

**COLLEGE ON  
PROBLEMS OF  
DRUG  
DEPENDENCE**



**Mini-Program**



*Focus on  
Women & Gender Differences*



**June 8-13, 2002**

**Hilton Québec and the Québec City Convention Centre,  
Québec City, Québec, Canada**

Provided by

**NIDA** NATIONAL INSTITUTE  
ON DRUG ABUSE

## 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 may be 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 has encouraged the submission of College for Problems on Drug Dependence (CPDD) abstracts on this topic.

To support investigators pursuing research careers on women and gender issues, special NIDA Travel Awards have been granted to junior investigators annually since 1998. Each year competitive travel awards have been given to up to 30 junior investigators (predoctoral 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.

This special volume of the CPDD program highlights not only the travel awardees chosen for this year, but also all research on women and gender issues presented at the 2002 annual meeting in Quebec City.

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](mailto:Wetherington@nih.gov).

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**CPDD 2002 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES**

**Andrew C. Barrett  
Klark Bennett  
Veronica Bisagno, Ph.D.  
Jessica Dean, Psy.D.  
Jay C. Elliott  
Eugene D. Festa  
Colin N. Haile, Ph.D.  
Sara M. Handy  
Carlos A. Hernandez-Avila, M.D.  
Sharon D. Johnson, Ph.D.  
Lynne M. Kemen  
Wendy J. Lynch, Ph.D.  
Sherry A. McKee, Ph.D.  
Aimee L. McRae, Pharm.D.  
Katherine J. McVeigh, Ph.D.  
Fumi Mitsuishi  
Christina J. Nelson, Ph.D.  
Lynda Payne, Ph.D.  
Jessica M. Peirce, Ph.D.  
Marc N. Potenza, M.D., Ph.D.  
Jovita F. Randall  
Kara S. Riehman, Ph.D.  
Megan E. Roth  
Scott Russo  
Pilar M. Sanjuan  
Valerie J. Slaymaker, Ph.D.  
Anna Söderpalm  
Erin C. Stoffel  
Carolyn H. Stone, Ph.D.  
Jolan M. Turner**

**OVERVIEW OF  
CPDD 2002 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES' RESEARCH**

- Andrew C. Barrett                      Sex-related differences in mechanical nociception and kappa opioid antinociception in F344 rats. **Page No. 11**
- Klark Bennett                              Behavioral sensitization following repeated IV nicotine: Sex differences and dopamine D3 receptors. **Page No. 7**
- Veronica Bisagno, Ph.D.                d-Amphetamine induces differential effects on locomotion, stereotypy and object recognition memory in female and male rats. **Page No. 6**
- Jessica Dean, Psy.D.                      Gender differences, cue-exposure reactivity and nine-month outcome. **Page No. 14**
- Jay C. Elliott                                Characterization of profound sex differences in opioid-potentiated inflammation: Pharmacological and immunological investigations. **Page No. 7**
- Eugene D. Festa                            Gender Differences in Cocaine-induced Locomotor and Stereotypic Behavior. **Page No. 3**
- Colin N. Haile, Ph.D.                      Sex-selective effects of strain on cocaine self-administration. **Page No. 11**
- Sara M. Handy                               Basal sex differences in circulating levels of adrenocorticotrophic hormone, cortisol, and prolactin in normal and drug-dependent volunteers. **Page No. 5**
- Carlos A. Hernandez-Avila, M.D        Progression of Drug and Alcohol Dependence among Women Entering Substance Abuse Treatment: Evidence for telescoping. **Page No. 14**
- Sharon D. Johnson, Ph.D.                HIV-Risk, Violence, and Depression Among African American Female Drug Users. **Page No. 15**
- Lynne M. Kemen                            Effects of Estrogen and Progesterone on Nociceptive Responses and Morphine-induced Antinociception in Ovariectomized Rats. **Page No. 13**
- Wendy J. Lynch, Ph.D.                    Behavioral and motivational effects of 'binge' cocaine self-administration in male and female rats. **Page No. 11**
- Sherry A. McKee, Ph.D.                 Sex Differences in the Effects of Stressful Life Events on Changes in Smoking Status. **Page No. 7**

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CPDD 2002 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES' RESEARCH**

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- Katherine J. McVeigh, Ph.D.      Relationships between intimate partner violence and barriers to employment among substance-dependent women on welfare. **Page No. 4**
- Fumi Mitsuishi      Gender, ethnicity, and recruitment site as predictors of enrollment in a study on linkage methods. **Page No. 6**
- Christina J. Nelson, Ph.D.      Investigation of sex differences in the acute and long-term effects of MDMA administration in rats. **Page No. 7**
- Lynda Payne, Ph.D.      Gender differences among adolescents with substance use disorders and traumatic stress. **Page No. 9**
- Jessica M. Peirce, Ph.D.      PTSD and comorbid impairment in treatment-seeking drug abusers. **Page No. 3**
- Marc N. Potenza, M.D., Ph.D.      Characteristics of gamblers: Health Measures and Gender Differences. **Page No. 10**
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- Scott Russo      Gender Differences in Place Preference for Cocaine and HPA Activity in Rats. **Page No. 11**
- Pilar M. Sanjuan      Sexual Dysfunction Among Addicted Women With Prior Sexual Assault. **Page No. 14**
- Valerie J. Slaymaker, Ph.D.      Employed Women and Drug Dependence: Characteristics, Consequences, and Treatment Outcomes. **Page No. 5**
- Anna Söderpalm      Subjective effects of an acute high dose of progesterone in men and women. **Page No. 5**
- Erin C. Stoffel      Effects of gonadal steroid hormones on mu, kappa and delta opioid antinociception. **Page No. 13**

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CPDD 2002 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES' RESEARCH**

Carolyn H. Stone, Ph.D.

Severe Personality Disorders: Impact of Substance Dependence in HIV+ women. **Page No. 15**

Jolan M. Turner

Influence of Gonadal Hormone Depletion on the Antinociceptive Effects of Opioids in Male and Female Rats. **Page No. 13**



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**Sunday, June 9, 2002**

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**Oral Communications II**

**CCQ 205 BC  
1:30 – 2:45 PM**

**USERS IN UTERO**

Chairs: Paul R. Marques and Dace S. Svikis

- 1:30 *Developmental cocaine alters functional coupling in central DA systems*  
D. Dow-Edwards and S. Melnick, State University of New York, Downstate,  
Brooklyn, NY
- 1:45 *Perinatal Buprenorphine Alters Cholinergic Neurons in Rat Striatum*  
S.E. Robinson. Medical College of Virginia Campus of Virginia  
Commonwealth University, Richmond, VA
- 2:00 *Perinatal Opiate Dependence: Methadone and Birth Outcomes*  
L. Keyser-Marcus, D. Miles, L. Jansson, S. Lanni, H. Jones, D. Svikis,  
Virginia Commonwealth University, Richmond, VA, and Johns Hopkins  
University, Baltimore, MD
- 2:15 *Cognitive capabilities among school-age children prenatally exposed to cocaine*  
P.R. Marques, J.L. Pokorni, L.O Teti, D.G. Branch, H.R. Kirk, T. Long,  
Pacific Institute for Research and Evaluation, Calverton, MD, and  
Georgetown University Child Development Center, Washington, DC
- 2:30 *Longitudinal findings from 4 months through three years of age*  
C.E. Morrow, E.S. Bandstra, J.C. Anthony, A.Y Ofir, L. Xue and M.B. Reyes,  
University of Miami School of Medicine, Miami, FL, and Johns Hopkins  
University, Baltimore, MD

**Oral Communications III**

**CCQ 205 BC  
2:50 – 4:05 PM**

**ATTENTION TO PREVENTION**

Chairs: Ada C. Mezzich and Howard B. Moss

- 2:50 *Preventing alcohol-exposed pregnancies in college women*  
S.D. Ceperich, K.S. Ingersoll, and M.D. Nettleman, Virginia Commonwealth  
University, Richmond, VA
- 3:35 *Impact of maternal psychopathology and parenting attitude on dysregulation in  
children of women with substance use disorder*  
M.G. Dunn and A.C. Mezzich, University of Pittsburgh, Pittsburgh, PA
- 3:50 *Thirty-year follow-up of the influence of early parenting on persistent drug use*  
A.M. Windham and H. Chilcoat, Johns Hopkins Bloomberg School of Public  
Health, Baltimore, MD



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**Sunday, June 9, 2002**

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**Oral Communications IV**

**CCQ 204 AB  
1:30 – 4:00 PM**

**GETTING OFF YOUR HIGH HORSE**

Chairs: David A. Fiellin and Gabriele Fischer

2:30 *Office-based prescription study with buprenorphine*

G. Fischer, R. Ortner, S. Schindler R. Jagsch, University of Vienna, Austria



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**Monday, June 10, 2002**

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**POSTER SESSION I**

**CCQ 2000 BCD  
8:00 – 10:00 AM**

**Set up time begins Sunday 3:00 P.M.  
Must be removed by Monday 2:00 P.M.**

**COCAINE: ANIMAL BEHAVIOR**

- 11 *Gender Differences in Cocaine-induced Locomotor and Stereotypic Behavior*  
E.D. Festa, S.J. Russo, L.M. Kemen, T. Niyomchai, S. Jenab, and V. Quinones-Jenab, Hunter College, City University of New York, New York, NY

**ALCOHOL**

- 28 *Changes in P300 activity as a function of familial alcoholism and alcohol cue exposure in female social drinkers*  
L.H. Lundahl and S.E. Lukas, Wayne State University School of Medicine, Detroit, MI, and Harvard Medical School, Belmont, MA

**SUBSTANCE ABUSE TREATMENT**

- 70 *Retention and treatment services received in the CASAWORKS for Families program*  
J. Meadows, J.R. McKay, M.A. Gutman, A.T. McLellan, R.D. Ketterlinus, and M. Randall, Treatment Research Institute at University of Pennsylvania, Philadelphia, PA
- 71 *Post-discharge Abstinence Rates for Women with Long-Term Residential Treatment in Three National Studies: RWC/PPW, NTIES, and DATOS*  
L. Greenfield, K. Burgdorf, A. Porowski, T. Roberts and J. Herrell, Caliber Associates, Fairfax, VA, and Center for Substance Abuse Treatment, Rockville, MD

**PSYCHIATRIC COMORBIDITY I**

- 82 *Trauma and substance abuse: Implications for treatment providers*  
K. James and N. Mautone-Smith, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, Rockville, MD
- 85 *PTSD and comorbid impairment in treatment-seeking drug abusers*  
J.M. Peirce, M.C. Waesche, A. Kendrick, K. Kindbom, R.K. Brooner, Johns Hopkins University School of Medicine, Baltimore, MD
- 86 *Substance Dependence and Symptoms of PTSD Among Female Sex Workers*  
L. Nuttbrock, A. Rosenblum, S. Magura, J. Wallace, M. Marthol, S. Farkas, National Development and Research Institutes, Inc., and Foundation for Sexually Transmitted Diseases, New York, NY

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- 87 *PTSD and psychosocial distress in pregnant drug-dependent women*  
M. Velez, J. Peirce, D. Svikis, V. Walters, L. Jansson, Johns Hopkins University School of Medicine, Baltimore, MD, and Virginia Commonwealth University, Richmond, VA
- 91 *Substance use, affective problems and personality traits in women: A test of two models of comorbidity*  
N. Chakroun, J. Doron, J. Swendsen, University of Bordeaux, France
- 92 *A TCI-based cluster-analytic classification of female drug-dependent inpatients*  
E. Bañuls, L. Gil, J. Trujols, A. Tejero, E. Ribalta, M. Nicolas, F. Batlle, J. Pérez de los Cobos, Addictive Behavior Unit, Santa Creu i Sant Pau Hospital, Barcelona, Spain

### **CRIMINAL JUSTICE**

- 117 *Health Disparity between Court- and Community-Recruited Substance-Abusing Women Enrolled in a Community HIV Prevention Study*  
C. Meeks, L.B. Cottler, W.M. Compton, A. Ben-Abdallah, J. Williford, B. Crecelius, J.E. Sullivan, Washington University School of Medicine and St. Louis City Municipal Courts, St. Louis, MO
- 122 *Gender Differences in Adolescents' Social Relationships and Drug Use Context: Implications for Treatment*  
R.N. Bluthenthal, K.S. Riehm, A.R. Morral, and J. Juvonen, RAND Drug Policy Research Center, Santa Monica, CA, and Arlington, VA
- 124 *Gender differences and risk factors for AOD disorders among California arrestees*  
J. Steinberg and C. Grella, UCLA Drug Abuse Research Center, Los Angeles, CA

### **JOBS AND HOUSING**

- 137 *Relationships between intimate partner violence and barriers to employment among substance-dependent women on welfare*  
K.H. McVeigh, J. Morgenstern, K.A. Blanchard, B.S. McCrady, T.W. Irwin, Rutgers Center of Alcohol Studies, National Center on Addiction and Substance Abuse at Columbia University, Mt. Sinai School of Medicine, New York, NY
- 140 *Characteristics and Needs of Substance-Abusing Women on Welfare: Findings from evaluation of the CASAWORKS for Families program*  
T. Nghe, M. Gutman, A.T. McLellan, R.D. Ketterlinus, J. McKay, and M. Randall, Treatment Research Institute at University of Pennsylvania, Philadelphia, PA

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**Monday, June 10, 2002**

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- 141 *Employed Women and Drug Dependence: Characteristics, Consequences, and Treatment Outcomes*  
V. Slaymaker and P. Owen, Butler Center for Research at Hazelden, Center City, MN

**Oral Communications VI**

**CCQ 204 AB**  
**10:00 AM – 12:00 PM**

**SOCIAL TREATMENT ISSUES**

Chairs: Joseph R. Guydish and Douglas B. Marlowe

- 10:30 *Barriers to Work and Employment Outcomes among Substance-Abusing Women on Welfare: Findings from the CASAWORKS for Families Program*  
M. Gutman, J. McKay, R.D. Ketterlinus, A.T. McLellan, K. Lynch, and M. Randall, Treatment Research Institute at University of Pennsylvania, Philadelphia, PA

**Oral Communications VIII**

**CCQ 205 BC**  
**2:30 – 5:00 PM**

**ALL ABOARD FOR GLAND CENTRAL!**

Chairs: Mary Jeanne Kreek and Anna Söderpalm

- 2:30 *Basal sex differences in circulating levels of adrenocorticotrophic hormone, cortisol, and prolactin in normal and drug-dependent volunteers*  
S.M. Handy, G. Bart, L. Borg, M. Green, J. Schluger, A. Ho, and M.J. Kreek, The Rockefeller University, New York, NY
- 3:15 *Subjective effects of an acute high dose of progesterone in men and women*  
A.H.V Söderpalm and H. de Wit, The University of Chicago, Chicago, IL
- 3:30 *Gonadal Steroids' Effects on Synergistic Neurotoxicity of Cocaine with HIV proteins*  
S.L. Kendall, C. Anderson, A. Nath, C.F. Mactutus, R.M. Booze, University of Kentucky, Lexington, KY

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**Tuesday, June 11, 2002**

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**POSTER SESSION II**

**CCQ 2000 BCD  
8:00 – 10:00 AM**

**Set up time begins Monday 3:00 P.M.  
Must be removed by Tuesday 2:00 P.M.**

**OPIOIDS: CLINICAL PHARMACOLOGY AND TREATMENT**

- 19 *Gender, ethnicity, and recruitment site as predictors of enrollment in a study on linkage methods*

F. Mitsuishi, J. Sorensen, K. Delucchi, K. Sporer, D. Young, H. Harris,  
University of California, San Francisco, San Francisco, CA

**POLYDRUG ABUSE/DRUG INTERACTIONS**

- 54 *Gender Differences in Alcohol and polydrug Abuse Among Young Adults*

T. Koeing, L. Simons, L. Braun, B. Schatz, and E. Cimo, Widener University,  
Chester, PA

**AMPHETAMINE AND METHAMPHETAMINE**

- 70 *d-Amphetamine induces differential effects on locomotion, stereotypy and object recognition memory in female and male rats*

V. Bisagno, D. Ferguson and V.N. Luine, Hunter College, City University of  
New York, New York, NY

- 75 *Methamphetamine-induced neurotoxicity: Sex Differences and the Effect on Subsequent Methamphetamine Reward*

B.J. Gehrke and M.T. Bardo, University of Kentucky, Lexington, KY

- 77 *Sex differences in the acquisition and maintenance of intravenously self-administered methamphetamine in rats*

M.E. Roth, E.B. Larson, and M.E. Carroll, University of Minnesota,  
Minneapolis, MN

- 80 *Weight change during treatment for methamphetamine abuse*

R. Sodano, N. Capulong, J.M. Roll, A. Huber, and S. Shoptaw, Friends  
Research Institute and UCLA Integrated Substance Abuse Programs, Los  
Angeles, CA

- 88 *A Descriptive Analysis of Participant Characteristics and Patterns of Substance Abuse in the CSAT Methamphetamine Treatment Project*

P. Marinelli-Casey, R.A. Rawson, C. Gallagher, J. Herrell, UCLA Integrated  
Substance Abuse Programs, Matrix Institute on Addictions, Center for  
Substance Abuse Treatment, Los Angeles, CA

**CLUB DRUGS**

- 95 *Investigation of sex differences in the acute and long-term effects of MDMA*

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**Tuesday, June 11, 2002**

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*administration in rats*

C.J. Nelson and C.M. Kuhn, Duke University, Durham, NC

**IMMUNE EFFECTS**

- 112 *Characterization of profound sex differences in opioid-potentiated inflammation: Pharmacological and immunological investigations*  
J.C. Elliott, M.J. Picker, C.J. Nelson, and D.T. Lysle, University of North Carolina-Chapel Hill, Chapel Hill, NC

**NICOTINE**

- 124 *Behavioral sensitization following repeated IV nicotine: Sex differences and dopamine D3 receptors*  
K.R. Bennett, C.F. Mactutus, M.A. Welch, U. Hasselrot, G. Wu, and R.M. Booze, University of Kentucky College of Medicine, Lexington, KY
- 142 *Sex Differences in the Effects of Stressful Life Events on Changes in Smoking Status*  
S. McKee, P.K. Maciejewski, T. Falba, C.M. Mazure, Donaghue Women's Health Investigator Program, Yale University, New Haven, CT

**POSTER SESSION III**

**CCQ 2000 BCD  
8:00 – 10:00 AM**

**Set up time begins Tuesday 3:00 P.M.  
Must be removed by Wednesday 2:00 P.M.**

**MOLECULES AND GENES**

- 37 *C-fos and AP-1 activation by cocaine in Fischer rats, roles of gender and NMDA*  
S. Jenab, S.J. Russo, S.J. Fabian, E.D. Festa and V. Quinones-Jenab, Hunter College, City University of New York, New York, NY

**PERINATAL EXPOSURE TO DRUGS OF ABUSE**

- 43 *Birth Outcomes as a Function of Addiction Severity*  
S. Fox and D.L. Haller, Virginia Commonwealth University, Richmond, VA
- 47 *Mothers' prenatal and current cocaine use, and their parenting of children age 9*  
L.O. Teti, P.R. Marques, J.L. Pokorni, D.G. Branch, H.R. Kirk, T. Long, Pacific Institute for Research and Evaluation, Calverton, MD, and Georgetown University Child Development Center, Washington, DC
- 48 *The early caregiving of heavy cocaine-using mothers*  
J. Howard, L. Beckwith, R. Tyler, and M. Espinosa, University of California, Los Angeles, CA
- 51 *Relationship of regular cocaine, heroin and alcohol use and psychosocial functioning in pregnant women*  
L. Haase, D. Svikis and K. Cropsey, Virginia Commonwealth University, Richmond, VA
- 52 *Behavioral Treatment for Cocaine-Dependent Women*  
R.S. Schottenfeld, M.C. Chawarski, M.V. Pantaloni, D. LaPaglia, K. Carroll, and J. Pakes, Substance Abuse Center, Yale University School of Medicine and The APT Foundation, New Haven, CT
- 53 *Pregnancies and newborn infants among 260 opiate-dependent women in 1998-1999: Final results and analysis of the French 'GEGA' prospective study*  
L. Gourarier, S. Aubisson, F. Cneude, M. Piquet, E. Peyret, L. Simmat-Durand, C. Lejeune, Centre Monte Cristo, HEGP, Paris, Hôpital Louis Mourier, Colombes, Université de Paris Sorbonne, France
- 56 *Buprenorphine high dosage in pregnancy: First data of a prospective study*  
I. Lacroix, A. Berrebi, L. Schmitt, D. Garripuy, M. Lapeyre-Mestre, J.L. Montastruc, C. Damase-Michel, Faculté de Médecine, Toulouse, France

- 57 *Opiate dependency: A Barrier to Substance Abuse Treatment Among Pregnant Women*  
M. Jessup, Institute for Health Policy Studies, University of California, San Francisco, CA
- 58 *The Impact of Managed Care on Treatment for Drug-Dependent Women and Their Children: One-Year Follow-up*  
L. Jansson, D. Svikis, M. Velez, E. Fitzgerald, H. Jones, Johns Hopkins University School of Medicine, Baltimore, MD, and Virginia Commonwealth University, Richmond, VA
- 59 *Baseline smoking as a predictor of response to vouchers in pregnant smokers*  
J. Plebani Lussier, S.T. Higgins, R.L. Abel, M.E. Lynch, L. McHale, S.H. Heil, and L.J. Solomon, University of Vermont, Burlington, VT

#### **ADOLESCENT DRUG ABUSE I**

- 64 *Gender differences among adolescents with substance use disorders and traumatic stress*  
L. Payne, P. Clemmey, G. Subramaniam, F. Brophy, and M. Fishman, Potomac Healthcare Foundation, and Johns Hopkins University, Baltimore, MD
- 72 *Impact of male partners' psychopathology on substance use disorder from adolescence to young adulthood in women*  
A.C. Mezzich, M.G. Dunn, B. Day, and M. Swaney, University of Pittsburgh, Pittsburgh, PA
- 83 *Smoking Topography in Adolescent Girls Seeking Treatment for Tobacco Addiction*  
N. Thatte and E.T. Moolchan, NIH/NIDA-Intramural Research Program, TTATRC, Baltimore MD

#### **FAMILY**

- 91 *Intimate Partner Violence among Women in Methadone Maintenance Treatment*  
L. Gilbert, N. El-Bassel, V. Frye, E. Wu, H. Go, J. Hill, B.L. Richman, Social Intervention Group and Beth Israel Medical Center, New York, NY
- 92 *The Influence of Partner Drug Use and Relationship Power on Treatment Engagement*  
K.S. Riehmman, M.Y. Iguchi, A.R. Morral, and M. Zeller, RAND, Santa Monica, CA



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**Wednesday, June 12, 2002**

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- 93 *A partner's drug-using status impacts women's drug treatment outcome*  
M. Tuten, H. Jones and T. Byers, Johns Hopkins University School of  
Medicine, Baltimore, MD
- 94 *Residential Substance Abuse Treatment for mothers and their Children*  
T.K. Killeen, K.T. Brady, T.D. Brewerton, Medical University of South  
Carolina, Charleston, SC
- 95 *Relationship between Mother's Substance Abuse and Mental Health Problems  
and Children's Behavior among Women in Outpatient Substance Abuse  
Treatment*  
L. Blue, M. Guiont, C. Foltz, M.A. Gutman, and A.T. McLellan, Treatment  
Research Institute at the University of Pennsylvania, Philadelphia, PA
- 97 *Family Studies of Substance Dependence and Antisocial Personality Disorder: A  
Potential Selection Bias?*  
J. Sakai, M. Stallings, S.K. Mikulich, R.P. Corley, S.E. Young, and T.J.  
Crowley, Substance Dependence Division, University of Colorado School of  
Medicine, Denver, and Institute For Behavioral Genetics, University of  
Colorado, Boulder, CO

