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# Do drug treatment services predict reunification outcomes of mothers and their children in child welfare?

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**Abstract**

The effect of mothers' participation in substance abuse treatment on reunification with their children who are in out-of-home care is an important policy issue. This article examines the predictors of child reunification among mothers who participated in a statewide treatment outcome study. Data were integrated from multiple sources to determine the contributions of characteristics of mothers ($n$ = 1,115), their children ($n$ = 2,299), and treatment programs ($n$ = 43) on reunification outcomes. Hierarchical linear modeling was used to determine the fixed and random effects of mother, child, and program characteristics. Mothers with more employment and psychiatric problems were less likely to be reunified with their children; completion of 90 or more days in treatment approximately doubled their likelihood of reunification. Mothers who were treated in programs providing a "high" level of family-related or education/employment services were approximately twice as likely to reunify with their children as those who were treated in programs with "low" levels of these services.


*Keywords:* Substance abuse treatment; Child welfare; Reunification; Treatment services

## 1. Introduction

There has been increasing attention to the problems associated with substance abuse among parents whose children enter into the child welfare system (General Accounting Office, 1994; National Center on Addiction and Substance Abuse, 1999). Considerable research has examined the characteristics of parents and their children who come into contact with the child welfare system, the types of placements and caregivers, and whether children eventually return to the care of their parents. Yet, there is limited understanding of whether and how parental participation in substance abuse treatment is related to the outcomes of their children who have been placed into out-of-home care. Questions persist, such as: Does treatment participation itself, duration of time in treatment, or treatment completion, increase the likelihood of parental reunification with children? Further, what aspects of treatment participation, including the types of services provided to mothers in treatment, are positively related to reunification outcomes? This study was designed to address these questions by using data from mothers who participated in a statewide treatment outcome study, combined with data from the state child welfare system on the characteristics of their children's placements and associated placement outcomes. The study examines their children's placement episodes and outcomes to assess the effects of mothers' participation in substance abuse treatment on the likelihood of eventual reunification with their children.

### 1.1. Substance abuse and child welfare involvement

Parental substance abuse has been associated with high rates of child maltreatment in community-based epidemiological studies (Chaffin, Kelleher, & Hollenberg, 1996;

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Kelleher, Chaffin, Hollenberg, & Fischer, 1994; Walsh, MacMillan, & Jamieson, 2003) as well as in studies using administrative records (Magura & Laudet, 1996; Smith & Testa, 2002). Substance-abusing parents are less able to provide adequate shelter, care, and economic stability for their children, and hence, their children are at high risk of neglect (Bays, 1990; Takayama, Wolfe, & Coulter, 1998). Further, impaired judgment, emotional dysregulation, and co-occurring psychopathology contribute to child maltreatment by parents who have substance abuse problems (Ammerman, Koklo, Kirisci, Blackson, & Dawes, 1999; Hans, Bernstein, & Henson, 1999). Several studies show that substance-abusing mothers display less-appropriate parental involvement with their children, endorse attitudes associated with abusive and neglectful parenting behaviors, and often lack basic knowledge of parenting behaviors and appropriate developmental expectations (Kettinger, Nair, & Schuler, 2000; Velez et al., 2004). However, the impaired parenting behaviors displayed by these mothers may also be related to low socioeconomic status and other environmental stressors that are typically associated with substance abuse (Nair, Schuler, Black, Kettinger, & Harrington, 2003), as well as high levels of parenting stress (Suchman & Luthar, 2000, 2001) and low levels of perceived support (Suchman, McMahon, Slade, & Luthar, 2005).

As a consequence of their higher risk of child maltreatment, substance-abusing parents have a high likelihood of contact with the child welfare system (Ross, 1997). Estimates of the prevalence of substance abuse problems among parents whose children have been placed into the foster care system are highly variable but range from at least half to 80% (Curtis & McCullough, 1993; Semidei, Radel, & Nolan, 2001; Young, Boles, & Otero, 2007). In a review of case records of 268 children that had been placed into foster care, three quarters of the cases had some indication of parental substance abuse, such as a referral for treatment, court mandate for drug testing or treatment, incarceration on a drug-related charge, or documentation of prenatal drug exposure (McNichol & Tash, 2001). Estimates of drug use and dependence are lower for parents whose children remain at home rather than being placed into out-of-home care, but no firm conclusions on prevalence can be drawn due to the high rate of underdiagnosis of substance use disorders among parents who come into contact with the child welfare system (Young, Boles, & Otero, 2007). However, child-welfare-involved mothers who have substance abuse problems are more likely to lose their parental rights as compared with non-substance-abusing mothers (Marcenko, Kemp, & Larson, 2000).

### *1.2. Effects of parental substance abuse treatment on child welfare outcomes*

Findings on the effects of participation in substance abuse treatment on child welfare outcomes are mixed (Hohman & Butt, 2001). Completion of substance abuse treatment has been shown to increase the rate of reunification of mothers with children, independent of whether mothers reported ongoing drug use or demonstrated risks for poor parenting behaviors (Smith, 2003). In another study using case records, compliance with court-ordered substance abuse treatment did not affect either the likelihood of subsequent reports of abuse of children or duration of child welfare services received (Rittner & Dozier, 2000). Generally, treatment completion among parents who come into contact with the child welfare system is relatively low. In one study, less than one quarter of parents who were referred to treatment from child welfare completed treatment, and treatment noncompletion was strongly associated with continued substance abuse and eventual loss of parental rights (Gregoire & Schultz, 2001). Similarly, in a study using records from the child welfare system in Illinois, less than one quarter of participants referred to substance abuse treatment completed the treatment episode; completion was higher among participants who were older, had outstanding legal issues, were employed, and were alcohol (vs. heroin) users (Choi & Ryan, 2006). Furthermore, the nature of treatment participation may influence child welfare outcomes. In a study using child welfare data from Oregon, women who entered into substance abuse treatment more quickly (following initial placement of their children into out-of-home care), who spent more time in treatment, or who completed at least one treatment episode were more likely to reunify with their children than were other mothers, and their children spent fewer days in foster care (Green, Rockhill, & Furrer, 2007).

