Published in final edited form as:

Addict Behav. 2009 March ; 34(3): 258–263. doi:10.1016/j.addbeh.2008.10.020.

Marriage and Relationship Closeness as Predictors of Cocaine and Heroin Use

Adrienne J. Heinz, M.A.,
University of Illinois at Chicago

Johnny Wu, M.A.,
University of Washington

Katie Witkiewitz, Ph.D.,
University of Washington

David H. Epstein, Ph.D., and
National Institute on Drug Abuse

Kenzie L. Preston, Ph.D.
National Institute on Drug Abuse

Abstract

Marriage has been cited as a protective factor against drug use, but the relationship between marriage and drug use has not been explored longitudinally during addiction treatment. The current study assessed individual trajectories of substance use during treatment as a function of marital status and perceived closeness of the marital relationship. A parallel-process growth model was used to (1) estimate the rate of change in percentage of cocaine-positive and heroin-positive urine samples, and (2) examine the relationship between marital status and drug use trajectories over 35 weeks, during and after treatment. Percent days of use for both drugs were lowest for married participants across all time points. Among married participants, reporting a close relationship with one's partner predicted less cocaine and heroin use. These findings suggest that being married and having a close relationship with one's spouse are associated with better outcomes over time. The causal nature of the association is suggested by previous research that has demonstrated the effectiveness of couples therapy as an adjunct to methadone maintenance.

Keywords

Heroin; Cocaine; Social Support; Marital Status; Treatment

1. Introduction

Substance-use disorders are a widespread and persistent health problem in the United States, with significant social and economic consequences (Harwood, Fountain, & Livermore, 1998;

Correspondence concerning this article should be addressed to: Adrienne J. Heinz, University of Illinois at Chicago, Department of Psychology (MC 285), 3022A Behavioral Sciences Building, 1007 W. Harrison St., Chicago, IL 60602. E-mail may be sent to aheinz3@uic.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Office of National Drug Control Policy, 2001). The National Epidemiologic Survey on Alcohol and Related Conditions showed that approximately two percent of adult Americans experienced a drug-use disorder in the past year (2001- 2002) and 10.3 experienced a drug-use disorder during their lifetimes (Compton, Thomas, Stinson, & Grant, 2007). Given the low rate of recovery among individuals with chronic drug-use disorders (e.g., Hser, Anglin, & Powers, 1993; O'Donnell, 1972), it is important to determine factors that may facilitate recovery. One such factor, social support, has been shown to predict a variety of positive treatment outcomes in substance-abuse programs, including greater treatment retention (Dobkin, De Civita, Paraherakis, & Gill, 2002), lower rates of relapse (Havassy, Wasserman, & Hall, 1995), and greater subjective well-being (Beattie & Longabaugh, 1997).

Long-term committed relationships, such as marriage, provide the primary form of social support for many individuals. Unfortunately, researchers have found that substance use is related to divorce or separation (Lex, 1994) and remaining unmarried (Kaestner, 1997). Interestingly, epidemiological data provides evidence to suggest that married individuals are much less likely to use illicit drugs. For example, Merline and colleagues (2004) analyzed rates of drug use among 35-year-old adults in the Monitoring the Future study and found that married individuals were significantly less likely to use cocaine than unmarried individuals: 3.8% of married men and 2.0% of married women reported cocaine use, whereas 11.4% of unmarried men and 5.1% of unmarried women reported cocaine use.

Perhaps more important is the possibility that marriage may serve as a protective factor among those who have already initiated drug use. In an investigation of 8,427 patients who received substance-abuse treatment through the Department of Veterans Affairs, being married was significantly related to stable or improved outcomes after treatment (Moos, Nichol, & Moos (2002). In contrast, patients who were not married were significantly more likely to experience symptom exacerbation over time. Cessation of cocaine use has also been shown to be significantly related to marital status; in a community sample, cessation of cocaine use was three times more common among married individuals than among unmarried individuals (White & Bates, 1995). As such, marital status may be a proxy for improved treatment outcome. Additionally, it may also be useful in determining which elements of the relationship contribute to the above described pattern. In turn, this knowledge may inform interventions and allow researchers to prospectively evaluate the direction of any causal relationships between drug use and marital status.