#### **PSYCHIATRIC COMORBIDITY II**

- 104 *Initial pilot testing of an integrated treatment manual for stimulant dependence  
and an eating disorder in women*  
C. Cochrane, R. Malcolm, K. Brady, K. Carroll and J. Mitchell, Medical  
University of South Carolina, Charleston, SC, Yale University, New Haven,  
CT, and University of North Dakota, Grand Forks, ND
- 105 *Characteristics of gamblers: Health Measures and Gender Differences*  
M.N. Potenza, P.K. Maciejewski, R.A. Desai, B. Calderone, W. Lynch, I.  
Cavus, B.J. Rounsaville, C.M. Mazure, Yale University, New Haven, CT
- 112 *Addiction history, treatment utilization, and service needs among sub-groups of  
dually diagnosed patients*  
C.E. Grella, L. Greenwell, and L. Cooper, Drug Abuse Research  
Center/Integrated Substance Abuse Program, University of California, Los  
Angeles, CA

#### **EPIDEMIOLOGY**

- 129 *Male-female differences and family attention in early inhalant transitions:  
Evidence from the PACARDO study of adolescents in Latin America*  
C.M. Dormitzer, M. Sánchez, G. Gosebruch, J. Delva and J.C. Anthony,  
Bloomberg School of Public Health, The Johns Hopkins University,  
Baltimore, MD, and PACARDO research team

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**Wednesday, June 12, 2002**

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- 138 *Could the length of time from onset of DSM-IV abuse to dependence provide a measure of abuse liability of drugs in humans?*  
T.A. Ridenour, W.M. Compton, R.M. Cunningham-Williams, L.B. Cottler,  
Washington University School of Medicine, St. Louis, MO

**Oral Communications XI**

**CCQ 205 BC**  
**10:00 AM – 12:30 PM**

**WHAT A RELIEF!**

Chairs: Andrew C. Barrett and Aimee L. McRae

- 10:30 *Sex-related differences in mechanical nociception and kappa opioid antinociception in F344 rats*  
A.C. Barrett, E.S. Smith and M.J. Picker, University of North Carolina,  
Chapel Hill, NC
- 11:15 *Gender differences in response to the cold pressor test*  
A.L. McRae, K.T. Brady, M.A. Timmerman, H. Upadhyaya, M. Saladin, and  
R. Durazo, Medical University of South Carolina, Charleston, SC

**Oral Communications XIV**

**CCQ 206 B**  
**4:20 – 5:35 PM**

**COCAINE: XX VS. XY**

Chairs: Therese A. Kosten and Rachel L. Peltier

- 4:20 *Cocaine and heroin self-administration in rats bred for saccharin preference: Sex differences*  
M.E. Carroll, A.D. Morgan, W.D. Lynch, U.C. Campbell, and N.K. Dess,  
University of Minnesota, Minneapolis, MN
- 4:35 *Behavioral and motivational effects of 'binge' cocaine self-administration in male and female rats*  
W.J. Lynch and J.R. Taylor, Yale University School of Medicine, New  
Haven, CT
- 4:50 *Sex-selective effects of strain on cocaine self-administration*  
C.N. Haile and T.A. Kosten, Thomas Jefferson Medical College,  
Philadelphia, PA, and Yale University School of Medicine, New Haven, CT
- 5:05 *The Effects of Female Gonadal Hormones and the HPA axis on Cocaine Self-Administration in Rats*  
R.L. Peltier and N.E. Goeders, Louisiana State University Health Science  
Campus-Shreveport, Shreveport, LA
- 5:20 *Gender Differences in Place Preference for Cocaine and HPA Activity in Rats*  
S.J. Russo, S.J. Fabian, S. Jenab and V. Quiñones-Jenab, Hunter College,  
GSUC, City University of New York, New York, NY

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**Wednesday, June 12, 2002**

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**Oral Communications XV**

**CCQ 204 AB  
3:00 – 4:15 PM**

**NICO-TEEN**

Chairs: Stephen J. Heishman and Eric T. Moolchan

3:30 *Is the gender gap closing? Gender differences in substance use prevalence between White and Lakota 7th grade students in South Dakota*  
S. Spear and D. Longshore, UCLA Integrated Substance Abuse Programs, Los Angeles, CA

4:00 *The Effect of Personality and Family History of Smoking on Smoking Severity in Adolescent Females*  
M.L. Pergadia K.K. Bucholz, A.C. Heath, W.S. Slutske, C.N. Lessov, and P.A.F. Madden, Washington University School of Medicine, St. Louis, University of Missouri, Columbia, MO

**Oral Communications XVI**

**CCQ 204 AB  
4:20 – 5:35 PM**

**EPIDEMIOLOGY**

Chairs: Philip A. May and Yehuda D. Neumark

4:35 *Alcohol Consumption Among Child-Bearing Age and Older Females Within Five Tribes of Plains Indians*  
P.A. May and J.P. Gossage, The University of New Mexico Center on Alcoholism, Substance Abuse, and Addictions, Albuquerque, NM

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**Thursday, June 13, 2002**

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**POSTER SESSION IV**

**CCQ 2000 BCD  
7:30 – 9:30 AM**

**Set up time begins Wednesday 3:00 P.M.  
Must be removed by Thursday 2:00 P.M.**

**NEUROENDOCRINE EFFECTS AND SEX DIFFERENCES**

- 57 *Influence of Gonadal Hormone Depletion on the Antinociceptive Effects of Opioids in Male and Female Rats*  
J.M. Turner, A.C. Barrett, E. Grossell, and M.J. Picker, University of North Carolina at Chapel Hill, Chapel Hill, NC
- 58 *Sex differences in opioid antinociception: Importance of rodent strain and opioid effectiveness*  
M.J. Picker, J.M. Turner, A.C. Barrett, and E. Smith, University of North Carolina at Chapel Hill, Chapel Hill, NC
- 59 *Effects of Estrogen and Progesterone on Nociceptive Responses and Morphine-induced Antinociception in Ovariectomized Rats*  
L.M. Kemen, C.A. Mannino, C. Casriel, E.D. Festa, M. Kraish, S.J. Russo, S. South, S. Jenab, C. Inturrisi, V. Quinones-Jenab, Hunter College, Graduate Center, City University of New York, and Weill Medical College of Cornell University, New York, NY
- 60 *Effects of gonadal steroid hormones on mu, kappa and delta opioid antinociception*  
E.C. Stoffel, J.E. Folk, K.C. Rice, and R.M. Craft, Washington State University, Pullman, WA, and NIDDK, Bethesda, MD
- 61 *Assessment of Sex Differences in Morphine-Induced Conditioned Taste Aversions*  
J.F. Randall and A.L. Riley, American University, Washington, DC
- 62 *Effects of bremazocine and a nondrug alternative reinforcer on the self-administration of phencyclidine in rhesus monkeys: Sex differences*  
K.P. Cosgrove, M.E. Roth, and M.E. Carroll, University of Minnesota, Minneapolis, MN
- 66 *Ovarian Steroid Hormone Modulation of the Acute Effects of Cocaine on Anterior Pituitary Hormones in Ovariectomized Rhesus Monkeys*  
N.K. Mello, J.H. Mendelson, S.S. Negus, M. Kelly, C.A. Bowen, Alcohol and Drug Abuse Research Center, McLean Hospital/Harvard Medical School, Belmont, MA
- 67 *Cocaine pharmacokinetics in female rhesus monkeys across four phases of the menstrual cycle*  
S.M. Evans and R.W. Foltin, Columbia University and New York State Psychiatric Institute, New York, NY

- 69 *Sex and hormonal influences on pain responsivity in humans*  
M.R. Donovan, S.D. Comer, S.M. Evans, A.M. Bisaga, New York State Psychiatric Institute, and Columbia University, New York, NY
- 70 *Progression of Drug and Alcohol Dependence among Women Entering Substance Abuse Treatment: Evidence for telescoping*  
C.A. Hernandez-Avila, J. Poling, B.J. Rounsaville, H.R. Kranzler, Alcohol Research Center, University of Connecticut School of Medicine, Farmington, CT, and Yale University School of Medicine, Boston, MA
- 71 *Gender differences in genetic and environmental risk factors for adolescent tobacco, alcohol and illicit drug use*  
D.R. Miles, J.L. Silberg, R.W. Pickens, and L.J. Eaves, Virginia Commonwealth University, Richmond, VA
- 72 *Investigation of gender and treatment modality differences using the TCU Client Evaluation of Self and Treatment*  
G.A. Rowan-Szal, P.M. Flynn, and D.D. Simpson, Institute of Behavioral Research, Texas Christian University, Fort Worth, TX
- 73 *Gender-differential Pathways to Substance Use and Abuse*  
H. Hops, B. Davis, and F. Li, Oregon Research Institute, Eugene, OR
- 74 *Substance Use and other Risk Factors Associated with Physical Injury among Women*  
K.L. Pierre, J. Sanchez, and D. Koo, University of Miami, Coral Gables, FL
- 75 *Sexual Dysfunction Among Addicted Women With Prior Sexual Assault*  
P.M. Sanjuan, J.W. Langenbucher, and E. Labouvie, Research Diagnostic Project, Center of Alcohol Studies, Rutgers University, Piscataway, NJ

**COCAINE: HUMAN STUDIES**

- 91 *Problem severity, gender, and reduction in cocaine use following brief motivational intervention*  
P.L. Peterson, E.A. Wells, D.A. Calsyn, M.E. Archibald, and T.R Jackson, University of Washington, Evergreen Treatment Services, Puget Sound Health Care System of the Veterans Administration, Seattle, WA
- 103 *Gender differences, cue-exposure reactivity and nine-month outcome*  
J. Dean, R. Sterling, S. Weinstein, E. Gottheil, Thomas Jefferson University, Philadelphia, PA
- 105 *Six- and Twelve-Month Outcomes from a Comprehensive Intervention for Substance-Abusing TANF Recipients - CASAWORKS for Families*  
A.T. McLellan, M.A. Gutman, R. Ketterlinus, J.R. McKay, J. Meadows, T. Nghe, Treatment Research Institute at the University of Pennsylvania, Philadelphia, PA

**HIV/AIDS**

- 116 *HIV risk behaviors among female injecting drug users in Philadelphia*  
H. Mark, A. Davis-Vogel, H. Navaline, R. Scotti, R. Wickrema, G. Woody,  
and D. Metzger, Center for Studies of Addiction, University of Pennsylvania,  
Philadelphia, PA
- 122 *Drug Abuse, Violence, and HIV/AIDS Among Impoverished Women*  
S. Wenzel, J. Tucker, M. Elliott, K. Hambarsoomians, A. Nyamathi, D.  
Longshore, J. Perlman, K. Anderson, K. Becker, L. Gelberg, M. Iguchi,  
RAND Drug Policy Research Center, Santa Monica, CA
- 126 *HIV-Risk, Violence, and Depression Among African American Female Drug  
Users*  
S. Johnson L. Cottler, R. Cunningham-Williams, University of Missouri-St.  
Louis, Washington University School of Medicine, St. Louis, MO
- 128 *Severe Personality Disorders: Impact of Substance Dependence in HIV+ women*  
C. Heckman-Stone, D.L. Haller, K.S. Ingersoll, Virginia Commonwealth  
University, Richmond, VA
- 130 *Married Drug-Abusing Men: An examination of HIV High Risk Behaviors and  
Factors Associated with Unprotected Sex with Their Wives*  
T.B. Kashdan and W. Fals-Stewart, Research Institute on Addictions,  
Buffalo, NY

**MEDICAL COMPLICATIONS**

- 134 *Hepatitis C seroprevalence and risk behaviors among drug-involved female sex  
workers in Miami*  
H.L. Surratt, and J.A. Inciardi, Center for Drug and Alcohol Studies,  
University of Delaware, Newark, DE
- 139 *Screening for Sexually Transmitted Infections in Substance Abuse Treatment  
Programs: Prevalence and Screening Criteria*  
J.M. Liebschutz, E.P. Finley, P.G. Braslins, D. Christiansen, N.J. Horton, J.H.  
Samet, Boston Medical Center, Boston, MA

## ABSTRACTS

### **A TCI-based cluster-analytic classification of female drug-dependent inpatients**

E. Bañuls, L. Gil, J. Trujols, A. Tejero, E. Ribalta, M. Nicolas, F. Batlle, J. Pérez de los Cobos  
*Addictive Behavior Unit, Santa Creu i Sant Pau Hospital, Barcelona, Spain*

Background: Personality-based classification of drug-dependent patients is a promising strategy for individualized management of this population. Hypothesis: The Temperament and Character Inventory (TCI) could be useful for subtyping female drug-dependent patients. Method: Participants were 103 female drug-dependent patients undergoing detoxification treatment, assessed with the TCI, the SF-36 and ASI. TCI scores were subjected to a cluster analysis using Ward method. A validation of the cluster solution was performed using one-way ANOVA of the ASI and SF-36 scores. Results: The best solution showed three groups of personality profiles. One cluster (n=45) presented high scores in Harm Avoidance, and low scores in Persistence and Self-directedness; a second cluster (n=21) was characterized by a non-extreme personality profile; and the third cluster (n=37) by high scores in Novelty Seeking and low scores in Self-directedness. The non-extreme personality traits group, compared with the other two groups, presented higher SF-36 scores (Physical Functioning:  $F(2,70)=4.78$ ,  $p<0.02$ ; Role-physical:  $F(2,70)=3.41$ ,  $p<0.04$ ; Bodily Pain,  $F(2,70)=3.77$ ,  $p<0.03$ ; Vitality  $F(2,70)=4.98$ ,  $p<0.01$ ; Mental Health  $F(2,70)=4.03$ ,  $p<0.03$ ) and lower ASI scores (Drug composite score:  $F(2,100)=6.72$ ,  $p<0.002$ ; Psychiatric Severity score:  $F(2,100)=9.33$ ,  $P<0.001$ ). Conclusion: Our results suggest that there are three reliable TCI-based subtypes of female drug-dependent inpatients: High Anxiety/Low Persistence, non-extreme personality profile, and Novelty Seeking. Supported by Catalonia Government.

### **Sex-related differences in mechanical nociception and kappa opioid antinociception in F344 rats**

*A.C. Barrett, E.S. Smith and M.J. Picker*  
*University of North Carolina, Chapel Hill, NC*

Previous studies indicate that in thermal nociceptive assays, some kappa opioids are more potent and effective in male than female rats. However, few studies have used non-thermal nociceptive stimuli to examine sex differences, and thus the purpose of the present study was to examine nociception and kappa opioid antinociception in male and female F344 rats using a mechanical (paw pressure) nociceptive stimulus. Results indicate that males had a higher threshold for baseline nociception, but sex differences were not observed in the psychophysical relationship between nociceptive stimulus intensity and paw withdrawal latency. Repeated testing did not systematically alter nociceptive thresholds in either males or females. To determine the relative contribution of the endogenous opioid system to baseline nociception, various doses of naltrexone were administered prior to testing. Although naltrexone dose-dependently decreased nociceptive thresholds in males and females, sex differences were not apparent. Spiradoline, enadoline and U50,488 produced intermediate to high levels of antinociception, and were equally potent and effective in males and females. Whereas the maximal effect produced by U69,593 and ethylketocyclazocine (EKC) were comparable in males and females, an intermediate dose of U69,593 was more effective in females and EKC was slightly more potent in males. Proxorphane and nalorphine produced only low levels of antinociception, with an intermediate dose of proxorphane producing greater effects in females. These data indicate sex differences in mechanical nociception, but a similar psychophysical relationship between nociceptive stimulus intensity and paw withdrawal latency as well as similar involvement of the endogenous opioid system. Furthermore, that sex differences were not observed consistently in kappa opioid antinociception contrasts with findings using thermal nociceptive stimuli, suggesting that stimulus modality should be considered when examining sex differences in opioid antinociception. (Supported by NIDA grants DA10277 and DA07244)

### **Behavioral sensitization following repeated IV nicotine: Sex differences and dopamine D3 receptors**

K.R. Bennett, C.F. Mactutus, M.A. Welch, U. Hasselrot, G. Wu, and R.M. Booze  
*University of Kentucky College of Medicine, Lexington, KY*

Repeated administration of stimulants, by SC and IP routes, is known to yield behavioral sensitization in male animals. The study at hand investigated whether behavioral sensitization occurs in response to repeated IV nicotine administration, particularly when employing low doses of nicotine; and secondly, if there is a sex difference in the expression of behavioral sensitization. Sprague-Dawley rats (intact male and female) were surgically implanted with an intravenous access port (Mactutus et al., 1994), and habituated to 60 cm diameter chambers for three days with no drug. Animals received 50 ug/kg/ml IV nicotine 1/day for 21 days, delivered as a bolus injection (30s). This dose does not affect estrous cyclicity (Booze et al., 1999). On days 1 and 21, observers blind to treatment condition performed observational time sampling of behavior. On the 22nd day the animals were euthanized and their brains were removed and frozen for subsequent dopamine receptor analysis. There was an overall effect of repeated IV nicotine on centrally directed locomotor activity and rearing; i.e., robust sensitization was produced. For both measures, no sex difference was observed after saline or the initial nicotine injection; however, the females were markedly more sensitized than males following repeated nicotine administration. The number of D3 receptors in the dorsolateral striatum was positively correlated with centrally directed activity of sensitized females ( $R = +0.55$ ) and negatively correlated with centrally directed activity of sensitized males ( $R = -0.35$ ). There was also a relationship between D3 receptors and rearing in the dorsolateral striatum of females ( $R = 0.45$ ) that was not apparent in males. In sum, IV dosing in rats served to 1) produce robust behavioral sensitization, 2) sensitization was noted in two components of behavior, suggesting a commonality of the sensitization effect, and 3) sex differences in behavioral sensitization were not only observed, but related to sex-dependent alterations of D3 receptor number. Supported by NIDA DA014401, DA011337, and DA013137.

### **d-Amphetamine induces differential effects on locomotion, stereotypy and object recognition memory in female and male rats**

V. Bisagno, D. Ferguson and V.N. Luine  
*Hunter College, City University of New York, New York, NY*

Since d-amphetamine (AMPH) produces greater scores for locomotion and stereotypy in female as compared to male rats, it is hypothesized that AMPH will also induce gender differences on cognition. We investigated object recognition memory during a withdrawal period following chronic AMPH or acute AMPH administration to female and male rats; and, measured locomotion, stereotypy and neurochemistry changes induced by an AMPH challenge dose after a 16-day withdrawal period. Sprague-Dawley male and female adult rats were treated chronically ( $N=8/10$  per group), (10 i.p. inj., one every other day; males: 3mg/kg, females: 2.6 mg/kg), or acutely ( $N=8$  per group) (one inj., same doses). Locomotion and stereotypy were also quantified. Object recognition memory was evaluated during the withdrawal period and after acute administration. Monoamines in brain areas were measured after a challenge dose on the 16th withdrawal day. Two-way ANOVA (sex X treatment) tested statistical significances. AMPH treated rats showed impairments in visual recognition memory during withdrawal, but no sex differences were found. However, after acute AMPH, treated males showed the lowest performance in the object recognition test. Females treated had higher scores of stereotypy and locomotion after an acute and chronic treatment but no gender differences were found after a challenge dose. In AMPH groups, striatal DA, 5-HT and 5-HIAA were increased (females also had higher 5-HT and less HVA), in substantia nigra 5-HIAA and 5-HIAA/5-HT were also increased. In nucleus accumbens, females had lower norepinephrine levels than males. Thus, both sexes showed memory impairments during the withdrawal period but after acute AMPH, object recognition performance was not impaired in females. Further, an amphetamine challenge dose after a withdrawal period did not amplify gender differences in locomotion/stereotypy or monoamine levels. This study provides novel information to better understand functional cognitive consequences of AMPH administration and suggests that females may have less/differential cognitive impairments to psychoactive drugs than males. MIDARP (R24 DA12136, NIDA)



### **Relationship between Mother's Substance Abuse and Mental Health Problems and Children's Behavior among Women in Outpatient Substance Abuse Treatment**

L. Blue, M. Guiont, C. Foltz, M.A. Gutman, and A.T. McLellan

*Treatment Research Institute at the University of Pennsylvania, Philadelphia, PA*

Research suggests that children of substance abusing mothers are vulnerable to behavioral problems. It has been shown that children of mothers with mental health problems are also prone to behavioral problems. This study examined whether the nature and severity of children's problems were affected differentially by their mother's substance abuse and mental health problems. Mothers and children (ages 6-11) were enrolled from four Philadelphia intensive outpatient addictions treatment programs (n=111 mother/child pairs). The Addiction Severity Index (ASI) measured parent problems, while the Child Behavior Checklist (CBCL) and the Social Skills Rating System (SSRS) measured child's behavior. All instruments were completed by the mother at baseline. A series of three blocked regression analyses were used to examine the relationship between the severity of mother's substance abuse and psychiatric symptoms and the target child's problem behaviors. The same procedure was used to examine the relationship between mother's problems and child's pro-social skills. Overall, the findings indicated that mother's severity of substance abuse and mental health problems were related to child's problem behaviors. Internalizing behaviors (social withdrawal, somatic complaints and anxious and depressed feeling) in the child were positively related to mother's psychiatric severity but not substance abuse severity. The severity of mother's psychiatric symptoms and drug problems was associated with externalizing problems (delinquency and aggression) in the child. Pro-social skills in the child were not related to the severity of mother's psychiatric symptoms, but mothers with more severe substance abuse problems had children with poorer pro-social skills. These findings lend preliminary support to the premise that a mother's substance abuse and mental health problems make independent contributions to the problem behaviors of her children.

### **Gender Differences in Adolescents' Social Relationships and Drug Use Context: Implications for Treatment**

R.N. Bluthenthal, K.S. Riehm, A.R. Morral, and J. Juvonen

*RAND Drug Policy Research Center, Santa Monica, CA, and Arlington, VA*

The juvenile justice system relies on residential drug treatment for male and female adolescents, though the latter represent a minority of clients in this modality. In light of gender differences in background characteristics and behavior among adolescent juvenile offenders, we conducted a case study of the Therapeutic Community treatment experience for female adolescents. Data from quantitative interviews with adolescents court mandated to residential treatment (N=449) and semi-structured interviews with 7 boys and 3 girls attending a co-ed residential treatment program indicate that girls' and boys' social support systems and social networks prior to treatment entry differ dramatically. Girls' drug-using and support networks are comprised of older males who act as "protectors," as well as sexual partners, while those of boys are comprised of same-sex, same-aged peers. Girls' relationships with boys are highly sexualized and they express distrust of other girls. These relationship patterns continue during treatment. In addition, girls are more likely to have a history of either sexual or physical abuse, and have more problematic family environments. We discuss gender differences in responses to treatment components as a result of these pretreatment differences. Acknowledgement: This research was supported by CSAT grant KD1-TI11433 (Morral).