In a recent study using data from a large national probability sample of children and their caregivers who were involved with the child welfare system, parents or other caregivers who had indicators of substance abuse problems were matched with a comparison sample based on whether they had received substance abuse treatment services. Caregivers who had received treatment were nearly twice as likely to have another child abuse report within 18 months compared with those who had not been in treatment (Barth, Gibbons, & Guo, 2006). The authors surmised that substance abuse treatment participation may indicate a high level of severity of problems in functioning and that treatment participation, in itself, may not be sufficient to impact the course of child welfare outcomes.

### *1.3. Factors that influence type of placement and placement outcomes*

Children who enter into the foster care system may be placed in a variety of settings, including with family members of the parent, non-kin foster families, and group homes; they may frequently move between settings as well (Leslie, Landsverk, Horton, Ganger, & Newton, 2000). There is some evidence that children in kin foster placements have differing characteristics and experiences than those in non-kin foster placements (Geen, 2004; Webster, Barth, & Needell, 2000). For instance, children placed in kin foster

care compared to those in non-kin placements are younger and more likely to come from homes in which parents were drug abusers. Moreover, ethnic minority children are disproportionately represented within the child welfare system (Keller et al., 2001), more often enter into foster care due to parental arrest, and are more likely to be placed with kin (Phillips, Burns, Wagner, & Barth, 2004).

A number of studies have found that children placed into kin foster care tend to stay in out-of-home placement for longer periods (Courtney, 1994; Iglehart, 1994; Wulczyn & Goerge, 1992). Children in kin placement also tend to have fewer total placements, more frequent contact with birth parents and siblings, and are more likely to be placed with siblings (Geen, 2004). In contrast, children placed in non-kin foster homes are three times more likely to be moved to different foster homes (within the same placement episode) than children in kinship care. Prior research has also shown that younger children, children who spend longer time in out-of-home placement, and children who have multiple placement episodes are less likely to reunify with parents (Ehrle & Geen, 2002). Thus, characteristics of children and their types of placements, as well as parental characteristics and treatment participation, may mutually influence each other and influence the likelihood of eventual family reunification.

### *1.4. Current study*

This study builds upon the prior literature showing that characteristics of parents and their children and the types of placements for children in out-of-home care all potentially interact and influence placement outcomes. In addition to these factors, we examine another contextual factor that may influence reunification outcomes, namely, the specific aspects of substance abuse treatment received by mothers, including type and duration of treatment received and the type and intensity of services provided by treatment programs. The study uses data from mothers who participated in a statewide treatment outcome study, in conjunction with data obtained on these mothers and their children from the statewide child welfare administrative data system. We examine the independent contributions of each of the following to child welfare outcomes: characteristics of mothers, including their treatment participation; characteristics of their children, including their placement history and current placement; and the types of services provided by the substance abuse treatment programs in which the mothers participated. The study was confined to mothers who had children who had been placed into out-of-home care prior to their entry into treatment, and reunification was examined following the mothers' discharge from treatment.

In prior analyses conducted with the intake treatment sample, we examined the characteristics of child-welfare-involved mothers compared with those who were not (using self-report data on child welfare involvement; Grella, Hser, & Huang, 2006). Child-welfare-involved mothers presented to treatment with a different clinical profile from other mothers. They had a generally lower level of addiction severity (i.e., fewer alcohol problems) but were more economically unstable, as seen in lower levels of education, lower rates of employment, and greater reliance upon others for economic support. Moreover, on average, these women were younger and had more children compared with other mothers. Based on child welfare involvement, there were few differences, however, in criminal behavior history or psychiatric severity, although mothers who were involved with child welfare were more likely than other mothers to report a history of having been physically abused. Methamphetamine users were overrepresented among the child-welfare-involved mothers, and these women were more likely to be involved with the criminal justice system, to have fewer years of education, to be younger, to have never been married, and to be White or Hispanic (compared with primary users of opiates or alcohol).

Given the limited research that has been conducted on mothers who are involved with both substance abuse treatment and the child welfare system, as well as the contradictory findings regarding the effects of their treatment participation on child welfare outcomes, this article addresses the following question: Does participation in substance abuse treatment programs that provide a greater range of services addressing women's treatment needs improve the likelihood of mothers' reunification with their children? We hypothesized that attendance in programs that provided a greater range of services would be associated with a higher likelihood of reunification following treatment, after controlling for other characteristics of mothers and children that are known to be associated with reunification outcomes (e.g., child's age, race/ethnicity, type of placement, and placement history). We were particularly interested in the provision of services that addressed the specific needs of child-welfare-involved mothers, based on prior research, including research conducted with the study sample showing their high level of economic instability and, presumably, their need for employment- and family-related services. Multilevel hierarchical models were used to test the study hypotheses because of the nested nature of the data, that is, children were nested within mothers, who in turn were nested within treatment programs.

## 2. Materials and methods

### *2.1. Research design*

The California Treatment Outcome Project (CalTOP) was a multisite and multicounty prospective treatment outcome study that was part of the Treatment Outcome Pilot Projects II funded by the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (CSAT; see Hser et al., 2002, and Evans & Hser, 2004, for a detailed description of the CalTOP study design and methods). This statewide outcome monitoring

system was developed and implemented through a collaboration by the California Department of Alcohol and Drug Programs (ADP), the UCLA Integrated Substance Abuse Programs, and county administrators and treatment providers in the participating counties. The system was designed to track client movement through the treatment programs, measure standardized assessment of client service needs, record service utilization, assess treatment outcomes, and determine the extent to which substance abuse treatment produces cost-offsets in other health and social service systems. Study participants provided informed consent for all procedures, including linkage of their information with state administrative data on outcomes. All study procedures were approved by the Institutional Review Boards of the California Department of Health Services and the University of California, Los Angeles.