Different types and definitions of social support may be related to treatment outcomes in different ways. Structural social support represents the extent of supportive resources (Beattie, 2001) whereas functional social support is defined as the perceived or actual support received (Dobkin et al., 2002). The quality of the marital relationship (a form of functional social support) may be at least as important a predictor of treatment outcome as marital status *per se* (a form of structural social support). In the alcohol-research literature, low marital satisfaction has been shown to predict poor treatment outcomes (Beattie, 2001; McCrady, Epstein & Sell, 2003), whereas marital happiness predicts optimal treatment outcomes (McCrady, Epstein, & Kahler, 2004). Promotion of marital satisfaction through couples therapy with substance abusers has been shown to reduce drug use, increase treatment retention, and promote better dyadic adjustment (e.g., Epstein, & McCrady, 1998; Fals-Stewart, Birchler, & O'Farrell, 1996; O'Farrell, & Falls-Stewart, 2000; Winters, Fals-Stewart, O'Farrell, Birchler, & Kelley, 2002). Thus, it appears that higher levels of extant marital satisfaction, or increases in marital satisfaction achieved through counseling, are associated with better treatment outcomes. Findings from these studies collectively warrant further exploration of the observed associations between spousal relationships and maintenance of substance use and/or recovery.

Despite the extensive body of literature on alcoholism and marriage, there is little research on the relationship between marital status and opiate and cocaine use during treatment. Several researchers (e.g., McCrady, 2004; Witkiewitz & Marlatt, 2005) posit that such relationships should be investigated at the level of the individual substance user because traditional analytical methods often fail to account for individual heterogeneity. Therefore, the goal of the current study was to test whether individual trajectories of cocaine and heroin use during treatment are predicted by marital status and by the perceived closeness (i.e., functional social support) of the marital relationship. Based on previous epidemiological data, as well as the extant literature from the alcohol field, we predicted that married individuals would have significantly better outcomes than nonmarried individuals and that closeness of the marital relationship would account for additional variance in outcome among those participants who were married. Furthermore, we examined whether being in a domestic partnership (i.e., living together, but not married) resulted in better outcomes, compared to being single or separated.

2. Methods

2.1 Participants

The current study is a secondary analysis of pooled data from three consecutively run clinical trials involving contingency management (CM) and methadone maintenance (Epstein, Schmittner, Schroeder, & Preston, 2003; Preston, Ghitza, Schmittner, Schroeder, & Epstein, in press; Ghitza, Epstein, Schmittner, Vahabzadeh, Lin, & Preston, in press). Across the three trials, 635 cocaine-abusing, opiate-dependent individuals were enrolled in a methadone-maintenance outpatient treatment program at the National Institute on Drug Abuse in Baltimore, Maryland between the years of 2000 and 2006. Participants qualified for enrollment if they were between the ages of 21 and 65 and seeking treatment for cocaine abuse and opiate dependence. Exclusion criteria were: current psychotic, bipolar, or major depressive disorders, current physical dependence on alcohol or sedatives, unstable serious medical illness, estimated IQ below 80, and urologic conditions precluding urine collection. For the present analyses, data from 70 participants were excluded due to missing data.

2.2 Instruments

Demographic information including marital status and living arrangements along with several relationship variables were derived from the Addiction Severity index (ASI; McLellan, Luborsky, Cacciola, Griffith, Evans, Barr, et al., 1985). The participant's relationship status with sexual partner/spouse was assessed with the item, "Would you say that you have had a close, long-lasting, personal relationships with your sexual partner/spouse?" to which the participant responded "yes," "no," "I don't know," or "Not relevant."

Urinalysis assays were conducted with an Enzyme Multiplied Immunoassay Technique (EMIT; Syva Corp., Palo Alto, CA) which provided qualitative results (i.e., positive/negative for the presence of drug or metabolite at the concentration cutoff of 300 ng/ml) for cocaine (benzoylecgonine equivalents) and opiate (morphine) use. The mean percentage of scheduled specimens collected was $75\% \pm 1.7\%$ (range 46% to 98%).