### **Cocaine and heroin self-administration in rats bred for saccharin preference: Sex differences**

M.E. Carroll, A.D. Morgan, W.D. Lynch, U.C. Campbell, and N.K. Dess

*University of Minnesota, Minneapolis, MN*

Rats selectively bred for high (HiS) and low (LoS) intake of a saccharin solution were compared on their rate and success of acquisition of i.v. cocaine and heroin self-administration. It was hypothesized that saccharin preference may be a predictor of drug self-administration. Rats were trained to self-administer i.v. cocaine and heroin under a fixed-ratio 1 (FR 1) schedule, and cocaine-reinforced behavior was

examined under a progressive-ratio (PR) schedule. There were 4 cocaine (0.2 mg/kg) groups (HiS males and females and LoS males and females) and another set of 4 heroin (0.015 mg/kg) groups. Rats were allowed 30 days to reach a criterion of 100 (cocaine) or 20 (heroin) infusions/ day during 6-hr sessions for 5 days. The HiS females acquired cocaine self-administration more rapidly than the LoS females, and females of both phenotypes met the acquisition criteria more rapidly than males. In both HiS and LoS cocaine groups a greater percentage of females (vs. males) met the acquisition criteria within 30 days. The female (vs. male) heroin groups showed a more rapid rate of acquisition, but there was no difference due to saccharin phenotype. All of the heroin groups met the criteria within 30 days. There were higher break points on the PR schedule in HiS females vs. males, but no differences in females due to phenotype. In conclusion, HiS female rats show more rapid and successful acquisition of i.v. self-administration of a low dose of cocaine than LoS rats. Female rats (vs. males) consistently showed accelerated rates of acquisition and maintenance (PR) of cocaine self-administration and acquisition of heroin self-administration. This work was supported by NIDA grants R37 DA03240 (MEC), T32 DA07097 (ADM, UCC), and F31 DA05915 (WJL).

### **Preventing alcohol-exposed pregnancies in college women**

S.D. Ceperich, K.S. Ingersoll, and M.D. Nettleman

*Virginia Commonwealth University, Richmond, VA*

Many young women place themselves at risk for alcohol-exposed pregnancy (AEP) through drinking and inadequate contraception. Although most non-dependent drinkers reduce drinking upon awareness of pregnancy, teratogenic effects (especially during weeks 3-10 of gestation) may have already occurred during critical early phases of embryonic development. Project BALANCE is a randomized clinical trial of a motivational intervention targeting the dual behaviors of risky drinking and ineffective contraception in college women. The study includes an epidemiologic survey of the female college population and an intervention for women who screen eligible. The 200 participants are moderate to heavy drinkers who drink frequently and/or binge drink who are sexually active, fertile, not currently pregnant, and not using contraception adequately. They will complete an assessment battery and are randomized to either an information-only condition or a one session, 2 hour motivational interviewing (MI) session. Measures include the TimeLine Follow Back for drinking and contraception, a risk questionnaire, the AUDIT, the OQ-45, and the NEO-Five Factor Inventory. The MI session is conducted in a counseling style designed to express empathy, develop discrepancy, roll with resistance, and support self-efficacy. Discrepancy is fostered through the provision of personalized feedback about risk behaviors, including drinking, contraception, and other behavioral patterns. Data collection is underway. Results from the first 6 months of the epidemiologic survey (approximately 200 women), and the baseline assessment and 1-month outcome for approximately 40 women will be presented. We will also discuss the feasibility and technical challenges of providing and processing personalized feedback in a single session and of conducting follow-up using multiple means (telephone, mail, and internet-based). If the MI intervention is superior to the information only condition, it will be a portable, low-cost method of motivating young women to reduce their risk of alcohol-exposed pregnancy. Sponsored by CDC grant MM-0044-02.02.

### **Substance use, affective problems and personality traits in women: A test of two models of comorbidity**

N. Chakroun, J. Doron, J. Swendsen

*University of Bordeaux, France*

Although the association between personality traits, affective disorders and substances use is well-documented, the majority of these studies has been conducted on clinical samples which limit conclusions about the direction of causality. The objective of this investigation is to examine in non clinical subjects if specific personality traits or affective problems are associated with substance use. Two explanations of comorbidity were examined: 1) the self-medication model which posits that a particular substance is chosen due to its psychopharmacologic effects on pre-existing psychiatric conditions or affective states, and 2) the social deviance model which postulates that maladaptive traits are associated with the deviance or diversity of substances used. Based on a sample of 612 individuals, 82 normal subjects were selected to form four

groups of consumers: non-consumers, alcohol users, cannabis users, and those who use other illicit substances (such as cocaine or heroin). Only consumers of 'other' illicit substances differed significantly from non-consumers, and only for the trait of novelty seeking. Furthermore, a comparison of the four groups of consumers demonstrated that scores for novelty seeking increased linearly from the non-consumers to the group who consumed substances that were most socially deviant. The findings support the conclusion that the social deviance model may be globally more relevant than self-medication to explaining certain forms of substance use comorbidity in women.

### **Initial pilot testing of an integrated treatment manual for stimulant dependence and an eating disorder in women**

C. Cochrane, R. Malcolm, K. Brady, K. Carroll and J. Mitchell

*Medical University of South Carolina, Charleston, SC, Yale University, New Haven, CT, and University of North Dakota, Grand Forks, ND*

Most treatment outcome studies of eating disorders do not include substance abusers as study subjects. Currently, the treatment of the two disorders is usually separate and sequential. Treating the two disorders separately ignores the possible weight-related motivation that has been reported to exist for women. Presented here are the results of the initial pilot study used to test the integrated manual for women with stimulant dependence and an eating disorder involving binge eating. To date, 7 women have finished the 11 week integrated treatment and 4 of these women have completed the 3 month follow-up. Three more women are at week 8 of the integrated treatment. The eating disorder and substance abuse outcomes for the 4 women who have completed the 3 month follow-up are as follows: 4 subjects (2 ephedrine abusers, 1 prescription thyroid abuser and 1 crack cocaine abuser) maintained the binge free status that they achieved at the end of the 11 week treatment program and only 1 was still using any stimulants (cocaine abuser). Improvement in eating disorder pathology as measured by the Eating Disorder Examination at 11 weeks and 23 weeks were stable and averaged a 50% improvement in change scores over the 4 subjects. The 3 women (1 adderall abuser, 2 ephedrine abusers) who have completed the 11 weeks trial have had good results as well. Two are binge free at the end of treatment and substance free since at least week 3 of the trial. The other subject has had a 28% change in her bingeing and has been substance free since week 6. The 23 week follow up of these 3 subjects and the 3 subjects now at week 8 will be presented as well data from other variables such as SCID I and II, BDI, BAI and Self-Harm Inventory. The next phase of the study testing the integrated treatment approach (15 subjects) versus sequential treatment (15 subjects) for women with stimulant dependence and an eating disorder can now move forward. Implications for future treatment and research directions will be discussed. ACKNOWLEDGMENT: Supported by NIDA grant DA 00413

### **Effects of bremazocine and a nondrug alternative reinforcer on the self-administration of phencyclidine in rhesus monkeys: Sex differences**

K.P. Cosgrove, M.E. Roth, and M.E. Carroll

*University of Minnesota, Minneapolis, MN*

Sex differences have been demonstrated in drug self-administration during various phases of drug abuse; however, few studies have examined whether the effects of treatments for drug abuse may vary as a function of sex. The purpose of the present study was to compare pharmacological and behavioral treatments in male and female rhesus monkeys self-administering PCP. Eight adult male and 7 female rhesus monkeys orally self-administered PCP concurrently with water on fixed ratio (FR) 16 schedules. Liquid deliveries (0.6 ml) were contingent upon lip-contact responses. Bremazocine (0.00032, 0.001, 0.0025, i.m.) was administered for 5 consecutive days with the 4 preceding days serving as a no treatment baseline. Subsequently, the animals self-administered PCP concurrently with water at FR values 4, 8, 16, 32, 64, 128 to obtain demand curves (consumption as a function of number of responses). Saccharin was then substituted for water at the same FR values. Preliminary results indicate that males and females consumed similar amounts (mg/kg) of PCP, and that low doses of bremazocine were more effective in reducing PCP intake in female monkeys. Additionally, preliminary results suggest that saccharin functions as a nondrug reinforcer and reduces PCP intake in females. These results suggest that there may be differential treatment effects in males and females, and sex may interact with treatment dose. This research

was supported by NIAAA grant F31 AA05575-03 (KPC) and NIDA grant R37 DA02486-22 (MEC).

### **Gender differences, cue-exposure reactivity and nine-month outcome**

J. Dean, R. Sterling, S. Weinstein, E. Gottheil  
*Thomas Jefferson University, Philadelphia, PA*

Gender differences have been shown to be related to the course of cocaine dependence and treatment. And while previous research has shown cue exposure procedures to be somewhat effective at reducing responsivity of substance dependent individuals to drug related stimuli, the few studies that have examined gender differences in craving and cue-reactivity have yielded equivocal results. We have recently demonstrated that an active cue-exposure procedure that featured cocaine-dependent individuals receiving immediate feedback about their level of physiological arousal following videotaped exposure to cocaine-related stimuli was capable of positively influencing in-treatment (helplessness, abstinence efficacy), as well as, nine-month outcome (i.e., urinalysis) indices (Sterling et al., 2001). The purpose of the current study was to determine whether differential in-treatment or nine-month follow-up outcomes were obtained for male and female study participants. Subjects in this study were 81 individuals (47 male) who met DSM-IV criteria for cocaine dependence and who had consented to be randomly assigned to either the active cue-exposure or control conditions. Participants were compared along a myriad of pre-treatment, in-treatment, and nine-month follow-up measures. While no obvious systematic pattern of differences on pre-treatment indices was observed, male subjects did report significantly more recent work,  $t(79) = 3.08, p < .05$ , and significantly less SCL-90R measured somatization,  $t(75) = 2.01, p < .05$ , than their female counterparts. Regarding cue-responsivity, we observed that male subjects responded to a greater number of stimuli,  $t(39) = 1.98, p = .058$ , and were more successful at establishing control over their responsivity to the cocaine-related stimuli,  $t(35) = 1.90, p = .07$ . These results are especially interesting in light of the finding that no gender differences in treatment retention were observed. With respect to nine-month follow-up, no gender differences on measures of addiction severity, psychological functioning or urinalysis were seen. Further examination of the role of gender in the addiction treatment process is needed. The research was funded by grant #R29 DAO9415 from NIDA.

### **Male-female differences and family attention in early inhalant transitions: Evidence from the PACARDO study of adolescents in Latin America**

C.M. Dormitzer, M. Sánchez, G. Gosebruch, J. Delva and J.C. Anthony  
*Bloomberg School of Public Health, The Johns Hopkins University, Baltimore, MD, and PACARDO research team*

Mainly from U.S. studies, current evidence suggests protective influence of parental supervision on early initiation of drug use. We seek to estimate how inhalant drug use might depend upon two inter-related aspects of family attention, with separate estimates for males and females. Our study data are from anonymous self-report questionnaires administered for recent NIDA-sponsored PACARDO surveys of school-attending adolescents in nationally representative samples drawn within Panama, five countries of Central America, and the Dominican Republic. Standardized multi-item sets were used to assess response variables (e.g., ages at first inhalant use), with separate scales for family supervision (FS) and communication (FC). Among 5,121 male and 5,621 female students, 635 reported use of inhalants. Based upon the polytomous form of multiple logistic regression, and with attention to classroom-clustered samples, among boys, occurrence of inhalants use was found to be associated with higher FS levels and, independently, with higher FC levels, but among girls, the association was present for FS but not for FC. Boys with the lowest supervision were about 2-2.5 times more likely to have used inhalants as compared to boys in the two upper tertiles ( $p < 0.05$ ); for FC, boys with the lowest communication were about 1.5-2. times more likely to have used inhalants as compared to boys in the two upper tertiles ( $p < 0.05$ ). A similar magnitude of association was found for girls with the lower supervision scores ( $p < 0.05$ ), but not with respect to communication ( $p > 0.05$ ). Next steps include consideration of exposure opportunity as an intermediate step, and consideration of other potential intermediary variables such as affiliation with drug-using peers, or others influenced by family attention. A long-term goal is new insights for design of evidence-based prevention strategies for boys and girls. Acknowledgments: NIDA R01DA10502,

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### **Sex and hormonal influences on pain responsivity in humans**

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Although most studies show that women have higher subjective pain ratings in response to painful stimuli, less consistency exists across studies with regard to sex differences in the ability to discriminate painful stimuli. This study evaluated both the emotional and sensory aspects of pain in normally-menstruating women (NMW) at five menstrual cycle phases, in women maintained on oral contraceptives (OCW), and in men (M). All participants completed 10 sessions (two sessions per "phase"). During the cold pressor test (CPT), participants immersed the forearm into water (4°C); latency to first pain report (threshold) and latency to withdraw the arm from the water (tolerance) were measured. During the mechanical pressure test (MPT), weights were placed, one at a time, upon the fingers. Two primary dependent measures obtained from the MPT were P(A), ability to discriminate between two stimuli, and B, willingness to report pain. Preliminary results suggest that both pain threshold and tolerance during the CPT were greater in NMW, compared to OCW and M. In contrast, for the MPT, B values were greater in M, indicating greater stoicism, compared to the two groups of women. Ability to discriminate pain, however, was similar across groups. Pain tolerance increased in an orderly fashion across the menstrual cycle in NMW, and was greatest during the late luteal phase. No systematic changes across menstrual phase in P(A) and B were found for NMW during the MPT. These results suggest that for mechanical pressure pain, men and women do not differ in the ability to discriminate pain, but willingness to report pain is lower in men. However, NMW appear to have a greater tolerance for cold pressor pain, particularly during the late luteal phase. Future studies will examine the effects of morphine as a function of sex and hormonal status. Supported by DE12763.

### **Developmental cocaine alters functional coupling in central DA systems**

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Postnatal cocaine administration to the SD rat (a model of third trimester human exposure) has been shown to alter brain function and behavioral responses to dopaminergic drugs when tested in adulthood. This study tested the hypothesis that cocaine exposure during postnatal day (PnD) 11-20 alters the functional relationships between components of the mesolimbic and nigrostriatal dopamine systems. During PnD11-20, 40 male rats received either water or 50 mg/kg cocaine daily. On PnD60, subjects were challenged with either saline or 5.0 mg/kg SKF82958, a selective full D1 receptor agonist, and were monitored for locomotor activity and videotaped to allow for behavioral assessments for 75 min. Thirty minutes after the drug challenge, the 2-deoxyglucose method of Sokoloff was carried out. Rates of metabolism in components of the nigrostriatal and mesolimbic systems were examined using Pearson Product Moment Correlations which revealed that in the nigrostriatal system of the controls, rates were highly correlated and that the cocaine-treated rats showed much lower degrees of correlation. For example, there was a significant difference in the correlation between the somatomotor cortex—caudate@1.6 in the two groups (Linear regression analysis). These data suggest that function in components of the nigrostriatal and mesolimbic systems is strongly linked and that this relationship is significantly weaker in the cocaine-treated rats compared to the controls. Supported by NIDA grant DA 10990

### **Impact of maternal psychopathology and parenting attitude on dysregulation in children of women with substance use disorder**

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This study examined the relation between maternal psychopathology and child dysregulation (cognitive,

emotional, behavioral) in a sample of substance abusing (SUD+; n=179) and non-abusing (SUD-; n=26) women and their children (n=207). Fifty three percent of the children were female, ranging in age from 1-9 years, with non-significant differences in the mean age between the children in the SUD+ and SUD- groups of mothers. There were no significant differences in mean age, SES, ethnicity, and education between the SUD+ and the SUD- women. The results of moderation analyses revealed that maternal psychopathology assessed in adolescence (age 14-18) did not predict child dysregulation. However, parenting attitude assessed at age 19-23 predicted child dysregulation (assessed contemporaneously, but independently) (Beta = -.19; p = .008). In addition, parenting attitude moderated the association between maternal antisocial behavior (ASB) and child dysregulation (Beta = -.16; p = .05). These findings indicate that parenting attitude in interaction with ASB in young adult SUD women, relative to adolescent psychopathology, is a better predictor of child dysregulation. In conclusion, given that dysregulation is typically an antecedent to ASB which is, in turn, a precursor to substance abuse, the quality of parenting may be a mechanism that places children of SUD mothers at high risk for developing early-onset SUD themselves.

### **Characterization of profound sex differences in opioid-potentiated inflammation: Pharmacological and immunological investigations**

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A series of experiments was conducted to assess whether male and female rats differ in their sensitivity to the immunomodulatory effects of opioids using a model of chemically-induced cutaneous inflammation, the contact hypersensitivity response. Male and female CDF rats were sensitized on the ventrum with 2,4-dinitrofluorobenzene (DNFB) on two consecutive days. Four days later they were administered either selected doses of mu opioid receptor agonists or vehicle (6 animals/group) and one hour later challenged on the pinna with DNFB. Measurements of pinna thickness were performed from 12-192 hours after challenge. Results indicate significant proinflammatory effects of morphine (2.5-25 mg/kg), buprenorphine (0.01-1.0 mg/kg) and etorphine (0.001-0.01 mg/kg) (all p<0.001) and that across all drugs tested females displayed a markedly potentiated and prolonged inflammatory response compared to males (all p<0.001). In another set of experiments, mRNA levels of early molecular mediators of inflammation were assessed at 3 and 6 hours post-challenge using RT-PCR to determine which cytokines underlie the observed sex differences. Preliminary analyses suggest that opioids induce a complex, differential pattern of cytokine expression in males and females that may underlie these sex differences. These results have implications for the understanding of sex differences in immune function and guiding opioid analgesic selection for use in males and females. (Supported by NIH grants DA 07481 to D.T.L. and DA10277 to M.J.P.)

### **Cocaine pharmacokinetics in female rhesus monkeys across four phases of the menstrual cycle**

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Several preclinical studies in rodents suggest that there are sex differences in response to cocaine and that these differences appear to be related to fluctuations in the ovarian hormones of females. Female rhesus monkeys have menstrual cycles that are remarkably similar to human menstrual cycles in both duration and hormonal variations. Therefore, data obtained in monkeys should be an ideal model for assessing the effects of cocaine across the menstrual cycle in humans. The present study assessed the acute effects of intravenous cocaine (0, 0.25, 0.50 and 1.0 mg/kg) in 5 female rhesus monkeys during 4 phases of the menstrual cycle: menses, midfollicular, periovulatory and midluteal. To limit the effects of stress, all animals were trained to enter primate chairs and while restrained they received fruit and treats. Similarly, during the 2 hour experimental sessions, females were in the primate chairs and their feet were restrained in shoes so that repeated blood samples could be obtained from the leg veins. Hormone levels for estradiol and progesterone were measured each session before cocaine administration. Cocaine plasma levels were measured at 5, 15, 30, 45, 60 and 90 min after cocaine administration. Similarly, levels of cortisol and luteinizing hormone (LH) were measured before, 15, 30 and 60 min after cocaine administration. Within 5 min of cocaine administration, behavioral changes such as increased motor activity, mydriasis and refusal of treats were observed. These effects typically resolved in 15-30 min and were dose-related. Results on

cocaine, cortisol and LH plasma levels as a function of cocaine dose and menstrual cycle phase will be presented. Supported by NIDA grant DA-12675.

### **Gender Differences in Cocaine-induced Locomotor and Stereotypic Behavior**

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There is accumulating evidence which suggests that male and female humans and animals respond differently to psychomotor stimulants. To extend our understanding of sex effects in drug-induced psychomotor activity, the present study examined the relationship of dose and gender on the behavioral effects of cocaine. Male and female rats were given a single injection of cocaine (5, 15, 20, and 30 mg/kg) of cocaine or saline. Total locomotor, ambulatory, and rearing behaviors were measured for a total of 3 hours post-injection. Stereotypic scores were measured at 30 minutes, 1 hour, and 2 hours. In male and female rats, there is a linear relationship between dose and behavioral activity which peaks at 20 mg/kg. Overall, female rats had greater total, ambulatory, rearing, and stereotypic counts at 5, 15, 20, and 30 mg/kg of cocaine as compared to males. Females also have a longer-lasting and prolonged period of motor activation. Taken together, our data suggests that there are dose and gender effects on cocaine-induced behaviors, which may highlight differences in the pattern of cocaine abuse or relapse between males and females. This work was supported by PS-CUNY, RR-03037, NIDA DA12136. SCORE 506-GM60654, and SNRP NF-39534.

### **Office-based prescription study with buprenorphine**

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Introduction: Since 1999 buprenorphine has been registered in EU- countries for the treatment of opioid dependence. We conducted an office based treatment study, with standardized supervision through a specialized addiction center. Methods: 120 opioid dependent subjects (DSM IV:304.0) were enrolled at the addiction clinic of the University of Psychiatry, Vienna for a study period of three weeks with a continuation of 12 weeks at general practitioners office. Induction onto buprenorphine took place during the first five days until reaching sufficient dosing. Supervised urinalysis was undertaken weekly during the first month with a continuation on a two weekly basis over the study period. Structured rating instruments for withdrawal, craving and physical condition were applied. Results: A retention rate of 58 % was achieved after 15 weeks investigational period, the drop out analysis showed a significant gender difference regarding age ( $p=0.015$ ) and onset of dependence ( $p=0.040$ ). The mean daily buprenorphine doses (without induction period) was 16 mg (range: 8-28). A significant reduction on heroin consumption ( $p<0.01$ ) as well as cocaine consumption ( $p<0.05$ ) was evaluated. In addition a significant improvement in physical and psychological wellbeing could be shown. Discussion: Buprenorphine is a medication which showed efficacy as well as well acceptance and safety for opioid dependent patients when treated in GP's office in collaboration with a specialized center.

### **Birth Outcomes as a Function of Addiction Severity**

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This study explored the relationship between various measures of addiction severity in pregnant drug abusers and 2 birth outcomes: (1) weight in grams; and (2) head circumference. Subjects were 54 women with DSM-IV substance dependence diagnoses who were receiving treatment at the Center for Perinatal Addiction (CPA), a model treatment program for pregnant and parenting women and their children. Subjects were primarily African-American (86%), with a mean age of 29 years of age. The prevalence of alcohol use disorder was 58%, cocaine (89%), cannabis (58%) and heroin/other opioids (23%). Variables included in a discriminate function analysis predicting neonatal outcomes were amount of cigarettes smoked per day, ASI drug severity (t-score), ASI alcohol severity (t-score), and the MacAndrews Scale

(MacR), Addiction Potential Scale (APS) and Alcohol Acknowledgement Scale (AAS) scales from the MMIP-2 (t-scores). The mean weight of the infants was 2844.23 grams (SD = 789.29). Of the candidate variables, only smoking status predicted infant weight (Wilks' Lambda = .004). None of the variables predicted head circumference. While prenatal exposure to alcohol and illicit drugs can and does have devastating effect on unborn children, the implications of cigarette smoking during pregnancy are often downplayed or ignored. These data suggest the need for smoking cessation programs for pregnant drug-dependent women. Supported by #HS\$ TI00555

### **Methamphetamine-induced neurotoxicity: Sex Differences and the Effect on Subsequent Methamphetamine Reward**

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Experiment 1 determined if there are sex differences in the amount of methamphetamine-induced neurotoxicity produced in dopamine (DA) terminals of the nucleus accumbens (NAcc) in rats. Experiment 2 examined the effects of methamphetamine-induced neurotoxicity on the rewarding effect of subsequent administration of methamphetamine assessed by the conditioned place preference (CPP) paradigm. It was predicted that due to a depletion of DA, methamphetamine-induced neurotoxicity would decrease methamphetamine CPP. In both Experiments 1 and 2, rats were treated with a neurotoxic regimen of methamphetamine (10 mg/kg, s.c., every 2 hours for a total of 4 injections) or saline. In Experiment 1, female (n=20) and male (n=19) Sprague-Dawley rats were administered the neurotoxic methamphetamine treatment or saline. Two weeks later, DA, DOPAC, 5-HT, and 5-HIAA concentrations in the striatum (Str), NAcc, and prefrontal cortex (PFC) were measured using HPLC-EC. Results showed that regardless of drug treatment, females had significantly lower concentrations of 5-HT in the PFC; however, the amount of neurotoxicity measured by depletion of DA or 5-HT was not significantly different between males and females. In Experiment 2, male rats (n=60) were administered the neurotoxic methamphetamine treatment or saline and then conditioned with methamphetamine (0.1, 0.3, or 1.0 mg/kg, s.c.) or saline using a 4-trial CPP procedure. Additionally, locomotor activity was measured during the conditioning sessions for trials 1 and 4. Overall, methamphetamine neurotoxic treatment increased locomotor activity. Methamphetamine-induced neurotoxicity also enhanced methamphetamine reward, since CPP was demonstrated with 0.3 and 1 mg/kg methamphetamine for rats with methamphetamine neurotoxicity, but only with 1 mg/kg methamphetamine for saline controls. These results suggest that the amount of neurotoxicity produced by methamphetamine is similar between females and males, and that methamphetamine-induced neurotoxicity increases methamphetamine reward.