Counties throughout the state were invited to participate in CalTOP, and 13 of the 19 that volunteered were selected (out of a total of 58 within the state). Counties were selected using the following criteria developed by ADP in collaboration with key stakeholders (e.g., associations of state and county administrators): client demographics, client flow, automation readiness, familiarity with assessment tools, ability to collect required client data using the specified instruments, geographic location, and commitment and willingness to participate in the project. Counties then recommended treatment agencies within their systems for study participation using similar criteria. Characteristics of the participating treatment programs have been described in-depth elsewhere (Hser, Evans, Huang, & Anglin, 2004).

At admission, treatment program staff collected assessment information using an abbreviated version of the Addiction Severity Index (ASI-Lite; McLellan, Luborsky, Woody, & O'Brien, 1980) and client locator information for the follow-up study (note: follow-up data are not used in the current study). Beginning in April 2000, intake assessments were conducted with approximately 15,000 participants admitted to 43 programs (including outpatient drug-free [nonmethadone], residential, and methadone maintenance) in 13 counties for approximately 2 years.

### 2.2. Participants

Approximately 70% of the sample of women in CalTOP reported that they had children that were younger than 18 years at the time of the mother's admission into treatment ($n$ = 4,156); about two thirds (66.4%, $n$ = 2,760) of this sample had been in contact with the child welfare system prior to their treatment admission, based on data obtained from the state child welfare administrative data system (described below). The analysis sample for this study consisted of mothers who had at least one child who had been placed into out-of-home care prior to the mother's admission into substance abuse treatment in CalTOP ($n$ = 1,115; 26.8% of the sample of mothers with dependent children).

Table 1
Background and treatment characteristics of mothers in CalTOP ($N$ = 1,115)

| Variables | $n$ | % | $\overline{X}$ ($SD$) |
|---|---|---|---|
| Ethnicity | | | |
| White | 553 | 49.6 | |
| African American | 223 | 20.0 | |
| Hispanic | 288 | 25.8 | |
| Other | 51 | 4.6 | |
| Age | | | 31.54 (7.10) |
| Marital status | | | |
| Married/remarried | 187 | 16.8 | |
| Divorced, widowed, separated | 408 | 36.6 | |
| Never married | 520 | 46.6 | |
| Completed high school | | | |
| No | 575 | 51.6 | |
| Yes | 540 | 48.4 | |
| ASI composite scores | | | |
| Alcohol | | | 0.11 (0.20) |
| Drug | | | 0.11 (0.11) |
| Employment | | | 0.81 (0.25) |
| Medical | | | 0.19 (0.30) |
| Psychiatric | | | 0.22 (0.24) |
| Family/Social | | | 0.19 (0.23) |
| Legal | | | 0.17 (0.20) |
| Type of primary drug | | | |
| Alcohol | 185 | 16.6 | |
| Cocaine/crack | 142 | 12.7 | |
| Heroin/other opiates | 117 | 10.5 | |
| Methamphetamine | 526 | 47.2 | |
| Marijuana | 145 | 13.0 | |
| Under parole/probation | | | |
| No | 620 | 55.6 | |
| Yes | 495 | 44.4 | |
| No. of arrests (lifetime) | | | 4.60 (8.45) |
| Total months incarcerated (lifetime) | | | 6.71 (13.61) |
| Ever drug arrest (lifetime) | | | |
| No | 532 | 47.7 | |
| Yes | 583 | 52.3 | |
| Ever prior AOD treatment | | | |
| No | 417 | 37.4 | |
| Yes | 698 | 62.6 | |
| Ever prior mental health treatment | | | |
| No | 636 | 57.0 | |
| Yes | 479 | 43.0 | |
| Pregnant at time of admission to CalTOP | | | |
| No | 1,014 | 90.9 | |
| Yes | 101 | 9.1 | |
| No. of children <18 years of age | | | 3.15 (1.79) |
| CalTOP treatment | | | |
| Source of referral to CalTOP | | | |
| Criminal justice system | 434 | 38.9 | |
| Self or other individual | 251 | 22.5 | |
| AOD provider | 92 | 8.3 | |
| Other organization (e.g., school, employer, child welfare, other health services provider) | 338 | 30.3 | |
| Completed treatment or 90 days in treatment | | | |
| No | 546 | 49.0 | |
| Yes | 569 | 51.0 | |

Background characteristics of mothers in the study sample are shown in Table 1. Overall, 20% of this sample was African American, 25.8% was Hispanic, 49.6% was White, and 4.6% was of "other" ethnic groups. The average age was 31.5 (*SD* = 7.1) years. About half of the sample had completed high school, and half had not. Less than one fifth of the sample (16.8%) reported being currently married, 36.6% had been previously married or was currently separated, and 46.6% had never been married. They had an average of 3.2 (*SD* = 1.8) children less than 18 years of age, and approximately 9% of the sample was pregnant at treatment admission. Close to half of the sample (47.2%) reported methamphetamine as their primary substance, 16.6% reported alcohol, and about 11% to 13% each reported primary use of opiates, cocaine/crack, or marijuana. Over half (52.3%) reported a history of at least one arrest on drug-related charges, and 44.4% was on probation or parole at the time of treatment admission. Close to two thirds (62.6%) had been in substance abuse treatment prior to the CalTOP treatment episode, and 43% reported having a history of mental health treatment.

### 2.3. Measures

Variables used in the analyses were organized into four domains: (a) background characteristics of mothers, (b) mother's participation in the CalTOP treatment episode, (c) characteristics of the CalTOP programs in which mothers were treated, and (d) child welfare interactions of mothers and their children (including characteristics of children obtained from child welfare records). Within these domains, variables that had been previously identified in the literature as associated with either treatment outcomes of mothers or placement outcomes of children were examined to test the study hypotheses regarding the independent contributions of each of these domains to placement outcomes. The construction and properties of the measures in each domain are described below.

#### 2.3.1. Characteristics of mothers

Data on the characteristics of mothers were obtained from the baseline interview conducted with participants at admission to the CalTOP treatment episode.

