Screening to Establish Risk (WISER) is a brief, self-administered, computerized HIV risk screening and assessment tool designed to be implemented in primary care settings and substance abuse treatment facilities. This presentation will describe the development of WISER instrument as well as the results of a psychometric evaluation (N=243) and an effectiveness evaluation (N= 70). The results revealed that WISER is a reliable and valid tool. The majority of the participants reported that the instrument was simple and enjoyable to use. Privacy and ease were frequently cited advantages of the WISER over face to face interviews. In addition, most women found the WISER to be useful as an educational tool to learn new information about risk and protective behaviors.

Opioid-induced antihyperalgesia in temporal summation of thermal nociception

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Temporal summation, the perceived increase in pain in response to a repetitive presentation of a noxious stimulus, has been used to examine the factors that modulate the central processing of pain. The purpose of this study was to examine the effects of high- (morphine) and low- (buprenorphine, butorphanol) efficacy

m opioids in reducing the development of temporal summation (i.e., hyperalgesia) in F344 male and female rats. In this animal model, temporal summation was defined by a decrease in tail-withdrawal latency in response to 8 presentations of a thermal nociceptive stimulus (51oC warm water) with the test of temporal summation conducted 3-sec after the final presentation of the thermal stimulus. Prior to the start of the temporal summation procedure, animals were given a 30 min pretreatment with various doses of each opioid followed by assessment of baseline latencies in a standard warm water tail-withdrawal procedure. In this condition, morphine, buprenorphine and butorphanol produced maximal antinociceptive effects and were more potent in males than females. Such findings are consistent with the marked sex differences in opioid antinociception observed in various acute models of pain. In the temporal summation procedure, marked hyperalgesia was observed in both males and females, with males exhibiting greater levels of hyperalgesia. In both females and males morphine, buprenorphine and butorphanol were equally potent in producing antihyperalgesic effects in the temporal summation procedure. However, in males these opioids were approximately 6 times less potent in the temporal summation procedure than in the warm water tail-withdrawal procedure, whereas in females these opioids were approximately 1.2 times more potent in the temporal summation procedure than in the warm water tail-withdrawal procedure. These findings are consistent with the direction of sex differences in opioid sensitivity reported previously in acute and chronic pain models and suggest further the importance of the pain model when assessing sex differences in opioid antinociception. (Supported by grants DA10277 and DA07244)

Doctors talking with their young adult patients about tobacco smoking: Epidemiologic evidence of male-female and race-ethnicity differences

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Aims: This study explores possible male-female and race-ethnicity differences in doctor-patient discussions about tobacco smoking, and tests hypotheses about these differences. Methods: A total of 1681 young adult participants (age 20-24; 50% male; 66% African heritage), originally recruited for an epidemiologic sample in the mid-Atlantic states, have completed standardized interview assessments. During the assessment, respondents answered this standardized survey item: "In the last six months, if you went to the doctor, did he or she ever ask questions about your smoking tobacco or did the doctor discuss the health effects of smoking?" Results: Estimates indicate no appreciable sex- or race-associated variation in odds of seeing a doctor, but young adult women were more likely than men to have been asked questions or to have received a doctor's consultation about tobacco smoking (odds ratio, OR = 1.4; $p<0.05$). With respect to race-ethnicity, non-Hispanic White young adults were more likely than those in historically disadvantaged minority groups to have had this form of doctor-patient communication about smoking (OR=1.4; $p<0.05$). Simultaneous statistical adjustment for these covariates and for age yielded estimates not appreciably different from these values. Discussion: These findings of male-female differences and race-ethnicity differences may prove to be useful as the United States seeks to reduce health disparities associated with tobacco smoking and to refine programs for primary care screening and outreach to prevent smoking and to aid smoking cessation. Support: This research was supported by NIDAawards: D43TW05819, KO5DA015799, T32DA07292, & R01DA009897.

The relationship of conduct disorder to substance use disorders across gender in Chinese-, Korean-, and White-American college student

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Conduct disorder (CD) is strongly associated with substance use disorders (SUDs). Rates of both CD and SUDs differ across gender and ethnicity. Our previous research found the relationship between alcohol dependence and ethnicity is mediated by conduct disorder in White and Koreans, but only partially mediated in Chinese. This study examined whether the relationship of CD to three SUDs, alcohol, nicotine, and marijuana dependence, is similar across gender and ethnicity. We hypothesized the relationship would be similar in Korean and Whites, but not in Chinese. Participants (222 Chinese, 229 Korean, 235 White, 50% men) were assessed for lifetime diagnoses of CD and SUDs. The table presents the percent diagnosed by ethnicity and gender. Conduct disorder was similarly related to each SUD for all subgroups (odds ratios, ORs, from 1.2-1.6 for alcohol dependence, 1.3-1.8 for nicotine dependence, and 1.4-1.9 for marijuana

dependence) but Chinese women. For this subgroup, the ORs were not even in the predicted direction for alcohol (OR = 0.4, p = .922) or nicotine dependence (OR = 0.3, p = .858), and for marijuana dependence the relationship was slightly stronger (OR = 2.3, p = .029) than in the other subgroups. These results suggest that, despite different prevalence rates, the association between CD and SUDs are similar across gender and ethnic subgroups, with the exception of Chinese women. What affords this group greater protection from SUDs remains to be determined. Chinese Korean White Men Women Men Women Men Women Conduct Disorder 10% 2% 28% 3% 14% 5% Alcohol Dependence 6% 2% 16% 9% 24% 11% Nicotine Dependence 11% 7% 35% 14% 15% 11% Marijuana Dependence 6% 4% 22% 4% 8% 9%

Chronic amphetamine enhancements in locomotion, impairments in visual memory and changes in synaptic protein in female rats are differentially altered by chronic stress

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Psychoactive drugs and stress show cross-sensitization for locomotion, and we have recently reported that amphetamine (AMPH), but not chronic stress, enhances locomotion and impairs recognition memory in female rats (Bisagno et al, Endocrine 21: 33, 2003). We investigated whether daily restraint stress (6 h/day for 21 days) would alter effects of chronic AMPH (10 x 2.6 mg/kg injections given IP every other day) on locomotion, anxiety and object recognition on the open field (testing begun after the last injection). Object recognition is a working memory task that assesses visual memory. Following the 5 days of behavioral testing, serum corticosterone and the brain synaptic proteins, synaptophysin and PSD-95, were measured by ICC to determine possible neural mechanisms for effects. Chronic AMPH alone increased serum corticosterone, locomotion, and anxiety, but AMPH impaired object recognition. Stress did not alter these parameters, but stress potentiated AMPH dependent locomotion while blocking AMPH effects on anxiety and recognition memory and attenuating corticosterone levels. In the brain, AMPH group showed decreased synaptophysin expression in the hippocampus, and stress group showed decreased PSD-95 expression in the caudate. AMPH also increased caudate synaptophysin expression, an effect that was reversed by stress. Results of chronic AMPH - alone and combined with stress - on locomotion and anxiety are consistent with results of previous reports, but the stress-dependent reversal of AMPH-dependent memory deficits and caudate synaptic protein levels are novel. Overall, the results show that chronic stress differentially alters several AMPH dependent behavioral and neural effects. They provide novel information for understanding the functional cognitive consequences of extended AMPH use as well as potential interactions between psychoactive drug abuse and stress. (Supported by NIH Grants R24 DA 121136, NIDA; GM 07823, NIGMS).

Role of estrogen in cocaine self-administration under a 24-hr access discrete trial procedure

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Although more men than women are addicted to cocaine, it has been suggested that women may have an accelerated transition to addiction, and that once addicted they may be more vulnerable to relapse. We have recently reported similar findings in male and female rats self-administering cocaine under high access conditions with females self-administering more cocaine, for longer initial periods of time, and showing a greater disruption in the diurnal control over intake than did males. Additionally, females responded at higher levels under a progressive-ratio schedule to obtain cocaine infusions than did males when tested after an extended abstinence period but lower levels when tested during an initial withdrawal period. Here we investigate estrogen as a possible mechanism underlying these sex differences. OVX female rats with (N=6) and without (N=6) estrogen replacement were given 24-hr access to cocaine (1.5 mg/kg/infusion) under a 4 discrete trial/hr schedule for 7 consecutive days. Subsequently rats were compared following a 1-day and a 10-day abstinence period on motivation to obtain cocaine as assessed by responding under a progressive-ratio schedule. Preliminary results revealed that compared to vehicle-treated OVX rats, estrogen-treated OVX rats self-administered more cocaine and for longer initial periods of time. Results also revealed estrogen-specific changes in motivation to obtain cocaine following access under the 24-hr discrete trial procedure. These results support the hypothesis that estrogen underlies sex differences in cocaine self-administration behavior and they raise the possibility that altered vulnerability to addiction and/or relapse in females is associated with increased motivation to use cocaine. Supported by Yale IWHR

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Management of chronic pain in substance abusers

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Objective: The purpose of the article is to review the existing guidelines and to establish a framework for the development of an evidence-based practice guideline. Method: The author conducted a med-line search augmented by a manual search of bibliography and review of textbooks to identify all relevant articles in chronic pain and substance abuse. Result: 1) Limited controlled studies or empirical data currently available are not sufficient to develop scientific treatment guidelines. 2) Few professionals are fully trained in both disciplines. Conclusion: 1) A history of substance abuse can undermine the palliative care and increase the risk of morbidity and mortality. 2) Definition of addiction and abuse that are already applied to the physically ills have been developed from addiction population that do not suffer from physical ailments. 3) Rate of addiction is rare among pain patients who are chronically treated with the opioids. 4) Under-medication of pain is ubiquitous which may result in pseudo-addiction. 5) Gender, race, and ethnicity may influence proper pain management. 6) Socio-cultural influence is a powerful factor in defining drug-seeking behaviors in minorities, women, substance abusers and AIDS patients.

Risk-taking and delayed discounting in prenatally cocaine-exposed 13-year-olds

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Various behavioral deficits have been identified in chronic cocaine users, and we are interested in whether they represent a vulnerability to cocaine abuse. We are currently assessing decision-making, impulsivity and risk taking in a sample of economically disadvantaged, urban, African American 13 year olds. Our sample (n=18) is a subset of a larger group (n= 219) recruited for a study of the sequelae of prenatal cocaine exposure. 44% of our sample was exposed to cocaine in utero. The cocaine-exposed (CE) adolescents may be at greater risk for substance abuse, because of their prenatal cocaine exposure and the genetic risk of having a substance-abusing mother. The Gambling Task (GT) and the Delayed Discounting Task (DDP) have revealed decision-making deficits and heightened impulsivity in adult substance abusers. The Balloon Analogue Risk Task (BART) has predicted risky behavior in adolescents and adults. We sought to determine whether these deficits would be exhibited in at risk adolescents prior to onset of drug use, hypothesizing that the CE adolescents would perform more poorly on these tasks. There was no difference in IQ between CE and non-CE subjects; with an overall mean in the low average range (83+ 10.5). We found no significant difference between the GT performance of the CE and non-CE groups. Of note, the mean GT bias score for our entire sample (-2 + 13.9) was in the impaired range according to Bechara's criteria. On the DDP, the CE Ss discounted future rewards more steeply than non-CE Ss, although due to the small sample size, these analyses only approached statistical significance ($p = .059$). The BART revealed significantly "riskier" behavior in the CE adolescents ($p = .03$). We will continue to collect data from this cohort, and investigate whether these scores predict onset of drug use in this at-risk adolescent population.

A distinct neurochemical profile for WKY rats at baseline and in response to acute stress: Implications for altered reward in animal models of anxiety and depression

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Wistar-Kyoto (WKY) rats exhibit hyperresponsive neuroendocrine and behavioral responses to stress that exceed normal controls, and are especially prone to develop stress-induced depressive disorder. We have previously reported reduced sucrose pellet consumption and intravenous nicotine self-administration in WKY rats, and these behaviors may arise due to altered neurochemical functioning in these animals. To test this possibility, WKY and Wistar rats (N=6/grp) were exposed to an acute forced swim stress or left untreated as controls. The prefrontal cortex, striatum, nucleus accumbens, and amygdala were assayed for

levels of norepinephrine, dopamine (DA), and serotonin (5-HT), as well as major metabolites, by HPLC. In a separate experiment, designed to assess baseline- and stress-induced neuroendocrine activation, Wistar and WKY rats (N=6/grp) were exposed to an acute forced swim stress of 15 min or left untreated as controls. Animals were killed immediately (T=0), 30 min (T=30), or 60 min (T=60) after the test, and control animals were killed after weighing. The neurochemical results demonstrate distinct patterns of baseline- and stress-induced monoamine turnover in WKY rats, including alterations to DA and 5-HT turnover in prefrontal cortex and nucleus accumbens, two critical brain areas implicated in anxiety, depression, and drug reward. For example, the data reveal significantly higher DA turnover at baseline in WKY rats, and a significant reduction in DA turnover in response to acute stress in WKY rats, effects not observed in Wistar rats. The neuroendocrine results indicate that WKY rats exhibited a sustained corticosterone response to acute stress, as compared to Wistar controls. Overall, the data reveal unique neurochemical and neuroendocrine profiles in WKY rats and provide important information for understanding altered reward behavior in animals with a genetic predisposition to exhibit anxiety- and depressive-like behavior.

Examining gender differences in the relation between dieting and smoking behaviors among adolescents

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The present study aims to examine gender differences in the relation between dieting and smoking behavior onset in youth. Previous research has suggested that dieting behaviors increase the risk of involvement with cigarettes and because females tend to diet more often than males, the present study examined whether the role of dieting as a risk factor for smoking differs across genders. It is hypothesized that the prevalence of smoking will not differ across dieting behaviors among males. However, it is hypothesized that female dieters are at higher risk for engaging in cigarette use. Analyses were performed on data from The National Longitudinal Study of Adolescent Health (AddHealth; Resnick et al., 1997). A total of 9904 Non-Latino Caucasian and Non-Latino African American youth were included. Latent Transition Analysis (LTA; Collins & Wugalter, 1992) was used to examine the sequence of stages describing cigarette use involvement. Youth were categorized into three groups: non-dieters, initiating dieters (those who initiated dieting during the one-year study period), and consistent dieters (those who have previously dieted and continue dieting throughout the one-year study period). Results suggested that females were 2.76 times more likely than males to initiate dieting behaviors ($p<.0001$). Female initiating dieters were also 1.33 times more likely than female non-dieters to engage in smoking behaviors ($p=.004$). By contrast, the prevalence of smoking did not differ between male initiating dieters and non-dieters ($p=.29$). In addition, females were 4.19 times more likely to engage in consistent dieting when compared to males ($p<.0001$). Among females, consistent dieters were 1.21 times more likely than non-dieters to engage in smoking ($p=.002$). Among males, the prevalence of smoking was not significantly different between consistent dieters and non-dieters ($p=.70$). Supporting our hypotheses, these results suggest that that there is a relation between dieting and smoking among females but not among males. Results demonstrate how it is essential to examine gender differences in the role that dieting behavior and other risk factors play in the initiation, maintenance, and prevention of smoking among youth.

The role of gender and acculturation in smoking behaviors and perceived health risk from smoking and nicotine

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There has been an emphasis placed on culturally sensitive smoking cessation programs for minority populations. To date few studies have investigated the role of acculturation in smoking behaviors and perceived health risk among African-Americans. The purpose of this study was to examine the role of gender and acculturation on African-American smoking behaviors (e.g. age of initiation, age of regular smoking, brand preference, quit attempts, reason for smoking relapse, and motivation to quit smoking) using the African-American Acculturation Scale and indices of perceived health risk from smoking or nicotine alone. We hypothesize that persons who are less acculturated will initiate smoking later in life, will prefer menthol brand cigarettes, and have higher quit attempts and motivation to quit smoking than those

who are more acculturated. We also hypothesized that there would be significant gender interactions of acculturation and smoking behaviors and perceived health risk from smoking. Baseline data was collected from 31 African-Americans (17 men and 14 women) volunteering to be in a smoking cessation study. Although data will continue to be collected, preliminary results showed, using general linear model (GLM), that level of acculturation significantly affected most indices of smoking behavior, with very few indices showing gender effect. Furthermore, level of acculturation also affected perceived health risk from smoking among African-Americans.