### **Intimate Partner Violence among Women in Methadone Maintenance Treatment**

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Background: Intimate partner violence (IPV) among drug-involved women is a serious public health concern. However, no studies have been conducted on IPV with representative samples among women in methadone maintenance treatment programs (MMTPs). This study assesses prevalence of IPV among a random sample of 416 women recruited from MMTPs and examines associations between the women's drug use and IPV after adjusting for sociodemographics and partners' drug use. Methods: Data were collected during face-to-face interviews with women in MMTPs, who participated in a three-year, NIDA funded study which examined the co-occurrence of IPV and drug use over time. Results: The majority (87%) of the women reported experiencing physical or sexual IPV during their lifetime using the Revised Conflict Tactics Scale and about one half (47%) experienced such IPV in the past 6 months. One-fifth (20%) reported severe IPV in the past 6 months. Logistic regression analyses indicated that women's use of marijuana, crack cocaine and/or heroin were not significantly associated with IPV in the past 6 months, after adjusting for socio-demographics and partners' drug use. Women, however, who indicated that their partners used both crack cocaine and heroin in the past 6 months were more likely than the women who did not report drug use for their partners to report any IPV (OR= 3.3, CI=1.7-2.7) sexual IPV (OR=2.1, CI=1.1-4.1), physical IPV (OR=4.2, CI=2.2-8.3), and severe IPV (OR=5.2, CI=2.5-11.1) in the past 6 months.



Significant associations were also found between partners' use of crack cocaine only and IPV, but not for partners' use of heroin only. Conclusion: Prevalence estimates of IPV among this random sample of women in MMTPs are much higher than estimates in the general populations of women and exceed estimates found in other non-random samples of women in drug treatment programs. Perpetrators' drug use is a stronger indicator of IPV than women's drug use.

**Pregnancies and newborn infants among 260 opiate-dependent women in 1998-1999: Final results and analysis of the French 'GEGA' prospective study**

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Previous results from our team have shown that opiate dependent women who received substitution during pregnancy and early post partum period had rather similar results on birth, neonatal withdrawal syndrome (NWS) and perinatal patterns of the infant, whether they received oral methadone or sublingual buprenorphine treatment. Even though, demographic issues need to be better discussed. Social status, polydrug abuse medical and psychiatric items appear meaningful compared to the type of substitution chosen. Moreover, this population seem to be older, with less education and longer obstetrical history in face of a witness population. Despite few differences concerning NWS age of maximum and late premature newborn, both the methadone and buprenorphine regimen had a group of severe cases grouping several harmful factors with poor or very poor results. Consequences for a future guide line of indications for "liberal-managed" buprenorphine treated pregnant women or for "in-center" methadone maintained ones will be discussed.

**Post-discharge Abstinence Rates for Women with Long-Term Residential Treatment in Three National Studies: RWC/PPW, NTIES, and DATOS**

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This analysis compares post-discharge abstinence rates obtained in three national studies of women in long-term residential treatment (LTR). In the first study, 6-month abstinence data (n=1,181) were assessed for women who received LTR in CSAT's Residential Women and Children/Pregnant and Postpartum Women (RWC/PPW) program. In the second study, 9-month abstinence data on average were assessed for women who received LTR in CSAT's National Treatment Improvement Evaluation Study (NTIES), (n=424), and in the third study, 6- and 12-month abstinence data women were assessed for women who received LTR in NIDA's Drug Abuse Treatment Outcomes Study (DATOS), (n=239). The clients' length of stay in treatment (LOS) was controlled in the analysis and the association of abstinence with parent/pregnancy status was assessed. In all three studies, post-discharge abstinence rates were strongly related to LOS. Despite varying clientele, treatment programs, and follow-up intervals women who received LTR of 6 months or longer showed consistently high post-discharge abstinence rates, ranging from 68-71% in the three studies. Between-study differences were largest for women with LOS under 1 month, (ranging from 18% abstinent in DATOS to 43% in RWC/PPW), but diminished as LOS increased. Length of follow-up interval and client pregnancy/parenting status both showed only slight associations with post-discharge abstinence. Parenting and pregnant women with the longest LOS ranged from 62%-71% abstinent.

**Addiction history, treatment utilization, and service needs among sub-groups of dually diagnosed patients**

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Hypotheses: Individuals with co-occurring substance use and mental disorders are heterogeneous with regard to types of mental disorders and substances used. The hypothesis of this study is that addiction

history, treatment utilization, and service needs vary among sub-groups of dually diagnosed patients by diagnosis and gender. Procedures: This study will examine relationships among addiction history, treatment utilization, and service needs among 300 adult (humans) who are receiving residential drug treatment. In-depth interviews are conducted at the time of treatment admission. Results: 36% of the sample has a psychotic disorder and 64% has a mood disorder. Statistical Analyses: Chi square and ANOVA tests were performed to test differences between diagnostic groups. Significant differences were found with regard to ethnicity, with a higher proportion of whites among those with mood disorder (51% vs. 31%) and a higher proportion of African Americans with psychotic disorders (41% vs. 31%,  $p < .05$ ); a higher proportion of psychotics who were dependent on cannabis (56% vs. 41%,  $p < .05$ ); more years of regular cocaine use among individuals with mood disorder (13.7 vs. 11.0,  $p < .01$ ); more use of opiates (non-heroin) among those with mood disorders (31% vs. 20%,  $p < .05$ ); more use of tranquilizers among those with mood disorders (32% vs. 21%,  $p < .05$ ). Regarding treatment participation, individuals with mood disorders had a higher number of prior treatments for alcohol use (1.8 vs. 1.2,  $p < .01$ ), were more likely to have been treated in short-term inpatient modalities (31% vs. 11%,  $p < .01$ ), and had more episodes of outpatient mental health treatment (5.8 vs. 4.0,  $p < .05$ ). Yet the two groups did not differ with regard to number of perceived barriers to mental health treatment (Mean=3.0) or substance abuse treatment (Mean=3.3). Implications: The findings suggest that dually diagnosed individuals of different diagnostic groups have different substance use and treatment histories, but perceive similar barriers to accessing treatment. Supported by the National Institute on Drug Abuse (R01-DA11966)

### **Barriers to Work and Employment Outcomes among Substance-Abusing Women on Welfare: Findings from the CASAWORKS for Families Program**

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States face a special challenge moving women with substance abuse problems from welfare to work under the requirements of the 1996 federal Temporary Assistance to Needy Families program (TANF). In prior work, Danziger and colleagues found that a simple, summary index of fifteen potential barriers to employment faced by these women was an excellent predictor of 12-month employment status among welfare dependent women. This study used the ASI and TSR to construct a similar "employment barriers index" modeled after the Danziger work and examined its predictive utility among 342 substance abusing women on welfare in 11 locales around the nation. These women received a multi-service intervention (CASAWORKS for Families) designed to support female welfare recipients' efforts to achieve stable employment by overcoming substance abuse and other potential major barriers to work. Substance abuse treatment was integrated with employment-related services, and services for domestic violence, parenting skills, and other needs. A repeated measures design with no formal control group was employed during the initial developmental phase. Findings indicated that almost all 15 barriers were quite prevalent among the CWF sample at admission, particularly lack of transportation (85%), low work experience (78%), major depressive symptoms (70%), and legal problems (74%). Further, all substance abusing women on TANF were experiencing multiple potential barriers to work at admission, the average number being 7. Few single barriers predicted employment, but replicating the earlier findings of Danziger, there was a significant relationship between the number of barriers experienced at both baseline and 6 months and the likelihood of employment at 12 months. The conceptual framework of potential barriers to work appears to be promising based on these findings but analyses eventually (in a second phase) with a control group will provide a clearer picture of the utility of this approach.

### **Sex-selective effects of strain on cocaine self-administration**

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Female rats show greater neurobehavioral responses to stimulants than male rats, effects that may relate to activating effects of gonadal steroids, which increase DA levels, or to organizational effects leading to sexual dimorphism of specific brain regions. Data on sex differences in drug self-administration (SA) are

conflicting perhaps due to strain differences. Male Lewis (Lew) and Fischer 344 (F344) rats differ in cocaine SA, and in mesolimbic DA and HPA axis functions. Strain differences in these functions for female rats appear to oppose those for males. Thus, we examined IV cocaine SA in female and male, Lew and F344 rats. Rats were trained to self-administer cocaine until response rates were stable. Responding under fixed ratio (FR3; 0.25-1.0 mg/kg/infusion) and progressive ratio (PR; 0, 1 mg/kg/infusion) schedules were examined. Preliminary analysis suggests that male F344 rats have higher response rates under both schedules compared to male Lew rats and these rates are similar to those of female Lew rats. We also find female Lew rats have shorter estrus phase than F344 rats, shown previously to reflect lower estrogen levels. These data suggest that gender interacts with genetic background to affect the behavioral responses to cocaine. Support from Donaghue Medical Foundation and Yale BIRCIWH Scholar Program.

### **Basal sex differences in circulating levels of adrenocorticotrophic hormone, cortisol, and prolactin in normal and drug-dependent volunteers**

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Women have been shown to differ from men in their neuroendocrine profile at baseline and in response to hypothalamic pituitary adrenal (HPA) axis probes, such as dynorphin (Kreek et al. *J Pharmacol Exp Ther*, 1999). It has been reported that basal ACTH secretion is lower and the ratio of cortisol to ACTH higher in normal females than in males (Roelfsema et al. *J Clin Endocrinol Metab*, 1993), and that stress-induced prolactin release is greater in women than in men (Jezova et al. *Acta Physiol Scand*, 1994). We examined placebo data from ongoing studies of human neuroendocrine function for gender effects in normal, methadone-maintained (MM), and cocaine-dependent (CD) volunteers. Blood was sampled prior to I.V. administration of saline placebo and at 10, 20, 30, 40, 50, 60, 75, and 90 minute timepoints thereafter. Circulating ACTH, cortisol, and prolactin concentrations were determined by RIA. Examination of area under the curve revealed that normal women had significantly lower plasma levels of ACTH ( $p < 0.002$ ) and higher cortisol levels ( $p < 0.005$ ) than normal men whereas there was no ACTH or cortisol sex difference in the MM and CD groups. Serum prolactin concentrations in females were two-fold higher than those of males in the normal ( $p < 0.00005$ ), and also in the MM ( $p < 0.05$ ), and CD ( $p < 0.05$ ) groups. Elucidating sex differences in basal neuroendocrine function will be important in understanding the role of the HPA axis in addiction and stress responsivity. Supported by grants NIH DA-P50-05130, DA00049, & M01-RR00102.

### **Relationship of regular cocaine, heroin and alcohol use and psychosocial functioning in pregnant women**

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Drug use in pregnancy can adversely affect both mother and fetus. Since most drug abusing women report polysubstance use, it is important that we examine diversity in psychosocial functioning and its relationship to regular use of specific substances (i.e., alcohol, heroin, cocaine). The present study compared ASI composite scores and interviewer severity ratings in a sample of 205 treatment seeking pregnant women with and without lifetime histories of regular alcohol, cocaine and heroin use. Demographically, the sample had a mean age of 28.8 years and 81% were African American. There were some demographic differences across the various lifetime regular use patient subgroups. Regular alcohol users were more likely to be Caucasian. Regular heroin users were more likely to be African American and younger on admission, while regular cocaine users were somewhat older on admission. At least one year of regular use was reported by over one-fourth (27%) of women for alcohol; nearly three-fourths of women (73%) for heroin, and over two-thirds of women (69%) for cocaine. For alcohol, pregnant women with regular use had higher ASI composite scores for 2 of the 7 domains (alcohol, legal). For heroin, regular users had higher scores on 4 domains (employment, alcohol, drug, legal). A similar pattern was found for regular cocaine users, with higher scores for the alcohol, drug, family, and psychiatric domains. Similar patterns were observed for interviewer severity ratings, supporting the robustness of study findings. The data confirm different patterns of psychosocial functioning as a function of type of regular drug use. The implications of these data for

patient treatment matching will be discussed. This research was supported by DA RO1 DA11476 and RO1 DA12403.

### **Severe Personality Disorders: Impact of Substance Dependence in HIV+ women**

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There is a dearth of literature on drug-dependent women living with HIV, particularly with respect to co-occurring psychiatric disorders. As the proportion of HIV patients is increasingly female, it is important to understand how substance-dependence and psychiatric problems may affect the healthcare needs of these women. The current study sample consisted of 74 HIV+ women seeking ambulatory psychiatric care in an HIV-mental health clinic. Twenty-eight percent were substance-dependent based on the UM-CIDI (20% drug, 8% both EtOH and drug, 0% EtOH only). The majority were African-American (85%), unmarried (61%), and unemployed (76%). In addition, 43% were single mothers. The average participant earned less than \$10,000 per year and had less than a high school education. In terms of health status, the mean T-cell count was 347.71 (SD = 341.38). (Healthy T-cell counts range from 1000-1500, and counts below 200 are considered to be AIDS-defining.) Key findings of the study were: (1) almost 30% of the women were substance-dependent, (2) none were alcohol-dependent only, and (3) substance-dependence status was significantly related to Axis II but not Axis I disorders. Chi square comparisons of substance-dependent and non-dependent women produced the following significant results with regard to Axis II disorders on the MCMI-III: Antisocial ( $p = .000$ , OR = 13.48) and Borderline ( $p = .002$ , OR = 5.09). For example, the odds that substance-dependent women met criteria for co-morbid antisocial personality disorder were 13.5 times greater than the odds for the non-dependent women. Of personality disorders not currently in the core DSM-IV, Aggressive/Sadistic was found to be significant ( $p = .008$ , OR = 7.97), and Self-Defeating personality disorder ( $p = .059$ , OR = 2.68) approached significance. These findings suggest that, in addition to being from socially marginalized groups (i.e., poor, uneducated, Black), drug-dependent women with HIV suffer from severe Axis II disorders that can interfere with functioning as well as treatment process and outcome. Further implications for theory, research, and practice will be discussed. Supported by HS4 TI00555 and Training Grant T32 DA07027-26.

### **Progression of Drug and Alcohol Dependence among Women Entering Substance Abuse Treatment: Evidence for telescoping**

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Objective: To evaluate the effect of gender on the progression, severity and frequency of current DSM-III-R drug and alcohol dependence and related behaviors in a sample of 271 patients (mean age:  $32.6 \pm 7.7$  years; 156 women) entering treatment. Method: Multivariate and univariate ANOVAs were used to compare age at onset of regular use of cocaine, heroin, cannabis and alcohol. Time elapsed between initiation of regular use of each substance and entry into an index treatment and impairment scores on the Addiction Severity Index (ASI) were also examined. Results: There was no effect of gender on age at onset of regular use of cocaine, cannabis, or heroin among drug-dependent patients. However, alcohol-dependent women were older than their men counterpart at onset of regular alcohol drinking ( $F = 7.53$ ,  $df = 1,100$ ,  $p = .01$ ). There were no gender differences in rates of current cocaine, heroin, cannabis or alcohol dependence. However, drug dependent women reported fewer pretreatment years of regular use of heroin ( $F = 4.21$ ,  $df = 1,96$ ,  $p = .04$ ), cannabis ( $F = 5.01$ ,  $df = 1,38$ ,  $p = .03$ ) and alcohol ( $F = 7.71$ ,  $df = 1,100$ ,  $p = .01$ ). Across diagnostic groups, women experienced similar severity of drug and alcohol dependence and more severe medical, psychiatric, and employment problems than men (range of F values = 7.21-13.4,  $df = 1,271$ ,  $p$ 's < .05). Conclusions: Although age at onset of regular use of drugs was comparable between men and women, and despite the fact that women were older at onset of regular drinking, women had briefer drug and alcohol use careers at treatment entry than men. Nonetheless, women experienced more medical and psychosocial problems related to alcohol and drug use. These findings support the notion of an accelerated or telescoped progression of heroin, cannabis and alcohol dependence among women. Replication of these

findings in relation to drug dependence is warranted and an effort should be made to identify the specific mechanisms responsible for this apparent effect. (Supported by NIH grants DA05592, DA00089, AA07290 and AA00239.)

### **Gender-differential Pathways to Substance Use and Abuse**

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Despite continued efforts to reduce and/or prevent alcohol and drug use among children and adolescents through media and school prevention efforts, and despite an apparent declining trend during the 1980s in the USA, the last few years have witnessed an increase in the prevalence of drug use, particularly the illicit ones. These data suggest that prevention and/or intervention strategies may have to be examined from a different conceptual framework than has been done for traditional programs. One possibility is that the focus for prevention or intervention activities should be on distal events prior to the acquisition of drug use behaviors and established drug use patterns. Moreover, there is evidence that acquisition patterns differ by gender and by age. As part of a longitudinal study beginning in elementary school several hundred children were followed-up in high school. Early assessments were based on school-related variables including social and academic behaviors. High school assessments included parent and adolescent questionnaires and interviews of drug use and a variety of psychosocial variables. The results showed differential predictors by gender over a five-year period. Predictors for girls were more heavily weighted by academics whereas boys predictors were more likely to be in the social arena. These results by gender have significant implications for prevention and intervention efforts.

### **The early caregiving of heavy cocaine-using mothers**

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The purpose of this study was to study the caregiving of heavy cocaine-using mothers during the first 18 months of their offsprings' lives. Prior research has shown that the caregiving of substance abusing women is compromised early on. 71 women and their offspring participated in this study that lasted from pregnancy until the infants were 18 months of age. Maternal prenatal drug use was assessed through the ASI and urine toxicology screens at delivery. Prenatal maternal psychopathology was assessed use the MCMI-I. Maternal sensitive caregiving was assessed at 1-, 6-, and 18-month post-delivery. Maternal sensitivity remained low for the great majority of the sample over the 18 months of the study. No relationships were found between maternal sensitivity at any age and the measures of prenatal drug use. However, prenatal maternal psychopathology was consistently related to poor caregiving at all ages. These findings suggest that maternal caregiving is more influenced by psychopathology and treatment programs should include psychiatric evaluations and ongoing psychological support.

### **Trauma and substance abuse: Implications for treatment providers**

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The events of September 11th have sensitized substance abuse treatment providers to the important relationship between trauma and substance abuse. There is a substantial body of research that suggests that a significant proportion of patients in treatment settings have comorbid substance use disorders and post-traumatic stress disorder (PTSD). Additionally, many studies point to high rates of PTSD among "hard" drug use, such as those individuals using cocaine and opiates. The literature also suggests that individuals with substance abuse and PTSD are more likely to relapse if trauma issues are not addressed (appropriately in a comprehensive fashion. The issue of trauma is of particular importance to women with substance abuse problems, since they are known to develop PTSD at a higher rate than men, despite evidence indicating that substance-abusing men have more exposure to traumatic events. The clinical presentation of PTSD and a

substance use disorder can be quite complex, and is often accompanied by serious consequences such as psychosocial impairment. Current research focused on the substance abuse clinical workforce indicates that there is a substantial need for improvement in the training of professional and paraprofessional treatment providers in properly treating individuals with a substance use disorder and PTSD. The reviewers aim to discuss implications for workforce development, with special attention on projected clinical needs after the September 11th Terrorist Attacks.

### **The Impact of Managed Care on Treatment for Drug-Dependent Women and Their Children: One-Year Follow-up**

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Managed health care has imposed restrictions on the quantity and frequency of services for many high-risk patient subgroups including pregnant drug dependent women and their offspring. Jansson and colleagues (2001) previously reported higher rates of adverse outcomes and complications for pregnant opiate dependent women treated under managed care (MC) as compared to fee-for-service (FS) reimbursement plans. The FS model of care offered integrated substance abuse, OB/Gyn and pediatric health care; the MC model reduced service integration, with greater reliance upon community referral for pediatric and maternal health care. There was a seven-fold increase in in-utero deaths and a three-fold increase in infant deaths for the MC as compared to FS groups. Immunization rates at 4 months were significantly lower for the MC infants ( $p < .001$ ). The present study followed MC and FS mothers and infants through 12 months of age. Outcomes for the two groups were compared using chi-square and t-test analyses. In addition to immunization and medical records, Child Protective Service (CPS) involvement and foster care placement were also examined. Participants were 132 women who delivered an infant in 1995 under FS reimbursement and 108 women who delivered an infant in 2000 under MC reimbursement. The women were predominantly African American (85% FS, 96% MC) with a mean age of (29.0 FS, 31.3 MC) yrs. Patient demographics and drug use severity were comparable for the two groups. In our preliminary analysis, MC infants were nearly twice as likely to have CPS involvement (25%) as FS infants (13%) ( $p < .025$ ). The clinical and economic implications of such findings will be discussed. Immunization status at 6 months and one year will be reported. Additional analyses will examine maternal as well as staff perceptions of FS and MC models of care and the relationship of such perceptions to program management as well as maternal and infant functioning. This research is supported by NIDA grants K08DA00495 and R01DA12403.

### **C-fos and AP-1 activation by cocaine in Fischer rats, roles of gender and NMDA**

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Previous studies have shown that the immediate early gene c-fos and the AP-1 transcription factors increase after cocaine administration in male rats. In this study we used quantitative solution hybridization and electrophoretic mobility shift assays to measure the c-fos mRNA and AP-1 DNA binding in caudate/putamen, frontal cortex, amygdala and hypothalamus of male and female Fischer rats after one single injection of cocaine (15 mg/kg). A single cocaine administration increased c-fos mRNA levels after 30 min and AP-1 DNA binding after 3 hrs of treatments in the caudate/putamen and the frontal cortex but not in the hypothalamus or the amygdala of both male and female rats. Furthermore, the NMDA antagonist, MK801, blocked this cocaine-induced upregulation of c-fos mRNA levels in the caudate/putamen and the frontal cortex. The induction of these molecular markers may be used as a tool to study neuronal activation that lead to addiction in different sexes after cocaine. This work was supported by DA12136, 506-GM60654, NF-39534, PSCUNY, RR-03037

### **Opiate dependency: A Barrier to Substance Abuse Treatment Among Pregnant Women**

M. Jessup

The use of heroin and other opiates during pregnancy can lead to serious multiple consequences for the woman, fetus and newborn infant. Treatment entry is therefore critical early in pregnancy in order to prevent significant maternal and infant morbidity and to improve health and social outcomes. The objective of this qualitative study was to examine extrinsic barriers to substance abuse treatment among 36 pregnant and parenting women enrolled in residential perinatal treatment programs in northern California. Results indicate that among a subset of women (n = 5), the status of opiate dependency in particular acted as a barrier that delayed and deterred women from treatment entry. Requirements of child welfare agencies and substance abuse treatment programs, health care providers' mismanagement of opiate dependence, and unfavorable methadone maintenance treatment financing policies served as extrinsic barriers to substance abuse treatment. The findings suggest the need for education and training initiatives for substance abuse treatment personnel, child welfare staff and health care providers. Policy implications for child welfare agencies and substance abuse treatment programs and systems will be discussed. Support: National Institute for Nursing Research F31-NR07440-03 and NIDA grant no. P50DA09253.