*2.3.1.1. Demographics.* Ethnicity, age, marital status (coded as married or remarried, divorced or separated, never married) were included.

*2.3.1.2. ASI scores.* Composite scores from the ASI, a structured client interview, were included to assess problem severity in the following domains: alcohol, drug, employment, medical, psychiatric, family/social, and legal. Individual questions (10–15 per domain) address the number of days/times that relevant problems or events were experienced in each of the domains, covering both the past 30 days and lifetime. Composite scores are calculated to measure problem severity during the prior 30 days in each domain of functioning. ASI composite scores range between 0 and 1, and higher scores indicate greater problem severity (McLellan et al., 1992). The ASI has been used extensively in studies of substance abuse treatment, and hence, its psychometric properties have been closely scrutinized (see Makela, 2004, for a recent review of 37 studies reporting data on the psychometric properties of the ASI). Among the composite scores used in this analysis, relatively high internal consistencies (above 0.70) have been found across multiple studies for the alcohol use and psychiatric status composite scores, but lower consistencies (below 0.70) for the drug use, legal status, and employment status composite scores (Makela, 2004). Reliability and validity vary across subject populations, with lower psychometric properties among subjects with serious mental disorders (Zanis, McLellan, Cnaan, & Randall, 1994; Zanis, McLellan, & Corse, 1997). Studies of women in substance abuse treatment have reported generally favorable test–retest reliability and internal consistency (Comfort, Zanis, Whiteley, Kelly-Tyler, & Kaltenbach, 1999). Reliability is improved with a greater degree of training and supervision of staff who administer the assessment; staff in CalTOP programs who administered the ASI underwent a series of training sessions and were closely monitored by study staff.

#### 2.3.2. CalTOP treatment episode

Source of mother's referral to the CalTOP treatment episode was derived from the treatment program records; it was coded as follows: (a) an alcohol or other drug (AOD) provider; (2) criminal justice system; (3) an individual, including self, family, or friend; or (4) other type of organization or service provider, such as child welfare, health services provider, school, employer, or other.

The type of *CalTOP treatment modality* was indicated as either outpatient drug-free (i.e., nonmethadone), residential, or methadone maintenance. Whether the mother completed treatment or stayed in treatment at least 90 days was obtained from program records and was coded with a dummy variable (1 = *yes*, 0 = *no*). This variable has been used previously in studies of CalTOP treatment outcomes and represents a benchmark for a "successful" treatment outcome (Hser et al., 2004).

#### 2.3.3. CalTOP program characteristics

Data on the characteristics of CalTOP treatment programs were obtained from the survey of administrators of the participating programs. Variables were constructed to describe the range and types of services provided by the treatment programs. These variables are shown in Table 2.

A sum of all possible services was created for an index of total program services (range = 0–39). Categories of services included the following (multiple questions were asked per category): intake and assessment, individual and group counseling, education/training, laboratory tests, medical,

Table 2
CalTOP program characteristics ($n$ = 43)

| Characteristics | $n$ | % |
|---|---|---|
| Modality | | |
| Residential | 13 | 30.2 |
| Outpatient | 25 | 58.2 |
| Methadone maintenance | 5 | 11.6 |
| Total no. of services provided | | |
| Low (0–21) | 15 | 34.8 |
| Medium (22–31) | 14 | 32.6 |
| High (32-39) | 14 | 32.6 |
| Family/Children's services provided | | |
| Low (0–3) | 12 | 27.9 |
| Medium (4) | 14 | 32.6 |
| High (5-7) | 17 | 39.5 |
| Education/employment services provided | | |
| Low (0–1) | 14 | 32.6 |
| Medium (2–4) | 15 | 34.8 |
| High (5–6) | 14 | 32.6 |
| Psychiatric/mental health services provided | | |
| Low (0) | 16 | 37.2 |
| Medium (1–2) | 9 | 20.9 |
| High (3–5) | 18 | 41.9 |

pharmacotherapy, vocational/educational–rehabilitation, social support, and other.

Three separate subcategories of service variables were created that were relevant to the service needs of child-welfare-involved mothers, based on prior literature. These included the following: family/children's services (i.e., individual, group, or family counseling regarding family issues; education/training regarding family issues; child care; child development services); education/employment services (i.e., individual or group employment counseling, education/training regarding employment, employment services, vocational services, rehabilitation services); and psychiatric/mental health services (i.e., individual or group psychiatric counseling, education/training regarding psychiatric issues, medication management regarding psychiatric medications, psychiatric/psychological evaluation). The total program services and specific service variables were each categorized as being low, medium, or high levels of services (with each level representing approximately one third of the programs), based on each of the distributions.

### 2.4. Child welfare interactions

Data on all interactions of the study sample (including both mothers and children) with the child welfare system were obtained from the Child Welfare Services/Case Management System (CWS/CMS), which is a statewide automated data system containing information on all child welfare events in California from 1998 to present. Data obtained on study participants were current through July 1, 2006. All referrals for suspected child maltreatment are reported by county child welfare agencies into the CWS/CMS system (in "real time"), including the outcomes (disposition) of these referrals. If a referral results in an open case (i.e., there is a determination of sufficient evidence of child maltreatment), information is reported to the system on the case, including relevant dates, types of service referrals, placement episodes of children into out-of-home care, changes in placement, and resultant case outcomes, including reunification with family, adoption, kin guardianship, emancipation, etc.

Data on the original pool of participants (i.e., all women in CalTOP who had children younger than 18 years) were linked with data from the CWS/CMS on their child welfare interactions and their children's associated outcomes. Personal identifiers, including social security number, name, date of birth, and other supporting information were used to link data on participants in the CWS/CMS. Reliance on a single identifier to link records across systems can lead to incorrect matches or missed matches because of errors, missing data, or lack of standardization. For this reason, a variety of techniques was used to conduct the record linkage. The most powerful of these is a methodology called *probabilistic record linkage* or *probabilistic matching*. The probabilistic method can take into account all of the attributes of the person common to both data systems and assign a composite score to all potential match pairs. The score represents the likelihood that the match pair is indeed a correct match rather than a "false positive." The method employs string similarity scoring and frequency analysis, so that relatively rare values produce a higher score than relatively common ones. Statistical guidelines are employed to determine a match threshold; scores above the threshold are considered matches.