2.3 Procedure

All participants gave written informed consent prior to participation. During initial assessment, all participants underwent a thorough evaluation, overseen by a licensed medical doctor, including a detailed medical history, physical examination, laboratory tests of blood and urine, electrocardiogram, administration of the ASI (McLellan et al., 1985), and several standardized psychiatric and cognitive assessments and were then enrolled in methadone maintenance treatment. The duration of each of the three clinical trials was 35 weeks, and each consisted of 4 distinct phases: Pre-Intervention Baseline maintenance (5 weeks), Intervention (12 weeks,

CM in effect), Post-Intervention Maintenance (8 weeks, CM discontinued), and Methadone Dose Taper (10 weeks). Throughout the study, all participants received daily oral methadone from registered nurses and were required to attend weekly sessions of individual drug counseling conducted by licensed therapists. At the end of the Post-Intervention Maintenance, participants were encouraged to and assisted in transferring to a community treatment program; the 10-week methadone taper was provided to those participants who chose not to enter another maintenance program.

To measure drug use, urine specimens were collected under direct staff supervision thrice weekly for the first 25 weeks (Baseline, Intervention, Maintenance) and weekly for the last ten weeks of the study (Methadone Dose Taper). During the Intervention Phase, participants were randomly assigned to a CM schedule reinforcing drug abstinence (reinforcers were delivered for cocaine and/or heroin negative urine specimens) or to a noncontingent control condition in which reinforcers were given independent of urine cocaine and heroin drug screens. Briefly, depending on the trial, reinforcers for abstinence were awarded in the form of a monetary stipend or with vouchers or prizes that could be “won” through a drawing system. The current analyses also include participants who were excluded from randomization in the original three studies due to their not having met prespecified criteria for number of drug-positive urines during the first five weeks of treatment (Baseline). These participants received noncontingent reinforcers during the Intervention Phase. Participants were considered completers if they reached the last week of the Maintenance phase, after which they were encouraged to transfer to a community methadone program (as noted above).

2.4 Data Analyses

Demographic information and drug use history were drawn from the ASI. A percentage, representing amount of cocaine and heroin positive urine samples, was calculated in one month intervals. The number of cocaine and heroin positive urine samples was divided by the total number of urine samples collected within the respective month, and these variables were used as observed indicators for both cocaine and heroin growth models. The program Mplus version 4.1 (Muthén & Muthén, 2004) was used to estimate all models. Mplus utilizes the expectation-maximization algorithm (EM; Allison, 2002) to obtain maximum-likelihood estimation with robust standard errors (MLR). MLR generates the most likely parameters given the variances and covariances of the observed data and is a widely accepted approach for handling missing data, when data are missing at random (MAR; Little & Rubin, 2002; Muthén & Shedden, 1999). To test whether missing data influenced our dependent variables in a non-ignorable manner, cocaine and heroin slope factors from the latent growth model were regressed on binary missing variables at each time point. Results indicated that missing data at months 5 and 6 influenced the slope for heroin use ($\beta = .39, p < .05$ & $\beta = .22, p < .05$, respectively), but not cocaine use. That is, participants with incomplete data at months 5 and 6 had more heroin use over time. Hence, in subsequent analyses, “missing” at months 5 and 6 was explicitly modeled to control for its influence on heroin trajectories (Little, 1995).

With the positive urine samples from baseline and months 1-7 as the observed indicators, three latent growth factors were then estimated: (a) intercept (i.e., percent positive urine at baseline), (b) linear slope (i.e., linear rate of change), and (c) quadratic slope (i.e., non-linear rate of change). Analyses comparing deviance values of an unconditional linear latent growth model to a quadratic latent growth model indicated that the quadratic model fit significantly better than the linear model, $\chi^2\Delta (2 df) = 526.98$. Individuals were allowed to vary in intercepts and linear slopes so that these growth factors could be regressed on covariates. Variance of the quadratic slope, however, was fixed at zero (i.e., no random effect for quadratic slope) in order for the models to converge. Because participants reported high levels of both cocaine and heroin use coming into the study, we expected a robust association between cocaine and heroin use

throughout the study period. Thus, cocaine and heroin slopes were simultaneously estimated and correlated with one another to test the extent to which the trajectories of the two drugs influenced each other (Muthén & Muthén, 2004).