### **HIV-Risk, Violence, and Depression Among African American Female Drug Users**

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African American women are disproportionately burdened with HIV infection; thus, the need for increased understanding of the contributing factors is critical. This paper examines drug use, violence, and depression to determine if the presence of these factors conjointly are associated with an increased risk for HIV among African American women and thus warrant specific consideration in designing interventions. The analyses use data collected from the NIDA-funded "EachOneTeachOne" project (Dr. L. Cottler, PI). Data were collected on 420 African American women who were current injection drug users, heroin smokers, or crack cocaine users and at least 18 years of age. A mutually exclusive tripartite classification system was developed and the women were stratified across the tripartite based on whether they were drug users only (n=253), drug users with a violence exposure (n=65), drug users with depression (n=62) or drug users with both violence and depression (n=40). Logistic regression analyses were conducted at each level to determine which risk factors were predictive of having one, two, or all three of the tripartite factors when confounding variables were considered in the model. Both violence (25%) and depression (24%) were highly prevalent within the sample. Having a reported history of a sexually transmitted disease was significant at each of the tripartite levels. In addition, women who had two or more sexual partners in the last 30 days (OR=2.89) and women who had an early onset of alcohol use (OR=2.71) were at an increased risk for having the full tripartite, while never having married was a protective factor. These results indicate that perhaps some sexual risk factors and early onset alcohol use can be utilized as a screening mechanism for potential violence and depression in drug using African American women who present for treatment. The presence of psychopathology in the lives of these women increases the risk trajectory for HIV infection and thus should be considered in HIV intervention efforts.

### **Married Drug-Abusing Men: An examination of HIV High Risk Behaviors and Factors Associated with Unprotected Sex with Their Wives**

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Married men entering outpatient treatment for substance abuse (N = 329) and their wives were interviewed at admission about behaviors in which they had engaged that placed them at high risk for HIV transmission. One hundred forty five husbands (44%) reported that they (a) had engaged in unprotected sexual intercourse with their wives at least once in the last 3 months, (b) had also engaged in unprotected sex with other partners or shared needles with other IV drug users during the last 3 months, and (c) were unaware of their present HIV seropositive status. One hundred of the wives (69%) of this subset of husbands reported that they were unaware that their husbands had engaged in these high risk behaviors during the last 3 months. The remaining 45 wives (31%) were aware of these behaviors but chose to engage

nonetheless in unprotected sexual intercourse with their husbands. Logistic regression revealed the following factors were associated with couples engaging in unprotected sexual intercourse: (a) higher reported relationship satisfaction, (b) husbands meeting criteria for antisocial personality disorder, (c) wives meeting current abuse or dependence criteria for one or more psychoactive substances, and (d) longer marital relationships. Clinical and ethical implications of these findings will be explored.

### **Effects of Estrogen and Progesterone on Nociceptive Responses and Morphine-induced Antinociception in Ovariectomized Rats**

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Menstrual/estrous cycle and gonadal hormones modulate pain sensitivity in females. No complete systematic study to deduce the effects of estrogen and progesterone on acute and tonic pain states has been reported. By delivering graded subcutaneous doses of beta-estradiol (estrogen) and progesterone to ovariectomized (OVX) animals, this study was able to assess any dose dependant effects on baseline nociceptive thresholds and morphine cumulative dose response curve values using the antinociceptive tail-flick test (acute thermal). OVX rats received estrogen (5, 10, 15 or 20%) or progesterone (100%: 1cm, 1.5cm, 3cm, 9cm) or cholesterol; (placebo) via subcutaneous SILASTIC capsules. Compared to placebo, these doses of estrogen or progesterone did not alter baseline tail-flick threshold values (at 48, 52.5 or 55 ° C) or the ED<sub>50</sub> values of morphine. It is possible that estrogen and progesterone modulate other nociceptive behaviors such as hyperalgesia. Concurrent studies in our group are addressing this possibility. Supported by: 1454-NS41073, DA 01457, DA 00198, DA 07274 to C.I. and PS-CUNY RR03037, DA 12136,506-GM 60654, NF-39534 to VQJ

### **Gonadal Steroids' Effects on Synergistic Neurotoxicity of Cocaine with HIV proteins**

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HIV-Associated Dementia (HAD) is more prevalent among HIV infected IV drug users than non-users. The HIV infection rate is growing faster among women than men, and IV drug use plays a larger role in HIV transmission to women than it does to men. We have developed an in vitro model of human neurotoxicity to investigate cellular mechanisms that may contribute to HAD. Our previous work has shown that the HIV-proteins, Tat and gp 120, are dose-dependently neurotoxic and that physiological levels of cocaine (Coc) (1.6  $\mu$ M), in conjunction with subtoxic levels of gp 120 and Tat, produces synergistic neurotoxicity. The goal of this work was to determine whether Coc or its longer-lived metabolite, benzoylecgonine (BE), promotes toxicity and to identify gonadal steroids' effects in this model. After 15-hour drug treatment cell death was assayed by trypan blue exclusion. We found that BE is not neurotoxic, and unlike Coc, does not synergize with HIV-proteins. This is true even at the supraphysiological levels that may accumulate with repeated Coc use (100  $\mu$ M). Additionally, Coc and HIV-protein synergistic neurotoxicity is reversible by both 17 beta-estradiol (10 nM) and 5 alpha-testosterone (10 nM). The dose response is described from no protection to full reversal of toxicity (1pM - 10 $\mu$ M). Neither the non-aromatizable testosterone analogue, dihydrotestosterone (DHT) (1-100 nM), nor progesterone (1-100 nM) reverse this synergistic toxicity. However, the anti-oxidant, vitamin E (1-100 nM), is potently neuroprotective. In sum: 1) Neurotoxicity is not due to the Coc metabolite, BE; 2) Coc, not BE, synergizes with HIV-proteins to produce neurotoxicity; 3) Estradiol, testosterone and vitamin E have neuroprotective effects, but DHT and progesterone do not. This is evidence for a direct interaction of Coc with HIV-protein mediated neurotoxicity. Furthermore, while an estrogen receptor-mediated neuroprotective mechanism is not proven, the current data strongly support such a process. Importantly, our results suggest that investigation of receptor-mediated, steroid-specific treatment of HAD is warranted. Supported by DA014401, DA01137, DA13137.



### **Perinatal Opiate Dependence: Methadone and Birth Outcomes**

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The use of methadone for treatment of perinatal opiate addiction remains clinically controversial, particularly among abstinence-oriented drug treatment clinicians. The majority of data supporting administration of methadone during pregnancy originate from clinical studies of perinatal addiction. The purpose of the current study is to compare pregnant opiate dependent pregnant women receiving methadone maintenance (N=137) with opiate dependent pregnant women electing abstinence-based treatment (N=80). Participants were pregnant opiate dependent women admitted to a comprehensive treatment program for perinatal drug dependence. Most were never married (75%), African-American (80%) with a mean age of 29 years. Half had completed high school. Infants born to methadone maintained mothers differed from infants born to nonmethadone maintained mothers differed only on birthweight, with methadone-exposed infants weighing significantly less at delivery than those infants not exposed to methadone in-utero. A similar pattern was seen for infant birth length, with methadone maintained infants having shorter birth lengths than nonmethadone infants. Interestingly, however, when measures of opiate use severity (e.g., quantity and frequency of opiate use in month prior to treatment admission, route of administration, years of regular opiate use) were included in the data analysis, infants of methadone maintained mothers no longer differed from infants of nonmethadone maintained mothers for birth weight or birth length. Study findings suggest that difference in birth weight and length were due primarily to greater opiate use severity among methadone maintained pregnant women. After controlling for opiate use severity, study data suggest no additional, independent teratogenic impact specific to methadone administration during pregnancy.

### **Residential Substance Abuse Treatment for mothers and their Children**

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Background: Residential treatment for drug dependent women and their children offers specialized care that traditional treatment cannot afford. For single mothers, raising children can be a significant trigger for substance use. Residential treatment allows mothers to implement newly learned parenting skills in a supervised environment. Women who remain in the residential programs show improvement in addiction, parenting and psychosocial outcomes. There is limited data showing how the children in these programs progress behaviorally, emotionally and developmentally. This naturalistic descriptive study shows outcome data for children who were in residential treatment with their mothers. Methods: Children (N=21) of drug addicted mothers (N=21) were administered the Child Development Inventory, the Brigance Inventory, and the Child Behavior Checklist (CBCL) at baseline and at 6 months follow-up. Differences between baseline and 6 months were calculated using paired student-t tests for continuous data and Wilcoxon signed rank test for nonparametric data. Results: Forty-eight percent of the children were female and 52% were male. Average age was 51.5 months (range 25-80 months). Average length of stay for mothers and their children was 9.9 months (range 7 - 15 months). There were significant improvements from baseline to 6 months whereby all children moved from clinical to normal range on CBCL Total scores (60.67 + 8.46 to 53 + 9.68,  $p < 0.001$ ). In school age children (N=10) there was a significant improvement in social behaviors (38.6 + 9.54 to 44.9 + 11.2,  $p < 0.046$ ). Fifty-eight percent of toddlers and older children fell 1.3 standard deviations (> 20%) below age in developmental capabilities on the Child Development Inventory. This was reduced to 24% at 6-month follow-up ( $p < 0.02$ ). Average score on the Brigance Inventory was 68.9 + 18 at baseline and 87.24 + 9.2 ( $p < 0.0001$ ) at follow-up. Conclusion: These results show the benefits of a therapeutic environment on developmental and behavioral outcomes. Moving children out of a drug environment into a healthy, supportive environment is particularly powerful during this time of rapid growth and development.

### **Gender Differences in Alcohol and polydrug Abuse Among Young Adults**

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Differences in drinking, smoking, and polydrug abuse between male and female undergraduate students were investigated. Questionnaires containing items assessing demographic characteristics, alcohol frequencies and severities, and polydrug use patterns were administered to 61 undergraduate students as part of a class assignment. A One-Way ANOVA was conducted to test the hypothesis that there are differences in alcohol use between males and females. The results support the hypothesis that males drink more heavily in a 14-day and a 30-day period than females. T-tests demonstrated significant differences in polydrug use between males and females. This finding further supports that males are more likely to use illicit drugs. A gender-specific model may be effective in preventing and treating substance abuse disorders among young adults.

### **Buprenorphine high dosage in pregnancy: First data of a prospective study**

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In order to investigate the effects of buprenorphine exposure during pregnancy, a multicentric prospective study comparing 100 buprenorphine- and 100 methadone-exposed pregnant women is now in progress in opiate maintenance therapy centres, maternities, general practitioner networks and centres of drug information in pregnancy in Toulouse and Paris. All pregnant women who are treated with buprenorphine or methadone are included before the end of the eighth month of pregnancy. For each woman, the following data were collected: sociodemographic data, medical past history, duration of addiction, substance use, prescribed and self-medicated drugs and obstetrical events. For offspring, birth weight, characteristics and severity of withdrawal syndrome, malformations, neonatal diseases and neonatal mortality were recorded. We report the first data about 34 pregnancy outcomes in buprenorphine-exposed women. 31 of them ended in birth, one infant was stillborn, one ended in spontaneous abortion and one was voluntary terminated. A neonatal withdrawal was observed in 13 cases (41.9%) and 8 babies required an opiate treatment. Neonatal abstinence signs occurred between 1 to 8 days (mean of 3 days). Two neonates had a malformation: a tragus appendice in a newborn also exposed to sulfamethoxazole, trimethoprim, lamivudine and zidovudine in utero and a premature ductus arteriosus closure in a newborn also exposed to aspirin and cannabis. Further results of the present study are required to determine whether buprenorphine could be a valuable alternative to methadone in pregnant women.

### **Screening for Sexually Transmitted Infections in Substance Abuse Treatment Programs: Prevalence and Screening Criteria**

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Hypothesis: New technology enables the use of urine samples to screen for sexually transmitted infections (STI). We hypothesized that universal STI screening in substance abuse treatment settings would detect Chlamydia or Gonorrhea infections in 5% or more clients, both asymptomatic and in those not meeting recommended CDC guidelines for screening. Number of Subjects: 670 (496 clients of a detoxification program [Detox] and 174 from a methadone maintenance program [MM]). Procedures: All subjects (n=670) provided urine samples and 80% (533/670) completed an interview including demographics, substance use history, prior STIs, current STI symptoms, and sexual risk behaviors. Statistical Analyses: Descriptive summary statistics. Results: STIs were diagnosed in 0.9% of all subjects (5/670). Subject (n=533) characteristics were as follows: 67% male; median age 37 years; 33% Black, 26% Hispanic, 36% White and 5% Other. Primary drugs of choice were alcohol (18%), cocaine (11%), and heroin (65%). Prior STIs (including HIV) were reported by 40% (211/533) of all subjects. Of subjects who reported being sexually active within the previous two months, 42% (178/422) reported more than one sexual partner. 74 subjects reported genitourinary symptoms. No subject tested positive for Gonorrhea; five (0.9%, 95%

CI=0.1-1.8%) had Chlamydia. No STI was detected in MM subjects, which represented 74% (174/235) of all MM clients. All 5 Chlamydia positive subjects fell within the CDC guidelines for STI screening (age less than 25 years, inconsistent use of barrier method, new or more than one sex partner in the past three months, current STI). Although 2.7% (2/74) of subjects with STI symptoms had Chlamydia, 3 of 5 Chlamydia positive subjects were asymptomatic. Chlamydia prevalence was 2.2% (5/227) among those who met CDC guidelines. Importance of Findings: Based on prevalence, universal screening for STIs in substance abuse treatments programs is not warranted. Current CDC screening guidelines adequately detect the small percentage of persons with STIs.

### **Changes in P300 activity as a function of familial alcoholism and alcohol cue exposure in female social drinkers**

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Although several studies have shown that individuals with a family history of alcoholism show an attenuated P300 response to alcohol consumption, few studies have included females and none have investigated the effects of alcohol cue exposure on P300 activity. To investigate the effects of familial alcoholism on brain electrical activity in response to alcohol cue exposure, 23 female moderate social drinkers (aged 21-25 years) with a history of familial alcoholism (FHP, n = 10) and without such a history (FHN; n=13) participated in an auditory oddball task following presentation both to neutral and alcohol-related visual, tactile, and olfactory cues. Preliminary analyses of data from 14 subjects (7 FHP and 7 FHN) have been completed. Baseline values were subtracted from values obtained following neutral cue exposure and alcohol cue exposure to yield change from baseline scores for each condition. A 2 (FH) x 2 (cue) repeated measures MANOVA conducted on CZ, FZ, and PZ revealed a FH x cue interaction on PZ, indicating that P300 activity over the occipital cortex was attenuated in FHP females subsequent to alcohol cue exposure relative to neutral exposure. Conversely, FHN females had an increase in P300 activity following presentation of alcohol cues compared to neutral cue presentation. These data suggest that alcohol cue exposure can elicit a physiological response similar to that observed after actual alcohol consumption in FHP females. The findings also support the potential utility of the P300 paradigm with alcohol cue exposure as a biological marker in the identification of individuals at risk for developing alcohol problems. Supported by a Livingston Fellowship Award from Harvard Medical School and Grant DA00343

### **Behavioral and motivational effects of 'binge' cocaine self-administration in male and female rats**

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Chronic cocaine self-administration can produce profound behavioral and motivational changes, and these changes may differ between males and females. The purpose of the present experiment was to characterize the effect of 'binge' cocaine self-administration on subsequent responding for cocaine under both fixed ratio (FR) and progressive ratio (PR) schedules of reinforcement. A discrete trials (DT) procedure was used that allowed rats 24-hr access to cocaine for 7 days. Discrete trials were initiated every 15 min for a total of 4 cocaine injections (1.5 mg/kg) each hr. Previous work with male rats has shown that under these conditions animals self-administer cocaine in noncircadian, 'binge' patterns and maintain high levels of intake. Responding under an FR and a PR schedule was assessed prior to and following the DT procedure. Preliminary results show that although females self-administer lower levels of cocaine, 'binge' self-administration has a greater effect on subsequent responding in females rats. Specifically, mean inter-injection intervals observed under the FR schedule and break points observed under the PR schedule were markedly reduced in females compared to males following 'binge' self-administration. These findings indicate sex differences in behavioral and motivational aspects of cocaine addiction following chronic intake. Whether these sex differences are due to differences in the development of tolerance or toxicity is currently under investigation. Supported by Yale IWHR Scholar Program on Women and Drug Abuse (BIRWCH) 1K12DA114038-01.

### **A Descriptive Analysis of Participant Characteristics and Patterns of Substance Abuse in the CSAT Methamphetamine Treatment Project**

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The Methamphetamine Treatment Study is an eight-site randomized clinical trial designed to compare the Matrix Model of treatment for methamphetamine dependent individuals with "Treatment As Usual" at each site. The Matrix Model is a manualized outpatient treatment approach that integrates treatment elements from a number of specific strategies, including cognitive-behavioral therapy, motivational interviewing, psychoeducation, and 12-step program involvement. Treatment As Usual as a comparison condition varies by study site. Patients at each site were randomly assigned to either the Matrix Model (n = 75 per site) or Treatment As Usual (n = 75 per site). In addition to participating in treatment services, patients were asked to provide weekly data, including a urine specimen for drug testing. Data is also collected at discharge, 6-month, and 12-month follow-up interviews. This poster presents a demographic description of the cohort, and describes patterns of drug use, abuse, and related problems among the 1,016 participants recruited between April 1999 and July 2001. Specific analyses include: demographic composition of the sample with respect to gender (55% female, 45% male), age (mean = 32.8 years), ethnicity (60% Caucasian, 17% Asian or Pacific Islander, Hispanic 18%, Native American 3%, and African American 2%), education completed (mean = 12.2 years), and income (mean = \$1,073.8 per month). Other descriptive analyses include: primary drug used, mean percent of days using various drugs including methamphetamine, alcohol, and marijuana, and percent of sample reporting various routes of drug administration. Mean baseline Addiction Severity Index composite scores describing medical, employment, alcohol, drug, legal, family/social, and psychiatric status are also presented. This research was supported by the Center for Substance Abuse Treatment collaborative agreement # TI 11440.

### **HIV risk behaviors among female injecting drug users in Philadelphia**

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Past research has indicated that not all injecting drug users are at equal risk of contracting HIV infection. Consequently, it is important to develop methods for locating and intervening with those IDUs at greatest risk of infection. The data presented here examines the demographic, psychological, drug use, and HIV risk characteristics of 122 injecting drug using (IDU) women. Subjects were recruited from three types of programs serving IDUs-- methadone maintenance, detoxification, and needle exchange in Philadelphia, Pennsylvania during a six-month period starting in November, 1997. Data were collected using self-administered questionnaires and personal interviews. Thirty-eight percent of subjects reported sharing needles and twenty-one percent reported having multiple sex partners during the six months prior to interview. The Beck Hopelessness Scale was significantly related to both sharing needles ( $X^2 = 6.86$ ,  $p < .05$ ) and having multiple sex partners ( $X^2 = 4.0$ ,  $p < .05$ ). Recruitment site ( $X^2 = 6.1$ ,  $p < .05$ ) was related only to having multiple partners. In multivariate logistic regression analyses (controlling for race, education, recruitment site, age, alcohol use, and multiple drug use versus heroin only), the Beck Hopelessness Scale remained significantly associated with sharing needles and having more than one sexual partner. Younger age and recruitment from the needle exchange program were also significantly associated with having multiple sex partners. These data suggest that affecting hopelessness is an important goal for HIV prevention among IDU women. Also, these data suggest that younger women and those who use the needle exchange may be in particular need of prevention interventions addressing sexual risk.

### **Cognitive capabilities among school-age children prenatally exposed to cocaine**

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Now in its final year, this study is an ongoing evaluation of development and performance in two cohorts of children who have reached age nine. A cocaine exposed cohort (n=42), on whom four different gestational exposure measures are available, was studied as part of a perinatal research program in the early 1990s; age mates who were not similarly exposed now serve as a contrast (n=39). Children were all born in Maryland suburbs adjacent to Washington DC, live in the same neighborhoods and go to the same schools. Findings are summarized in three different ways: a two group contrast with covariates controlled, examination of the relationship between level of prenatal exposure and level of cognitive abilities, three group comparison in which the exposed cohort is broken by maternal postnatal drug use. Mothers of the unexposed contrast group are healthier in several ways, differing strongly on prior drug use and on Millon Depressive and Cluster C factors, Kbit IQ, somewhat on education, some measures of neighborhood and life events, but not on ASI medical, psychiatric, legal or family scales, financial strain, or 5 of 7 HOME subscales. Children in both groups perform below standard on assessments, the cocaine-exposed group had much poorer performance on cognitive related assessments: CELF3, WISC, WAIT, and visual motor integration. In MANOVA, controlling for maternal IQ, smoking, education, and postnatal cocaine use eliminated all exposure effects in the general cognitive vector; specific verbal effects of prenatal exposure level persist. Prior to covariate control, the WIAT math composite and the WISC verbal comprehension scores were the most different with Cohen's  $d > .95$ . The overall strongest predictor of poor cognitive performance was mother IQ. In general cessation of cocaine during the postnatal years was found to be associated with much better child cognitive scores, but strong prenatal exposure effects on verbal scores persist and this is associated with maternal depression. This work supported by Field-Initiated Award U.S. Dept Education H324C980092.

### **Alcohol Consumption Among Child-Bearing Age and Older Females Within Five Tribes of Plains Indians**

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Research on the epidemiology and prevention of Fetal Alcohol Syndrome (FAS) within six American Indian communities is ongoing in Montana (2 sites), North Dakota (1 site), and South Dakota (2 sites). This study of adult drinking and substance use includes the largest randomly-selected sample of American Indian adults (N = 1800+) ever collected. Data about females from the first four sites were divided into four age groups: 16-24 (n=170), 25-34 (n=200), 35-44 (n=186), and 45+ (n=294). Data reveal statistically significant differences on the number of lifelong abstainers, mean age started drinking, mean age began drinking regularly, number of drinks consumed in the 30 days preceding interview, and prevalence of drinking within the year preceding interview. Of importance for FAS prevention, females currently in the child-bearing ages (16-44) began drinking two years earlier than older women. The current 16-44 year olds also began drinking regularly three years before the older cohort. As expected, the 16-44 year olds consumed more alcohol in the 30 days preceding their interview with the highest use among the 25-34 year olds. Data from the fifth tribe were recently collected and are being added to our database; analysis continues. Funding provided by the NIAAA (RO1 AA09440 and RO1 AA11685) and the NIH Office for Minority Health Research.

### **Sex Differences in the Effects of Stressful Life Events on Changes in Smoking Status**

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The purpose of this study was to examine the impact of stress on smoking status to determine if there was a sex-specific response to life event stress. Sex differences in event-related risk for changes in smoking status were examined by means of a secondary analysis from the Americans' Changing Lives study. A community based sample of ever smokers (N=1539, 46% female) was used to examine the interactive effects of sex and stressful life events on the likelihood of two outcomes; relapse among former smokers and failure to quit among current smokers. To improve recall bias, indicators of stressful life events (interpersonal loss, financial events, change of residence, health events) were confined to the 12-month period preceding the

Wave II interview. Logistic regression procedures were used to calculate odds ratios. In the sample of former smokers (n=757), change of residence and financial events were associated with increased occurrence of relapse, however, women were more likely than men to relapse in response to a financial event. In the sample of current smokers (n=782), financial events were associated with continued smoking whereas health events were associated with increased likelihood of quitting. However, women were more likely to continue smoking in the presence of an adverse financial event and less likely than men to quit in response to an adverse health event. Overall, stressful life events appear to have a greater deleterious effect on continued abstinence and the ability to quit smoking for women when compared to men.