The influence of main sex partner's drug use on the African-American adolescent girls' drug use
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Introduction: With the rate of marijuana use among adolescent girls at an historical high, understanding factors that influence its use is critical for the design of effective prevention programs. The influence of peers on adolescent substance use has been well described; however, the literature does not distinguish sex partners from plutonic peers. The objective of this study is to determine whether main sex partner's marijuana use precipitates changes in adolescent girls' marijuana use. Methods: Longitudinal data were obtained from interviewer administered questionnaires as part of a larger study on partner-specific measures of perception of risk for STDs. African American girls aged 14 to 19 years living in Baltimore, MD were interviewed at baseline, 6 months, and 12 months about personal and most recent sex partner's drug use. Girls who had a sex partner at both the 6 and 12 months (mo) surveys were included in the analysis (N = 157). Marijuana use was defined as any use of marijuana in the three months preceding the interview. Results: Mean age was 17.7 yrs. Partner marijuana use at 12 mo was associated with changes in participants marijuana use. Among girls who had not used marijuana at 6 mo, those whose 12 mo partner used marijuana were more lilkely to use marijuana at 12 mo compared to those whose 12 mo partners did not use marijuana (47.9% vs. 16.7%, p = 0.001). Among girls who had used marijuana at 6 mo, those whose 12 mo partner had not used marijuana were more lilkely to not use marijuana at 12 mo compared to those whose 12 mo partners used marijuana (79.0% vs. 35.7%, p = 0.002). Using multivariate logistic regression and controlling for age and 6 mo marijuana use, participants whose sex partners used marijuana were more likely to use marijuana at 12 mo (OR: 5.3, 95% CI: 2.5, 11.4). Conclusion: Our results show that sex partner's marijuana use influences girl's marijuana use. Girls are significantly less likely to use marijuana if their partners do not use marijuana. Funded by NIDA award: T32DA072920.001).

History of physical abuse predicts outcome in men in cocaine-dependence treatment trials
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BACKGROUND: The psychological consequences of physical or sexual abuse may include symptoms of depression, anxiety, and post-traumatic stress disorder. These psychological sequelae can exacerbate substance abuse and diminish the success of substance abuse treatment. The impact of a history of physical abuse on the outcome of cocaine treatment remains undetermined. This study looks at the correlation between a history of physical abuse in a large sample of outpatients enrolled in cocaine pharmacotherapy trials. METHODS: We evaluated the ability of physical abuse to predict treatment outcome in a series of cocaine pharmacotherapy trials that included 429 cocaine dependent subjects. Outcome measures included UDS results obtained during the trials, and results from the ASI obtained at the end of the trials. RESULTS: Preliminary analysis demonstrated a correlation between physical abuse and treatment outcome in male but not female patients enrolled in outpatient treatment of cocaine dependence. Future analyses will seek associations between psychological complaints and the incidence of physical abuse. CONCLUSION: History of physical abuse in men predicts a worse outcome in substance abuse treatment and may need to be taken into consideration when designing treatment protocols. Supported by NIDA grant P50 DA12756

Use of tranquilizers: Who is becoming dependent?
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Background: Public concern about extra-medical use of anxiolytic or tranquilizing medicines is motivation to study risk of drug dependence when individuals begin to use these drugs extra-medically. Methods: Data from the 2000 and 2001 National Household Surveys on Drug Abuse (n= 114,241 respondents) were analyzed using contingency table and logistic regression analyses. Results: Among 114,241 total respondents, a total of 972 respondents (0.85% of the total sample) were found to have started using anxiolytic/tranquilizing medicines for the first time within 24 months of interview assessment. An estimated 8% of recent-onset users had become dependent on these drugs, mainly after onset of benzodiazepine drug use.There is a slight male excess (53%) among dependence cases and a modest excess occurrence when use of these medicines occurred before age 21. Among users, there also was variation in risk of dependence for non-Hispanic Blacks ($p<0.05$). Conclusion: These epidemiological findings help quantify the public health burdens associated with new onsets of extra-medical anxiolytic/tranquilizer use in the United States. SUPPORT: NIH Fogarty International Center and NIDA awards D43TW05819, T32 DA007292, & R01DA009897, as well as K05DA015799 to the senior author.

Gender differences and similarities in the nonmedical use of prescription stimulants among college students: Results from a national survey

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There are several indicators that the nonmedical use of prescription stimulants is a growing problem among American young adults. College students report higher past year rates of nonmedical use of prescription stimulants than their same-age peers not attending college. The aim of this study was to examine the gender differences and similarities in the prevalence rates and correlates of nonmedical use of prescription stimulants among college students in terms of individual and college characteristics. A mail survey was completed by 10,904 randomly selected students from one hundred and nineteen nationally representative four-year colleges in the United States. Data included self-reports of nonmedical use of prescription stimulants and other substance use behaviors. After controlling for individual and college characteristics, college women were significantly less likely than college men to report past year nonmedical use of prescription stimulants. Bivariate and multivariate analyses indicated that there were many more gender similarities than differences with respect to individual correlates of nonmedical use. Among these correlates, being white, less than 24 years old, a member of a fraternity or sorority, and attending a more competitive college were significant risk factors for both women and men. Race operated differently as a risk factor for women and men. Nonmedical prescription stimulant users reported significantly higher rates than non-users of substance use for both women and men. Although the findings offer support for gender differences in the prevalence of the nonmedical use of prescription stimulants, the risk factors were similar for college women and men. The nonmedical use of prescription stimulants represents a high-risk behavior that should be further monitored and intervention efforts are needed to curb this form of drug misuse, especially among college men.

Gender differences in ecstasy abuse and dependence criteria and diagnoses

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In an on-going NIDA-funded study of ecstasy use, abuse and dependence, 210 ecstasy users living in the St. Louis metropolitan area have been interviewed. To enroll in the study, respondents must have used ecstasy > 5x lifetime, and once in the last 12 months. To date, we have interviewed 114 men and 96 women, using a modified Substance Abuse Module (SAM) for DSM-IV. The SAM obtains information about all drugs used, including onset and recency, abuse and dependence potential, and detailed information about possible withdrawal syndromes for all drugs. This study evaluates gender differences in ecstasy abuse and dependence criteria. The mean age of male respondents was 24 years; and 22 years for females, 46% of the sample was female, 12% were African American, 35% were employed full time, and the mean years of education was 13.6. At this point, data show no gender differences in the age of onset of alcohol and cannabis use, but a younger age of onset for ecstasy use among women vs. men (19 yrs vs. 21 yrs). Females did not differ from males in terms of ecstasy abuse but did endorse failure to fulfill role

obligations and continuing to use despite social problems at a higher rate than men. There was also no difference between males and females for ecstasy dependence. However, females endorsed giving up activities, spending time using, getting and recovering, and withdrawal at higher rates than men. Despite the fact that women began using ecstasy at an earlier age, and endorse more abuse and dependence symptoms, there is no gender difference found when looking at DSM-IV abuse and dependence diagnoses. Funded by NIDA DA 14854

Gender differences in response to cues in cocaine dependence

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Factors influencing initiation, maintenance, and relapse to drug abuse are critical areas in the investigation of gender differences in cocaine dependence. In particular, there is preliminary evidence to suggest that there may be gender differences in reactivity to cocaine-related cues and in the impact of emotional states on drug-related cue reactivity, as well as important gender differences in hypothalamic-pituitary-adrenal (HPA) axisresponse to acute stressors. In particular, females may have greater reactivity when experiencing a negative mood state as compared to males. To test this hypothesis, HPA axis (e.g., ACTH, cortisol), physiologic (e.g., HR, GSR) and subjective responses to the presentation of cocaine-related cues and negative affect-inducing cues are being compared in cocaine-dependent men and women. To date, 5 cocaine-dependent male subjects and 4 cocaine-dependent female subjects have been recruited. A preliminary between-subject comparison suggests that males report more craving (as measured by a 10-point Likert scale) following exposure to the cocaine-related cues than do females ($p=0.05$; one-sided t-test). A within-subject comparison shows a trend for males to report feeling more stress after the cocaine-related cues as compared to the negative affect-inducing cues ($p=0.06$; one-sided t-test). Of interest, in this small sample females have a larger maximum cortisol response following the cocaine-related cues than the negative imagery cues ($p=0.09$; two-sided t-test) while no difference in response is observed in male subjects. Differences in heart rate and GSR between genders and/or cues have not been observed. Recruitment is ongoing and data from additional subjects, including further neuroendocrine results, will be presented. The exploration of gender differences in reactivity to drug-related cues and negative emotional states may have clear implications for drug abuse treatment. Acknowledgements: Supported by P50DA16511 (Dr. Brady) and M01RR01070 (MUSC GCRC).

Violence and trauma characterize the lives o f street-recruited sex-trading women

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Sex traders – women who exchange sex for money, alcohol or drugs – represent a unique subset of substance users at risk for HIV/STDs. Our ongoing NIAAA (AA12111) and NIDA (DA11622) funded HIV prevention studies of at-risk women evaluated risky sexual behaviors, and exposure to emotional, sexual and physical violence. Sex traders were stratified into 2 groups – VST reported exposure to emotional, sexual or physical violence in the last 12 months (n=283), while NVST denied exposure to violence (n=115). Demographics were similar across the sample. The sex trading women were primarily African American (80%), undereducated (62% <HS), and unmarried (66%). Although substance using women were targeted for the study, VSTs were more likely than NVSTs to be alcohol dependent (77% vs. 60%), cocaine dependent (94% vs. 86%), and to report seriously heavy binge drinking (20+ drinks >1 times; 41% vs. 29%). Although exposure to violence and trauma appears to typify the lives of sex traders, VSTs reported earlier onsets of violence and trauma, back into childhood. VST's were more likely than NVSTs to report physical abuse by a parent (14% vs. 6%), unwanted touch (44% vs. 18%), and forced sex (38% vs. 16%). This pattern of trauma and violence persisted into adulthood as VSTs were more likely to report being raped (68% vs. 44%). The elevated likelihood of exposure to violence and trauma related to sex potentially impacts their ability to communicate about sex and implement protective behaviors. In fact, VSTs were more likely than NVST's to report discomfort discussing sex (92% vs. 86%). Data revealing that that 90% do not regularly use condoms is startling. Implications for interventions tailored to focus on issues relevant to these women will be discussed.

Acute effects of estradiol and progesterone on cocaine self-administration by rhesus monkeys

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Gonadal steroid hormones appear to modulate some of cocaine's behavioral effects in preclinical studies (Lynch et al., 2002; Mello and Mendelson, 2002). In rodents, estradiol and progesterone influence the locomotor activating and reinforcing effects of cocaine under some but not all conditions (Caine et al., 2003). The present study was designed to evaluate the effects of acute administration of estradiol and progesterone on cocaine self-administration by female rhesus monkeys. We examined the effects of single doses of estradiol (0.00001 to 0.01 mg/kg, i.m.) and progesterone (0.1, 0.2 and 0.3 mg/kg, i.m.) on cocaine self-administration dose-effect curves (0.001-0.3 mg/kg/inj). Each monkey served as her own control across gonadal steroid hormone treatment conditions. Cocaine self-administration (0.10 mg/kg/inj) was maintained on an FR30 schedule of reinforcement, and monkeys had unlimited access to cocaine during one 2 hr session each day. Estradiol or progesterone was administered before each test session, twice each week on Tuesday and Friday. Cocaine doses were administered in an irregular order during each cocaine dose-effect determination, and the same dose order was used in an individual monkey in all treatment conditions. Blood samples for hormone analysis were collected at the end of each test session. Acute administration of estradiol did not alter the cocaine dose-effect curve appreciably in comparison to the saline control treatment baseline dose-effect curve. In contrast, progesterone (0.2 and 0.3 mg/kg, i.m.) produced a dose-dependent downward and rightward shift in the cocaine self-administration dose-effect curve. These preliminary results are consistent with clinical reports that progesterone administration may decrease ratings of positive subjective effects after smoked cocaine in women This research was supported in part by R01-DA14670, P01-DA14528, K05-DA00101 and K05-DA00064 from the National Institute on Drug Abuse, NIH.

Comparison of the effects of cigarette smoking on the hypothalamic-pituitary-adrenal axis and prolactin in follicular-phase women and men

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Ten men and six women provided informed consent for participation in studies to examine the acute effects of cigarette smoking on behavioral and neuroendocrine endpoints. All subjects met DSM-IV criteria for nicotine dependence, and women were studied during the follicular phase of the menstrual cycle. Subjects smoked a commercially available, high dose nicotine cigarette under controlled conditions. Subjects took one 5 sec puff every 30 sec for 12 min. Plasma nicotine levels increased significantly within 2 min ($P< .01$), and peak levels averaged between 20 and 25 ng/ml within 12 to 16 min. There was no significant difference in plasma nicotine pharmacokinetics between men and women. Plasma levels of ACTH, cortisol, DHEA and prolactin increased significantly following initiation of cigarette smoking ($P=.001$-$.05$) and the time course of changes in these hormones was equivalent in men and women. Heart rate increased significantly from baseline within 2 min and remained significantly elevated for 60 min in men and for 120 min in women ($P=.0001$-$.03$). Subjective responses to smoking were assessed every 2 min during the 12 min smoking period with a Visual Analog Scale (VAS). Significant increases in reports of "high," "stimulated," "like nicotine," "feeling good," "rush" occurred within 2 min after smoking began and persisted throughout the smoking period. Follicular phase women reported feeling more "stimulated" than men ($P=.001$), but other VAS item scores were similar. These findings suggest that the effects of cigarette smoking on neuroendocrine hormones and VAS ratings are very similar in men and follicular phase women. These studies are ongoing, and studies in luteal phase women are in progress. This research was supported in part by grants R01-DA15067, P01-DA14528, K05

Effects of testosterone on cocaine-induced locomotor activity in male rats

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Previous studies have shown sex differences in cocaine-induced locomotor activity. Our laboratory, among others, has shown that estrogen increases cocaine-induced locomotor activity in the female rat. The role of testosterone in cocaine-induced locomotor activity in the male is still unclear. Adult male rats (300-320g) were gonadectomized and received an empty (GDX) or testosterone filled (GDX-T) Silastic implant (n=10

per group). After seven days, rats were individually placed in an automated activity cage (Accuscan Instruments) and basal locomotor activity was recorded for an hour. During the next 5 days, animals received a daily i.p. injection with saline or cocaine (15 mg/kg). This was followed by a 7 day drug-free period, rats were re-exposed to cocaine on day 13. The locomotor response to cocaine was recorded on days 1, 5 and 13. Cocaine administration increased locomotor activity of all rats. GDX rats showed higher cocaine-induced locomotor activity than sham or GDX-T animals. Repeated cocaine induced behavioral sensitization in sham and GDX animals, however, GDX rats that received testosterone did not exhibit behavioral sensitization suggesting that high plasma testosterone levels abolishes locomotor sensitization to cocaine. These results indicate that testosterone modulates cocaine-induced locomotor activity in the male rat.

Connectedness is associated with depression among female substance abusers

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Data from ongoing NIAAA and NIDA funded HIV-prevention studies among 847 female substance users recruited from St. Louis were used to determine the association of social connectedness to depression, hypothesizing that connectedness was negatively associated with depression. Connectedness was operationalized as the number of contacts the respondent gave on the Washington University Locator Form for future follow-ups. The sample was stratified into three groups: low (2-4 contacts), medium (5-6 contacts), and high (7-11 contacts) connectedness (no respondent had less than 2 contacts). The sample was 82% African American, with a mean age of 36 yrs.; and 55% have not graduated high school. There were no SES differences across groups. Contrary to our hypothesis, women with less connectedness were less likely to be depressed (31% vs. 35% vs. 45%) than those with more connectedness. Women with less connectedness were less likely to feel worthless (23% vs. 26% vs. 34%) and lose interest or pleasure (50% vs. 54% vs. 61%). Using logistic regression, controlling for SES, connectedness was found to be associated with depression. Women with more connectedness were approximately 1.5 times more likely to meet DSM IV criteria for depression than those with less connectedness (95% CI 1.15-1.84). Results indicate that more connectedness may be a risk factor and less connectedness a protective factor for female substance abusers. Alternative explanations may be that more contacts reflect the respondent's willingness to trust, or the interviewer's attitude to obtain contacts, rather than connectedness. These results demand further analyses controlling for respondent and interviewer characteristics. AA12111 & DA11622 (L. B. Cottler, PI)

Correlates of recidivism for women parolees from prison-based treatment in California

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Correlates of Recidivism for Women Parolees from Prison-Based Treatment in California N. Messina, W. Burdon, M. Prendergast. UCLA Integrated Substance Abuse Programs The extent to which traditional therapeutic community (TC) methods meet the specialized treatment needs of drug-dependent women in prison is largely unknown. Drug-dependent women offenders entering prisonTC treatment programs often report severe levels of poly-drug use, psychological impairment, and histories of sexual/physical abuse. Very little research has been conducted specifically with this population and the degree to which these factors are related to recidivism is uncertain. The purpose of this study is to identify critical factors that are related to the reincarceration rates of women offenders who paroled from prisonTC treatment programs compared with women parolees who received no treatment during incarceration. In-depth baseline interview data for 316 women inmates from the Central California Women's Facility was compared using Chi-square analysis and t-tests to identify differences between those who were (171) and those who were not (145) in treatment. Self-report data come from a five-year process and outcome evaluation of the California Department of Corrections' (CDC) treatment expansion initiative. The return-to-custody data come from the CDCs Offender Based Information System. Logistic regression analyses was used to indicate which women are at greater risk of reincarceration. Preliminary findings among the treatment group show that women with psychological impairments are most likely to be reincarcerated within 12-months of their parole, compared with women with no psychological impairments. Outcome data on the no-treatment control group is currently being collected and will be available at the time of the presentation.