Data obtained from the CWS/CMS on mothers in CalTOP and their children and construction of variables for analysis are described below.

#### 2.4.1. Mother's prior involvement with child welfare

Any prior involvement with child welfare (back to 1998) was examined for the mothers, including having an open case but no child placement into out-of-home care; having had a child in out-of-home care prior to the current episode; and having had a child adopted. Having had no prior contact with child welfare was also noted.

#### 2.4.2. Mother's referral for treatment services

This variable indicates whether case files contained in the CWS/CMS noted a referral for AOD treatment services at any time prior to her admission into CalTOP (1 = *yes*, 0 = *no*). A yes response to this variable should be interpreted not as a direct indication of the type or severity of the mother's alcohol or drug problem but as an indication that her AOD problem was recognized by the child welfare system to be of sufficient severity to merit a referral.

#### 2.4.3. Child demographics

These included child ethnicity and age.

#### 2.4.4. Child's current placement episode

These included the reason for removal (coded as caretaker absence or incapacity, emotional abuse or neglect, severe neglect, sexual abuse, physical abuse, or exploitation); type of placement facility (coded as foster home, kin placement, foster family agency [FFA]/group home; in instances where the child had more than one placement within the span of the placement episode, the predominant type of placement was coded); duration of the current placement episode in months; number of placements within the total placement episode (i.e., moves from one facility or placement to another); and the placement outcome (these included adoption, reunification, still in placement, kin or other guardianship, deceased, emancipation, or other). This variable was dichotomized in the outcome models as *reunification* (1 = *yes*, 0 = *no*). In addition, to control for the amount of time that the child had been in placement prior to the mother's admission into substance abuse treatment, a dichotomous variable was entered that indicated if the child had been in the current placement episode for 180 days or less prior to the mother's entry into treatment.

#### 2.4.5. Child's placement history

This variable indicated whether the child had ever been in out-of-home placement prior to the current episode (1 = *yes*, 0 = *no*).

### 2.5. Statistical analyses

Descriptive analyses (e.g., frequency distributions, means and ranges of variables) were conducted, and univariate correlations were examined to assess the distributions and interrelationships among the variables in each of the domains and to assess the relationships of these variables with the outcome variable (i.e., reunification following the mother's discharge from CalTOP treatment). In some cases, we eliminated variables that were highly intercorrelated with others from the pool of potential predictors to avoid multicollinearity. We then constructed Bernoulli outcome hierarchical linear models (HLMs) using HLM Software (HLM for Windows Version 6.00). The variable domains were entered into three-level nested models, where children (Level 1) were nested within their mothers (Level 2), who, in turn, were nested within their CalTOP treatment programs (Level 3).

Three separate HLMs were constructed with reunification between mother and child as the binary outcome. The models each contained the same sets of variables at the mother and child levels but differed with regard to variables at the program level. A different model was constructed that included one of the subtypes of service variables (i.e., education/employment, family/children, psychiatric/mental health). In addition, type of modality (referent = outpatient) and total program services provided (referent = low) were included as covariates at the program level in each model. The same sets of variables were entered at the mother and child levels to characterize their demographics, the mother's background characteristics at the time of treatment admission, the mother's and children's prior contact with the child

Table 3
Mother and child characteristics from child welfare data system

| | *N* | % |
|---|---|---|
| Mother characteristics (*n* = 1,115) | | |
| Mother received referral for AOD services | | |
| No | 278 | 24.9 |
| Yes | 837 | 75.1 |
| Mother's prior contact with child welfare system | | |
| No prior contact | 485 | 43.5 |
| Has children with prior open case (no removal) | 28 | 2.5 |
| Has children with prior removals from home | 584 | 52.4 |
| Has children with prior adoption | 18 | 1.6 |
| Child characteristics (*n* = 2,299) | | |
| Ethnicity | | |
| White | 876 | 38.1 |
| African American | 541 | 23.5 |
| Hispanic | 845 | 36.8 |
| Other | 37 | 1.6 |
| Child age | | |
| 0–2 | 609 | 26.5 |
| 3–5 | 469 | 20.4 |
| 6–10 | 687 | 29.9 |
| ≥11 | 534 | 23.2 |
| Type of placement | | |
| Foster home | 385 | 16.8 |
| FFA/group home | 576 | 25.0 |
| Kin/Other | 1,338 | 58.2 |
| Reason for removal | | |
| Caretaker absence or incapacity | 750 | 32.6 |
| Emotional abuse/neglect | 979 | 42.6 |
| Severe neglect | 311 | 13.5 |
| Exploitation, sexual or physical abuse | 259 | 11.3 |
| Ever prior placement before current | | |
| No | 1,825 | 79.4 |
| Yes | 474 | 20.6 |
| Duration of current placement episode (months)[a] | | |
| 0–12 | 427 | 18.6 |
| 13–24 | 669 | 29.1 |
| 25–36 | 394 | 17.1 |
| ≥37 | 809 | 35.2 |
| Placement episode began ≤180 days prior to CalTOP admission | | |
| No | 1,124 | 48.9 |
| Yes | 1,175 | 51.1 |
| No. of placements in current episode | | |
| 1 | 354 | 15.4 |
| 2 | 565 | 24.6 |
| 3 | 464 | 20.2 |
| 4 | 330 | 14.3 |
| ≥5 | 586 | 25.5 |
| Placement outcome | | |
| Adoption | 570 | 24.8 |
| Reunification | 1,009 | 43.9 |
| Still in placement | 229 | 10.0 |
| Other[b] | 491 | 21.3 |

[a] Through July 1, 2006.
[b] Includes kin or other guardianship, deceased, emancipation.