### **Six- and Twelve-Month Outcomes from a Comprehensive Intervention for Substance-Abusing TANF Recipients - CASAWORKS for Families**

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We present substance use, employment, personal health and social function outcomes at 6 & 12 months for substance abusing women on TANF who participated in an initial study of CASAWORKS for Families (CWF). A repeated measures evaluation was conducted in 10 sites to determine viability, proof of the concepts underlying CWF and whether there was any initial evidence of improvement. Standard measures of client status and severity (ASI) and treatment content (TSR) were collected by independent evaluators at each site, at baseline, 3, 6 and 12 months. There was no control condition. Retention was quite good; 81% of those enrolled were still in the intervention at the one-month point, 61% at three months and 51% at six months. Substance use showed significant reductions by 6-months and sustained improvement thereafter. At 12 months 46% reported complete abstinence. Employment (half time or more) improved significantly from 16% at enrollment to 41% at 12 months - though earnings were still quite low and few had benefits. By the 12-month point 88% of the sample was no longer experiencing domestic violence, 66% reported adequate childcare, and 94% had adequate housing. Although there were statistically significant improvements in the medical and psychiatric problem areas - at 12 months, approximately 40% of women still reported significant physical medical problems, anxiety and depression. Though these findings are positive and consistent with the goals of the intervention, the lack of random assignment and a control group limits causal interpretation. Implications of the findings for the design of an improved CWF intervention and a randomized, controlled trial of effectiveness are discussed.

### **Gender differences in response to the cold pressor test**

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The relationship between stress, alcohol use disorders, and relapse to alcohol use is not yet well understood. In this study, hypothalamic-pituitary-adrenal axis response and subjective stress and craving ratings have been obtained in individuals with alcoholism (n=13), alcoholism and posttraumatic stress disorder (PTSD) (n=11), PTSD (n=14), and a normal control group (n=11) after completion of a physical stressor, the cold pressor task. Significant baseline gender differences were found prior to completion of the cold pressor task. Males had higher baseline ACTH levels than females (p=0.007) and also reported higher baseline craving (p=0.09). Females reported higher baseline pain (p=0.09) and stress (p=0.01) ratings and had a higher baseline heartrate (p=0.02). However, after completion of the stress task, there is not a significant gender difference between change from baseline to maximum value for any of these variables. This suggests that although baseline differences may exist, males and females have similar magnitude of responses to the cold pressor test. This study is ongoing; the sample size is expected to increase by the presentation date. At that time, additional data will be presented including analyses of each diagnostic group.

### **Relationships between intimate partner violence and barriers to employment among substance-dependent women on welfare**

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Substance abuse and domestic violence are both recognized by the welfare reform legislation of 1996 as barriers to employment. However, the two problems are not independent, as indicated by the high comorbidity (61%) found in this sample of 175 women with partners enrolled in a Substance Abuse Research Demonstration Project (SARD). While substance-dependent women already encounter significant barriers to employment, we hypothesize that substance-dependent women who have experienced intimate partner physical aggression in the past year encounter a larger and more severe constellation of barriers. Women were classified as victims of aggression based on their responses to the Modified Conflict Tactics Scale (Pan & Neidig, 1994). Clients were assessed using 2 scales measuring their perceptions of employment barriers they have encountered (Allen, 1995; Olson & Pavetti, 1996), as well as measures covering the domains of substance abuse, education, work skills, physical health, mental health, family, recent stressful events, legal problems, housing/neighborhood, childcare and transportation. Differences between groups were tested using standard parametric and non-parametric methods. Preliminary data indicate that victims of aggression have been living with their partner over the previous 3 years at twice the rate of women who have not experienced aggression (30% vs. 14%). They report somewhat more barriers to employment (3.9 vs. 3.2), and are also more likely to have moved in with friends in the past year (39% vs. 23%), and to have problems with both drugs and alcohol (31% vs. 25%). Significantly more victims of aggression report problems with the cost of childcare (27% vs. 13%), recent pregnancy or newborn care (14% vs. 4%), and having been arrested (20% vs. 6%) as reasons they have not been working. Further analysis will indicate domains where targeted interventions are required to address the special needs of women affected by both substance dependence and intimate partner aggression.

### **Retention and treatment services received in the CASAWORKS for Families program**

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This presentation focuses on the treatment services received by women participating in an initial study of CASAWORKS for Families (CWF), a program designed to provide a wide range of services to women with substance use disorders who were attempting to move from welfare to work. The CWF program was recently evaluated in 11 sites around the nation. Predictors of retention in the program were examined, as was the relation of retention and services received to employment and substance use outcomes at 12 months. Data on services received at 1, 3, 6, and 12 month post-intake follow-ups indicated that the program was successful in delivering services. Most women received services to address medical, employment, basic needs, alcohol and drug, family, and psychiatric problems during the first six months of the program. The clients also had frequent contact with their case managers, and were retained in the program for an average of 222 days. Better retention in the program was predicted by a number of factors at baseline, including heroin use, higher psychiatric severity, and greater basic needs problems. Poorer retention was predicted by greater alcohol and cocaine use, more severe problems with children and other family members, and worse employment status at baseline. Longer retention was associated with better alcohol use outcomes, but was unrelated to employment or drug use outcomes. More alcohol and drug treatment services received in the first month predicted better substance abuse status at 12 months, but none of the other treatment service measures predicted substance use or employment outcomes. Implications of the findings for further development of the CASAWORKS program are discussed.

### **Health Disparity between Court- and Community-Recruited Substance-Abusing Women Enrolled in a Community HIV Prevention Study**

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NIDA has highlighted the need to focus on research areas where gaps or disparities in prevention and treatment are evident. As part of an ongoing NIDA-funded study of cocaine, heroin or amphetamine using women, 18-44 years old, in St. Louis, Missouri, we were introduced to the City Court System and the presiding judge of the St. Louis drug court. This introduction resulted in the opportunity to augment our community-based sample with a sub-group of court-referred women. Based on involvement with the criminal justice system, these women represent an especially vulnerable population with potentially elevated risks for health issues. To date, our preliminary sample is comprised of 165 drug-using women. Although court (N=21) and community (N=144) respondents did not differ in terms of number of lifetime arrests, court referred respondents reported more nights in jail or prison. They were also likely to test positive for a sexually transmitted disease, including Hepatitis C (43% court vs. 22% community) and syphilis (10% court vs. 2% community). Sexual risk behaviors were significantly elevated in court referred respondents: four or more sex partners (29% court vs. 10% community); and sex trading (95% court vs. 50% community). Moreover, reported substance use differed by recruitment method. Community referred respondents were more likely to report lifetime alcohol use (57% court vs. 88% community) and cannabis use (33% court vs. 57% community). Although nearly the entire sample reported lifetime cocaine use, court respondents were more likely to meet criteria for cocaine dependence (95% court vs. 77% community). Based on preliminary results, it is clear that continued efforts to evaluate the differential risk factors for health issues in women are a fundamental focus for the research community.

### **Ovarian Steroid Hormone Modulation of the Acute Effects of Cocaine on Anterior Pituitary Hormones in Ovariectomized Rhesus Monkeys**

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Cocaine increases LH and decreases prolactin in gonadally intact rhesus monkeys but not in ovariectomized females (Mello and Mendelson, 1997). These findings suggested that ovarian steroid hormones may contribute to the endocrine effects of acute cocaine administration. The effects of cocaine and placebo-cocaine on LH and prolactin were examined in five ovariectomized rhesus females during saline maintenance and during three chronic hormone replacement conditions: estradiol (E2 $\beta$ ) treatment (0.0015-0.006 mg/kg/day, i.m.); progesterone treatment (0.32 mg/kg/day, i.m.) and combinations of progesterone (0.32 mg/kg/day, i.m.) and E2 $\beta$  (0.004 mg/kg/day, i.m.). Before hormone replacement, neither cocaine (0.8 mg/kg, i.v.) nor placebo-cocaine altered basal levels of LH and prolactin, and this finding is consistent with our previous report (Mello et al., 1995). Cocaine significantly reduced prolactin under all hormone replacement conditions ( $P < 0.05 - 0.001$ ). In contrast, cocaine stimulated LH release only during low dose estradiol treatment and during maintenance on progesterone alone. These data suggest that physiologically relevant doses of ovarian steroid hormones modulate cocaine's effects on anterior pituitary hormones. This research was supported in part by R01-DA14670, K05-DA00064, K05-DA00101 and P50-DA04059 from the National Institute on Drug Abuse, NIH.

### **Impact of male partners' psychopathology on substance use disorder from adolescence to young adulthood in women**

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This study determined the contribution of male partners' substance use disorders (SUD) and psychiatric disorders [anxiety, depressive, and conduct disorder (CD)] to the association of female adolescents' SUD and psychiatric disorders with severity of SUD from adolescence to young adulthood in women ages 19-23. The sample included 85 couples. The age range of the females was between 14-18 and their average education level was ninth grade. All male partners were assessed when the females were young adults. The results of the moderating analysis controlling for female adolescents' SUD revealed that: (1) SUD (BetaF = .32,  $p = .02$ ; BetaM = .37,  $p = .00$ ) and CD (BetaF = .29,  $p = .01$ ; BetaM = .31,  $p = .002$ ) in both members of the couple are related to severity of SUD in the young adult females, and (2) male partner CD increased the strength of the relation between female adolescent SUD (Beta = .40,  $p = .005$ ) and CD (Beta = .43,  $p = .003$ ) and her SUD in young adulthood. In conclusion, the results underscore the value of the interaction of



SUD and CD, rather than anxiety and depressive disorders, in both members of the couple in predicting the severity of SUD in women.

### **Gender differences in genetic and environmental risk factors for adolescent tobacco, alcohol and illicit drug use**

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The purpose of the present study is to estimate the contribution of genetic and environmental factors to tobacco, alcohol, and other substance use in adolescent boys and girls. Multivariate genetic structural equation models will be fit to longitudinal data collected in extensive home interviews with adolescent twins (aged 12- 17 years old) from the Virginia Twin Study of Adolescent Behavioral Development (VTSABD). Two waves of data are available from 1071 twin pairs (307 monozygotic male; 392 monozygotic female; 185 dizygotic male; 187 dizygotic female). For both boys and girls, of those who smoked cigarettes or drank alcohol without parental permission at the time of the first assessment (roughly 10%), the majority were still smoking and drinking alcohol at the last assessment; however, many adolescents began smoking and drinking between assessments, reflecting a large rise in substance use over this age period (roughly 20%). An increase in illicit drug use was also found, although to a lesser extent, with less than 5% of the sample reporting any illicit drug use at the last assessment. The patterns of correlations across the two waves of the study allow examination of the extent to which each type of substance use may lead to later substance use. For both sexes, the correlation between early alcohol use and later smoking/drug use were greater in magnitude than those between early smoking/drug use and later drinking, suggesting that alcohol use may be a potential gateway to further substance use. The extent to which genetic and environmental factors are shared across substances and specific to each type of substance will be explored through comparison of a common pathway model and an independent pathway model. The role of gender in the magnitude of genetic and environmental parameter estimates will also be assessed. Results from this study will lead to a better understanding of the comorbidity of substance use and the underlying genetic and environmental factors that may contribute to later substance use in adolescent males and females.

### **Gender, ethnicity, and recruitment site as predictors of enrollment in a study on linkage methods**

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Background: We examined the factors that predict participant enrollment in an ongoing study investigating the effectiveness of methods for linking heroin-injecting patients to substance abuse treatment. The current data reflect patients screened over 18 months through 12/01 (168 screened, 128 eligible, 71 enrolled). A total of 120 subjects are expected to enroll. Procedure: Patients were screened for eligibility in the Integrated Soft Tissue Infection Services (ISIS), the Emergency Department (ED), and the inpatient units (Inpt), all at the San Francisco General Hospital (SFGH). Patients eligible were adults that met state methadone maintenance requirements. Demographic information was collected. Once eligibility confirmed, an interview was scheduled within the next few days. Hypotheses: 1) Female and minority patients are less likely to enroll, 2) Enrollment success depends on recruitment site, in descending order from ISIS, to ED, to Inpt, because patients are more alert in an outpatient setting than at an acute inpatient or trauma unit. Results: 71% women vs. 78% men eligible ( $\chi^2=1.05$ ,  $DF=1$ ,  $p<0.305$ ), 57% eligible women vs. 55% eligible men enrolled ( $\chi^2=0.035$ ,  $DF=1$ ,  $p<0.852$ ). 75% White, 79% African-American, 71% Latino/a, 80% Mixed/Other eligible ( $\chi^2=0.79$ ,  $DF=3$ ,  $p<0.853$ ). 61% White, 50% African-American, 58% Latino/a, and 38% Mixed/Other of eligible enrolled ( $\chi^2=2.49$ ,  $DF=3$ ,  $p<0.48$ ). Female and minority patients were just as likely to be eligible for and enroll in the study. Our first hypothesis was not supported, indicating that in respect to gender/race our sample was representative of the larger sample. The second hypothesis was reflected in the data. Patients recruited at ISIS, though as likely to be eligible (ISIS 84%, ED 68%, Inpt 74%,  $\chi^2=4.35$ ,  $DF=2$ ,  $p<0.114$ ), were more likely to enroll in the study (ISIS 70%, ED 53%, Inpt 38%,  $\chi^2=10.17$ ,  $DF=2$ ,  $p<0.006$ ) than patients seen in ED or Inpt. Conclusions: There were no apparent biases in

study enrollment according to gender/ethnicity. The outpatient clinic appears to be a promising setting for participant recruitment.

#### **Longitudinal findings from 4 months through three years of age**

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The influence of prenatal cocaine exposure on children's language functioning was evaluated longitudinally at 6 time-points from 4 months through 3 years of age. Methods: The Miami Prenatal Cocaine Study prospectively enrolled 476 full-term, African-American infants at birth, categorized as cocaine-exposed (CE; n = 253) or noncocaine exposed (NCE; n = 223) by maternal self-report and bioassays (maternal/infant urine, meconium). The Bayley Scales of Infant Development (BSID), scored using the Kent Scoring Adaptation for language, was conducted at 4, 8, 12, 18, and 24 months. The Clinical Evaluation of Language Fundamentals-Preschool (CELF-P) was administered at 3 years. From the original sample, 464 children received at least one language assessment during the longitudinal study period and were included in the present analyses. Results: Using General Estimating Equations (GEE) longitudinal analyses, CE children had lower overall language skills than NCE children ( $D = -0.151$ ; 95% CI =  $-0.269, -0.033$ ;  $p = 0.012$ ). Longitudinal findings remained stable after evaluation of potential confounding influences including other prenatal drug exposures and sociodemographic factors. Preliminary evidence also suggested possible mediation through an intermediary effect involving cocaine-associated deficits in fetal growth. Discussion: Although the cocaine-associated language deficit is subtle, it may have important ramifications for long-term academic and social adaptation, particularly when taken into consideration within the broader context of other potential risk factors. Support: NIDA R01DA065561; Florida Healthy Start Coalition, Health Foundation of South Florida; Kenneth A. Lattman Foundation

#### **Investigation of sex differences in the acute and long-term effects of MDMA administration in rats**

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Studies have shown robust sex differences in the behavioral and neurobiological effects of many drugs of abuse, including cocaine and alcohol. The current investigation extends these studies to 3,4-methylenedioxymethamphetamine (MDMA; "Ecstasy"). The use of MDMA is rising exponentially, and a newly released report suggests that women are more susceptible to neurobiological damage following MDMA usage. To investigate sex differences to the effects of MDMA in an animal model, male and female rats received a standard neurotoxic dosing regimen of MDMA (15mg/kg, ip, every 12hrs for 4 days). Locomotor activity and core rectal temperature increased similarly in MDMA-treated males and females directly following drug administration. Daily administration of MDMA resulted in an attenuation of drug-induced increases in locomotor activity and temperature. Tests of anxiety were conducted on MDMA-treated rats 2wks following drug administration. All MDMA-treated rats spent significantly less time on the open arms in the elevated plus maze, suggesting that MDMA treatment was anxiogenic. Male and female-treated MDMA rats were not different. Additional tests of anxiety using the light:dark box and the social interaction test revealed no effect of MDMA treatment. Thus, the long-term effects of MDMA on anxiety are not universal. The specific effect of MDMA on a single test of anxiety resembles similar effects on specific tests of memory and may reflect the subtle long-term functional effects of MDMA usage. These results suggest that the effects of a neurotoxic dosing regimen of MDMA are not sexually dimorphic in the measures of acute locomotor activity and core rectal temperature nor in the long-term effects of MDMA on a variety of measures of anxiety.

#### **Characteristics and Needs of Substance-Abusing Women on Welfare: Findings from evaluation of the CASAWORKS for Families program**

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States face a special challenge moving women with substance abuse problems from welfare to work under the requirements of the 1996 federal Temporary Assistance to Needy Families Program (TANF). Yet, little is known even about the characteristics and needs of this potentially important population. We examined the characteristics and needs of a large diverse sample of substance abusing women on TANF who entered the CASAWORKS for Families (CWF N=673) intervention from 11 sites in 9 states. Sites were substance abuse treatment programs, mostly outpatient, specializing in women, and were situated in urban, suburban and rural locales. Substance abusing women on TANF were recruited from welfare offices, welfare employment programs, or other agencies serving this population (e.g., child protective services). This CWF group was compared with: 1) a general TANF sample (GTS N=157) recruited at local welfare offices in 8 of the 11 sites without regard to clients' use of addictive substances; and 2) a sample of substance abusing women on TANF entering 81 standard outpatient substance abuse treatment programs in seven metropolitan areas through the Drug Evaluation Network System (DENS N=520). Findings indicated that substance abusing women on TANF in all samples had multiple, serious and generally chronic health and social problems that can be barriers to employment. In general, the CWF women showed the most severe domestic violence, legal, employment history and psychiatric problems. DENS clients showed the most serious addiction problems. GTS women showed the least severe health, social and addiction problems. Although none of the samples utilized can be considered truly representative, they do provide for the first time a multi-locale, diverse picture of substance abusing women on TANF as compared with other pertinent groups.

### **Substance Dependence and Symptoms of PTSD Among Female Sex Workers**

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In a study of 179 street-based female sex workers in New York City, associations were observed among specific types of substance dependence and particular aspects of post-traumatic stress disorder (PTSD). Drug specific dependence was measured with scaling procedures developed and validated by Gossop et al. (1994) in a previous study of sex workers. Symptoms of PTSD were measured with the Mini-International Neuropsychiatric Interview (MINI) (Sheehan et al. 1998). 54.2% (n=97) of the women experienced or witnessed a traumatic event during their lifetime; 26.8% (n=48) re-experienced this trauma during the prior month; 16.2% (n=29) reported a pattern of symptoms consistent with a full-blown PTSD disorder. Among those reporting trauma, alcohol dependence was associated with its re-experience (e.g. flashback, dreams) during the prior month ( $r=.20$ ;  $p=.01$ ). Intrusive symptomatology (e.g. being "easily startled" or "constantly on guard") was associated with alcohol ( $r=.34$ ;  $p=.04$ ) and cocaine dependence ( $r=.37$ ;  $p=.02$ ). Psychological numbing (e.g. avoiding thinking about the trauma) was not associated with drug specific dependence. The criteria for a PTSD diagnosis (trauma re-experience, psychological numbing, intrusive symptomatology, role impairment/distress) were not correlated with the number of days specific drugs (including alcohol) were used during the prior month. These data point to a clinically significant, albeit complex, association between substance dependence and PTSD in this population.

### **Gender differences among adolescents with substance use disorders and traumatic stress**

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The purpose of this study was to examine gender differences associated with traumatic stress and substance use among adolescents in an urban, short-term residential drug treatment facility. This study is part of a larger, multi-site project examining adolescent addiction treatment outcomes (Baltimore site N=153, 120 males, 33 females). Drug use and traumatic stress were measured using the Global Assessment of Individual Needs (GAIN), a structured interview, self-report instrument. Females (M=5.72) had significantly higher overall traumatic stress scores than males (M=3.5,  $p<.01$ ). Females reported significantly more instances of forced sex and emotional abuse, and males reported more instances of weapon attacks. More females than males had traumatic experiences prior to age 18, that lasted longer, and were perpetrated by someone they trusted. Females reported significantly more days of being disturbed by

memories, feelings of being unable to go on, being frightened by their urges, exploding over minor things, and using drugs to forget the past. Since traumatic stress symptoms have previously been associated with the use of harder drugs (opiates versus marijuana), gender differences in heroin-using adolescents were also examined. Forty-five of the 153 adolescents were treated for heroin use (females=14, males=31). Overall, those needing treatment for heroin had higher traumatic stress scores than those needing treatment for other drugs ( $F=4.93$ ,  $p=.03$ ). There was a trend (Chi Square=3.43,  $p=.06$ ) of a greater percentage of females needing treatment for heroin abuse (42%) than males (26%). However, the interaction of gender and heroin use was not significantly related to traumatic stress. Severity of post-treatment drug use and traumatic stress on admission was only significantly correlated for males ( $r=.44$ ) during the 3-6-month follow-up. These findings suggest that although adolescent females may be at higher risk for traumatic stress symptoms and need treatment for harder drugs, female substance use outcomes following addiction treatment may be less associated with traumatic stress at admission than males.

### **PTSD and comorbid impairment in treatment-seeking drug abusers**

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Recent studies have found high rates of PTSD in drug abusing populations, but less is known about the relationship between PTSD and indices of drug use severity and other clinical problems. These relationships were evaluated in the present study using a large number of consecutive new admissions to a treatment program that uses methadone ( $N=1645$ ). All patients were interviewed with the ASI and the SCID after one month in the program. Over half of the sample had a history of traumatic events and 7% those exposed to traumatic events had a history of PTSD. As expected, women were more likely to develop PTSD in response to a traumatic event than men (11% vs. 3%;  $O.R.=3.3$ ), in spite of similar rates of trauma exposure (55% vs. 53%; ns). Patients with versus without a diagnosis of PTSD were more likely to have other comorbid psychiatric disorders. Patients with a history of PTSD were at greater risk for a history of depression (54% vs. 15%;  $O.R.=7$ ), dysthymia (11% vs. 4%;  $O.R.=3.1$ ), borderline personality disorder (19% vs. 3%;  $O.R.=6.1$ ), and avoidant personality disorder (8% vs. 2%;  $O.R.=4.5$ ). Patients with a history of PTSD were also more likely to also have a history of alcohol dependence (68% vs. 49%;  $O.R.=2.2$ ). The impairment related to PTSD extended to current problems as reported in the medical, employment, and psychiatric dimensions of the ASI ( $ps < .01$ ). Specifically, they were more likely to report chronic medical problems (53% vs. 30%;  $p < .01$ ) and more days of psychiatric problems (7.7 vs. 2.9;  $t(62.7)=-3.6$ ;  $p < .001$ ). They were also more likely to report recent problems with anxiety, depression, trouble concentrating, violent behavior, and suicidal ideation ( $O.R.s > 3.2$ ;  $ps < .001$ ). These findings indicate that a history of PTSD is associated with increased risk for both current and past medical, psychiatric and alcohol problems; these important relationships were most apparent in women. Research supported by NIH-NIDA 1 P50 DA 05273.

### **The Effects of Female Gonadal Hormones and the HPA axis on Cocaine Self-Administration in Rats**

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It has been previously demonstrated that female rats acquire cocaine self-administration quicker and at a higher rate than male rats. In addition, female rats respond at higher levels than male rats during cocaine-induced reinstatement. Our laboratory, as well as others, have shown that the hypothalamo-pituitary-adrenal (HPA) axis plays an important role in the self-administration of cocaine in male rats. The current experiments were designed to combine and further examine these two areas by investigating the role of female gonadal hormones and the HPA axis on cocaine self-administration in rats. Female ( $n=9$ ) Wistar rats were implanted with indwelling jugular catheters. During the same surgical procedure four female rats also underwent bilateral ovariectomy (OVX). Rats were first trained on a fixed ratio 1 schedule of cocaine (0.25 mg/kg/infusion) self-administration. Following stable rates of self-administration, rats were then trained on an extinction procedure where lever-pressing had no programmed consequences. When the rates of responding during extinction were  $< 20\%$  of baseline rates, reinstatement was tested using either an ip injection of cocaine (10 mg/kg) or by presenting cues that were previously associated with cocaine self-

administration. Plasma corticosterone was also measured on the first and last days of cocaine self-administration, the first and last days of extinction and on the reinstatement test days. Intact female rats had a higher rate of cocaine intake and showed less lever pressing during extinction than OVX rats. In addition, OVX female rats had higher basal levels of plasma corticosterone than intact females. In summary, these data demonstrate that there is a difference in cocaine self-administration between intact and OVX female rats which may be influenced by the HPA axis. Supported by DA06013 from the National Institute on Drug Abuse.