Adolescent female smokers: gender-specific-prevalence, risk and protective factors

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This study examined female adolescent tobacco use based on data collected through the Virginia Community Youth Survey, a statewide survey of adolescents conducted under the auspices of the Virginia Department of Mental Health, Mental Retardation and Substance Abuse Services with funding from the federal Center for Substance Abuse Prevention Survey respondents consisted of both male and female 8th, 10th, and 12th graders from throughout Virginia. The sampling frame used a three-stage, stratified random sample design in order to provide a representative sample at the state and regional levels. The survey was administered to randomly selected classrooms within selected school divisions. The survey questionnaire assessed lifetime and past 30-day ATOD use as well as antisocial behavior, 25 risk factors and 10 protective factors related to ATOD use commonly identified in the prevention literature. The questionnaire has 36 scales with good internal consistency (alpha=.63 to .93). Demographic data were also collected on each respondent. Following data cleaning, there were a total of 3,166 valid surveys, including 1,545 female respondents. The resulting data set was then weighted to ensure a representative sample at the state and regional levels. Ecological risk and protective factors associated with former and current female smokers were of interest in the present study. Logistic regression analyses (female sample only) revealed the factors influencing the odds of being a current smoker: friends drug use (Wald=6.54, p=.011 Exp(B)=1), rewards for antisocial behavior (Wald=13.65 p=.000 Exp(B)=1.599), attitudes favor drug use (Wald=14.739 p=.000 Exp(B)=2.541), attitudes favor antisocial behavior (Wald=7.717 p=.005 Exp(B)=.425), early initiation of drug use (Wald=7.239 p=.007 Exp(B)=1.283), parental attitudes favor drug use (Wald=6.248 p=.012 Exp(B)=1.850), high family conflict (Wald=9.539 p=.002). Exp(B)=.59), and low school commitment (Wald=4.813 p=.028 Exp(B)=2.040). These findings have implications for intervention programs targeting girls who are currently smokers.

Abuse types, psychopathology, and physical health in adolescent onset substance use disorder and normal control young women: a longitudinal study

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Childhood/adult abuse, substance use disorder (SUD), and antisocial behavior (ASB) are related to physical health in women. Childhood and adult abuse are also related to SUD and ASB. This study aimed at determining the (1) impact of childhood/adult physical, sexual, and emotional abuse on physical health symptoms (PHS) and (2) the mediating role of ASB and SUD on the relation between abuse types and PHS at ages 14-18 (T1) and 19-23 (T2) and from T1 to T2 controlling for physical health at T1 and adult abuse, ASB and SUD at T2 in SUD young women and controls separately. The sample was composed of 155 SUD women and 113 controls. Age, educational level and ethnicity did not differentiate between groups at T1 with the exception of socioeconomic status (SES) (p<.001). Multiple Regression Results: I. cross-sectional studies (controlling for age and SES). SUD group-T1: (1) ASB (Beta=.44, p<.001) and SUD severity (Beta=.18, p<.01), but not physical abuse, were associated with PHS and (2) the global model explained 32% of the total variance of PHS (F=10, p<.001). Control group-T1: None of the predictors were related to PHS. B. SUD group-T2: (1) SUD mediated the relation between ASB and PHS and (2) the global model explained 15% (F=3.6, p<.001of the total variance of PHS. Control group-T2: adult emotional abuse (Beta=.34, p<.01) was related to PHS, (2) the relation between sexual abuse and PHS almost reached significance, and (3) the model explained 14 % (F=2.4, p<.05) of the total variance of PHS. II. Longitudinal studies (from T1 to T2, controlling for PHS at T1 and adult abuse, ASB and SUD at T2). SUD group: (1) PHS (Beta=.33, p<.001) and physical abuse (Beta=31, p<.001) at T1 and SUD (Beta=.23,p<.01) at T2 were associated with PHS at T2 and (2) the model accounted for 33 % (F=6.5, p<.001) of the total variance of PHS at T2. Control group: (1) PHS (Beta=.24 ,p<.01) at T1 predicted PHS at T2, (2) the relation between adult sexual abuse and PHS almost reached significance, and (3) the model accounted for 21% (F2.5 ,p<.01) of the total variance of PHS at T2. Implications for prevention and treatment are discussed.

Gender differences in the course of antisocial behavior among injection drug users
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Introduction: Males exhibit higher rates of Antisocial Personality Disorder (ASPD) than females, in general and in substance using populations. However, more female drug abusers have been shown to meet behavioral criteria of ASPD in adulthood without having antisocial behavior (i.e conduct disorder, CD) before age 15 (adult antisocial behavior, AASB). How do gender and/or ASPD compared to AASB impact prognosis in injection drug users (IDUs)? Methods: IDUs originally recruited from 1992-1994 as part of NIDA's Cooperative Agreement in Denver were re-interviewed in 1999-2003 (192 males, 132 females) to assess DSM-IV diagnoses and current antisocial behavior and substance use. Results: More males had ASPD (40%) than females (21%) but more females had AASB (67% vs 56%, $p<.001$). Males reported more CD (50%) than females (24%, $p<.0005$) and began using drugs earlier ($p<.05$), but both had tried 6 drugs on average. Regarding status at re-interview, there were no significant gender differences in most outcomes examined so far, including: unemployment (24%), positive urinalysis (61%), number of drugs used past month (2.1) or whether they had injected in the past month (42%). More males were in jail in the past month (12%) than females (5%, $p<.03$). The group with ASPD (32%) did not differ from those with AASB (61%) on any of those same outcome measures. The joint and separate roles of gender and duration of antisocial behavior (ASPD vs AASB) in the prognosis for IDUs will be examined further. Conclusions: Although substance use and antisocial behavior (as CD) began earlier in these male IDUs, female IDUs exhibited considerable antisocial behavior and were as severe as the males on many outcomes assessed at re-interview. High rates of adult antisocial behavior (AASB) in female IDUs could indicate a variant of ASPD in women without CD or that there is a different configuration of CD in females than that currently recognized in DSM-IV. Supported by NIDA RO1 DA12322

Genetic and environmental interactions for tobacco, alcohol and illicit drug use in adolescent female twins
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Both genetic and common environmental influences contribute to twin associations for substance use; however, twin concordance rates may vary by environmental setting indicating the presence of genetic-environmental interactions. We examined such interactions through the application of log linear models using data from the Virginia Twin Study of Adolescent Behavioral Development, a longitudinal study with extensive home interviews of adolescent (aged 12- 17 years old) female twins (372 MZ; 174 DZ pairs). Twin concordance for substance use varied by environmental setting such that greater MZ-DZ differences in correlations for tobacco use were found in families with low parental education and involvement. For example, MZ-DZ correlations for tobacco use in families with low parental education were .90 and .05, respectively, compared to .85 and .74 for high parental education families. Greater MZ-DZ correlational differences for illicit drug use were also found in pairs with low intra-twin conflict. These results indicate that the genetic effects for substance use interact with the measured family environment and that the heritability of tobacco use may vary according to parental education, involvement and conflict. In addition, differences in twin concordance regardless of zygosity were found with greater twin similarities for tobacco use in strict families, families with greater parental quarreling, few life changes (e.g. moving, divorce), and less family togetherness. Twin concordance rates were also greater for alcohol use among pairs with low intra-twin conflict. These results suggest that the twin association interacts with common environmental influences on substance use. Supported in part by NIMH Research Grant (MH-45268), BIRCWH Award (DA-14041) and the Virginia Tobacco Settlement Foundation (#8520012).

Gender and the assessment of liability and exposure to substance use and antisocial behavior
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The ALEXSA (Assessment of Liability and EXposure to Substance use and Antisocial behavior) is a novel, computerized self-report assessment of elementary school-aged children's predictors of behavior problems. The ALEXSA© survey is a compilation of 125 existing measures of risk and protective factors for

substance abuse and antisocial behavior. Furthermore, the survey is designed to increase the reliability and validity of self-reports of nine to 12 year olds using professional cartoon graphics to lengthen attention span, to improve comprehension of certain questions, and to improve reliability of responses. The purpose of this study is to compare girls' and boys' ALEXSA responses. Data were collected from children of mixed ethnicities and urbanicities (n=300) from convenience samples in community settings and consecutively-admitted inpatients to a child psychiatric unit. Girls comprised approximately half of the sample. Test-retest reliability coefficients were good to excellent for most ALEXSA measures for both boys and girls. However, girls test/retest reliability tended to be greater than boys. Preliminary correlational data suggest distinctions in substance use etiology between girls and boys. For example, the associations between substance use and distractibility and gambling were different between the girls and boys. 1. Funded by NIDA grants K01 00434 and R01 15984.

Prenatal cocaine use: 6-year longitudinal maternal mental health outcomes

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Prenatal cocaine increases risk for more severe mental health symptoms post partum, yet little is known about the course of symptoms over time. In a prospective study of 402 primarily African American women of low socioeconomic status (207 prenatal cocaine use (C+); 195 no prenatal cocaine use (C-)) were assessed for mental health symptoms post partum and 6 _ months, 1, 2, 4, and 6 years after. It was hypothesized that women using cocaine prenatally would report more mental health symptoms post partum, and over 6 years, than a high risk, polysubstance abuse, control group. Women were identified as C+ at their infant's birth. Mental health symptoms were assessed using the Brief Symptom Inventory (BSI). BSI subscale means were normalized and analyzed longitudinally using SAS PROC MIX. BSI scores were also dicotomized as clinical/non-clinical and analyzed using General Estimating Equation (GEE). Cocaine group status predicted overall greater mean symptoms (p's < .008) and percentage above the clinical cutoff scores (p's < .009) for all subscales including the global severity index (GSI), somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychotisicm. There were significant overall effects for time, with both groups reporting fewer average symptoms over six years, except for obsessive compulsive and phobic anxiety which decreased only in the C+ group, and somatization, which had no time effect. 53% of the C+ group versus 37% of the C- group had clinically elevated psychoticism scores at birth (p<.05). C+ mean psycoticism scores remained clinically elevated (>.50) through the 1 year assessment and remained at, or marginally below, clinical elevation, at 2, 4, and 6 years. C+ women had significantly more clinically elevated scores for paranoid ideation at birth (53% vs. 30%; p<.05) and 2 years (31% vs. 25%; p<.05) then C- women. Mean paranoid ideation scores for the C+ group were clinically elevated (>1.03) post partum (1.11 vs. 79; p<.05). Prenatal cocaine use increases the risk of serious mental health symptoms post partum, and over a six year period, compared to high risk controls.

Amphetamine-induced locomotor activity in rats prenatally exposed to toluene

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Accumulating data suggest that maternal inhalant abuse can cause adverse effects in offspring, although few well-controlled, prospective studies have been conducted. The current investigation was designed to examine the effects of repeated, brief, high-concentration toluene inhalation by pregnant rats on amphetamine-induced locomotor activity of their offspring. Timed-pregnant Sprague-Dawley rats were given 15-min exposures twice daily to 8,000 parts per million (ppm) toluene, 12,000 ppm toluene, or air (0 ppm) from gestation day 8 (GD8) through GD20. On postnatal day 28 (PN28), male and female offspring were given an s.c. dose of 0.0 (saline vehicle), 0.56, or 1.78 mg/kg d-amphetamine and placed into Opto-3 Varimex activity monitors where locomotor activity was quantified for 2 hrs. Measurements included distance traveled, ambulatory time, and frequency of bursts of stereotypic movement. This regime of prenatal toluene exposure did not increase spontaneous locomotor activity, i.e., following saline injections in male rats but there were significant increases in spontaneous activity in females exposed prenatally to 8,000 ppm. Both male and female offspring exposed prenatally to either 8,000 ppm or 12,000 ppm toluene and given a challenge dose of 0.56 mg/kg amphetamine on PN28 displayed greater amphetamine-induced

increases in locomotor activity than the 0 ppm control animals. In addition, both male and female pups exposed prenatally to toluene displayed lesser amphetamine-induced increases in locomotor after being given 1.78 mg/kg amphetamine on PN28. These findings show that prenatal exposure to toluene alters the biphasic sensitivity to both low and high doses of amphetamine. The results demonstrate that brief, repeated, high-concentration toluene exposures in rats that mimic patterns of organic solvent abuse in pregnant women may change drug sensitivities in offspring. The neural and/or metabolic bases for these dose-response shifts after prenatal toluene remain to be determined. Supported in part by NIDA grant No. DA015951-01 to S.E.B.

Classical and emotional Stroop performance and treatment response

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Cocaine users have deficits in inhibitory control mechanisms. The Stroop Test requires participants to override a dominant tendency and measures response inhibition and conflict. This pilot study used the classical and emotional Stroop to test sensitivity of treatment response and whether improvement in cognitive performance following treatment resulted in behavioral change marked by decreased drug use. Participants included 6 male treatment-seeking cocaine/opiate subjects who took the classical (congruent and incongruent) and cocaine Stroop before and after 6 weeks of progesterone treatment, methadone, and weekly counseling. The emotional trial consists of cocaine-related words (crack) printed in red, green, and blue that match the classical task parameters. In all trials participants were asked to name the color of the ink. Data were analyzed with within-subjects ANOVA. The mean Hamilton Depression Score decreased significantly over the course of the trial ($p.<.03$). Mean reaction times (msec) for the incongruent and cocaine trials from time 1 to time 2 decreased significantly ($p <.02$) by 118.02, and 132.42 respectively. The mean score for the congruent trial decreased by 58.25, which was not significant. Over the six weeks, participants used significantly less opiates ($p. <01$), but had no change in their cocaine use ($p.<.33$). This is one of the first studies to develop a computerized cocaine Stroop and to compare performance on classical and cocaine Stroop tests within the same subjects. The study also demonstrated feasibility while assessing the impact of treatment on Stroop performance. The data suggest that classical and emotional versions of the Stroop can be sensitive outcome measures of overall treatment effects. Since no change between the timepoints for the congruent trial was observed, it is unlikely that the observed treatment effects on Stroop performance were due to practice. Further studies need to be done with larger sample sizes. (Supported by NIDA P50 DA 12762 and NIDA K12 DA00167)

The role of D1 and D2 receptors in cocaine conditioned place preference of male and female rats

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Cocaine produces its rewarding effects by enhancing dopamine levels in the synapse, thus stimulating dopamine receptors in the brain reward circuit. Previous findings have shown that sex differences exist in the rewarding effects of cocaine using the conditioned place preference (CPP) paradigm. It is unclear what role dopamine D1 and D2 receptors play in the observed sex differences in cocaine CPP. Thus, the present study was conduced to determine if D1 and D2 receptors contribute to sex differences in cocaine CPP using a standard 4 day CPP paradigm. Fifteen minutes prior to receiving cocaine (5 mg/kg for females and 20 mg/kg for males, i.p.) or saline, rats were pretreated either with SCH 23390, a D1 receptor antagonist, (0, 0.1, 0.25, or 0.5 mg/kg, i.p) , or eticlopride, a D2 receptor antagonist, (0, 0.05, 0.1, or 0.25 mg/kg, i.p.). Both male and female rats showed cocaine CPP. All doses of SCH 23390 blocked cocaine CPP in male rats, whereas, only the 0.1 and 0.25 mg/kg dose of SCH 23390 blocked cocaine CPP in female rats. Eticlopride did not block cocaine CPP in male or female rats. These findings suggest that D1 receptors modulate cocaine CPP in a sex-dependent manner, which may contribute to the sex differences previously observed in cocaine CPP. This research was supported by PS-CUNY, RR-03037, NIDA DA 12136, SCORE 506-GM60654, and SNRP NF 39534.

Neurocognitive function in alcohol-dependent domestic violence offenders
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Although substance-abusing male domestic violence (DV) offenders are increasingly recognized as a high risk group necessitating effective treatment interventions, few studies to date have investigated neurocognitive function in this population, which may be crucial for the development of rational treatments. Accordingly, in preliminary studies we examined differences between male subjects with (n=6) and without (n=6) a history of DV. Urine toxicology screens, alcohol withdrawal severity assessments (CIWA), and breathalyzer readings (BAL=0) were obtained at all pre-treatment assessments and on the neurocognitive testing day. All subjects were abstinent from alcohol for at least 7 days and did not display alcohol withdrawal symptoms at the time of the assessment. The neurocognitive battery included assessments of decision making (Iowa Gambling Task), response inhibition (Stroop Color Word Test), attention and vigilance (CPT-X, Digit Span), spatial working memory, verbal learning (CVLT-II), speed of processing (Trails A), and executive functioning (Trails B). Significant impairments ($p<0.05$) in decisional making, response inhibition, attentional function, impulse control, and executive function were found in the alcohol- dependent DV versus the control group. Our findings show wide-spread deficits in neurocognitive functioning among male alcohol-dependent domestic violence offenders which may contribute to their clinical presentation and course. Future studies may determine whether neurocognitive functioning predicts treatment outcomes in males with DV histories. Supported in part by the Donaghue Medical Research Foundation (C.J.E.), NARSAD (T.P.G.), and NIDA grants P50-DA09240 and R01-DA-14039 (T.P.G.).