Table 4
HLM on reunification following mother's participation in drug treatment: effects of family/children's services

| Fixed effect | Coefficient | *SE* | *t* ratio | OR | CI |
|---|---|---|---|---|---|
| Child intercept | −1.39 | 0.55 | −2.52 ** | 0.25 | 0.08–0.76 |
| Program variables | | | | | |
| Program modality (ref = outpatient) | | | | | |
| Methadone | −0.49 | 0.46 | −1.08 | 0.61 | 0.24–1.54 |
| Residential | −0.21 | 0.20 | −1.06 | 0.81 | 0.54–1.21 |
| Total program services (ref = low) | | | | | |
| Medium | −0.31 | 0.22 | −1.41 | 0.73 | 0.47–1.15 |
| High | −0.27 | 0.22 | −1.22 | 0.76 | 0.48–1.20 |
| Family/child services (ref = low) | | | | | |
| Medium | 0.49 | 0.25 | 1.94 * | 1.63 | 0.98–2.73 |
| High | 0.57 | 0.25 | 2.25 ** | 1.77 | 1.06–2.97 |
| Mother variables | | | | | |
| Mother referred to AOD services | 0.41 | 0.19 | 2.16 ** | 1.51 | 1.04–2.18 |
| ASI alcohol | −0.75 | 0.46 | −1.62 | 0.47 | 0.19–1.17 |
| ASI drug | −0.41 | 0.76 | −0.54 | 0.67 | 0.15–2.95 |
| ASI employment | −1.40 | 0.24 | −5.74 **** | 0.25 | 0.15–0.40 |
| ASI medical | −0.12 | 0.24 | −0.51 | 0.89 | 0.55–1.42 |
| ASI psychiatric | −0.64 | 0.29 | −2.22 ** | 0.53 | 0.30–0.93 |
| ASI family/social | 0.11 | 0.33 | 0.34 | 1.12 | 0.58–2.15 |
| ASI legal | 0.75 | 0.35 | 2.15 ** | 2.12 | 1.07–4.20 |
| Completion/90 or more days in CalTOP treatment | 0.67 | 0.18 | 3.63 *** | 1.95 | 1.36–2.80 |
| Mother ethnicity (ref = White) | | | | | |
| African American | 0.42 | 0.40 | 1.03 | 1.52 | 0.69–3.34 |
| Hispanic | −0.18 | 0.19 | −0.98 | 0.83 | 0.58–1.20 |
| Other | 0.04 | 0.51 | 0.08 | 1.04 | 0.39–2.80 |
| Primary drug used (ref = alcohol) | | | | | |
| Cocaine/Crack | −0.33 | 0.32 | −1.05 | 0.72 | 0.39–1.34 |
| Heroin/Other opiates | −0.94 | 0.34 | −2.74 *** | 0.39 | 0.20–0.77 |
| Methamphetamine | −0.29 | 0.22 | −1.35 | 0.75 | 0.49–1.14 |
| Marijuana | −0.30 | 0.30 | −1.00 | 0.74 | 0.41–1.34 |
| CalTOP referral type (ref = AOD provider) | | | | | |
| Criminal justice system | −0.42 | 0.34 | −1.22 | 0.66 | 0.34–1.29 |
| Self or other individual | −0.69 | 0.31 | −2.24 ** | 0.50 | 0.28–0.92 |
| Other organization | −0.28 | 0.33 | −0.86 | 0.75 | 0.40–1.43 |
| Child variables | | | | | |
| Child age at CalTOP start (ref = 0–2) | | | | | |
| 3–5 | 0.60 | 0.15 | 3.97 **** | 1.82 | 1.36–2.45 |
| 6–10 | 1.19 | 0.16 | 7.35 **** | 3.27 | 2.39–4.49 |
| ≥11 | 0.52 | 0.24 | 2.16 ** | 1.68 | 1.05–2.70 |
| Child ethnicity (ref = White) | | | | | |
| African American | 0.17 | 0.37 | 0.45 | 1.18 | 0.57, 2.43 |
| Hispanic | 0.10 | 0.19 | 0.56 | 1.11 | 0.77–1.60 |
| Other | 0.34 | 0.63 | 0.54 | 1.41 | 0.41–4.83 |
| Type of placement (ref = kin/other) | | | | | |
| Foster home | 0.29 | 0.13 | 2.30 ** | 1.34 | 1.04–1.72 |
| FFA/Group home | 0.82 | 0.13 | 6.24 **** | 2.26 | 1.75–2.92 |
| No. of placement episodes prior to CalTOP (ref = 0) | | | | | |
| 1 | −0.47 | 0.15 | −3.09 *** | 0.63 | 0.47–0.84 |
| 2 or more | −0.51 | 0.35 | −1.49 | 0.60 | 0.30–1.18 |
| Placement episode began <180 days prior to CalTOP start | 0.36 | 0.15 | 2.45 ** | 1.43 | 1.07–1.90 |

(*continued on next page*)

Table 4 (*continued*)

| Fixed effect | Coefficient | *SE* | *t* ratio | OR | CI |
|---|---|---|---|---|---|
| No. of placements in current placement episode (ref = 1) | | | | | |
| 2 | 0.26 | 0.22 | 1.14 | 1.29 | 0.83–2.01 |
| 3 | −0.29 | 0.29 | −1.02 | 0.75 | 0.43–1.31 |
| 4 | −0.78 | 0.31 | −2.55 ** | 0.46 | 0.25–0.84 |
| 5 or more | −0.99 | 0.32 | −3.09 *** | 0.37 | 0.20–0.70 |
| Duration of current placement episode (months) | −0.05 | 0.01 | −5.33 **** | 0.95 | 0.93–0.97 |
| Random effect | *SD* | Variance component | *Df* | $X^2$ | *p* |
| Mother intercept | 1.47 | 2.17 | 1,053 | 1,995.75 | .001 |
| Program intercept | 0.08 | 0.006 | 36 | 36.11 | .464 |

* $p < .10$.
** $p < .05$.
*** $p < .01$.
**** $p < .001$.

welfare system, relevant aspects of the child's current placement episode, and characteristics of the mother's CalTOP treatment episode.