### **The Effect of Personality and Family History of Smoking on Smoking Severity in Adolescent Females**

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Rates of adolescent female smoking are rising. The extent to which family history of smoking [(FHS):parents-ever-smokers(both-BE, one-OE, neither-NE) or current smokers(both-BC, one-OC, neither-NC) interacts with personality deviance to affect severity of smoking-behavior:[never(NS), regular/non-dependent-smoking(RS), regular/nicotine-dependent-smoking (ND)] in young women has not been systematically examined. We tested the extent to FHS would moderate the effects of Extraversion (E), Neuroticism (N), Social-Nonconformity/Lie-scale (L), Novelty-Seeking (NS), Aggression, and Alienation on smoking. Interview and mailed-questionnaire-data from a survey conducted in 1995-1997 (N=1856 female like-sex twin pairs born 1975-1983) were analyzed by logistic-regression. Overall, high (>75th percentile) levels of: E (ORs=1.81,1.61), N (ORs=1.73,1.87), L (ORs=1.38,1.82), and NS (ORs=2.00,2.51) significantly increased risk for both RS and ND respectively. Low-levels (<25th percentile) of E, N, L, and NS on the other hand appeared to significantly protect against development ND. After controlling for age, FHS, and personality, for FHS-ever smoking, low E (<25th percentile) interacted with BE to significantly increase risk of ND (OR=2.68). For FHS-current-smoking: low E (<25th percentile) interacted with BC to significantly increase risk of RS (OR=6.20), high E (>75th percentile) interacted with BC to significantly protect against ND(OR=.39), high L(>75th percentile) interacted with OC to significantly decrease risk of RS (OR=.20), and high NS (>75th percentile) significantly interacted with OC to increase risk of ND (OR=3.02). These results suggest that in young females the effects of E, L, and NS on smoking depends upon FHS. In particular, when both parents are ever or current smokers, low levels of E, or shyness, appears to be a clear risk factor for RS and ND. Supported by NIH Grants AA07535, AA07728, AA13321, AA11998 (A.C.H.), DA12540 and DA12854 (P.A.F.M), and AA07580 (M.L.P).

### **Problem severity, gender, and reduction in cocaine use following brief motivational intervention**

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It has been noted that women entering SA treatment often present with greater problem severity along a number of life dimensions, but that they also fare better in terms of retention and outcome. We sought to test whether street-recruited women cocaine users also showed greater problem severity than a sample of men recruited in a similar way and whether problem severity and gender predicted response to a brief motivational intervention. This analysis is based on initial and 1-month follow-up data from 113 participants in two groups of a 3 group randomized trial. Both groups completed an initial assessment on the same day as recruitment and one received motivational enhancement feedback immediately after the assessment. Three fourths of participants are male; two thirds reported their ethnic background as African American; their mean age was 42. Cluster analysis of ASI composite scores identified two subgroups, one with greater problem severity (medical, employment, alcohol, and psychiatric) than the other. Women were more likely to be in the higher severity subgroup (54% of women vs. 29% of men). Gender differences paralleled subgroup differences with women having higher means on medical, employment, and psychiatric problems and, additionally on the family/social composite score. In this study there were no main effects of intervention (assessment = assessment plus feedback), but gender and severity each individually predicted reductions in cocaine use from initial to 1-month follow-up. Both women and the high problem severity subgroup showed greater reductions in cocaine use than men and the low severity group respectively.

Severity appears to account for variance in drug use beyond that accounted for by gender. The results have implications for selection into brief intervention programs. Supported by NIDA grant #DA08625.

### **Sex differences in opioid antinociception: Importance of rodent strain and opioid effectiveness**

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Sex differences in the antinociceptive effects of opioids have been reported previously in rats, with males being more sensitive to opioid antinociception than females. There is also evidence indicating that the magnitude of these sex differences can vary markedly across opioids as well as across rat strains. In the present study, the influence of rat strain (F344, F344 Sasco, Long Evans, Lewis, Sprague Dawley, Wistar) on sex differences in opioid antinociception were examined in the rat warm-water (50, 52, 55°C) tail-withdrawal procedure. Tests were conducted with a number of opioid compounds that included the highly effective mu agonist morphine, the less effective mu agonist buprenorphine, and the less effective mu/kappa agonists butorphanol and nalbuphine. Collapsed across all strains and sexes, the rank order of opioid effectiveness in producing antinociception was morphine > buprenorphine > butorphanol = nalbuphine. Sex differences were observed in all strains, and were largest with the less effective opioids buprenorphine, butorphanol and nalbuphine. Differences across strains were also apparent, as the opioids were generally most potent in the F344, F344 Sasco, Sprague-Dawley and Long Evans strains, and least potent in the Wistar and Lewis strains. Although sex differences were observed in all strains with at least one of the opioids tested, the magnitude of these sex differences was largest in the F344 rats and their substrain the F344 Sasco. In summary, the magnitude of sex differences in opioid antinociception varies across rat strains and across opioids that vary in their effectiveness in producing antinociception. That the largest sex differences were obtained with the less effective opioids suggests that these opioids may represent a sensitive pharmacological tool to study the mechanisms underlying sex differences in opioid antinociception (Supported by grants DA10277, MH07431, and DA07244).

### **Substance Use and other Risk Factors Associated with Physical Injury among Women**

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**Purpose:** The objective of this study is to examine the relationship between substance use and other risk factors associated with physical injury (defined as trauma such as broken bones, concussion, gunshot or knife wounds, sport injuries, sexual assault in the last 12 months). **Methods:** Interview data from 633 female participants were collected in Miami-Dade County, FL, using a network-based sample. 59.4% of the sample were substance users (19.4% injection drug users and 40.0% other chronic drug users) and 40.6% were non-substance users. Bivariate and multiple regression techniques were used. **Results:** Approximately one-quarter (23.7%) of the sample experienced physical injury within the last 12 months. Bivariate analysis revealed that risk factors for physical injury within the last twelve months differed by ethnicity. White non-Hispanics (38.7%) were more likely than Blacks (30.0%), or Latina/Hispanic women (31.3%,  $p<.004$ ) to experience physical injury. Substance users (28.7%) were more likely than non substance use (55%,  $p<.000$ ) to experience physical injury. Persons who did not live in their own house or apartment (29.4%) were more likely than persons who lived in their own house or apartment (13.3%,  $p<.000$ ) to experience physical injury. Persons who had been arrested in the past 12 month (38.8%) were more likely than those with no arrest (19.1%,  $p<.000$ ) to experience physical injury. Age and education were insignificant. Multivariate logistic regression was used to identify the independent risk factors for physical injury. Injection drug use, not living in own house or apartment, and arrest in the last 12 months remained significant indicators of physical injury. **Conclusion:** The findings indicate that women substance users are at higher risk of physical injury compared to non-substance using women.

### **Baseline smoking as a predictor of response to vouchers in pregnant smokers**

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Effective interventions are available for pregnant cigarette smokers, but cessation rates are often less than 20%. As part of a pilot study examining the efficacy of a voucher-based incentive program for achieving higher cessation rates, 25 pregnant smokers earned vouchers contingent on smoking abstinence. The purpose of this study was to assess whether baseline smoking levels differed for women who did and did not achieve abstinence. To date, 12 of the 25 (48%) women have achieved abstinence, defined as self-reported non-smoking for at least 7 days verified by saliva cotinine analysis. Mean cigs/day among abstainers vs. non-abstainers were 4.8 + 2.9 vs. 11.9 + 12.1 at baseline ( $p = .03$ ). Of those who reported smoking less than 15 cigs/day prior to pregnancy, 5/6 (83%) achieved abstinence vs. 7/19 (37%) among those smoking > 15 cigs/day ( $p = .02$ ). Among those smoking less than 10 cigs/day at baseline, 11/19 (58%) achieved abstinence vs. 1/6 (17%) of those smoking > 10 cigs/day ( $p = .04$ ). These preliminary results offer compelling evidence for baseline smoking frequency as a predictor of response to this voucher-based intervention.

### **Characteristics of gamblers: Health Measures and Gender Differences**

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Background: Gambling and drug use behaviors are prevalent and share multiple features. Approximately 2 of 3 adults have gambled recreationally within the last year. However, few studies have systematically investigated in a gender-sensitive fashion for health measures associated with recreational gambling. Methods: The random digit dialing database of 2,417 adult respondents from the 1998 Gambling Impact and Behavior Study performed by the National Opinion Research Center was used, excluding data from subjects with current or past problem or pathological gambling. Multivariate analyses were used to identify characteristics distinguishing groups of past-year, prior and never gamblers. Multivariate analyses were also performed to identify characteristics distinguishing female and male past-year gamblers. Results: Past-year gamblers as compared with never gamblers had higher rates of substance abuse, depression, incarceration and good to excellent general health. Past-year as compared with prior gamblers had higher rates of bankruptcy. Female as compared with male past-year gamblers were less likely to report incarceration or problems with substance abuse and more likely to report lifetime depression (trend) and having sought mental health treatment. Female gamblers as compared with males were more likely to report gambling onset later in life, engaging in casino gambling, and describing non-strategic or machine forms as favorite. Male as compared with female gamblers were more likely to report engaging in strategic and non-casino forms of gambling and describing strategic forms as favorite. Conclusions: Both negative and positive measures of health and well-being are associated with past-year gambling. Significant differences exist in the gambling attitudes and behaviors of men and women. These findings highlight the need for more research into the nature of the associations between gambling, health, gender and substance use such that appropriate public health recommendations can be made. Support: NIDA, APA, NARSAD, VA MIRECC, Women's Health Research at Yale.

### **Assessment of Sex Differences in Morphine-Induced Conditioned Taste Aversions**

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Although sex differences in taste aversion learning have been reported, such assessments are generally limited to studies in which LiCl is the aversive agent. It is not known to what extent (if any) the findings with LiCl generalize to other drugs. One compound that has received considerable attention in aversion learning, but has not been examined in relation to sex differences, is morphine. Interestingly, morphine is widely reported to be reinforcing in other preparations, and these effects are sex dependent. To assess whether sex differences are also evident in the aversive effects of morphine, the present study examined the acquisition and extinction of morphine-induced taste aversions in fluid-deprived male and female Sprague-Dawley rats. Specifically, during acquisition different groups of male and female rats ( $n=8$  per group) were

injected subcutaneously with morphine (0, 10, 18 and 32 mg/kg) following 20-min access to a novel saccharin solution (four conditioning trials). Subsequently, during extinction subjects were allowed access to saccharin but were not injected (eight extinction trials). On each of the 3 days following conditioning and extinction trials, all subjects were given 20-min access to water. Over conditioning, male and female subjects injected with morphine drank significantly less saccharin than vehicle-injected controls, with no systematic dose-response relationship. These patterns were identical for male and female subjects. Over extinction, male and female subjects previously conditioned with morphine significantly increased saccharin consumption, drinking more on the final extinction trial than at the outset of extinction. Again, there was no systematic dose-response relationship and there was no significant sex effect. Although sex differences have been reported with LiCl-induced aversions, there were no sex differences with morphine, suggesting that such differences are drug specific. Given that drug acceptability is generally assumed to reflect a balance of the reinforcing and aversive properties of drugs, these findings suggest that differences in morphine self-administration result from differences in the reinforcing effects of this drug. Supported by a grant from the Mellon Foundation to ALR.

### **Could the length of time from onset of DSM-IV abuse to dependence provide a measure of abuse liability of drugs in humans?**

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Previous analyses suggest that the length of time between onset of DSM-IV abuse to dependence (LOTAD) is longest for alcohol disorders and progressively shortens for cannabis disorders to opiate disorders to cocaine disorders. This result is consistent with animal study findings concerning the abuse liability of these drugs. Abuse liability of drugs in humans is often measured using research designs that are similar to animal studies such as progressive-ratio schedules. LOTAD offers the advantage of measuring abuse liability in terms of drug-related diagnoses. Based on abuse liability animal studies, we hypothesized that LOTAD differences occur between (a) genders, (b) early initiators vs. later initiators, and (c) route of use. Data for these analyses come from the DSM-IV Field Trials study (N=1,226), which used the CIDI - Substance Abuse Module. Substance-specific analyses included only those participants who were users of the drug (alcohol, cannabis, cocaine, or opiates). Analytical techniques included configural frequency analysis and survival analysis. Compared to men, a greater proportion of women experienced dependence as their first disorder pertaining to alcohol use or cannabis use (i.e., negative LOTAD). Early initiators of use of alcohol, cannabis, and cocaine experienced shorter LOTAD than later initiators of use of these substances. Intravenous route of drug use was associated with shorter LOTAD than other routes. LOTAD was very short regardless of injection status for cocaine use, suggesting that cocaine is highly addictive (consistent with animal studies). Overall, these data suggest that LOTAD could provide a valid measure of a drug's abuse liability in humans. Supported by NIDA grants DA00434 and DA05585.

### **The Influence of Partner Drug Use and Relationship Power on Treatment Engagement**

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Substance-using intimate partners negatively impact individuals' substance abuse treatment engagement and drug use, but there is little research assessing the impact of other aspects of relationships on treatment. In this study we examine how partner drug use and relationship dynamics (power, control, dependence and insecurity) influence treatment engagement, and whether this differs by gender. Sixty-four heroin users (42 men and 22 women) receiving methadone detoxification treatment were interviewed at treatment entry and submitted daily diaries of drug use throughout the 21-day treatment. Individuals reporting 5 or more heroin-free days in the first 14 days of treatment were characterized as treatment-engaged. Bivariate analyses revealed that among those with heroin-using partners, greater relationship power predicted treatment engagement, while among those with heroin-free partners, less relationship power predicted engagement. Women were more likely to have substance-using partners and reported greater power and control and less dependency in their relationships. Women who reported less dependency in their intimate relationships were more likely to engage in treatment. Men with heroin-free partners were more likely to



engage than those with heroin-using partners. Relationship power and other dynamics may be important influences on the treatment process, though the impact may differ by gender. This research was supported by NIDA grants #R01 DA06096 and #R01 DA10778 (Iguchi).

### **Perinatal Buprenorphine Alters Cholinergic Neurons in Rat Striatum**

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The partial opioid agonist buprenorphine is under consideration for managing pregnant heroin addicts. In the rat, perinatal exposure to methadone disrupts the development of striatal cholinergic neurons. Buprenorphine was hypothesized to have an effect similar to that of methadone. The effect of perinatal buprenorphine exposure on striatal cholinergic neurons was determined in "weanling" and "adolescent" rats. On day 7 of gestation, pregnant Sprague-Dawley CD rats under methoxyflurane anesthesia were implanted subcutaneously with 28-day osmotic minipumps delivering sterile water (w) or buprenorphine HCl (b, 0.3, 1, or 3 mg/kg/day). These doses spanned buprenorphine's bell-shaped dose-effect curve. Within 24 hr of birth, litters were culled to 10 and cross-fostered, resulting in the following prenatal/postnatal exposure groups: w/w, b/w, w/b, and b/b. New pumps were implanted in dams on postnatal day (PD) 10. On PDs 21 (n=135) and 35 (0.3 mg/kg/day, n=45), acetylcholine (ACh) content and turnover were determined. Rats were infused via the tail vein with deuterium-labeled phosphorylcholine (15  $\mu$ mol/kg/min) for 9 min and were euthanized by microwave radiation focussed to the skull (7.5 kW, 0.75 sec). Data were analyzed by ANOVA followed by Dunnett's test with  $p < 0.05$  considered significant. Buprenorphine's effect on cholinergic activity differed from that of methadone, with the most pronounced effect being reduced ACh content following prenatal exposure to the 3 mg/kg/day dose on PD21. Like methadone, prenatal exposure to buprenorphine (0.3 or 1 mg/kg/day) increased ACh turnover on PD21. Unlike methadone, postnatal exposure to buprenorphine (3 mg/kg/day) increased ACh turnover. On PD 35, there were no effects of treatment on either ACh content or turnover; however a statistically nonsignificant increase in ACh turnover was observed in males exposed prenatally to buprenorphine, 0.3mg/kg/day. Unlike methadone, buprenorphine acts at  $\kappa$ , as well as  $\mu$ , opioid receptors, and is an antagonist at higher doses which may explain its different effect on cholinergic neurons. [Supported by DA09399]

### **Sex differences in the acquisition and maintenance of intravenously self-administered methamphetamine in rats**

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Previous work indicates that female and male rats differ on several aspects of psychostimulant self-administration. Specifically, female rats initiate cocaine use sooner than male rats and reach significantly higher breaking points (BPs) for a single injection of cocaine under a progressive ratio (PR) schedule than male rats. The present study extends previous work examining sex differences in the acquisition and maintenance of cocaine self-administration to methamphetamine (METH) self-administration. An automated autoshaping procedure that has previously been shown to be sensitive in detecting sex differences in the acquisition of drug self-administration was used for the acquisition portion of the experiment. Additionally, a PR schedule that has been previously used to detect sex differences in maintenance levels of cocaine and heroin self-administration was used for the maintenance portion of the experiment. Preliminary results indicate that a greater percentage of female rats met the acquisition criteria for METH (0.02 mg/kg) self-administration compared to male rats (50% vs. 14.5%, respectively), and they did so in significantly fewer days compared to males (7.3 + 1.4 vs. 20 + 0 days, respectively). Dose-response curves using BPs obtained under a PR schedule as the response measure indicate that female rats have increased motivation to self-administer low doses of METH (0.01 and 0.02 mg/kg) compared to male rats, as indicated by a vertical shift upward in the dose-response function of female rats at the 0.01 and 0.02 mg/kg doses of METH compared to males. These data suggest that female rats are more vulnerable to the acquisition of METH self-administration compared to male rats. The data also indicate that female rats are more sensitive to the reinforcing effects of low doses of METH, and they have increased motivation to self-administer low doses of METH compared to male rats. This work was supported by NIDA grants R01

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### **Investigation of gender and treatment modality differences using the TCU Client Evaluation of Self and Treatment**

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Levels of motivational, psychological, and social functioning at admission to treatment are different for women and men. The TCU Client Evaluation of Self and Treatment (CEST) instrument, which includes 16 scales, was used to assess patient functioning and investigate gender differences. Subjects included 580 patients receiving treatment in outpatient and residential programs. Analysis of variance (ANOVA) was used in a 2 x 2 design (gender by treatment modality) to examine psychological and social functioning, treatment needs, services received, and treatment engagement. Gender differences were found in motivation, treatment engagement, psychological functioning, and services. Women had higher levels of motivation, poorer psychological functioning, were more engaged in their treatment, and received more services. Patients in residential treatment had greater motivation, lower psychological functioning, more treatment participation, and utilized more services. Interactions between gender and treatment modality were found in levels of anxiety and hostility, with no gender difference in hostility among outpatients, but significantly higher hostility among males in residential treatment compared with females. Treatment services also showed an interaction with women receiving more services in outpatient, but no gender differences in residential. Treatment implications include the need to assess patient functioning in order to adequately plan and adjust treatment regimens based on gender differences.

### **Gender Differences in Place Preference for Cocaine and HPA Activity in Rats**

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Although sex differences in the behavioral and neurochemical response to cocaine have been reported, it is not clear whether these differences exist in cocaine reward. To determine the role of sex in the development of conditioned place preference (CPP), intact male and female rats were conditioned with cocaine (10 mg/kg) and saline on alternating days for 4 or 8 days. Female rats demonstrated CPP after 4 days, which was extinguished following 8 days of conditioning. On the other hand, male rats developed a significant place preference following 8 days of conditioning only. Though, females had higher blood plasma levels of CORT, no effects of conditioning were observed for either sex. A second cohort was conditioned with saline, 5, 10, or 20 mg/kg of cocaine for 4 days. Female rats developed CPP at lower cocaine doses (5-10 mg/kg), while males required higher doses (20 mg/kg of cocaine). Saline/saline pairings did not produce a significant preference in any of the conditions. A dose-dependent induction of HPA activity was observed in female rats, where plasma CORT levels were significantly higher in rats given 20 mg/kg than 5 mg/kg of cocaine. Collectively, these results suggest that females are more sensitive to the rewarding effects of cocaine, which may be influenced by increased HPA activity. This work was supported by PS-CUNY, RR-03037, NIDA DA12136, SCORE 506-GM60654, and SNRP NF-39534.

### **Family Studies of Substance Dependence and Antisocial Personality Disorder: A Potential Selection Bias?**

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Substance use disorders (SD) and antisocial personality disorder (ASPD) cluster within families and well-designed family studies are needed to further investigate this phenomenon. Hypothesis: Studies requiring interviews of multiple family members may select for the healthiest families regarding SD and ASPD. Methods: We attempted to interview both parents of 418 adolescent patients in treatment for substance and behavior problems and both parents of 285 adolescent controls. Results: We successfully interviewed both

parents in 36% of patient families and 72% of control families, mothers only in 56% and 21% respectively, and fathers only in 7% and 6%, respectively (Chi Sq = 92.23;  $p < 0.001$ ). Twenty-four mothers of adolescent patients met criteria for ASPD; in these 24 patient families, only 1 father was interviewed. In patient families where the mother did not have ASPD, it was 9.83 times more likely that both parents were interviewed, when compared to patient families where the mother did have ASPD. In patient families with mothers without SD, direct interviews of both parents were 1.18 times more likely, when compared with patient families with mothers with SD. Conclusions: In patient families with mothers with ASPD, few fathers were directly interviewed, suggesting that complete data on families with severe pathology is more difficult to obtain. Family history data collected from multiple informants may provide a correction to the bias of direct interviews. Additional analyses will be presented exploring the validity of family history data. Support: NIDA grants DA 09842, DA 11015.

### **Sexual Dysfunction Among Addicted Women With Prior Sexual Assault**

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Sexual assault triggers post traumatic stress disorder in women more often than any other traumatic event. Lifetime rates of sexual assault for women in treatment for substance use disorders vary from 20% to 70% (a wide range due to differences in measures). The characteristics of this population appear to include a higher incidence of depression, anxiety, suicidality, drug use disorders, severe alcohol problems; as well as an earlier onset of alcohol and other drug use. According to a small but growing body of research these women also frequently suffer from sexual dysfunction, leading a few investigators to suggest that self-medication of this condition may lead to substance use disorders. Building on these previous findings, this study involved examining the relationship between sexual dysfunction and sexual assault in a sample of 71 female patients receiving treatment for substance use disorders. Clinicians administered a multidimensional battery of tests at baseline and at 6 and 12 month follow-up intervals. Results from baseline data indicated that 34% of the women reported at least one previous sexual assault. These women scored significantly higher than non-assaulted women for sexual dysfunction overall on the Golombok Rust Inventory of Sexual Satisfaction, a discrepancy accounted for by high scores among assaulted women on the Avoidance and Non-sensuality subscales. Sexual inhibition and a history of sexual assault each predicted the use of substances to increase sexual desire. The interaction between sexual inhibition and a history of sexual assault accounted for 2.6% of the variance in using substances to increase sexual desire, but the magnitude of this relationship did not reach levels of significance. These findings suggest that sexually abused women may follow a different course into substance-related problems than do non-abused women, possibly including self-medication to relieve sexual inhibition. Such patients may benefit from interventions tailored to their specific characteristics and needs, including the treatment of sexual inhibition. In addition, prevention efforts might focus on assessing and alleviating sexual dysfunction among survivors of sexual assault before the initiation of self-medication can occur.