Neurocognitive sex differences in bipolar disorder with stimulant dependence
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Neurocognitive deficits are common in cocaine or amphetamine dependence (CAD). Rates of CAD are as high as 34% in bipolar (BP) disorder. Sex differences in neurocognitive functioning (NCF) are evident in controls, cocaine, & BP alone subjects. However, sex differences in NCF in subjects with BP+CAD are unknown. As strategic (rather than impulsive) & flexible (rather than perseverative) decision-making are relevant to drug rehabilitation, inefficient NCF may underlie CAD in BP. We examined sex differences in NCF in BP+CAD and hypothesized there would be sex differences in NCF related to decision-making strategies. 15 females (mean age=35.4) & 18 males (mean age=36.6) with BP+CAD were enrolled. The Structured Clinical Interview for DSM-IV was used to determined diagnoses. Bechara's Gambling Task (BGT) & Wisconsin Card Sorting Task (WCST) were used to respectively measure impulsive & perseverative decision-making. Assessments measuring manic & depressive episodes were used to identify if mood influenced NCF. Urine drug screens were collected prior to NCF tasks. Log-likelihood ratios & a partial correlation controlling for sex were used for statistical analyses (a 95% confidence interval with $p=0.05$). 29 subjects with BPI (female=14, male=15) and 4 subjects with BPII (female=1, male=3) participated. There were no significant differences in age, education, mood symptoms & no significant effect of these indices on NCF scores. A trend ($p=0.07$) in BGT net scores showed females made more impulsive decisions than males & a trend ($p=0.19$) in WCST scores showed females made more perseverative errors than males. A partial correlation showed testing drug positive or negative at the time of the task was not related to BGT scores ($p=0.47$) but was significantly related to WCST scores ($p=0.02$). This is the first study to examine & show NCF sex differences in BP+CAD subjects. Our results differ from those who have shown no sex differences in BGT scores in cocaine dependent subjects without psychiatric illness. The data suggest the additive effect of concurrent CAD+BP may influence NCF. Limitations include small sample size and a mix of BP I & II. More research focusing on NCF in CAD subjects with BP is needed.

Traumatic event exposure and psychiatric outcomes
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Exposure to specific traumatic events has been consistently reported to be associated with risk for psychiatric and substance-related outcomes. Interpretation of these relationships is complicated by the

unclear direction of causality, presumably due to the sharing of genetic and environmental contributions to underlying liability. The tendency for exposure to various traumatic events to be clustered within individuals is another confounding factor. The current analyses were undertaken to explore the relationship between psychiatric and drug-related outcomes and traumatic event exposure, with control both for the total number of events experienced and familial contributions to risk (by inclusion of the outcome in the co-twin as a covariate). The sample consisted of 1224 adolescent and young adult female twins (mean age 18.3 years) who completed a semi-structured, diagnostic telephone survey that included diagnostic assessments of major depressive disorder, externalizing disorders, and illicit drug abuse and also assessed history of suicide attempt, panic attacks, and exposure to various traumatic events. Parental reports, when available, were also used for externalizing disorders. Despite the sample's youth, 42.2% reported having experienced one or more traumatic events. The results support the presence of a dose-response relationship between trauma exposure and risk for psychiatric and substance-related outcomes. Some consistent patterns also emerged within the associations observed. Significant risk for cannabis abuse, non-cannabis illicit drug use, and externalizing disorders were associated with a history of sexual trauma (i.e. rape, molestation); similar risks were observed to be associated with having been threatened with a weapon or held captive and with a history of physical abuse. In contrast, a history of serious neglect was associated with significant risk for depression and for a suicide attempt, but not for illicit drug use or externalizing disorders. Our results provide some evidence for specific associations between exposure to individual traumatic events and psychiatric and substance-related outcomes. Supported by NIH grants AA09022 & AA07728 (ACH), AA00277 & DA17305 (ECN).

Preliminary evaluation of the acceptability and efficacy of a computer-based brief motivational intervention for perinatal drug use

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The present study is a pilot examination of the response of post-partum women with histories of drug use to a single-session computer-based motivational intervention. Participants were 15 post-partum women, recruited before leaving the hospital, who reported drug use in the month prior to pregnancy. All women completed a baseline assessment and computer-based intervention using a Tablet PC (laptop with integrated touch screen). The intervention was made up of three components: decisional balance, in which the pros and cons of drug use for the participant are elicited; normed feedback, in which the participant's drug use and related consequences are compared to national norms; and optional goal-setting, in which the participant is asked if they wish to set a change goal. All components were presented in counterbalanced order. Visual analogue scale items (range of 1 to 100) assessed participants' satisfaction with, and motivation following, each component (with motivation defined as the mean of self-reported problem recognition, openness to treatment, and likelihood of abstinence). Participant ratings of the overall acceptability of the intervention were high for ease of use (mean = 91.9) and respectfulness (mean = 88.4); participants gave more moderate ratings to overall liking of the components (mean = 69.2). Compared to baseline assessment, all three components were associated with increased motivation (baseline mean = 30.7; optional goal-setting = 38.2; feedback = 39.3; and decisional balance = 47.5). Results were similar when collapsing across sequential order of intervention component (34.6, 48.9, and 41.3, respectively, vs. baseline of 30.7). Overall, motivation across intervention components was 38.8% higher than at baseline ($t[14] = -2.1$, $p = .05$), and 9 of the 15 participants (60%) endorsed a goal of quitting. These results were deemed sufficient to support further testing of the intervention in a now ongoing N = 120 Phase II clinical trial. If validated, computer-based brief interventions could offer significant advantages in terms of cost, replicability, and integration with primary care.

Single nucleotide polymorphisms of the catechol-O-methyltransferase gene: Ethnic and gender distributions, and vulnerability to develop opiate addiction

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The gene for catechol-O-methyl-transferase enzyme (COMT) catalyzes the breakdown of catchelolamine neurotransmitters, including dopamine. We, therefore, chose to study the COMT gene because of the possible implications for opiate addiction. The COMT gene has 6 exons; only exons 4 and 5 were studied.

Exon 4 contains the previously-identified, common, Val/Met polymorphism which results in a four-fold difference in transferase enzyme activity. We amplified Exons 4 and 5 separately by designing PCR primers in the intronic regions flanking these exons so that both the exons and the entire intronic region in between were amplified. The subjects in this study were unrelated volunteers meeting inclusion/exclusion criteria who participated in a genetics of drug addiction study conducted at The Rockefeller University. Their addiction history was thoroughly characterized. Four previously identified SNPs were found in Exon 4, 2 previously identified SNPs were found in Exon 5, and 1 SNP was found in the intronic region flanking exon 5. To date, we have determined genotypes and performed analyses for the Val/Met polymorphism. Opiate dependent patients (n = 98) and normal volunteers (n = 102) were studied. Data was stratified by ethnic/cultural groups. Statistical analysis was performed on the three predominant groups (Caucasian, African American, and Hispanic). No deviations from Hardy-Weinberg equilibrium were observed in any group. We found that among ethnic groups the frequency of the genotype and allele frequency varied significantly (genotype frequency chi square (d.f. = 4) = 11.80, p = 0.019, allele frequency chi square (d.f. = 2) = 9.31, p = 0.010). Statistical analysis was also performed based on addiction history and gender within each ethnic group. No difference in odds ratio was observed between opiate-dependent cases and controls within any ethnic group for either genotype or allele frequency. In addition, no difference in allele and genotype frequency was observed between genders. This research was supported by grants NIH-NIDA-R01-12848; NIH-NIDA-P60-05130; NIH-NIDA-K05-00049, NIH-CRR-00102

Specialized versus standard chemical dependency treatment for women with children: Attending to heterogeneity in a retrospective multisite study

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This study is a retrospective evaluation of women who entered one of two treatment modalities in Washington State. One sample consists of 697 women with children who were admitted to specialized long-term residential treatment sites between 1994 and mid-2000. The other sample will include 751 women with children who were admitted to standard mixed-gender long-term residential sites during this same time period. Outcomes are gathered from administrative data sources on each client for two years pre- and four year post-admission. In addition, in-person interviews were conducted with select staff at all participating treatment programs. Contemporary evaluation theory and practice guidelines stress the need to assess the fidelity of any contrast or risk misinterpreting the findings. This presentation will focus on the qualitative site-level data and its implications for the fidelity of the specialized v. standard comparison. Site visit data suggest that the true distinction is "fuzzier" than the condition names imply, with some standard sites adopting practices more typically associated with the specialized sites, and considerable variation among specialized sites in their implementation of the specialized model. Preliminary examination of outcome data suggests that both groups increased employment and reduced dependence on income support benefits, with considerable site-level variation on outcomes as well.

Impulsivity (delay discounting) as a predictor of acquisition of i.v. cocaine self-administration in male (vs. female) rats

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Research in humans has suggested a relationship between drug abuse and impulsivity as shown by a selection of a smaller immediate reward over a larger delayed reward. Previous work in our laboratory has shown that female rats that chose a small, immediate reward (impulsive) acquired cocaine self-administration more readily than their counterparts that chose a larger, delayed reward (less impulsive). The purpose of the present study was to determine whether the relationship between impulsivity and subsequent drug use varies by sex. Male (N = 16) and female (N = 13) rats were trained on a delay discounting procedure that allowed them access to two response levers and a food pellet dispenser. Responses under a fixed-ratio (FR) 1 schedule on one lever resulted in the delivery of 1 pellet (45 mg) immediately; whereas, responses on the other lever resulted in the delivery of 3 pellets after a variable delay. The delay was initially set at 6 s, and it increased or decreased after responses on the delay or immediate levers, respectively. A mean adjusted delay (MAD) was calculated for each daily 3 hr session. Based on these values, rats were separated into high (MAD < 10 s) and low (MAD > 14 s) impulsive

groups. The rats were screened for locomotor activity and then trained to self-administer cocaine (0.2 mg/kg) contingent upon a lever press response (FR 1) using an automated autoshaping procedure. Preliminary data suggest that males in the high impulsive group were more likely to acquire cocaine self-administration than low impulsive males; however, it does not appear that they acquired cocaine self-administration as readily as high impulsive females. Understanding the relationship between sex, impulsivity, and vulnerability to drug abuse is important for developing new strategies for the prevention and treatment of drug abuse. Supported by NIDA R01 DA03240 and K05 DA15267.

Sex differences in the conditioning effect of nicotine in rats

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Nicotine has rewarding, conditioning (state dependency), cognitive and emotional effects which involve related as well as distinct mechanisms that mediate in addiction. Contextual cues may play a significant role in the maintenance of the smoking habit. Female smokers are less successful in smoking cessation programs which employ pharmacotherapeutic approaches, and this has been attributed to a greater impact of state-dependency in women than men. The present study aimed to study sex differences in conditioned place preference (CPP). The CPP apparatus consisted of black and white chambers (associated with nicotine or saline), and a third neutral chamber. Adult Sprague Dawley rats were initially allowed to explore all three chambers for 30 minutes and time spent in each chamber was monitored to depict preference. In 8 sessions that followed, nicotine (0.2, 0.4, and 0.6 mg/kg, s.c.) or saline were administered alternatively and rats were placed in appropriate chambers (nicotine was paired with the unpreferred chamber) for 15 minutes. Control animals received only saline. After conditioning trials, during the final assessment, the doors between the chambers were opened, rats were placed in the neutral chamber, and time spent in each compartment was monitored for 30 minutes. Our results show that: (1) Nicotine treatment induces CPP in male and female Sprague Dawley rats; the ffect is stronger in males than females. (2) In males the lower (0.2 mg/kg), and in females the higher (0.6 mg/kg) dose of nicotine is more effective in inducing CPP (3) The behaviour of rats is not uniform throughout the final exploration session. Females spend less time in the non-preferred/nicotine chamber as time progresses whereas males do not. Supported by Ege University Research Fund grant 2002/ TIP/ 014

Genomic regions controlling rat corticosterone levels

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Background: Stress-responsiveness and HPA axis function have been linked with drug addiction. The identification of genetic factors controlling stress-responsiveness should advance the understanding of susceptibility to drug use disorders. Methods: Rat strains, F344/NHsd and LEW/NHsd, that differ in measures of stress-responsiveness, were bred to generate F2 progeny that were used in a quantitative trait loci (QTL) analysis to identify genomic regions influencing late-afternoon corticosterone levels. Results: Regions on chromosomes 4 and 10 previously identified as influencing autoimmune phenomena were the most significant QTLs observed, reaching suggestive significance at the genome-wide level. Congenic animals targeting these regions with F344/NHsd DNA on a DA/Bkl genomic background demonstrated corticosterone levels approximating those of F344/NHsd rats and differing significantly from DA/Bkl rats. Conclusions: Specific genomic regions influence both corticosterone levels and stress-related disease susceptibility. These findings not only represent the first identification of QTL controlling corticosterone levels, but also suggest a mechanism underlying genetic differences in stress-responsiveness. Supported by the NIDA, NIMH, NIAAA, APA, NARSAD, and US Dept of Veterans Affairs

Social and drug-use indicators and consistent condom use with sex exchange partners among women in East Harlem, New York

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Research suggests that important contributing factors to the HIV/AIDS epidemic among women have been

drug use and the exchange of sex for money or drugs. In a study of the social context of HIV risk behavior, data from crack-, cocaine- and heroin-using women were collected from 1997 through 1999 in East Harlem, New York. In the subset of 390 HIV-negative women, the relationship between sex exchange and social and drug-use indicators was assessed. In a multiple logistic regression significant independent predictors of current (prior 30 day) sex exchange were current crack-use (AOR=3.47, CI=1.96-6.14) and younger age (AOR=0.95, CI=0.92-0.98). The relationship between condom use during sex exchange and social and drug-use indicators was also examined in a multiple logistic regression. Among current sex exchangers (n=92), financial support from a primary sexual partner was a significant positive predictor of consistent condom use with exchange partners (AOR=4.12, CI=1.43-11.25); exchange for drugs (independent of exchange for money) was a significant negative predictor (AOR=0.19, CI=0.07-0.57) of consistent condom use with exchange partners. Odds ratios for other indicators in the same regression approached significance: current injection drug use (AOR=4.12, CI=0.98-17.24) and current crack use (AOR=2.84, CI=0.78-10.44) were positively associated; and current alcohol use (AOR=0.33, CI=0.10-1.04) was negatively associated. Although crack users were more likely to exchange sex, crack users and injectors may have been more likely to use condoms during exchange. Alcohol users may have been less likely to use condoms. Our findings highlight the complex relationships among social factors, drug use, sex exchange and HIV risk.

Double-dummy, double-blind comparison of buprenorphine and methadone in pregnant opioid-dependent women

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Aim. To investigate whether retention rate and neonatal abstinence syndrome (NAS) is different in children born to women maintained on methadone compared with those maintained on buprenorphine and to compare additional drug consumption in these groups of women. Design, Setting and Participants. A double-blind, double-dummy randomised trial was conducted in an established addiction clinic. 146 pregnant, opioid dependent women presented to the clinic during the screening period and only 18 women could be enrolled in the daily supervised dosing schedule with maintenance on either methadone (8 women) or buprenorphine (10 women) up to and following delivery. The mean enrolment period was the 25th week of pregnancy. Measurements. Standard urinalysis methods were used to measure consumption of opiates, cocaine and benzodiazepines during pregnancy. NAS was measured according to Finnegan score and treated with morphine drops. Findings. At delivery, the mean doses for methadone was 53 mg and 14 mg for buprenorphine respectively, the mean delivery week was the 38th week of pregnancy. All children were born healthy and no serious complications arose, however one stillbirth occurred in the 39th week of pregnancy (methadone). Three neonates of each group did not experience any treatable NAS, others had a mean duration of 5 days of treatment with morphine. Concomitant consumption was high in both groups, with a higher percentage of positive urinalysis for opiates in the buprenorphine group and higher positive results for benzodiazepines in the methadone group. Conclusions. To tight inclusion criteria might exclude the target treatment group, further controlled comparison studies are needed to define the ideal medication for these subgroups.