To determine whether a term for CM treatment group (control, cocaine contingent, split contingent) needed to be included in our models, we regressed cocaine and heroin intercept and linear slope growth factors on CM treatment, while controlling for several baseline covariates: (a) age, (b) gender, (c) race, (d) years of education, (e) income, and (f) years of cocaine and heroin use. Dummy variable coding was used to compare the control group vs. the cocaine contingent and split contingent groups. Although inclusion of a quadratic improved model fit, it was not regressed on any covariates because the residual variance was not significant.

Lastly, marital status was coded as 0 = single and not living with partner, 1 = single or separated but living with partner, 2 = married, 3 = separated and not living with partner. A latent growth model was estimated with marital status as a set of dummy-coded variables to examine the impact of marriage on cocaine and heroin trajectories. In addition, age, gender, income, years of education, years of cocaine and heroin use, and CM treatment were included as control variables. To further assess the role of marriage on outcomes, a “close and personal relationship with partner” variable (CPR; from the Family/Social Relationships section of the ASI) was included in the model. The CPR variable was nominally coded as 0 or 1; “1” indicated a fulfilling, close, and personal relationship with one’s partner whereas “0” indicated the opposite. Hence, a negative regression coefficient between a CPR variable and cocaine or heroin slope would mean that having a close and personal relationship predicted less drug use over time.

Finally, an interaction term was created for marital status by CPR, and growth factors were also regressed on this term. This interaction variable (8 groups; single and no CPR, single and yes CPR, living with partner and no CPR, living with partner and yes CPR, married and no CPR, married and yes CPR, separated and no CPR, separated and yes CPR) was created by combining the marital status variable (4 groups; single, living with partner, married, and separated) with the CPR variable (2 groups; yes and no CPR with partner). A significant regression coefficient would indicate that marital status and CPR were synergistic predictors of cocaine and heroin outcomes.

3. Results

Participants’ mean age was 41.9 (7.9), and the majority were African-American (57%) and male (54%). The mean number of days of cocaine and heroin use in the past month was 17.6 (9.8) and 29.2 (3.7), respectively. Thirty-five percent of the sample was employed full time ($n = 196$), 43% were unemployed ($n = 245$), 20% reported working part-time ($n = 110$), and 2% were retired or on disability ($n = 13$). Further descriptive information for the sample is provided in Table 1. As expected, cocaine and heroin slopes were correlated with each other, $r = .32$, $p < .01$. At baseline, percentage of positive urine samples was 72% for cocaine and 64% for heroin. During months 1-3 (i.e., intervention), percentage of positive urine samples decreased for cocaine by 8%, although this reduction in use was not significant (slope = -2.67 , $p = .37$), and significantly decreased for heroin by 20% (slope = -5.47 , $p < .01$). During months 4-7 (i.e., maintenance and the first 8 weeks of the methadone taper), percentage of positive urine samples steadily increased for cocaine and averaged 78% by the end of the methadone taper. Likewise, percentage of heroin-positive urine samples increased during months 4-7 and averaged 73% by the end of the methadone taper.

Figures 1 and 2 display estimated cocaine and heroin trajectories as a function of marital status. Of our 565 participants, 36% of the participants were single, 29% were living with a partner, 14% were married, and 32% were separated. Examination of both cocaine and heroin trajectories revealed that married participants had the most favorable substance-use outcomes over time. For cocaine use, single participants started at 78% positive urine and increased to 80%, participants living with a partner started at 75% and increased to 86%, and separated participants started at 70% and increased to 74%. Married participants, however, started at 68% and decreased to 57%. For heroin use, single participants started at 74% positive urine and decreased to 68%, participants living with a partner started at 73% and decreased to 72%, and separated participants started at 58% and increased to 66%. Married participants, however, started at 57% and decreased to 45%.