### **Behavioral Treatment for Cocaine-Dependent Women**

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AIMS: To compare the efficacy of Community Reinforcement Approach (CRA) and 12-Step Facilitation (TSF) counseling and of voucher based reward therapy (VBRT) and a yoked, non-contingent voucher control (VC) for the treatment of cocaine dependent pregnant women or women with young children. METHODS: Subjects (N=145) were randomly assigned to 1 of 4 treatment groups (CRA+VBRT, CRA+VC, TSF+VBRT, TSF+VC). VBRT voucher value increased for each successive cocaine-free urine sample obtained twice weekly during the 1st 12 weeks and was faded from the final earned value to \$5 during the last 12 weeks (max. value \$880). All subjects earned vouchers for attendance at scheduled twice weekly counseling sessions (max. value \$120). Manual-guided CRA and TSF were provided by experienced clinicians who received extensive training in either CRA or TSF and weekly supervision. RESULTS: The 4 groups were comparable on most baseline characteristics: 91.7% not working; 90.3% not living with a partner; 42.8% less than HS education; 43.3% pregnant at enrollment; 77.9% black; mean age

31.1 (5.6) years; 46.9 % met SCID criteria for current alcohol dependence at enrollment. Significantly fewer women in TSF+VC (11% vs. 24.1% overall) reported baseline SCID depression symptoms, but depression did not predict outcome. Retention averaged 69.7% at 12-weeks, 57.9% at 18-weeks, and 34.5% at 24-weeks; 40% of the women achieved 3 or more consecutive weeks of abstinence (18%, 6-weeks); these outcomes did not differ among the 4 conditions. The mean max # of consecutive cocaine-negative urine samples was associated with treatment group (omnibus F test,  $p < .05$ ; TSF+VBRT significantly greater than TSF+VC and CRA+VC by LSD). Differences were due to more women in VBRT achieving very long periods of abstinence (>12 weeks) than in VC and not to significant differences between CRA and TSF. CONCLUSION: VBRT was associated with significant increases in the number of women achieving very long periods of abstinence and TSF and CRA were comparable in efficacy. Supported by the following grants from NIDA: DA06915 and DA00445.

### **Employed Women and Drug Dependence: Characteristics, Consequences, and Treatment Outcomes**

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Contrary to the image of the "skid row" drug user, 77% of drug users are gainfully employed (SAMHSA, 2002). Yet, little research exists on employed people with drug addiction, specifically, and most women included in addiction studies do not work outside the home. For the first time, this study explores characteristics, consequences of use, and treatment outcomes of employed women compared to male peers. Patients (N = 210) entering a 28-day treatment program completed the Addiction Severity Index (ASI; McLellan et al., 1980) at intake and 6 and 12 months follow-up. Women and men were similar in terms of employment (95% full-time), marital (42% married), and family status (67% with children). Similar to men, most women reported their employer knew of their treatment entry (93%) and that their jobs were not contingent upon treatment completion (88%). However, in the year prior to treatment entry, women were more likely than men to have been disciplined on the job (chi square = 4.94,  $p < .05$ ) or fired (chi square = 4.56,  $p < .05$ ), yet less likely than men to have been sent to treatment by their employer (chi square = 5.39,  $p < .05$ ) despite similar absenteeism rates (overall M = 9.15 days) and drug use severity. No differences were noted between women and men on baseline ASI composite scores across medical, employment, alcohol, drug, legal, family/social, or psychiatric domains. Problem drug use days in the month prior to treatment entry were similar among men and women (overall M = 7.86). Women were just as likely as men to be living with someone using drugs or alcohol (chi-square = .48,  $p > .05$ ) and reported a similar amount of family conflict days,  $F(1,209) = .16$ ,  $p > .05$ . Overall, these data suggest the severity of chemical dependency problems for women is similar to men at treatment entry, yet women appear to experience a greater degree of job-related problems. ASI data at 6 and 12-months have been collected and are currently being compiled. Follow-up analyses, including comparisons of the course of recovery and treatment outcomes among women and men, will be completed by spring.

### **Weight change during treatment for methamphetamine abuse**

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This report presents data on weight change gathered during the course of treatment for methamphetamine dependence. Data were collected in several clinical trials utilizing one or more of the following treatment strategies; relapse prevention, contingency management, and placebo controlled medication trials. The results from these studies were pooled for analyses. Data were grouped by treatment outcome, which was defined as being successful (i.e., provided a urine sample which was methamphetamine negative at the first follow up interview) or unsuccessful (i.e., provided a urine sample which was methamphetamine positive at the first follow up interview). Differences between genders were also examined. Our findings suggest that weight gain in men correlates with successful treatment. Men who were successful gained approximately 10 pounds, while those who were unsuccessful gained about 50% less. For women, regardless of treatment outcome, the results indicated that a weight gain of approximately 10 pounds was typical. These results suggest, that for women, weight gain is a likely outcome of treatment participation. These data have clinical implications for those considering methamphetamine treatment.

### **Subjective effects of an acute high dose of progesterone in men and women**

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The goal of this study was to investigate the effects of an acute intramuscular dose of progesterone in men and women. Although endogenous progesterone levels are very low in men, compared to women, there is evidence that metabolites of progesterone have central actions on GABAA receptors in men just as they do in women. Allopregnanolone and pregnanolone are highly potent ligands at the GABAA receptor complex, and in preclinical models produce marked sedative-like effects. These effects have been observed in both male and female animals. Relatively few studies have examined these neuroactive effects of steroids in humans, and only one previous study has examined the behavioral effects of progesterone in men. We hypothesized that progesterone would produce increases in self-reported sedation and sedative-like impairments in cognitive performance. Method: Women (n=8) in their early follicular phase and men (n=10) received intramuscular injections of progesterone (200 mg) or placebo. Plasma levels of progesterone, pregnanolone and allopregnanolone were obtained at regular intervals, and subjects completed self-report measures of mood and subjective effects and performed behavioral tests. Results: The results are complex and only partly support our hypothesis. In men, significant subjective ratings of sedation were found after progesterone administration, however, accompanied with increased feelings of discomfort. In women, both significant increases and decreases in sedation accompanied with increased feelings of restlessness were found after progesterone administration. The plasma assays of progesterone, pregnanolone and allopregnanolone are under analyzes. They may further shed light on the complexity of the result. Conclusions: This study is the first to investigate the effects of an intramuscular injection of 200 mg progesterone in both men and women. The results suggest that progesterone and its metabolites, can produce sedative-like effects in both men and women. Supported by USPHS grant RO3 DA12143.

### **Is the gender gap closing? Gender differences in substance use prevalence between White and Lakota 7th grade students in South Dakota**

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Despite evidence that American Indian youth tend to start using drugs at an earlier age compared to other ethnic groups, few studies have targeted samples of younger American Indian adolescents to closely examine substance abuse patterns and risk factors. Baseline data collected from students participating in a randomized field trial to evaluate the effectiveness of Project ALERT, a substance use prevention curriculum designed for middle-school students, provide a window into substance use behavior among Lakota (Sioux) girls and boys. The sample is comprised of White (N=4,289) and Lakota (N=400) 7th grade students enrolled in 55 middle schools in South Dakota in 1997-1998. Preliminary results showed higher rates of use among Lakota youth compared to White youth, for cigarettes, alcohol, marijuana and inhalants. Lakota girls showed higher rates of past month tobacco use as compared with Lakota boys, White boys, and White girls (43.0%, 30.2%, 9.7%, 8.9% respectively); alcohol use (26.7%, 19.6%, 14.5%, 11.1% respectively); marijuana use (17.6%, 14.9%, 2.6%, 1.5% respectively); and inhalant use (15.0%, 7.7%, 6.9%, 4.3% respectively). Additional analysis will be performed to identify risk factors for both White and Lakota boys and girls. The high rates of use among Lakota girls suggest that the period of risk for these girls may occur sooner than what is generally expected for American Indian girls.

### **Gender differences and risk factors for AOD disorders among California arrestees**

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Research has shown that both female and male arrestees have high rates of alcohol and drug (AOD) disorders, yet less is known about whether there are gender differences associated with risk factors that contribute to AOD disorders among arrestees. This study examined associations between: 1. family trauma

(sexual, physical or emotional abuse, parental AOD disorders, incarceration), 2. partner factors (partner AOD disorders, incarceration) and 3. crime history (length of time offending, types of crimes committed) and severity of alcohol and drug use in male and female arrestees using data from the California Drug Use Forecasting Project (CAL-DUF). Between 1994-1996, structured interviews were conducted with 1,321 males and 396 females in jails located in 13 counties throughout California. Urinalysis was also performed to validate self-reported drug use. 64.3% of males and 71.2% of females tested positive for one or more drugs. Separate logistic regression models were run to assess different predictors of AOD severity for males and females. Preliminary analyses suggest that there is a gender effect for familial abuse and addiction severity. For males who report prior abuse, crime is more closely associated with drug use severity, whereas for females who report prior abuse, mental health problems are more closely associated with drug use severity. Clinical and policy implications are discussed. Supported by NIDA DA07272.

### **Effects of gonadal steroid hormones on mu, kappa and delta opioid antinociception**

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Sex differences in opioid antinociception have been described in humans and rodents. This study was designed to examine the role of gonadal hormones in basal nociception and buprenorphine, U50,488 and SNC 80 antinociception in adult Sprague-Dawley rats. Eighty-one male and 168 female rats were gonadectomized (GDX) or sham-gonadectomized (sham). In GDX male rats, Silastic capsules containing testosterone (T) or nothing (0) were implanted s.c. immediately after surgery. GDX female rats received estradiol (E2)-filled or empty (0) capsules immediately after surgery, and vehicle (V) or progesterone (P) injections at 4-day intervals. Basal nociception and opioid antinociception were tested 28 days after surgery on 50°C hotplate (HP) and tail withdrawal (TW) assays. Estrous cycle effects on basal nociception and opioid antinociception were assessed by testing sham females in diestrus I, estrus or proestrus. There were no significant differences in baseline latencies among the male groups on the HP or TW assays. Among the females, GDX+E2 and GDX+E2+P females had significantly higher HP baseline latencies than GDX+0 females. On the TW assay, diestrus I, GDX+E2 and GDX+E2+P females had significantly higher baseline latencies than GDX+0 females. The effects of gonadal hormones on opioid antinociception varied across the different drugs and assays. On the HP assay, U50,488 was more potent in sham and GDX+T males than in GDX+0 males. U50,488 was more potent in diestrus and estrus females than in proestrus females, and more potent in GDX+E2 and GDX+E2+P females than in GDX+0 females. In contrast, on the TW assay, the efficacy of U50,488 was significantly decreased in GDX+P females relative to other GDX females. The effects of gonadal hormones on buprenorphine and SNC 80 antinociception were not significant. These results suggest that gonadal hormones modulate thermal pain thresholds in female but not male rats. In addition, gonadal hormones appear to modulate kappa opioid antinociception in rats of both sexes.

### **Hepatitis C seroprevalence and risk behaviors among drug-involved female sex workers in Miami**

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Hypothesis: Unprotected sex is a significant risk factor for Hepatitis C (HCV) infection among drug-involved female sex workers. Species: Human females. Number of Subjects: 300 Procedures: Participants are recruited from the streets of Miami by active sex workers trained in outreach techniques. Following informed consent, clients complete a baseline interview regarding risk behaviors, are urine tested for drug use, and participate in HIV/Hepatitis prevention education. Pre-test counseling and blood testing for hepatitis and HIV are then conducted. Test results, post-test counseling, and additional prevention education are provided two weeks later. Results: To date, the sample has a median age of 40 years, is 49% African-American, 43% white-Anglo, and 8% Latina; 81.1% used alcohol in the past 30 days, 56.8% used marijuana, 91.9% used crack-cocaine, and 13.5% used heroin. Drug use was confirmed by urine testing, and 35.1% of the participants reported a history of IDU. The participants had been sex workers for a mean of 18.1 years, with an average of 29.6 sex partners in the past month. Of those who results have been received, 41% tested HCV-positive and 17% tested HIV-positive. All of the women reporting a history of IDU tested positive for HCV, as did 23.1% of those who denied a history of IDU. Statistical Analysis:

Descriptive statistics were compiled on demographic data, drug use and sexual behaviors of the clients. Pearson's chi-square tests were used to examine relationships among categorical variables, and t-tests were used to examine continuous variables. Multi-variate logistic regression analyses will examine the relationship between HCV seropositivity and its predictors. Importance of Findings: Among persons with evidence of high-risk sexual practices who deny a history of IDU, HCV prevalence averages 6%. However, few studies have specifically targeted commercial sex workers for HCV testing. Rates of HCV infection are elevated in this sample (41% overall), and reach 23% among non-injecting women. This study suggests that HCV is sexually transmitted, and that HCV and HIV risk reduction programs for women sex workers are a priority.

### **Influence of Gonadal Hormone Depletion on the Antinociceptive Effects of Opioids in Male and Female Rats**

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Sex differences in the antinociceptive effects of opioids have been reported in a variety of nociceptive assays, and it has been postulated that these differences are mediated by gonadal hormones. The present study examined the influence of gonadal hormone depletion on opioid antinociception in male and female rats. In a warm-water tail-withdrawal procedure, the antinociceptive effects of the high-efficacy mu opioids etorphine and morphine, the low-efficacy mu opioids buprenorphine and dezocine, and the low-efficacy mixed-action opioids butorphanol and nalbuphine, were examined in sham operated (intact) and gonadectomized rats of the F344 and Sprague Dawley (SD) strains. The opioids examined were generally more potent in producing an antinociceptive effect in intact males than intact females, with larger sex differences obtained with the less effective opioids. In F344 males, gonadectomy decreased the potency of morphine and etorphine, and decreased both the potency and maximal effectiveness of buprenorphine, dezocine, butorphanol, and nalbuphine. Similarly, in SD males gonadectomy decreased the potency of etorphine, buprenorphine, and butorphanol. In contrast, in F344 females gonadectomy increased the potency and maximal effectiveness of buprenorphine, butorphanol, and nalbuphine as well as the maximal effectiveness of dezocine. Gonadectomy did not, however, consistently alter the potency or effectiveness of the opioid in SD females. The present findings suggest that depleting gonadal hormones decreases antinociception in male rats and increases opioid antinociception in female rats. Additionally, utilization of less effective opioids may represent a sensitive pharmacological tool to study the mechanisms underlying sex differences in opioid antinociception (Supported by grants DA10277, MH07431, and DA07244).

### **Mothers' prenatal and current cocaine use, and their parenting of children age 9**

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As part of ongoing research examining maternal prenatal cocaine use, data on current cocaine use, maternal psychopathology symptoms, environmental factors and parenting were gathered from two cohorts of children age 9. Data on prenatal cocaine exposure was obtained at delivery from maternal and infant hair samples, maternal urine metabolites and maternal self-report for the exposed cohort (n=42). A contrast cohort (n=39) born in the same hospitals and living in the same neighborhoods was recruited retrospectively. Mothers' current cocaine use was assessed through hair assays taken at the time of assessment. Environmental risk was determined through maternal report of negative neighborhood events, stressful life events, and financial stress. Mothers also completed the Raising Children Checklist, which yields scores indicating endorsement of firm, harsh, and lax parenting behaviors. Independent samples t-tests were conducted to describe differences between the groups. Mothers of the exposed cohort scored significantly higher on a Millon Depression factor and Cluster C personality disorder factor than did contrast mothers. Additionally, mothers in the exposed cohort reported more environmental risk factors (negative neighborhood events and stressful life events) and endorsed more lax parenting. Hierarchical regressions were conducted to explore the relative contributions of prenatal cocaine exposure, maternal current cocaine use, maternal psychopathological symptoms (depression and cluster C personality

disorders), and environmental risk to lax parenting. Prenatal cocaine exposure did not relate to lax parenting. Mothers' current cocaine use did predict more lax parenting, and predicted lax parenting more strongly than maternal psychopathology symptoms. However, environmental factors, when entered into the regression, eliminated all predictors of lax parenting. This work supported by Field-Initiated Award U.S. Dept Education H423C980092.

### **Smoking Topography in Adolescent Girls Seeking Treatment for Tobacco Addiction**

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The recent rise in smoking prevalence among teenage girls is of particular concern. Additionally, lower FTND scores among African Americans and other qualitative differences in nicotine dependence between African Americans (AA) and non-African Americans (non-AA) in both adults and teen smokers have been reported (Moolchan et al. 2000). These differences may be associated with differences in cigarette consumption, topography and/or cigarette brand. We examined smoking topography in 9 AA and 40 non-AA adolescent girls (mean age=15.3±1.3, mean FTND score=7.3±1.3) seeking treatment for tobacco addiction. 86% (n=42) of girls smoked menthol cigarettes (100% of AA, 79% of non-AA). In a baseline session prior to treatment, participants completed one topography measure in which they smoked their usual brand of cigarette. We obtained topographical measures (number of puffs, puff interval, puff volume, puff velocity) and physiological measures (blood pressure, heart rate, carbon monoxide). AA girls took more puffs (p=0.05), and had significantly shorter puff duration (p=0.03) and shorter intervals between puffs (p=0.01). There were no significant physiological differences observed between ethnic groups nor were there any differences in nicotine dependence as measured by FTND scores. While these data suggest potential differences in smoking topography in this small sample of AA and non-AA girls, replication is needed in larger studies that also include data with more variation in brand choice.

### **A partner's drug-using status impacts women's drug treatment outcome**

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Introduction: The role sexual partners play in the treatment outcome of drug dependent pregnant women has received little scientific attention. The aims of the present study were 1) to examine the psychosocial characteristics of drug using and drug-free sexual partners of drug-dependent pregnant women and 2) to examine the impact of a partner's drug using status in relation to the woman's retention in a specialized drug treatment facility. Methods: A 25-item Relationship Survey was developed to assess various areas of psychosocial functioning. Women (N=189) completed the questionnaire during an initial 7 day inpatient stay at the Center for Addiction and Pregnancy, and were categorized into two groups: those with drug-free (n=104) or drug-using (n=85) sexual partners. Results: Compared to drug-free partners, drug using partners were significantly older (33 years vs. 36 years; p<.05) with less education (11 vs. 12 years) (p<.05), and higher unemployment rates. On measures of legal involvement, drug-using partners were significantly more likely to currently be in jail, to have repeated arrests, and to be in need of legal assistance compared to drug-free partners. On relationship measures, drug-using partners had significantly more recent conflicts with their pregnant partners and were less likely to be supportive of her being enrolled in drug treatment relative to drug-free partners. Preliminary data from treatment retention suggest that women with drug-using partners are retained in treatment for a shorter time than women with drug-free partners. Final data will be presented in June. Conclusions: Drug-using partners have more severe psychosocial issues compared to drug-free partners. A partner's drug-using status should be considered when treating pregnant drug dependent women. Supported by RO1 DA13496

### **PTSD and psychosocial distress in pregnant drug-dependent women**

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Posttraumatic stress disorder (PTSD) is highly prevalent in patients with substance use disorders, especially women. Research has shown that drug dependent women with PTSD present for treatment with higher rates of psychopathology and other Axis I and Axis II disorders than drug dependent women without PTSD. Women with PTSD and drug dependence also present with more interpersonal and medical problems and tend to have more severe drug use disorders. The present study compared levels of psychological and psychosocial distress in a sample of 66 treatment seeking pregnant drug dependent women with and without a current diagnosis of PTSD. All participants had a history of traumatic event exposure. Psychological distress was measured by the Symptom Checklist 90 Revised (SCL-90R), and PTSD and psychosocial distress were assessed using the Post-traumatic Stress Diagnostic Scale (PDS). Participants were predominantly African American (47.5%), mean (SD) years of age 29.6 (4.7) with a mean (SD) of children 3.1 (2.2). Preliminary analyses found that nearly half (45%) of women met criteria for current PTSD. Although the majority of women presented for treatment with significant amounts of psychological distress, those women with PTSD had higher scores than non-PTSD women on all SCL-90R sub-scales as well as the Global Severity Index (1.72 vs. 0.85;  $p < .0001$ ), and the Positive Symptom Distress Index (2.35 vs. 1.74;  $p < .0001$ ). Patients with PTSD were more likely to report that their symptoms were currently interfering with enjoying leisure activities, family relationships, life satisfaction, and overall functioning ( $ps < .05$ ). These results suggest that comorbid PTSD in a sample of chronic drug dependent women is associated with greater psychological distress, which adversely affects their life functioning. Drug dependent women with PTSD may need intensive intervention at time of admission to minimize premature discontinuation of treatment participation. Research support provided by HRSA grant No. H64MC0017-02.

#### **Drug Abuse, Violence, and HIV/AIDS Among Impoverished Women**

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Drug use and abuse, violence against women, and HIV/AIDS are public health priorities of epidemic proportion and are significant, overlapping threats to the health of women. Although these public health problems are receiving greater attention as they affect women, comprehensive understanding of these threats among traditionally underserved women is still lacking, as is an understanding of the linkages among these problems. Understanding interrelationships among violence, substance use and abuse, and HIV/AIDS risk behaviors is necessary to the development of strategic community interventions for preventing and alleviating these problems and their impacts among impoverished housed and homeless women. Longitudinal interview data collected from probability samples of approximately 400 women living in shelters and 400 women living in low-income housing in Los Angeles County will shed light on these epidemics and their interrelationships. Bivariate analyses based on 414 total baseline interviews conducted thus far reveal higher rates of drug use and dependence, physical, sexual, and psychological victimization, and HIV risk (e.g., prostitution, less condom use) among sheltered women than housed women. Multivariate analyses on these 414 cases suggest, for example, that having multiple partners and having partners who use alcohol to intoxication are dramatically associated with women's victimization by their partners after adjusting for women's own drug problems and other key life context variables. Results from analyses of baseline data will be presented and implications for prevention will be discussed. (Supported by NIDA grant R01-DA 11370: S. Wenzel, A. Nyamathi, D. Longshore, J. Tucker)

#### **Thirty-year follow-up of the influence of early parenting on persistent drug use**

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Earlier reports indicated that maternal unresponsive behavior in infancy signaled increased risk of problem drug use in the offspring. This study extends previous work by: 1) examining the role of maternal behavior on the progression from no drug use to transient use and persistent use and 2) investigating the potential mediating role of known adolescent risk factors, i.e., deviant peer affiliation, parent monitoring, and

delinquent behavior. Data are from a longterm follow-up of a cohort of mother-infant pairs who represent a population-based sample of low to middle income families (n=1758). The offspring were followed up when they were approximately 30 years old. Maternal behavior was rated when the child was 8 months old and is categorized as either 'unresponsive' or 'nurturing.' Unresponsive refers to behavior that is critical, unresponsive and inconsistent. Nurturing reflects consistent, affectionate and responsive behavior. Study outcomes included lifetime (transient) and past year (persistent) marijuana, cocaine and heroin. Each drug was studied separately; transient and persistent drug use categories were mutually exclusive and were compared to the reference group of non-drug users for the respective drug. Unresponsive maternal behavior was unrelated to either transient or persistent marijuana use (AOR = 0.94, 95% CI = 0.70 - 1.27; AOR = 1.00, 95% CI = 0.66 - 1.52, respectively); unresponsive behavior was related to persistent cocaine use for women only (AOR = 1.91, 95% CI = 1.01 - 3.61; AOR for transient versus no use = 1.04, 95% CI = 0.63 - 1.72) and persistent heroin use for both women and men (AOR = 2.00; 95% CI = 1.24 - 3.24; AOR for transient use = 1.09; 0.67 - 1.77). While the adolescent risk factors had independent associations with maternal behavior, as well as the drug outcomes, there was no evidence that they mediated the associations observed between unresponsiveness and drug use. These findings indicate that very early parenting behavior may have long term effects on the developing child's subsequent drug use, specifically drug use that persists into adulthood. The effects appear to be independent of risk factors present in adolescence.

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