Who buys it, who grows it and who gets it for free? Marijuana procurement patterns in the US population

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AIMS: The present study builds upon the theory that drug users are initially introduced to drug use by receiving the drug for free and that as the frequency of drug use increases, so too does the likelihood of buying the drug. We examine how marijuana users procure the drug and assess whether these procurement methods vary by the frequency of marijuana use and select demographic characteristics, including the sex of the marijuana user. METHODS: Data are from the 2001 public files of the National Household Survey on Drug Abuse (NHSDA), a nationally representative sample of the US population. Respondents between ages 12 and 21 were asked if they had used marijuana in the past 12 months, the frequency of their use over the past 12 months, and how they acquired marijuana the last time they used the drug. RESULTS: A total of 5439 respondents aged 12 to 21 reported using marijuana in the past 12 months. 67% of the most

frequent marijuana users (used more than 300 times in the past 12 months) report buying marijuana the last time that they used compared to only 16% of the least frequent users (used 1-11 times in the same time period) (Odds Ratio: 8.35, 95% Confidence Interval: 6.32, 11.04). A dose-response relationship exists between frequency of marijuana use and the odds of buying the drug. Adjusted for frequency of use, female marijuana users had half the odds of reporting buying the marijuana they last used relative to their male counterparts (OR: 0.55, 95% CI: 0.47, 0.64). CONCLUSIONS: Frequency of marijuana use is associated with an increase in the odds of procuring the drug through purchase; female marijuana users are less likely to report purchasing the drug than males. This study lends evidence to the theory that as the frequency of marijuana use increases so too does the likelihood that marijuana users will enter into illicit drug markets. Future studies are needed to further test this theory, to study the point at which drug users enter into drug markets, and to explore procurement methods and circumstances surrounding marijuana use among females. ACKNOWLEDGEMENTS: NIDA

Relationship between maternal substance use and depression in pregnant women
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Maternal symptoms of depression during pregnancy have been associated with a variety of adverse consequences. Unfortunately, symptoms of depression often go undetected during pregnancy. The present study compared patient demographic and health related measures in a sample of 192 pregnant women with (N=52) and without (N=140) symptoms of clinical depression. Women were identified through an urban prenatal care clinic. Demographically, the sample had a mean age of 25.4 years; 65.9% were African-American and 29.5% were Caucasian. Mean estimated gestational age (EGA) at first prenatal visit was 15 weeks and over three-fourths of the sample (76.7%) reported the current pregnancy was unplanned. All participants provided informed consent and completed a self-report health behavior assessment, which included the Pregnancy Assessment Lifestyle (PAL), Beck Depression Inventory-II, and measures of domestic violence. Consistent with the literature, BDI-II scores above 16 were used to classify women as either positive or negative for clinical symptoms of depression. Mean BDI-II scores varied by trimester at first prenatal clinic visit with a mean score of 11.1 for women in first-trimester as compared to scores for 2nd (16.3) and 3rd (14.4) trimester cases. Participants with a planned pregnancy had a mean BDI-II score ($M = 9.0$) significantly lower than those with an unplanned pregnancy ($M = 14.4$) ($p < .02$). Women with clinical symptoms of depression were also more likely to report tobacco and other drug use, binge drinking, tobacco and other drug use by significant other as well as higher rates of current and lifetime physical abuse. Findings affirmed that women with symptoms of depression were at increased risk for a variety of health risk behaviors and confirm the importance of routine screening for depression in prenatal care settings. This research was supported by NIDA R01 DA11476.

Gender-specific effects of social relationships on crack use among out-of-treatment users
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Social support and interpersonal relationships may be motivating factors for, as well as barriers against reducing drug use, and there is some evidence that these factors may differ for men and women. We examine gender-specific effects of social relationship variables (partner drug use, family and peer relationships, social support, peer influence, crack-using friends) and individual factors (drug use history, victimization, depression, anxiety, readiness to change, and demographics) on crack use among out-of-treatment crack users. The sample includes 443 African-American crack users (119 women, 324 men) recruited through street outreach methods in Raleigh, North Carolina, who participated in a randomized trial of a Pretreatment intervention. Data were collected at baseline and 3-months following the intervention. At baseline, women were more likely to have a drug-using sexual partner. Men reported better relationships with relatives, and more drug-using friends. Women were more likely to have experienced physical and sexual abuse, and scored higher on the anxiety and depression scales. There were no gender differences in peer influence or support from relatives or friends. Step-wise multivariate regression models predicting crack use at 3-month follow-up were conducted separately for women and men with baseline variables as predictors. Results show that having a non-drug using sexual partner and having fewer drug-using friends were associated with less crack use at follow-up, but only for men. For women, only years of

lifetime crack use was associated with less crack use at follow-up. These data indicate that social relationships with non drug users may be beneficial in reducing crack use, but this was only the case for men in our sample. Women's continued drug use was not explained by either their social relationships or psychological functioning, suggesting that other factors may influence women's use. Additional research should explore contextual factors, in addition to individual and social relationship factors, that may contribute to women's continued crack use.

Sex differences and opiate abuse trends in dual diagnosed adolescents
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Although adolescent drug use has leveled out over the past several years opiate use other than heroin in the United States has gradually increased over the past six years according to 2003 Monitoring the Future (MTF) report. The present study consisted of 422 surveys given to adolescents admitted to a residential treatment center for both substance abuse/dependence and one other psychiatric illness. A 109-item survey was given to 208 males (49.2%) and 214 females (50.8%) with an average age of 15.9 +1.40. The results of the present study of dually diagnosed adolescent substance abusers was consistent with the MTF findings except in the areas of overall opiate use and sex-related differences. The MTF report depicts a gradual increase in opiate use other than heroin from 1998 until 2002 when there was a slight drop of 0.4% in 2003. Our survey revealed a similar overall pattern except that both the rate of use and the increase in recent years were much higher. The average difference between our sample and MTF over the years 1998 and 2003 was 11.1%. Second, there was a sex-related difference in that we observed an increase in male use and a decrease in female use which was not found in the MTF report. These sex-related differences begin to be significant in the year 2000 and gradually increased every year. In the year 2003 45% of the males in our sample used opiates other than heroin as compared to only 21% of the females. This 24% difference represents an increase of 22% from when the survey began in 1998. The use patterns of other drugs in our survey was consistent with the MTF report, but in some cases we observed the changing patterns in advance of the national population. An example of this is the 52% increase in opiate use from 2000 to 2001 in our sample as compared to the 27% increase in 2001 to 2002 of the MFT study. These preliminary results demonstrate that there is a difference between the adolescent dual diagnosed population and general adolescent population with respect to drug use trends; these data may be valuable in developing prevention and treatment strategies for the general population. Supported by NIDA Grant DA03994 and DA00343.

Reinstatement of i.v. cocaine self-administration in female rats: Effects of estrogen
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Previous research indicates that female rats show greater levels of reinstatement of extinguished i.v. cocaine-reinforced responding than male rats, and they do so at lower priming doses than males. Estrogen has been implicated in the observed sex differences during the acquisition and maintenance phases of cocaine self-administration. The present study examined the influence of estrogen on female rats' vulnerability to the reinstatement of i.v. cocaine self-administration. Three groups of female rats were compared: 1) sham (SH) + vehicle (VEH), 2) ovariectomized (OVX) + estradiol benzoate (EB) (0.05 mg/kg, s.c.), and 3) OVX + VEH. A reinstatement procedure including a long-term saline extinction period (i.e., 21 days) was used since it had been shown to induce robust reinstatement of i.v. cocaine self-administration in rats. Initially, rats had 14 days of access to 2-hr (9:00 a.m. to 11:00 a.m.) of i.v. cocaine (0.4 mg/kg) self-administration under a fixed ratio (FR) 1, 20 sec timeout schedule. Cocaine was then replaced with saline and rats had access to 21 days of saline self-administration under the same conditions. Following saline extinction, injections of either cocaine (10 mg/kg, i.p.) (C) or equal volume saline (S) were administered in alternating order at the beginning of each daily session, for 6 days (i.e., SCSCSC). Preliminary results revealed that priming injections of cocaine induced greater levels of responding on the cocaine-associated lever in SH + VEH and OVX + EB females compared to OVX + VEH females. These results suggest that estrogen contributes to female rats' vulnerability to the reinstatement of cocaine self-administration following a period of cocaine abstinence. We are currently testing male rats on the same procedure to compare their levels of reinstatement with the above 3 female groups. This research was supported by NIDA grants K05 DA15267 and R01 DA03240 (M.E.C.) and T32 DA07097 (M.E.R.).

An investigation of gender differences using the The TCU Client Problem Profile index
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Gender differences in drug treatment have frequently been reported in the literature, especially at intake. However, the number and severity of problems has also been found to be a predictor of outcomes. The present study examined the relative prediction of gender at follow-up in terms of the number and types of problems patients bring to treatment using the TCU Client Problem Profile (CPP). The CPP is based on information from the TCU Brief Intake and covers 14 problem areas related to psychosocial functioning, health, employment, criminality, HIV risks, and drug use (including cocaine, heroin/opiate, marijuana, other illegal drugs, and multiple drug use). Previous research with the CPP index (number of problem areas) indicates it is significantly related to therapeutic engagement, during treatment performance, and post-treatment follow-up outcomes. This study investigated the relationship of the CPP index and gender to follow-up outcomes. Subjects included 547 patients receiving treatment in an outpatient methadone program. Analysis of variance (ANOVA) was used in a 2 x 2 design (Gender by CPP Index) to examine post-treatment drug use, criminality, psychological and social functioning, and HIV risk. Results confirm that women have significantly higher CPP scores, reflecting a greater number of problems upon entering treatment. Preliminary analysis of one-year follow-up indicates that the CPP index is significantly related to post-treatment outcomes, but not gender or the interaction between the CPP index and gender. That is, although women enter treatment with more problems, patient outcomes are still better predicted by problem severity at intake, rather than gender. Treatment implications include the need to assess patient functioning in order to adequately plan and adjust treatment regimens based on specific problem areas.

Gender differences among injecting drug users in Sydney, Australia, 1996-2003
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Background: Previous research has found that female injecting drug users (IDU) are more likely to identify as Aboriginal, be involved in risky behaviours such as needle sharing and sex work than male IDU. Female drug users are also under represented in drug treatment. These factors complicate problems such as homelessness, unemployment and poverty, placing women IDU at increased risk. Although a substantial body of research exists, little trend analysis has been done in Australia, and much of the previous literature on gender difference focuses on treatment populations. Method: Cross sectional data from 1996 to 2003 from regular IDU in Sydney interviewed as part of Australia's drug monitoring system, the Illicit Drug Reporting System (IDRS) were analysed. The demographic characteristics, drug use patterns and self reported risk behaviours were examined for gender differences over time. Results: Since 1997, there has been a steady increase in the proportion of female IDU interviewed that identify as being of Aboriginal or Torres Straight Islander descent, and an increase in proportions reporting sex work. IDRS data show more females than males report engagement in drug treatment and female IDU were younger. Proportions of male and female IDU that report borrowing or lending needles has steadily decreased over time, however greater proportions of females report these behaviours. There were no noticeable gender differences with regard to drug use patterns or frequency of drug use, except in 2001 when females reported more frequent heroin and cocaine use, and males reported more frequent benzodiazepine use. Conclusions: The data suggests female IDU may place themselves at greater risk than their male counterparts by sharing injecting equipment and engaging in sex work. Treatment and other measures to reduce harm may need to be targeted specifically at women and, in particular, Aboriginal women.

Progesterone blocks acquisition and expression of cocaine-induced CPP in intact female rats
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We have recently demonstrated that female rats develop associations between environmental stimuli and cocaine's rewarding effects more quickly and at lower doses than males. These sex differences in cocaine conditioned place preference (CPP) appear to be mediated by gonadal hormone mechanisms, since

ovariectomy and ovarian hormone replacement affected the intensity of cocaine CPP behaviors in female rats. Furthermore, these studies showed that progesterone blocked cocaine-induced CPP in ovariectomized female rats. The present study expands upon these results by determining the role of progesterone in the acquisition and/or expression of cocaine CPP in intact male and female rats. For chronic progesterone treatment, rats received either progesterone (1 cm, 100% progesterone, SILASTIC capsules) or vehicle (empty capsules) 1 week prior to conditioning. For acute progesterone treatment, rats received s.c. injections of progesterone (500 ug), or vehicle, 1 hour prior to the administration of saline or cocaine (5 mg/kg in female and 20 mg/kg in males) on conditioning days (acquisition phase) or prior to testing (expression phase). In male and female intact rats, chronic progesterone replacement did not block cocaine-induced CPP. However, acute administration of progesterone during both the acquisition and expression phase of cocaine conditioning blocked cocaine-induced CPP in female, but not male, rats. These results suggest that acute progesterone treatment interferes with cocaine-induced reward associations in intact female rats. The observed sexual incongruities in progesterone's effects on cocaine CPP may help to explain current sex disparities in overall cocaine use and rates of relapse. This research was supported by RR-03037, DA-12136, 506-GM 60655, and NF 39534.

Almost half of incarcerated women smokers are nicotine-dependent

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Correctional populations smoke at rates 3-4 times higher than the general population. Nicotine dependence maintains smoking behavior and may be a marker for other drug dependence and risky behaviors. Research with prisoners has confirmed that individuals who are considered nicotine dependent are more likely to be in precontemplation stage and may not be ready for quitting smoking. The present study was designed to investigate nicotine dependence among 201 incarcerated women smokers. Participants were adult (M = 33.2 years), Caucasian (50.7%), single (48.8%) women. 69.8% had at least a high school diploma/GED. Participants completed demographic information, the FagerstrÖm Test for Nicotine Dependence (FTND), and questions about their smoking history. 47% of smokers were categorized as nicotine dependent. Overall, dependent smokers were more likely to report being Caucasian, younger at smoking initiation, having more difficulty quitting during their last quit attempt, having more family members who were regular smokers, having more personal medical problems related to their smoking, increasing their smoking since incarceration, and planning to continue to smoke after leaving prison. These results support previous findings about the characteristics of nicotine dependent individuals and suggest the need for smoking interventions that motivate incarcerated women to consider smoking cessation. This research was supported by NIDA grant K23DA15774-01.

Menstrual function during methadone maintenance

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While menstrual disruption by heroin has been demonstrated, there is little published data showing methadone maintenance's (MM) effect. We retrospectively examined data from 191 polydrug-using women enrolled in MM as part of two clinical trials, lasting 25 to 29 weeks. Participants were maintained on 70 to 100 mg of methadone per day. The start and end dates of each menstrual period were collected weekly. Participants who used hormonal therapy, became pregnant, were menopausal, or had hysterectomies were excluded. Participants were classified into the following categories: Regular, irregular, transient amenorrhea, persistent amenorrhea, or cycle restarters. The prevalence of these categories was calculated. Repeated-measures regression modeling was used to determine correlates of menstrual-cycle length, the probability of a long cycle (>40 days), and the probability of a short cycle (<20 days). Bleeding episodes (i.e., days from "start" to "stop") were defined as one or more bleeding days, bounded at each end by at least two non-bleeding days. Correlates of cycle length, body mass index, drug use, methadone dose, and race were also calculated. As expected, women in this study had a high prevalence of menstrual cycle length irregularity. 133 eligible participants were categorized: Regular 37 (27.8%); irregular 62 (46.7%); transient amenorrhea 7 (5.3%); persistent amenorrhea 11 (8.3%); cycle restarters 16 (12%). Each additional week on MM was associated with decreased risk of both long (OR=0.96, p=0.0007) and short (OR=0.92, p=0.0012) cycles. Of the 27 women who had secondary amenorrhea before entering the study, 16 (59%)

began to have periods again. Urine positivity for opioids or cocaine was not significantly associated with either short or long cycles. These findings indicate that menstrual cycle length begins to normalize as time in methadone maintenance increases. For some patients with secondary amenorrhea likely due to opiate dependence and its associated morbidity, there may be a resumption of menses. A plausible explanation for the normalization of menstrual cycle length is that methadone maintenance, despite interfering with menstrual function in an absolute sense, interferes less than illicit heroin abuse.

Inconsistencies in self-reports of substance abuse and risk behaviors
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The problem of inconsistencies between repeated self-reports of substance abuse or sexual/HIV risk behavior over time can conceptually be addressed in two different ways: first, from a psychometric perspective, inconsistencies between self-reports may be considered part of a study's error variance due to lack of clarity of the assessment instrument itself. Cognitive research has established memory aids that could be added to questionnaires to enhance autobiographical recall. For example, memory probing techniques such as context reinstatement or code-compatible retrieval could be applied to self-report questionnaires. Second, inconsistency between repeated reports of substance abuse as a dependent variable could be considered indicative of an underlying clinical or psychological construct. Accordingly, what is typically considered "noise in the data" could in fact differ depending on constructs such as gender, type of substance or personal/cultural background. For example, gender and cultural differences have been demonstrated in areas that affect self-reports, such as moral reasoning, social desirability, altruism, and helping behavior. We will discuss both concepts in light of recent research, adding recent memory research to the first and gender specific aspects to the second.