Table 2 presents the beta coefficients of cocaine and heroin slopes regressed on demographic variables, CM treatment, and the main effects of marital status and CPR (interaction terms are not included but are described below). Significance was determined by a p-value of less than .05. For demographic variables, only income and years of cocaine use were significant predictors of drug use, such that higher income predicted a higher heroin intercept ($\beta = .09$) and more years of cocaine use predicted a higher cocaine intercept ($\beta = .12$). In regard to CM treatment variables, the only significant difference detected was between the cocaine contingent group and the control group, such that the cocaine contingent group had a lower cocaine intercept ($\beta = -.18$). Several comparisons showed significant differences for main effects of marital status: (a) married participants had a more negative cocaine slope than single participants ($\beta = -.12$) and participants living with a partner ($\beta = -.19$), and (b) separated participants had a lower heroin intercept than participants living with a partner ($\beta = -.11$). There was no main effect of CPR in either the cocaine or heroin models.

Lastly, to determine if cocaine and heroin growth factors differed across marital status as a function of having a close and personal relationship with one's partner, an interaction term between marital status and CPR was added to both the cocaine and heroin latent growth models, while also controlling for demographic and CM treatment variables. Income, years of cocaine use, and cocaine contingent group versus control all remained significant predictors of drug-use growth factors. Nine interactions were found to be significant at the $\alpha = .05$ level: (a) Married and "yes CPR" participants had a more negative cocaine slope than single and "yes CPR" participants ($\beta = -.14$), living-with-partner and "yes CPR" participants ($\beta = -.21$), and married and "no CPR" participants ($\beta = -.47$). In addition, married and "yes CPR" participants also had a more negative heroin slope than separated and "yes CPR" participants ($\beta = -.16$); (b) Married and "no CPR" participants had a more positive cocaine slope than single and "no CPR" participants ($\beta = .12$); (c) Separated and "no CPR" participants had a lower cocaine intercept than single and "yes CPR" participants ($\beta = -.11$) and living-with-partner and "no CPR" participants ($\beta = -.18$). In addition, separated and "no CPR" participants also had a more negative cocaine slope than married and "no CPR" participants ($\beta = -.31$); (d) lastly, participants living with partner and "yes CPR" had a more positive cocaine slope than single and "no CPR" participants ($\beta = .19$).

4. Discussion

The primary objective of substance-abuse treatment and its associated outcome research has been to promote and maintain abstinence using various combinations of psychological and pharmacological treatments. However, given the usually chronic nature of addiction, it is also important to focus on protective factors that may facilitate lasting change. One such factor, social support, has been indicated in improved substance-use outcomes. Further, the quality of social support in a marital relationship (i.e., functional social support) has been associated with substance-use outcomes in important and meaningful ways. Less is known, though, regarding

how substance-use outcomes are affected by the *quality* of the relationship. Using latent growth modeling, the present study investigated how substance use during treatment was related to marital status and perceived closeness of personal relationships. For both cocaine and heroin use, the outcome trajectories were most favorable (i.e., fewer days of positive cocaine and/or heroin urine samples) for married participants across the 35-week studies. The results of the interaction between marital status and having a close and personal relationship with one's partner suggest that being married predicts a greater decrease in cocaine and heroin use over time, relative to being single, being separated, or cohabiting. This is only true, however, for married couples who have a close and personal relationship with each other. In the absence of a close and personal relationship with a partner, being separated actually predicted more favorable cocaine outcomes over time, rather than being married, single, or cohabiting.

To our knowledge, no prior studies have explicitly examined the link between marital status and polysubstance use using longitudinal data and a person-centered approach. Our findings are also important as they are among the first to suggest a potentially significant influence of marriage on treatment-outcome trajectories for both heroin and cocaine use. Moreover, our findings suggest that the quality of the marital relationship is particularly important for predicting substance use. Not only does being married and satisfied (i.e., having a close and personal relationship) appear to be a protective factor against relapse during treatment, it also predicts better substance use outcomes compared than being single, separated, or living with a partner and having a close and personal relationship. Further support for the potential benefits of marital counseling in conjunction with methadone maintenance is also warranted. Indeed, a great deal of research has been conducted to determine the effectiveness of family and couples therapy for substance abusers (see Stanton & Shadish, 1997). Within the context of methadone maintenance, Fals-Stewart, O'Farrell, and Birchler, (2001) found that male patients assigned to behavioral couples therapy reported greater reductions in drug use and higher dyadic adjustment compared to patients who received twice-weekly individual counseling. Some therapeutic implications may be derived from the finding that separated and single participants with no close and personal relationship had more negative cocaine slopes compared to married participants with no close and personal relationship. Specifically, one may speculate that in the absence of a close and personal marital relationship, separation may increase the chances for a better treatment outcome.