All child-, mother-, and program-level variables were considered to be fixed effects. Odds ratios (ORs) and 95% confidence intervals for these effects are reported to interpret the statistically significant effect size at the $p < .05$ level (although marginally significant findings at $p < .10$ are also discussed in the text). At the same time, the intercepts at the mother and program levels were taken to be random effects. The variance components for these effects are reported to interpret the statistically significant effect size at the $p < .05$ level.

## 3. Results

### 3.1. Child welfare involvement and outcomes of study sample

Data on child welfare involvement of mothers and their children in the study sample are shown in Table 3. Over two fifths (44%) of the mothers had no prior contact with the child welfare system before the current episode, although more than half (52%) had at least one child who had been removed from the home before. Few (2.5%) had a prior open case (without child removal) or a prior adoption (less than 2%). With regard to their children, about one fifth (20.6%) had been in out-of-home placement previous to the current episode. In the current episode, over 40% of the children had been removed for reasons of emotional abuse or neglect, about one third (33%) for caretaker absence or incapacity, 14% for severe neglect, and 11% for exploitation, sexual, and/or physical abuse. Most of the children (58%) were placed into the care of other family members, one fourth went into a group home or FFA, and 17% went into a (nonkin) foster home. About half of the children (49%) had been in out-of-home placement for less than 6 months prior to their mother's admission into CalTOP treatment, whereas the other half (51%) had been in placement for longer than 6 months.

With regard to child welfare outcomes (the basis for the dependent measure in the multivariate models), about one quarter of the children were eventually adopted, 44% were reunified with their mothers, 10% were still in placement at the time the child welfare data were obtained (July 1, 2006), and about one fifth had a variety of other outcomes, each of which accounted for no more than 5% (i.e., kin or other guardianship, child was deceased, or emancipation).

### 3.2. HLM predicting reunification: model including family/children's services

#### 3.2.1. Program-level variables

Table 4 shows the results of the HLM that included variables on the amount of family/children's services provided at the program level. As shown, mothers that were treated in programs that provided a medium level of these services, compared to a low level, were marginally more likely to reunify with their children (OR = 1.63); mothers that were treated in programs that provided a high level of these services were significantly more likely to reunify with their children, compared to those treated in programs with a low level of these services (OR = 1.77). The confidence intervals for these variables indicate that the effect of being treated in a program with a higher level of family/children's services increased the likelihood of reunification with children from approximately 6% greater to nearly three times greater, as compared with a program providing a low level of family/children's services. The variables indicating the total number of services provided

Table 5
HLM on reunification following mother's participation in drug treatment: effects of education/employment services

| Fixed effect | Coefficient | *SE* | *t* ratio | OR | CI |
|---|---|---|---|---|---|
| Child intercept | −1.36 | 0.51 | −2.68 ** | 0.26 | 0.09–0.72 |
| Program variables | | | | | |
| Program modality (ref = outpatient) | | | | | |
| Methadone | −0.71 | 0.46 | −1.56 | 0.49 | 0.20–1.24 |
| Residential | −0.30 | 0.22 | −1.35 | 0.74 | 0.47–1.16 |
| Program services (ref = low) | | | | | |
| Medium | −0.30 | 0.20 | −1.53 | 0.74 | 0.49–1.10 |
| High | −0.37 | 0.19 | −1.96 | 0.69 | 0.47–1.01 |
| Education/employment services (ref = low) | | | | | |
| Medium | 0.54 | 0.22 | 2.53 ** | 1.72 | 1.12–2.67 |
| High | 0.67 | 0.27 | 2.51 ** | 1.96 | 1.14–3.37 |
| Mother variables | | | | | |
| Mother referred to AOD services | 0.42 | 0.19 | 2.16 ** | 1.52 | 1.04–2.22 |
| ASI alcohol | −0.77 | 0.45 | −1.72 * | 0.46 | 0.19–1.11 |
| ASI drug | −0.29 | 0.76 | −0.38 | 0.75 | 0.17–3.33 |
| ASI employment | −1.38 | 0.24 | −5.74 **** | 0.25 | 0.16–0.40 |
| ASI medical | −0.08 | 0.24 | −0.34 | 0.92 | 0.58–1.47 |
| ASI psychiatric | −0.58 | 0.30 | −1.96 * | 0.56 | 0.32–1.00 |
| ASI family/social | 0.05 | 0.33 | 0.17 | 1.06 | 0.55–2.01 |
| ASI legal | 0.78 | 0.36 | 2.16 ** | 2.19 | 1.08–4.44 |
| Completion/90 or more days in CalTOP treatment | 0.67 | 0.18 | 3.62 *** | 1.95 | 1.36–2.80 |
| Mother ethnicity (ref = White) | | | | | |
| African American | 0.47 | 0.41 | 1.13 | 1.60 | 0.71–3.59 |
| Hispanic | −0.19 | 0.19 | −1.01 | 0.83 | 0.57–1.20 |
| Other | 0.03 | 0.50 | 0.06 | 1.03 | 0.39–2.76 |
| Primary drug used (ref = alcohol) | | | | | |
| Cocaine/Crack | −0.35 | 0.32 | −1.08 | 0.71 | 0.38–1.33 |
| Heroin/Other opiates | −0.95 | 0.34 | −2.76 *** | 0.39 | 0.20–0.76 |
| Methamphetamine | −0.32 | 0.22 | −1.44 | 0.72 | 0.47–1.12 |
| Marijuana | −0.33 | 0.31 | −1.06 | 0.72 | 0.40–1.32 |
| CalTOP referral type (ref = AOD provider) | | | | | |
| Criminal justice system | −0.40 | 0.34 | −1.17 | 0.67 | 0.34–1.31 |
| Self or other individual | −0.62 | 0.29 | −2.12 ** | 0.54 | 0.30–0.96 |
| Other organization | −0.29 | 0.32 | −0.90 | 0.75 | 0.40–1.40 |
| Child variables | | | | | |
| Child age at CalTOP start (ref = 0–2) | | | | | |
| 3–5 | 0.60 | 0.15 | 3.91 **** | 1.82 | 1.35–2.46 |
| 6–10 | 1.19 | 0.17 | 7.20 **** | 3.28 | 2.37–4.53 |
| ≥11 | 0.51 | 0.24 | 2.11 ** | 1.67 | 1.04–2.69 |
| Child ethnicity (ref = White) | | | | | |
| Black | 0.18 | 0.37 | 0.50 | 1.20 | 0.58–2.49 |
| Hispanic | 0.09 | 0.18 | 0.52 | 1.10 | 0.77–1.57 |
| Other | 0.37 | 0.63 | 0.58 | 1.44 | 0.42–4.98 |
| Type of placement (ref = kin/other) | | | | | |
| Foster home | 0.29 | 0.13 | 2.28 ** | 1.34 | 1.04–1.73 |
| FFA/Group home | 0.84 | 0.13 | 6.58 **** | 2.31 | 1.80–2.96 |
| No. of placement episodes prior to CalTOP (ref = 0) | | | | | |
| 1 | −0.47 | 0.15 | −3.06 *** | 0.63 | 0.46–0.85 |
| 2 or more | −0.53 | 0.34 | −1.54 | 0.59 | 0.30–1.15 |
| Placement episode began ≤180 days prior to CalTOP start | 0.35 | 0.15 | 2.40 ** | 1.42 | 1.07–1.90 |