Salary-based abstinence reinforcement in the treatment of persistent cocaine use in injection drug-using methadone patients
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The Therapeutic Workplace is an employment-based treatment for drug addiction that uses salary for work to reinforce abstinence. Participants are hired and paid to work, but are required to provide drug-free urine samples to gain daily workplace access. This intervention was shown effective in promoting abstinence from heroin and cocaine in treatment-resistant mothers in methadone treatment. This ongoing study is being conducted to determine if the Therapeutic Workplace can promote cocaine abstinence in injection drug using methadone patients and to examine the role of salary-based abstinence reinforcement in promoting abstinence. Unemployed methadone patients who provided a cocaine-positive urine sample and had visible injection marks were invited to attend the workplace independent of their urinalysis results. Participants who attended and continued to provide cocaine-positive samples over 4 wks were randomly assigned to a Work Only (n = 29) or Abstinence & Work (n = 27) group. All participants could attend the workplace 4hr/day for 26 wks and could earn up to $8/hr base pay and $2/hr for work performance. Urine samples were collected every M, W and F. Work Only participants could work and earn salary independent of urinalysis results. Abstinence & Work participants could work only when their urinary benzoylecgonine concentration decreased by 20% per day; missed or positive samples temporarily reduced the base pay to $1/hr. Preliminary results show that the percentage of urine samples negative for cocaine was significantly higher in the Abstinence & Work (29%) compared to the Work Only (10%) group ($p = 0.011$; effect size $f = 0.35$). These preliminary results show that the Therapeutic Workplace can increase cocaine abstinence in injection drug users and that the abstinence contingency is critical to increasing cocaine abstinence.
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Significant association between neurobiological and cognitive responses to stress and cocaine relapse
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Stress is thought to be one of the key factors that increase the risk of relapse in drug dependent individuals. In previous research we have shown that laboratory induction of emotional distress increases cocaine

craving and neurobiological indices of stress. However, whether these measures are significant correlated with measures of cocaine relapse has not been previously studied. Fifty-four treatment seeking, cocaine dependent individuals involved in inpatient treatment also participated in laboratory sessions examining biological and cognitive responses to stress, drug cue and neutral imagery exposure. After discharge from inpatient treatment, subjects were followed for 90 days to assess subsequent drug use and relapse status. Results indicated that high stress responders in measures of cortisol, epinephrine and norepinephrine were found to relapse more quickly than low responders. Also decrements in Stroop color-word performance post-stress significantly predicted time to cocaine relapse. These findings indicate that specific neurobiological and cognitive changes in stress circuits during emotional stress are associated with an increased vulnerability to cocaine relapse. Implications of these findings for the development of pharmacological and psychosocial treatments that target stress regulation are discussed. (Supported by ROIDA1107 (RS), P50-DA16556 (RS) to Yale University and P50-DA05130 (MJK) to Rockefeller University).

Progesterone treatment in methadone-stabilized cocaine users

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We recently reported that progesterone treatment attenuated cocaine-induced high in male and female cocaine users. In this study, we tested the efficacy of progesterone as a treatment for cocaine dependence in outpatient settings. We hypothesized that progesterone treatment, in comparison to placebo, would decrease cocaine use. A total of 45 male, methadone stabilized cocaine users were randomized to receive placebo (n=15) or progesterone (n=30) during a 10 week outpatient clinical trial. Subjects were stabilized on methadone during the first two weeks. Progesterone was slowly increased to 300 mg twice daily by week 4 and maintained through week 10. The main analysis compared the 2 treatments for cocaine urine toxicology results using hierarchical linear model (HLM). Treatment retention for the progesterone group (82%) was not significantly different from the placebo (86%) group (Log Rank = 1.3; p =0.3). At the end of the trial, the weekly percentage of change from baseline of cocaine-free urine samples reached a significantly greater magnitude for the progesterone group (57%) than for placebo (16%) (HLM, Z = 2.5, p = 0.001). These results suggest that progesterone may be more effective than placebo in reducing cocaine use in methadone-stabilized male cocaine users (Supported by NIH grant P-50 DA12762).

Association study of monoamine oxidase A and catechol-O-methyltransferase polymorphisms and club drugs use in the Chinese population

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Catechol-O-methyltransferase (COMT; valÆmet) and 941T>G in the monoamine oxidase A (MAOA) gene polymorphisms have been postulated to affect the dopamine prefrontal activity, thus may play a role in the vulnerability of drug abuse. In the present study, we investigated a possible association of the COMT and MAOA polymorphisms in 263 Chinese club drug users and 181 supernormal controls as well as their association with personality traits. We hypothesized that MAOA and COMT gene variants may interact with personality traits like sensation seeking and harm avoidance, thus contributing to the behavior aspects of club drug use. Results showed club drug users have a higher frequency of the high-activity COMT variant (79.1%, p=0.007) when compared to controls (71.3%). In female club drug users, the frequency of the 941T allele of MAOA (48.1%, p=0.029) is higher than in controls (36.6%); no difference was found in the male users. Further study on the interaction between COMT variant and sensation seeking personality traits showed a significant association between COMT and the ‘boredom susceptibility’ subscale of the Zuckerman Sensation Seeking Scale and the ‘drive’ subscale of the Behavioral Inhibition System and Behavioral Activation System Scale (BIS/BAS). MAOA gene variant in the female is also associated with the ‘reward responsiveness’ subscale of the BAS. Our results indicate that individuals with COMT and MAOA gene variants are associated with sensation seeking personality traits, perhaps rendering these individuals more predisposed to their experimenting of club drugs use.

Criminality, substance use, and perceived social support among female offenders
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Background: Research indicates that female offenders, as compared to male offenders, are unique with regard to substance use initiation, maintenance, relapse, and treatment outcomes in that patterns of substance use are often linked to their relationships with others and social support (Henderson, 1998; Westermeyer, & Boedicker, 2000). While increased social support has been shown to decrease criminal involvement and substance use (Cullen, 1994; Farrell, 2000), little is known about how the intensity of criminality and substance use may subsequently influence perceptions of social support. Thus, this study will examine the relationships between criminality, substance use, and perceptions of social support in a sample of female offenders. Method: Study participants were 141 female volunteers from two drug court programs. Face-to-face interviews were completed following treatment entry. This study incorporated correlations and multivariate regression analyses to examine the relationship between substance use and criminality at baseline with perceptions of social support collected at the one-year follow-up. Results: Analyses indicate that the number of years of marijuana use ($r = -.193$, $p<.05$), years of cocaine use ($r = -.170$, $p<.05$), and readiness for treatment ($r = .203$, $p<.05$) were marginally related to perceptions of social support. There was no significant relationship between criminality and perceptions of social support. While controlling for age, the years of substance use and readiness for treatment variables were then examined in a multivariate regression model. These variables explained 11% of the overall variance in perceived social support. Years of regular marijuana use ($B = -.016$, $SE=.007$, $p=.028$) and readiness for treatment ($B = .178$, $SE = .079$, $p=.025$) were significant predictors. Implications: These findings indicate that an increased lifetime pattern of substance use may impact perceptions of social support among female offenders. By examining the potential impact of problem behaviors in this sample, treatment providers could enhance interventions by tailoring services to address gender-specific needs related to social support networks that promote behavior change among substance abusers. **This project is supported by NIDA RO1-13076, Leukefeld, PI.

Alcohol and other drug prevalence among male and female students of the São Paulo University in 2001 - São Paulo Campus
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The objective of this research is to estimate levels of drug prevalence and associated sociodemographic characteristics of undergraduate students of the São Paulo University - São Paulo campus, in 2001. A sample of 2837 students completed an anonymous and self-administered questionnaire on lifetime, last 12-month and last 30-day drug use. By comparing male and female students it was possible to conclude that male students use more the following drugs (Confidence Interval 95%): lifetime use: alcohol, inhalants, anabolic, crack, cocaine, hallucinogens, marijuana and illicit drugs in general; last 12-month use: alcohol, inhalants, cocaine, hallucinogens, marijuana and illicit drugs in general; last 30-day use: alcohol, inhalants, hallucinogens, marijuana and illicit drugs in general. The female students use more the following drugs: lifetime use: amphetamines; last 12-month use: tranquilizers and opiates; last 30-day use: tranquilizers. The prevalence shows that the drug use among São Paulo University's male students is higher than among female ones for the most part of the drugs. These differences should be due to Brazilian gender culture in which men more frequently occupy public space than women. It is in the public space that the illicit drugs are more easily found. Nowadays, in Brazilian big urban areas, it's possible to observe that the trend of these differences is getting lower. Even though, gender is an important variable to be considered in order to planning preventive and harm reduction interventions among students from São Paulo University.

Gender differences in substance use, mental health, and criminal justice involvement of adolescents at treatment entry and at 3, 6,12, and 30-month follow-up
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Many adolescents entering substance abuse treatment have co-existing mental health problems and are criminally involved. Examination of the complexities of substance use, mental health, and criminal justice

involvement along with changes in these issues following treatment is needed. This study indicates 941 males and 266 females enrolled in seven drug treatment programs located in geographically diverse areas of the United States. Comparisons between males and females at treatment entry and at 3, 6 12 and 30 months following treatment entry with regard to substance use, mental health and criminal justice involvement. Results indicate that females show significantly greater severity in substance use, problems associated with use, and mental health related variables at intake while males have significantly more days on probation/parole. With respect to change over time, the rate of change in mental health and days on probation/parole differed between the sexes. Results indicate that while rate of change is different for males and females on most variables, there is a positive change following treatment for both groups with regard to substance use, mental health, and probation/parole status. The high severity levels of female at intake calls for gender specific outreach and identification along with gender specific treatments.

Who is becoming dependent on hallucinogens shortly after initiation of use

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This study aims to present new estimates for the risk of developing a hallucinogen dependence syndrome within 24 months after first use of any hallucinogen. Subgroup variations in risk of becoming hallucinogen dependent among this group also are explored. Study estimates are based on data from the National Household Surveys on Drug Abuse conducted during 2000-2001, with representative samples of non-institutionalized United States residents ages 12 and older (n = 114,241). A total of 2,035 respondents were found to have used hallucinogens for the first time within 24 months prior to assessment. An estimated 2% of these recent-onset hallucinogen users were found to have become dependent on hallucinogens. Individuals who had achieved a high school degree as their highest level of education were at greater risk for developing dependence on hallucinogens as compared to individuals without a high school degree. Respondents whose first use of hallucinogens occurred in their young adult years (age 21-25) were less likely to experience hallucinogen dependence as compared to individuals who started using hallucinogens at a younger age ($p<0.01$). These associations were found even with statistical control for age at first use, sex, and race/ethnicity, income, and other drug use prior to beginning hallucinogen use. The evidence from this study provides a starting point for understanding the epidemiology of hallucinogen use and dependence, with a focus on recent-onset users. Supported by NIDA awards: F31DA016820 and K05DA015799

Gender differences, overt and relational victimization, and urban adolescent drug use

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Peer victimization is a common experience for youth and is associated with a range of adjustment problems. Recent research on peer victimization has focused on identifying and studying victims of relational aggression. Relational victimization is a unique construct in that it encompasses behaviors specifically designed to inflict harm by damaging or manipulating the victim's relationship with other peers. The present study tested associations of overt and relational victimization with drug use in a sample of 276 (57% female) predominantly African American eighth graders. Measures were administered at school. Hierarchical regression analyses were used to identify the direct effects of victimization, as well as interactions with gender, on drug use frequency. Frequency of specific drug use in the past 30 days was the criterion variable. Overt and relational victimization both were significantly related to cigarette, beer/wine, liquor, and advanced alcohol use. Further, relational victimization predicted marijuana use ($R2$ inc = .02 to .05, $p < .01$). There were significant victimization X gender interactions. For males, increases in the level of overt victimization was related to higher frequency of all types of alcohol use, however for females there was no association. For females, increases in relational victimization was related to more tobacco and marijuana use, however for males there was no association. These data point to the importance of attending to differences in how males and females use drugs to cope with stress.

Individual and neighborhood-level predictors of drug use in low-income women
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This study assessed risk factors of drug use at both individual and neighborhood levels in a sample of low-income women aged 18 to 31 in southeast Texas, December 2000 to May 2003. Neighborhood-level indicators were obtained by using geocoding methods to link individual-level survey data with 2000 United States census tract data. Census-tract indicators included neighborhood socioeconomic status (% less than high school education, unemployment, and poverty in tracts), migration (% foreign-born in tracts), and demographics (% female, non-Hispanic White, and unmarried in tracts). Individual-level measures from the survey included age, race/ethnicity, education, and marital status. Multivariate logistic models were used to explore the association between individual-level and tract-level measures and individual-level drug use outcomes (no drug use, exclusive marijuana use, other illicit drug use). After controlling for both tract- and individual-level measures, compared to non-drug users, older women were less likely to use marijuana (OR=0.92, 95%CI=0.86-0.99). Those who were currently married (vs. those divorced/separated) and who were Hispanic (vs. White) were less likely to use either marijuana (OR=0.26, 95%CI=0.12-0.57; OR=0.25, 95%CI=0.11-0.58, respectively) or other illicit drugs (OR=0.29, 95%CI=0.13-0.67; OR=0.17, 95%CI=0.08-0.37 respectively). Those who were White (vs. Black) (OR=0.10, 95%CI=0.05-0,22), who had a lower level of education (OR=0.88, 95%CI=0.78, 0.99), and who lived in less socioeconomically disadvantaged neighborhood (OR=0.35, 95%CI=0.13-0.94) were more likely to engage in other illicit drug use. In conclusion, compared to nonusers, marijuana users were different at the individual level; however, other illicit drug users can be differentiated at both the individual and census-tract (neighborhood) level. These results may imply that interventions to reduce marijuana use might be more effective if focused on individuals while intervention strategies to reduce other major illicit drug use may need to incorporate both neighborhood and individual factors simultaneously.

Gender differences in HIV risk among Caribbean drug users
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Rates of AIDS in the Caribbean Basin are second only to those in Sub-Saharan Africa. In the U.S. Virgin Islands, rates of infection with HIV are also high, and are increasing especially fast among women. Although AIDS outreach and community awareness programs have been initiated, systematic HIV/AIDS prevention research has never been conducted in the U.S. Virgin Islands heretofore. This paper presents the first available data on the intersections of drug use, sexual behavior and HIV risk among 254 drug and alcohol involved women and men in St. Croix, U.S.V.I. Using targeted sampling, alcohol and drug users were recruited through street outreach into an HIV research study. Interviews used standard instrumentation, and focused on current drug-related and sexual risk for HIV, treatment history, and health status. The respondents reported a mean age of 38.5 years, and were 48% male and 52% female. The primary drugs used in the past month were alcohol (85.8%), marijuana (61.1%), and crack-cocaine (57.1%). Only 9.4% reported any history of injection drug use. In terms of sexual behavior, respondents reported a mean of 4.0 sexual partners in the past month, a mean of 58.6 lifetime partners, and significant proportions reported histories of trading sex for money (40.9%) or for drugs (31.1%). Analyses of gender differences indicate that Crucian women report significantly more involvement with crack cocaine than men (p=.000), more involvement in sex trading (p=.000), as well as more occasions of unprotected vaginal sex in the past month (p=.000), and lower AIDS knowledge (p=.035). Focus group data also indicate that drug-using women in St. Croix are often victims of physical and sexual violence. These data will be used to develop targeted, culturally-appropriate HIV interventions for drug-involved women and men in the U.S. Virgin Islands.

Influence of rodent strain and gonadal hormones on nociception and opioid antinociception in female rats
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A number of studies suggest that in female rats, gonadal hormones can influence both nociception and

opioid antinociception. These effects are generally small in magnitude and may depend on the type of nociceptive assay, the time of day testing occurs, and the rat strain employed. The present study examined the influence of estrous cycle phase and gonadectomy on levels of nociception and opioid (morphine and buprenorphine) antinociception in the rat warm-water tail-withdrawal procedure in female rats of the F344, Lewis, Long Evans, and Wistar strains. In normally cycling intact females of all strains, nociceptive latencies were highest in the metestrous phase and lowest in the estrous phase. Depletion of gonadal hormones following gonadectomies also increased nociceptive latencies relative to intact females. In tests of antinociception, morphine and buprenorphine were most potent during metestrous and least potent during the estrous phase in the Lewis, Long Evans and Wistar strains. In the F344 strain morphine was most potent in proestrous and least potent in diestrous, and buprenorphine was most potent in proestrous and least potent in metestrous. In all four strains, however, the magnitude of this effect was relatively small and in most cases failed to reach statistical significance. In each of the strains, gonadectomy significantly increased the potency of morphine and buprenorphine antinociception relative to intact females. These data suggest that the estrous cycle can modulate thermal nociception, and that this effect is consistent across four commonly used rat strains. In contrast, the influence of the estrous cycle on opioid antinociception is relatively small but can vary across rodent strains. (Supported by grants DA10277, DA07244, and DA17404).