Some limitations should be mentioned. Firstly, our reliance on one dichotomous measure as a proxy for relationship closeness poses a serious limitation. Relationship quality and dyadic adjustment are complex constructs that are typically assessed with a battery of measures. Future research is therefore needed to assess the relationship between multiple dimensions of relationship quality and polysubstance use over time. Another substantial limitation in the present study was the lack of information pertaining to partner substance use: being married to a nonuser has been shown to predict more positive treatment outcomes (Beattie, 2001). The current study also did not assess outcome post treatment. To provide a more complete picture of drug-use patterns as they may relate to protective factors, it is important that future studies examine drug use after counseling and medication administration have ceased. There is a possibility that the current findings were affected by selective attrition (e.g., more unhappily married individuals dropped out of treatment). The small number of married individuals ($n = 77$, 14%) may have been insufficient to detect an effect of worse outcomes among unhappily married individuals, which has been shown in previous studies (Beattie, 2001; McCrady, Epstein, & Sell, 2003). Our data are correlational, precluding firm conclusions about whether marital factors caused better drug-use outcomes or whether they only served as markers for other causal variables. That is, participants who are able to maintain a marriage may be different from those who are not married on a number of other characteristics. Lastly, no data were available to differentiate single participants without a significant other from single participants who had a significant other but were not in a close and personal relationship.

Nonetheless, these findings may have treatment implications such that attention might be given to proximal protective factors, particularly marital satisfaction and closeness, during the course of interventions for those with substance-use disorders. Further research is needed to replicate findings of improved treatment outcomes derived from implementation of couple's therapy within methadone-maintenance programs.

Acknowledgements

This research was supported in part by the Intramural Research Program of the NIH, National Institute on Drug Abuse.

References

- Allison, PD. Missing Data. Thousand Oaks, CA: Sage; 2002.
- Beattie MC. Meta-analysis of social relationships and posttreatment drinking outcomes: Comparison of relationship structure, function and quality. *Journal of Studies on Alcohol* 2001;62:518–527. [PubMed: 11513230]
- Beattie MC, Longabaugh R. Interpersonal factors and post-treatment drinking and subjective well being. *Addiction* 1997;92:1507–1521. [PubMed: 9519493]
- Compton WM, Thomas YF, Stinson FS, Grant BF. Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States - results from the national epidemiologic survey on alcohol and related conditions. *Archives of General Psychiatry* 2007;64:566–576. [PubMed: 17485608]
- Dobkin PL, De Civita MD, Paraherakis A, Gill K. The role of functional social support in treatment retention and outcomes among outpatient adult substance abusers. *Addiction* 2002;97:347–356. [PubMed: 11964111]
- Epstein DH, Schmittner J, Schroeder JR, Preston KL. Promoting simultaneous abstinence from cocaine and heroin with a methadone dose increase and a novel contingency. *The College on Problems of Drug Dependence Abstracts*. 2003
- Epstein EE, McCrady BS. Behavioral couples treatment of alcohol and drug use disorders: Current status and innovations. *Clinical Psychology Review* 1998;18(6):689–711. [PubMed: 9779329]
- Fals-Stewart W, Birchler GR, O' Farrell TJ. Behavioral couples therapy for male substance-abusing patients: Effects on relationship adjustment and drug-using behavior. *Journal of Consulting and Clinical Psychology* 1996;64:959–972. [PubMed: 8916625]
- Fals-Stewart W, O'Farrell TJ, Birchler GR. Behavioral couples therapy for male methadone maintenance patients: Effects on drug-using behavior and relationship adjustment. *Behavior Therapy* 2001;32:391–411.
- Ghitza UE, Epstein DH, Schmittner J, Vahabzadeh M, Lin JL, Preston KL. Randomized trial of prize-based reinforcement density for simultaneous abstinence from cocaine and heroin. *Journal of Consulting and Clinical Psychology*. In Press
- Havassy BE, Hall SM, Wasserman DA. Social support and relapse: commonalities among alcoholics, opiate users, and cigarette smokers. *Addictive Behaviors* 1991;16:253–246.
- Havassy BE, Wasserman DA, Hall SM. Social relationships and abstinence from cocaine in an American treatment sample. *Addiction* 1995;90:699–710. [PubMed: 7795506]
- Hser YI, Anglin MD, Powers K. A 24-year follow-up of California narcotics addicts. *Archives of General Psychiatry* 1993;50:577–584. [PubMed: 8317951]
- Kaestner R. The effects of cocaine and marijuana use on marriage and marital stability. *Journal of Family Issues* 1997;18:145–173.
- Lex BW. Alcohol and other drug abuse among women. *Alcohol Health and Research World* 1994;18:212–219.
- Little RJA. Modeling the drop-out mechanism in repeated-measures studies. *Journal of the American Statistical Association* 1995;90:1112–1121.
- Little, RJA.; Rubin, DB. *Statistical Analysis with Missing Data*. New York: Wiley-Interscience; 2002.
- McCrady B. To have but one true friend: Implications for practice of research on alcohol use disorders and social networks. *Psychology of Addictive Behaviors* 2004;18:113–121. [PubMed: 15238053]

- McCrady BS, Epstein EE, Kahler CW. Alcoholics Anonymous and Relapse Prevention as maintenance strategies after Conjoint Behavioral Alcohol Treatment for men: 18-Month Outcomes. *Journal of Consulting and Clinical Psychology* 2004;72(5):870–878. [PubMed: 15482044]
- McCrady, BS.; Epstein, EE.; Sell, RD. Theoretical bases of family approaches to substance abuse treatment. In: Rotgers, F.; Keller, DS.; Morgenstern, J., editors. *Treatment of substance abusers: Theory and technique*. Vol. 2. New York: Guilford Press; 2003. p. 112-139.
- McLellan AT, Luborsky L, Cacciola J, Griffith J, Evans F, Barr HL, et al. New data from the Addiction Severity Index. Reliability and validity in three centers. *Journal of Nervous and Mental Disorders* 1985;173:412–423.
- Merline AC, O'Malley PM, Schulenberg JE, Bachman JG, Johnston LD. Substance use among adults 35 years of age: Prevalence, adulthood predictors, and impact of adolescent substance use. *American Journal of Public Health* 2004;94:96–102. [PubMed: 14713705]
- Moos RH, Nichol AC, Moos BS. Risk factors for symptom exacerbation among treated patients with substance use disorders. *Addiction* 2002;97:75–85. [PubMed: 11895273]
- Muthén, L.; Muthén, B. *Mplus User's Guide: Statistical Analysis with Latent Variables*. Vol. 3. Los Angeles: Muthén & Muthén; 2004.
- Muthén B, Shedden K. Finite mixture modeling with mixture outcomes using the EM algorithm. *Biometrics* 1999;55:463–469. [PubMed: 11318201]
- O'Donnell, JA. Lifetime patterns of narcotic addiction. In: Roff, MA.; Robbins, LN.; Pollack, M., editors. *Life history research in psychopathology*. Vol. 2. Minneapolis: University of Minnesota Press; 1972. p. 236-254.
- O'Farrell TJ, Fals-Stewart W. Behavioral couples therapy for alcoholism and drug abuse. *Journal of Substance Abuse Treatment* 2000;18:51–54. [PubMed: 10636606]
- Preston KL, Ghitza EU, Schmittner J, Schroeder JR, Epstein DH. Randomized trial comparing two treatment strategies using prize-based reinforcement of abstinence in cocaine and opiate users. *Journal of Applied Behavior Analysis*. In Press
- Stanton MD, Shadish WR. Outcome, attrition, and family-couple treatment for drug abuse: A meta-analysis and review of the controlled, comparative studies. *Psychological Bulletin* 1997;122:170–191. [PubMed: 9283299]
- White HR, Bates ME. Cessation from cocaine use. *Addiction* 1995;90:947–957. [PubMed: 7663316]
- Willett, JB.; Sayer, AG. Cross-domain analyses of change over time: Combining growth modeling and covariance structure analysis. In: Marcoulides, GA.; Scumacker, RE., editors. *Advanced Structural Equation Modeling: Issues and Techniques*. Mahwah, NJ: Erlbaum; 1996. p. 125-157.
- Winters J, Fals-Stewart W, O'Farrell TJ, Birchler GR, Kelley ML. Behavioral couples therapy for female substance-abusing patients: Effects on substance use and relationship adjustment. *Journal of Consulting and Clinical Psychology* 2002;70:344–355. [PubMed: 11952192]
- Witkiewitz K, Marlatt GA. Emphasis on interpersonal factors in a dynamic model of relapse. *American Psychologist* 2005;60(4):341–342. [PubMed: 15943533]