Response to cocaine after methylphenidate pre-treatment: Gender and age effects in locomotion and stereotyped behaviors

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Expression of behavioral sensitization to psychostimulants depends on the age and gender of the animal. Adolescent rats are generally less sensitive to psychostimulants than preweaning or adult animals and females are usually more sensitive than males. We wanted to determine whether the neurochemical changes induced by repeated methylphenidate (MPD) administration at different developmental ages would persist to adulthood. We gave 5 daily i.p. injections of two doses of MPD (10 mg/kg and 20 mg/kg) or saline beginning on postnatal days (PND) 21, 45 or 60. When the groups reached PND 90 all rats were given a challenge injection of 10 mg/kg cocaine i.p. and immediately placed in a Plexiglas box equipped with activity monitor to record locomotor activity for 1 hr. Rats were also videotaped for later analysis of time-spent in 3 different intensities of stereotyped behavior. Results show that previous exposure to MPD produced a significant gender by age of MPD treatment interaction in the locomotion patterns during cocaine challenge. Briefly, female rats that received MPD beginning at PND 21 and 60 had significantly higher locomotion than males in the same age groups, but this difference was not observed when MPD was given at age 45. For stereotyped behaviors the cocaine challenge produced a MPD dose by gender effect in low and medium intensity stereotypies. In general MPD pre-treatment produced a shift in the behavior for the females towards more medium stereotypies than the males at all ages. In conclusion, MPD pretreatment produces gender specific effects especially in stereotyped behaviors in response to cocaine with females significantly more sensitive than males regardless of the age of MPD exposure. Supported by: APA-DNP to ATR and DA10990 to DDE.

Sex work by pregnant, drug-dependent women

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Introduction: An alarming number of pregnant, drug-dependent women exchange sex for money or drugs as a means of supporting their drug use. The specific characteristics and needs of this population deserves further study. Methods: Methadone treated patients at the Center for Addiction and Pregnancy (CAP) participating in a behavioral study (N=122) were categorized into 2 groups: those reporting current sex work (SW: n= 42), and those reporting no current sex work (NSW: n=80). Groups were compared on sexual risk behaviors, communicable diseases, drug/alcohol use and abuse histories using the Risk Assessment Battery (RAB) and the Addiction Severity Index (ASI). Results: The groups were similar on age, race and marital status. However, the SW group had less education and employment than the NSW group. The SW group reported greater fear of HIV exposure but had similar rates of condom use and HIV testing as the NSW group. The rate of condom use was equally low for both groups, with 47% of the

participants reporting no condom use in the past month. Rates of Hepatitis B and HIV were similar between groups; however, the SW group had a significantly higher rate of Hepatitis C than the NSW group (49% vs. 28%). The SW group reported higher rates of speed-balling and were more likely than the NSW group to smoke cocaine, to drink alcohol, to take painkillers and to share needles in the past month ($p<.05$). The SW group had a higher ASI drug composite score, longer histories of heroin and cocaine use, and used more cocaine than the NSW group. The SW group had higher medical composite scores, and were more likely to have been physically abused than the NSW group ($p<.05$). Conclusion: Drug dependent women who engage in sex work need more intensive treatment with emphasis on safe sex practices, STD testing, and vocational assistance. Rates of sexually transmitted diseases for each group will be presented in June. Supported by RO1 DA12403

The pharmacokinetics of intravenously administered methamphetamine enantiomers in humans
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Methamphetamine, the abuse of which is an international concern, has a chiral structure. The present study assessed the pharmacokinetics of methamphetamine optical enantiomers in humans. In a randomized, double-blind, six-period crossover study, 12 nondependent methamphetamine-experienced subjects received intravenous doses of methamphetamine (0.25 mg/kg d- or l-, 0.5 mg/kg d-, l- or racemic (1:1) methamphetamine and placebo). The AUC for d-methamphetamine was 30% smaller than that for l-methamphetamine after administration of the racemic form ($P<0.01$). However, AUCs were similar between d- and l-methamphetamine when given on separate occasions at both doses (0.25 and 0.5 mg/kg). AUC ratios for d-methamphetamine/l-methamphetamine were 0.910 (90% CI; 0.837-0.984) for the 0.25 mg/kg dose, 0.894 (0.821-0.967) for the 0.5 mg/kg dose, and 0.679 (0.623-0.736) for the racemic dose. Both AUC and Cmax for 0.5 mg/kg of methamphetamine were twofold greater compared to that for the 0.25 mg/kg dose for both enantiomers. The elimination half-lives were slightly longer for l-methamphetamine than d-methamphetamine. The t1/2 for d- and l-methamphetamine was 10.2 and 13.5 h for the 0.25 mg/kg dose; 10.3 and 13.3 h for the 0.5 mg/kg dose; 10.7 and 15.0 h for the racemic dose, respectively. Vd was similar for both formulations. AUC ratios for amphetamine/methamphetamine were significantly higher for the d-enantiomer (16-17%) than the l-enantiomer (3-4%). Methamphetamine was well tolerated for both isomers at both doses. Our data suggest d- and l-methamphetamine are exposure bioequivalent in terms of AUC when given separately, with linear pharmacokinetics between the 0.25 and 0.5 mg/kg doses. However, d-methamphetamine shows slightly greater clearance than l-methamphetamine when given as a racemic form. Supported by NIDA grant DA12521.

Gender differences in cue reactivity among nicotine-dependent individuals
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Background: Previous studies indicate there may be gender differences in cue-reactivity to in vivo smoking cues and stress/negative affect cues among nicotine dependent smokers. This preliminary report of an on-going study examined gender differences in cue reactivity among nicotine dependent smokers. It was predicted that males, relative to females, would experience greater reactivity and craving during in vivo smoking cues and females would exhibit greater reactivity and craving to negative affect cues. Methods: Eight subjects (3 females) completed four testing sessions. During the laboratory protocol, subjects were exposed to smoking cues (i.e. cigarettes) and neutral cues (i.e. pencils). They also listened to personalized stress and relaxation scripts. Heart rate (HR) and skin conductance response (SCR) were measured continuously for 90 seconds prior to and during each cue/script presentation. Pre- and post- measures of craving were collected as well. Results: Repeated-measure ANOVAs indicated that females had lower HR reactivity relative to males in response to the in vivo smoking cue, $F(1,6) = 6.37$, $p < .05$, but not the neutral cue. No gender differences in craving were noted. Women also evidenced lower levels of HR reactivity and greater craving to scripts, regardless of their content, F's $(1,6) = 7.16$ and 14.27, p's $< .05$, respectively. Conclusion: Although not entirely consistent with expectation, these preliminary results are suggestive of gender differences in smoking- and negative affect cue reactivity. It is noteworthy that these gender differences were present in this relatively small sample. Implications for further studies will be discussed.

High interest in smoking cessation treatments among incarcerated females
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Smoking among the incarcerated population is prevalent (70-80%) and little attention has focused on implementing smoking cessation programs with this group. One previous study indicated that women in prison expressed interest and motivation to quit smoking at rates similar to the general population. In particular, heavy smokers reported more interest in smoking cessation than moderate or light smokers. The present study was part of a larger investigation of smoking behavior that examined smoking cessation treatment interest with 283 incarcerated women. Participants completed questions that assessed their interest, level of motivation and self-efficacy related to smoking cessation. The sample was comprised of adult (M= 34.80 yrs.), Caucasian (47.7%), never been married (48.4%), incarcerated women with at least a high school or GED education (73.2%). 71.8% of the women identified themselves as current smokers, 11.1% as ex-smokers, and 17.1% as non-smokers. Overall, 86.1% of participants reported they would participate in a program to help them quit smoking, with Caucasian females expressing significantly less interest (81.4%) than non-Caucasian females (92.3%; $p<.05$). Caucasians and heavier smokers were significantly less interested, motivated, and confident in quitting smoking compared to lighter smokers and non-Caucasian groups. These results supported the previous study that found high interest in quitting smoking among women prisoners. However, in this sample lighter and non-Caucasian smokers were the most interested in smoking cessation programs. Interventions to help women quit smoking and programs that motivate heavier smokers to enter treatment are needed in prisons. This research was supported by NIDA grant K23DA15774-01.

Factors associated with lifetime history of drug abuse treatment among drug-dependent, pregnant women
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Although factors related to treatment completion and retention have often been investigated, factors related to history of treatment cmpared to no treatment history, particularly in women, are relatively understudied. A secondary analysis was completed examining factors associated with past history of substance abuse treatment among drug-dependent pregnant women. This investigation was a randomized clinical trial concerning strategies designed to motivate drug dependent pregnant women who enrolled in prenatal care to also enroll in drug treatment services. The setting was a prenatal clinic within an urban academic medical center. The intervention tested was case management and support groups compared to women receiving standard care. All participants received a baseline Addiction Severity Index (ASI) score on study entry. This study used the "women's" version that includes problems associated with personal safety considered particularly relevant for women. A backward stepwise multiple logistic regression analysis was employed to evaluate the independent contribution of factors associated with history of ever being in drug abuse treatment compared to women who had no history of being in treatment. Of the 153 predominantly African-American women used for this analysis, 47.4% had a lifetime history of at least one episodef drug treatment. Five variables had significant independent associations with treatment: number of days craving drugs, frequency of cocaine use, ASI alcohol composite score, perceived seriousness of legal problems, number of pregnancies, and history of physical abuse. While some measures of drug severity were related, psychiatric variables which are often presumed to be related to treatment were not. Frequency of pregnancy was also related to drug treatment, a finding not previously reported in the literature. Although number of children is frequently assessed, number of times pregnant may be a more sensitive measure.

The association of personality traits with club drug use in Chinese youth
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Club drug use amongst Chinese adolescents has become increasingly popular in recent years. It has been shown that an association exists between certain personality traits and the potential for developing substance abuse. The present study aimed to determine the relationship of sensation seeking and harm

avoidance personality traits with club drug use. 329 young Chinese young club drug users and 185 supernormal controls of a similar age group and socio-economic background were studied. All subjects completed the Chinese version of the Sensation Seeking Scale Form V (SSS-V; M. Zuckerman, 1994) and the Behavioral Inhibition System and Behavioral Activation System Scale (BIS/BAS; Carver and White, 1994). Our result showed that all 4 subscales of SSS, namely 'boredom susceptibility', 'disinhibition', 'experience seeking' and 'thrill and adventure seeking' showed a significant difference (P<0.001) between subjects and controls. In particular, there is a marked difference in the mean score for 'disinhibition' (6.48°"0.11 in subjects vs 2.28°"0.15 in controls) with also a significant difference between males and females (P<0.001). In the BIS/BAS assessment, a significant difference in BAS 'fun seeking' and 'drive' (P<0.001) was observed between subjects and controls. For BIS, a lower mean score (19.08°"0.18 in subjects vs 20.58°"0.24 in controls; P < 0.001) was observed, with males having a lower mean score than females (P=0.038). These findings showed that amongst the Chinese youth, particular males, those with higher sensation seeking and lower harm avoidance traits may be more predisposed to club drug use

In utero marijuana exposure effects on the mRNA expression of striatal opioid neuropeptides, prodynorphin and proenkephalin, in the human fetal brain

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Marijuana (Cannabis sativa) is the illicit drug most used by pregnant women and in utero cannabis exposure has been negatively associated with behavior and cognitive function in their offspring. A close interaction has been demonstrated between the cannabinoid and opioid systems in brain regions such as the striatum. The purpose of the present study was to evaluate the effects of prenatal cannabis exposure on mRNA expression of the opioid peptide genes, prodynorphin (PDYN) and proenkephalin (PENK), in the striatum of the human fetus. Human fetal samples (n = 42; 18-22 weeks of development) were studied using in situ hybridization histochemistry. Maternal cannabis use was estimated by mother's self-report in combination with maternal urine and fetal meconium toxicology. General linear modeling was employed for statistical analyses to control for confounding variables. The results revealed no significant alternation of the PDYN mRNA expression in association with in utero cannabis exposure. In contrast, the PENK mRNA expression was significantly reduced in the patch (limbic-related) and matrix (sensorimotor-related) striatal compartments in the cannabis-exposed subjects (30% vs. controls; p = 0.02) and the reduction correlated significantly with the amount (joint/day) of maternal cannabis use (p = 0.03). In utero exposure to other substances, e.g., alcohol and cigarette, was not found to influence the PDYN and PENK mRNA levels in the striatum. Studies are currently underway to assess opioid receptor gene expression in the fetal samples. Altogether, the findings to date indicate specific neural impairments of the PENK mRNA expression in associated with cannabis exposure in the human fetus that may influence limbic and sensorimotor functions.

Male, but not female, tobacco smokers more likely to be depressed, in a sample of African-American college seniors

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Introduction: Studies have shown a positive association between cigarette smoking and depression among youth and adults (Murphy et al., 2003; Martini et al., 2002; Kelder et al., 2001; Escobedo et al., 1998). Unfortunately only a few studies have examined depression with a focus on possible variation among African Americans in the tobacco-depression relationship by gender. Methods: This study uses data from 403 young adults (primarily African-American) who graduated in the spring of 2003 from a Historically Black University located in the Mid-Atlantic region. A self-administered paper-and-pencil survey was conducted as seniors waited in a student union room to receive their graduation regalia. The survey took approximately 30 to 45 minutes to complete. Upon completion of the questionnaire, each participant received a $10.00 incentive. Tobacco use measures included lifetime and past month involvement, as well as the Fagerstrom Test for Nicotine Dependence; depression symptoms were assessed using a revised version of the CES-D. Logistic regression models were used in the data analysis. Results: Male smokers

were estimated to be three times more likely to have depressive symptoms than male non-smokers (OR=3.23; 95%CI, 1.40, 7.42; p<0.007). However, female smokers did not have significantly more depressive symptoms than female non-smokers (OR=1.24; 95%CI, 0.69, 2.23; p>0.46) Comment: This study observed an association between cigarette use and depression among males, but not females. This surprising finding needs replication and further discussion. It is possible that tobacco interventions should need different strategies for males and females in HBCUs. Acknowledgements: National Institute on Drug Abuse grants DA12390; U.S. National Center for Minority Health and Health Disparities grant MD002217-01.

Changes in perceived employment barriers for women and men as a function of drug use
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Employment has been described as important for drug treatment retention and preventing relapse (Platt, 1995); however, some groups of drug abusers may have more difficulty than others in obtaining employment or advancing in their occupational status. For example, little is known about the types of employment barriers that burden drug-abusing criminal offenders as they attempt to integrate into the mainstream workforce, and many questions remain about how employment barriers for women differ from those of men. Furthermore, minimal research has examined how employment barriers change over time for drug abusers and how drug use may affect these changes. This study examined the roles gender and drug use play in the changes in perceived barriers to employment over a one year period. As part of the NIDA-funded drug court study (DA #13076), 158 women and 300 men completed both a baseline and a 12-month follow-up interview. Five different employment barriers were assessed by the Barriers to Employment Success Inventory. Approximately half of participants reported using drugs in the past year, and were categorized into "drug-using" and "non drug-using" groups for analysis. A series of repeated measures ANOVAs found that (1) perceived employment barriers significantly decreased from baseline to follow-up; (2) women reported higher levels of personal/financial barriers and emotional/physical barriers; (3) non drug-using women experienced large decreases in career decision-making and planning barriers across time; and (4) those who used drugs during the 12-month period reported higher levels of three types of employment barriers and smaller decreases in these barriers over time. The results of this study help fill a void in the drug abuse and employment literature and suggest that employment interventions for drug abusers should be tailored differently for men and women, focusing on the types of barriers that seem most problematic for each group. Future research should attempt to further explore why drug use affects the perception of employment barriers.

Predicting residential placement, relapse and recidivism among adolescents with the GAIN
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The Global Appraisal of Individual Needs (GAIN) is rapidly becoming one of the most common assessment tools used in adolescent substance abuse treatment research. This paper uses data from on 2072 adolescents recruited from 14 sites around the U.S. and interviewed quarterly for 12 months (98% 1 plus interview; 92% at 12 months) to predict placement, relapse and recidivism. The participants were 23% female, 52% ages 15-16, 17% African American and 15% Hispanic. In terms of substance use, 70% met criteria for lifetime dependence, 70% also reported weekly drug use, 87% reported their age of first use was under 15 years of age, and 44% entered residential treatment. In addition to substance use, 88% reported committing other illegal activities in the past year (59% violent crimes), 80% had a history of arrest, and 72% were currently on probation or parole. Using scales from the GAIN, adolescents were classified into low, moderate or high substance use severity and low, moderate, or high crime and violence severity. Relative to low substance use severity, those with moderate or high substance use severity were much more likely to be placed into residential treatment (odds ratio [OR]=3.8 and 16.8 respectively) and be using at 12 months (OR=3.8 and 3.4). Relative to low crime and violence severity, those with moderate or high severity crime and violence severity were more likely to rearrested (OR=1.5 and 1.9). This suggests that the GAIN is useful tool for adolescent placement and risk assessment. (Supported by NIDA R01 DA11323).

Sensitization to the abused inhalant toluene in adolescent rats
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Inhalant abuse is most prevalent among young adolescents; yet, most of the preclinical research on the effects of inhalants has been done in adult animals. The purpose of this study was to examine the effects of the abused inhalant toluene in adolescent rats and to determine whether exposure to toluene during adolescence would alter later consumption of ethanol (EtOH). Pairs of male and female Long-Evans rat pups from different litters were exposed to 4000 ppm toluene or to air for 20 min daily for 10 days on postnatal days (PN) 28-32 and 35-40 and locomotor activity was measured. On PN 52-67, rats were allowed nightly access in a single bottle paradigm to water or to increasing concentrations of EtOH. During the first week of exposure, activity was also approximately equal across exposure group for each sex. During the second week, however, activity was increased in the toluene exposure groups (compared to respective activities during week one), but not in either air exposure group. The magnitude of locomotor stimulation was greater in females than in males. In the EtOH drinking paradigm, amounts of fluid intake and EtOH consumed did not differ across exposure group for either sex. In adult rodents, toluene produces a biphasic concentration-response curve. In the adolescent rats here, 4000 ppm toluene did not alter activity during the first week of exposure; however, stimulation was observed during the second week. Sensitization to toluene's effects has been previously observed in adult rodents, but not in adolescent rodents. At least two possible explanations may account for these results: (1) sensitivity to toluene's locomotor stimulating effects does not develop until PN35 and/or (2) sensitization to these effects occurred after 5 days of exposure. A follow-up study supported the first explanation for male rats; however, for female rats, the second explanation was supported. The results of the EtOH consumption experiment suggest that the modest regimen of toluene exposure during adolescence was not sufficient to induce changes in later EtOH consumption. Research supported by NIDA grant DA-03112.

Motives for smoking and drinking: Country and gender differences in samples of Hungarian and US high-school students
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This research examined predictions about how motives for substance use in adolescents are shaped by cultural context. Data were from samples of high school students in Hungary (N=602) and the United States (N=1,225). Rates of cigarette smoking were higher in Hungary, chi-square = 34.94, $p < .01$ compared with the U.S, chi-square =7.73, ns., while rates of alcohol were comparable. Adolescents in Hungary tended to report higher levels of coping motives particularly for cigarette smoking, and higher levels of social motives for alcohol use. Boys showed higher rates of smoking in Hungary and higher rates of alcohol in both countries. For smoking, social motives ($p<.0001$) were predictive only in Hungary, while boredom relief and affect regulation motives were predictive in both countries. For alcohol use, the only dimension predictive for girls' and boys' drinking in Hungary was social motives. In the U.S. all motive dimensions were predictive for girls' drinking while social motives were primarily predictive for boys' drinking. Analyses showed that gender differences in alcohol use were mediated through motives for use, and this was true for both countries; however, the mediational process differs across countries. The discussion considers how gender differences are based in a cultural context in which particular motives are salient. This research was supported by NIDA grant DA-12623-S1

Distress tolerance and borderline symptom severity in female inner-city drug users
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Elevated symptoms of Borderline Personality Disorder (BPD) are common among individuals with substance use problems. As BPD symptoms including impulsivity, interpersonal sensitivity, aggression, and self-harm can greatly interfere with drug and alcohol treatment, it is necessary to conduct research aimed at better understanding BPD symptoms in substance users. Researchers have suggested that distress

tolerance (DT), defined as an inability to tolerate psychologically stressful situations and stimuli, may be a critical feature of BPD; However, the relationship between BPD and low DT has yet to be established empirically. Thus, the purpose of the present study was to provide an analogue examination of the relationship between DT and BPD symptom severity. Forty inner-city females receiving inpatient drug and alcohol treatment completed the Borderline Symptom List (BSL) and a task intended to produce high levels of psychological stress/negative affect, with latency to terminate the task used to index DT. As expected, there was a significant negative relationship between DT and total BSL score ($r = -.35$, $p = .03$), supporting the intuitive link between BPD and low levels of psychological DT. As low DT may serve as a risk-factor for drug and alcohol use treatment failure, the relationship between BPD symptoms and low DT may be especially relevant for those in substance use treatment.

Females have less physiological dependence to alcohol than men

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A few studies have shown that patterns of alcohol use disorder symptoms and particular consequences such as withdrawal and having a hangover vary by gender. The NIDA-funded EachOneTeachOne HIV prevention intervention study provided an opportunity to study how physiological dependence varied by gender among 921 drinkers who were out-of treatment street recruited drug users. Sixty one percent of the sample was male and 39% female; the sample was 90% African-American and 10% Caucasian. Four groups were created: those who endorsed tolerance only (n=177), withdrawal only (n=81), both (n=187) and neither (n=476). Tolerance and withdrawal alone did not vary significantly by gender: 21 % of men and 17% of the women endorsed tolerance, and 9% of men and 8% of women endorsed withdrawal. Endorsing both or neither varied significantly by gender, with 24% of the men and 14% of the women endorsing both, and 46% of the men and 61% of the women endorsing neither. Multinomial logistic regression comparing neither, tolerance or withdrawal alone and both was conducted, controlling for patterns of alcohol use such as binging. The model also included age started drinking, opiate and cocaine use. Gender difference in physiological dependence will be explored for their impact on both prevention and treatment of alcohol use disorders in women. Research funding from NIDA (501-DA08324, L.B. Cottler, PI) and NIMH training grant (5T32-MH17104, L.B.Cottler, Director

Profiling problem behaviors among young, female ecstasy users of low income

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This study profiles different clusters of risk factors among young, low income ecstasy users compared to those who ever exclusively used marijuana or other major illicit drugs. A total of 696 patients aged 18 to 31 years who sought care at university family planning clinics in southeast Texas were recruited between December 2001, and May 2003. Survey information included participants' demographics, eight problem behavior syndromes (e.g. aggressive, delinquent, intrusive) and five adaptive functioning scales (e.g. friends, family, spouse, job, and education) using Young Adult Self Report. Among all Ecstasy users (n=106), 47% reported using it within the last 12 months, 64% reported ever using marijuana and 45% ever using any other major drugs including cocaine, heroin, LSD, PCP, etc. After controlling for demographics, compared to nonusers, ecstasy users were more likely to exhibit almost all problem behavioral syndromes except withdrawn syndromes; for example, they were more anxious/depressed (OR=1.06, CI=1.02, 1.10), more intrusive (OR=1.21, CI=1.08, 1.38), more aggressive (OR=1.11, CI=1.03, 1.20), and more delinquent (OR=1.33, CI =1.16, 1.53). Overall, they also reported more total problems (OR=1.02, CI=1.01, 1.03) and were more likely to internalize and externalize their problems. Compared to exclusive marijuana users, ecstasy users reported significantly more thought problems (OR=1.36, CI=1.03, 1.80), delinquent behaviors (OR=1.33, CI=1.16, 1.53), and to externalize their problems in life. Compared to those who used other major illicit drugs, ecstasy users were not significant different in their behaviors. Further, ecstasy users did not significantly differ with regard to adaptive functioning compared to the other three groups. In conclusion, our findings demonstrated that ecstasy users, similar to other major illicit drug users, appear to have a larger cluster of problem behaviors than those who have never used any illicit drugs, but they have only slightly more behavioral problems than exclusive marijuana users.

Self-reported pain and nicotine use within a community sample

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This study examined the relationships among nicotine use, self-reported pain, and physical functioning within a community sample of problem- and non-problem drinkers. While prior studies have demonstrated the association between nicotine use and pain within clinical populations, this trend has not been widely examined within the community. For a study of health services use, a subsample of participants in the St. Louis Epidemiologic Catchment Area (ECA) Study was selected based on their alcohol use status at two ECA interviews from 1981-1983: Stable Alcoholics (SA) and two comparison groups who were frequency matched to the SA group, Problem/Heavy Drinkers (HD) and the Unaffected group (U). About 60% of each group were reinterviewed by telephone between 1997-1999 (n = 444; SA: 149 (34%); HD: 155 (35%) and U: 140 (31%)) to obtain their use of health services in the prior six months, as well as to update their status on psychiatric variables as measured by the DIS, current smoking and drinking habits, and quality of life as reported on the SF-36. 29% of the sample reported moderate to very severe pain during the past month according to the SF-36 pain subscale. 443 participants with complete data were subjected to a hierarchical regression analysis with self-reported pain as the outcome variable and alcohol use group, smoking status, and SF-36 quality of physical functioning serving as predictors. Continuous variables were subjected to a log transformation due to negative skew. The total model R-square was .329. Significant associations were found between classification in the Alcoholic group and greater pain compared to the Unaffected Group ($p = .04$) and between female gender and increased pain ($p = .04$). Smoking status showed no significant relationship to the level of self-reported pain. Decreasing scores on SF-36 physical functioning served as the best predictor of pain ($p = .0001$). These results suggest that while pain shows strong positive relationships to impaired physical activity and female gender, its relationship to smoking status is unclear within samples drawn from the community.

Substance abuse and mental health issues among abused women

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Although there is extensive empirical evidence of the co-occurrence of alcohol/drug abuse and mental health problems among male perpetrators of domestic violence, such comorbidity among abused women is rarely studied. This study examines the presence of the comorbidity of substance abuse with PTSD and/or depression, and the association between domestic violence severity and this comorbidity. A sample of 50 female domestic violence survivors was obtained from a legal advocacy program located in the Mid-West. In this cross-sectional descriptive study, several modules from the Diagnostic Interview Schedule were administrated during a face-to-face interview to assess for the prevalence of lifetime depression, PTSD, alcohol abuse, and drug abuse. In addition, severity of domestic violence experiences was assessed with the Composite Abuse Scale. The findings revealed that 74% of the sample met criteria for lifetime depression, 46% for lifetime PTSD, and 34% for lifetime alcohol/drug abuse. In terms of comorbidity, 28% of the sample reported lifetime depression or PTSD comorbid with alcohol/drug abuse. Bivariate analyses showed that alcohol or drug abusing battered women, who had comorbid depression or PTSD, had significantly more emotional and physical abuse in their domestic violence experiences than those who did not have such comorbidity. These findings suggest that comorbidity should be assessed for and incorporated into intervention and prevention plans for abused women.

Structural brain correlates of age of first alcohol and cannabis use: A magnetic resonance imaging study in healthy males

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Adolescence is a period during which dynamic changes and maturational processes occur within the brain. Whilst the majority of adolescents experiment with alcohol/drugs, this is usually brief/recreational. However, the true extent of the factors associated with substance use, even for brief periods, is still unclear.

We used MRI to measure hippocampal, amygdala and whole brain volumes in 22 healthy males (M age 23.3; SD 6.7; Range 16-41 years old) with a history of both alcohol and cannabis use but no personal or family history of psychiatric/substance-use disorder. Volumetric brain measures were computed using manual tracing and automated techniques. Three separate linear regression analyses with hippocampal, amygdala and whole brain volumes as the dependent variables and age and intra-cranial volume as covariates were performed. Findings revealed that, even within 'recreational' users, earlier age of cannabis and alcohol use were independently predictive of larger amygdala and smaller hippocampal volumes. The findings may have implications for the maturation of brain and cognitive systems and the development of future psychopathology. However, the relationship between drug and alcohol use and structural brain change is complex, poorly understood and needs further research. For example, it unclear whether early use of cannabis leads to larger amygdala and smaller hippocampal volumes or that larger amygdala and smaller hippocampal volumes leads to an earlier age of drug and alcohol use.

Ethanol preference in rats after variations in maternal separation

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Variations in neonatal care are known to alter behaviors of rats as adults. Accordingly, we tested ethanol intake of adult male rats that had undergone variations inneonatal treatment. Five groups of animals were subjected to different conditions of daily maternal separation/treatment from days PND2 to PND14. The different groups and conditions can be described as follows: maternally separated for 0 time (MS0), maternally separated for 15 min (MS15), maternally separated for 180 min (MS180), not touched and not handled (NH), and routine care according to standard animal care failities procedrues (AFR). Ethanol intake was measured over five days using a standard two bottle choice (8% ethanol in 2% sucrose vs 2% sucrose alone) with continuous 24 hour access. The groups were then subjected to sevaeral stressors over five days and ethanol intake was tested again. Before stress, the NH group had the greatest ethanol intake. Also, the MS 15 group had less ethanol intake than the MS180 group, and the MS15 had about the same intake as the AFRs. After stress, all groups exhibited about the same intake of ethanol. In summary, neonatal handling conditions can significantly affect ethanol intake as adults. Touching and/or handling in general reduced ethanol intake, and the amount of maternal separation also influenced ethanol intake.
Supported by RR00165, DA00418.

NIDA NATIONAL INSTITUTE ON DRUG ABUSE

WOMEN'S HEALTH AND GENDER DIFFERENCES

Women and Gender Differences Program Announcements

- PA-03-139: WOMEN, GENDER DIFFERENCES AND DRUG ABUSE
  Release date: June 16, 2003
  Expiration Date: June 30, 2006, unless reissued

  - Invites women and gender differences research, both human and animal, in all areas of drug abuse
  - Award mechanisms:
    - Research Project Grant (R01)
    - Small Grant (R03)
    - Exploratory/Developmental Grant (R21)
  - See full text at http://grants1.nih.gov/grants/guide/pa-files/PA-03-139.html

- PA-02-055: DRUG ABUSE DISSERTATION RESEARCH: EPIDEMIOLOGY, PREVENTION, TREATMENT, SERVICES, AND WOMEN AND GENDER DIFFERENCES
  Release Date: February 5, 2002
  Expiration Date: February 1, 2005, unless reissued

  - Provides support for dissertations on women and gender differences research, both human and animal, in all areas of drug abuseProvides up to 2 years of support
  - Provides up to $50,000 per year
  - Uses the R03 (Small Grant) award mechanism
  - See full text at http://grants1.nih.gov/grants/guide/pa-files/PA-02-055.html

For additional information

- on these announcements, contact Dr. Cora Lee Wetherington at wetherington@nih.gov or at (301) 435-1319
- on NIDA funding opportunities, visit NIDA's homepage at http://www.nida.nih.gov
- visit the women and gender differences site on NIDA's homepage at http://www.drugabuse.gov/WHGD/WHGDHome.html

National Institutes of Health - U.S. Department of Health and Human Services

NIDA NATIONAL INSTITUTE ON DRUG ABUSE

WOMEN'S HEALTH AND GENDER DIFFERENCES

2005 College on Problems of Drug Dependence Women & Gender Junior Investigator Travel Awards

Accumulating evidence suggests that the antecedents, consequences, and mechanisms of drug abuse and dependence are not identical in males and females and that gender is an important variable in treatment and prevention. To foster research on women and gender differences in all areas of drug abuse research, both human and animal, the National Institute on Drug Abuse encourages the submission of abstracts on this topic for the 2004 annual meeting of the College on Problems of Drug Dependence (CPDD).

Special NIDA travel awards of up to $750 will be granted to a maximum of 30 junior investigators whose CPDD abstract on women or gender differences is accepted for either a poster or oral session at the 2005 annual meeting in Orlando, Florida, June 18-23.

Eligibility:

- Graduate and medical students, post-doctoral students, medical residents, and investigators who are no more than five years past the doctoral degree or residency are eligible.
- Applicant must be first author on the CPDD abstract.
- Minority investigators and male investigators are especially encouraged to apply.
- Federal employees are ineligible.
- Priority may be given to those who have not received this award in the past.

Application Procedures:

- Follow the CPDD instructions for abstract submission. Then mail a **copy** of the **full** abstract form that you submitted to CPDD to:

  Dr. Cora Lee Wetherington
  National Institute on Drug Abuse
  6001 Executive Boulevard, Room 4282, MSC 9555
  Bethesda, MD 20892-9555 (For overnight mail: Rockville, MD 20852)
- Include your curriculum vitae.
- Include a cover letter indicating your eligibility and your interest in pursuing research on women and/or gender differences.
- Please do not fold your application materials.
- Applications for this award must be postmarked by **January 18, 2005.**

For additional information about this annual award, contact:
Dr. Cora Lee Wetherington at 301-435-1319 or at wetherington@nih.gov

National Institutes of Health - U.S. Department of Health and Human Services