Figure 1. Estimated cocaine trajectories as a function of marital status. Vertical dotted line indicates the beginning of methadone taper.

Figure 2.
Estimated heroin trajectories as a function of marital status. Vertical dotted line indicates the beginning of methadone taper.

Table 1

Demographic Characteristics of Participants at Intake

	Single	LiveW/Partner	Married	Separated	Total
	n = 205; 36%	n = 161; 28%	n = 77, 14%	n = 122; 22%	N = 565
Gender					
male	111; 54.1%	86; 53.4%	42; 54.5%	67; 54.9%	306; 54%
female	94; 45.9%	75; 46.6%	35; 45.5%	55; 45.1%	259; 46%
Race					
Caucasian	81; 39.5%	62; 38.5%	32; 41.6%	55; 45.1%	230; 41%
African American	121; 59.0%	97; 60.2%	43; 55.8%	64; 52.5%	325; 57%
other	3; 1.5%	2; 1.2%	2; 2.6%	3; 2.5%	10; 2%
Close Personal Rlt					
yes	121; 69.9%	131; 89.1%	68; 93.2%	67; 63.8%	387; 77.7%
no	52; 30.1%	16; 10.9%	5; 6.8%	38; 36.2%	111; 22.3%
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Age	39.20 (8.14)	41.48 (6.71)	42.68 (8.21)	46.36 (6.61)	41.9 (7.9)
Years Education	11.25 (1.75)	11.45 (1.45)	11.53 (1.68)	11.74 (1.83)	11.5 (1.7)
Num Years in Rlt Status	17.16 (8.12)	14.20 (8.12)	9.79 (8.17)	8.07 (6.42)	13.35 (8.58)
Num Previous Treatments	2.99 (3.40)	2.21 (2.22)	2.21 (2.70)	2.74 (3.03)	2.6 (2.9)
Cocaine Years	7.83 (6.67)	8.12 (6.87)	8.09 (6.47)	9.89 (7.21)	8.4 (6.8)
Heroin Years	10.40 (7.29)	10.13 (7.60)	9.10 (7.09)	12.35 (7.94)	10.6 (7.5)

* Note. Num. represents number; Rlt. represents relationship

Table 2

Beta Coefficients of Cocaine and Heroin Growth Factors Regressed on Baseline Covariates, Treatment, Marital Status, and Close and Personal Relationship with Partner

	Cocaine		Heroin	
	Intercept	Linear Slope	Intercept	Linear Slope
Age	-.02	.05	-.10	.03
Females vs Males	.05	-.04	-.04	-.04
Blacks vs Whites	-.07	-.03	.02	.06
Others vs Whites	.03	-.06	-.00	.03
Years of Education	.02	.03	.00	-.06
Income^a	.05	.04	.09[*]	.01
Years of Cocaine Use	.12[*]	.00	-	-
Years of Heroin Use	-	-	.06	-.01
Cocaine Contingency vs Control	-.18[*]	.04	-.02	.09
Split Contingency vs Control	-.09	-.05	-.10	.01
Living with Partner vs Single	-.05	.10	.01	.08
Married vs Single	-.04	-.12[*]	-.05	-.03
Separated vs Single	-.05	-.03	-.10	.11
Married vs Living with Partner	-.00	-.19[*]	-.06	-.08
Separated vs Living with Partner	-.00	-.12	-.11[*]	.04
Separated vs Married	-.00	.11	-.04	.14
CPR with Partner	.03	.04	.01	.02

Note: Whenever comparisons are made between two groups, the latter group is reference group

^a Due to the extreme positive skewness, income was square root transformed

*
p < .05