(*continued on next page*)

Table 5 (*continued*)

| Fixed effect | Coefficient | *SE* | *t* ratio | OR | CI |
|---|---|---|---|---|---|
| No. of placements in current placement episode (ref = 1) | | | | | |
| 2 | 0.25 | 0.22 | 1.13 | 1.29 | 0.83–2.00 |
| 3 | −0.30 | 0.28 | −1.05 | 0.74 | 0.42–1.30 |
| 4 | −0.78 | 0.31 | −2.55** | 0.46 | 0.25–0.83 |
| ≥5 | −1.02 | 0.32 | −3.16*** | 0.36 | 0.19–0.68 |
| Duration of current placement episode (months) | −0.05 | 0.01 | −5.28**** | 0.95 | 0.93–0.97 |
| Random effect | *SD* | Variance component | *Df* | $X^2$ | *p* |
| Mother intercept | 1.47 | 2.17 | 1,053 | 1,977.69 | .001 |
| Program intercept | 0.04 | 0.002 | 36 | 33.84 | >.500 |

* $p < .10$.
** $p < .05$.
*** $p < .01$.
**** $p < .001$.

within the program (high and medium vs. low) and the type of treatment modality in which the mother was treated were not significantly related to the outcome.

### 3.2.2. Mother-level variables

Several characteristics of mothers related to their level of treatment and service needs were significantly associated with the reunification outcome. Mothers who had higher ASI composite scores on employment and psychiatric severity were less likely to reunify with their children (ORs = 0.25, 0.53, respectively). In contrast, those who had higher scores in the area of legal problems were more likely than others to reunify (OR = 2.12). Further, mothers whose child welfare records indicated a referral to treatment for an alcohol or drug problem (not necessarily to the current CalTOP treatment episode) were about 50% more likely to be reunified with their children than mothers for which there was no indication of a treatment referral (OR = 1.51).

There were no differences in reunification outcomes associated with mother's ethnicity, although mothers who reported that their primary drug was heroin were significantly less likely to be reunified with their children following treatment compared with those who reported alcohol as their primary substance (OR = 0.39).

Two variables that pertained to aspects of the mothers' treatment episode in CalTOP were significantly related to reunification. Mothers who were referred to treatment by an individual (i.e., self, family, or friend) were about half as likely to be reunified with their children, compared with those who were referred to treatment through an alcohol or drug treatment provider (OR = 0.54), although there were no differences for those who were referred through the criminal justice system. With regard to their treatment outcome, mothers who had completed treatment or who spent at least 90 days in treatment were about twice as likely to be reunified with their children compared to those who did not complete or spend 90 days in treatment (OR = 1.95).

### 3.2.3. Child-level variables

Among the children's characteristics, age was significantly associated with reunification, such that the older age categories were all more likely to be reunified as compared with the youngest age category (0–2 years); ORs for those aged 3 to 5 years, 6 to 10 years, and 11 and older were, respectively, 1.82, 3.27, and 1.68.

As with mother's ethnicity, the children's ethnicity was unrelated to their likelihood of reunification. However, several aspects of the child's placement episode were significantly associated with the outcome. Those children who were placed into foster homes or into foster family agencies or group homes were significantly more likely to reunify compared with those who were in kin placements (OR = 2.3 and 6.2, respectively). In contrast, those children who had one prior out-of-home placement relative to the current episode were less likely to be reunified (OR = 0.63), but there was no effect for those who had two or more previous placement episodes. Those who had been in the current placement episode for less than 180 days prior to their mother's admission into the CalTOP treatment episode (compared with longer) were more likely to be reunified (OR = 1.43), and each month that the child was in the current placement reduced their likelihood of reunification by about 5% (OR = 0.95). The more times that children were moved within the current placement episode from one setting to another, the less likely they were to be reunified with their mothers, with those that had four or five or more moves less than half as likely to reunify compared with those who had been in only one setting within the placement episode (OR = 0.46, 0.36, respectively). We note that in previous models tested, a variable was included for reason for removal (i.e., sexual or physical abuse, emotional abuse, caretaker incapacity, exploitation, neglect), which was not significant in any of the models tested and was removed for parsimony.

### 3.3. HLM predicting reunification: model including education/employment services

#### 3.3.1. Program-level variables

Table 5 shows the results of the HLM that included variables on the amount of education/employment services provided by programs. As shown, mothers who were treated in programs that provided a medium or high level of these services were almost twice as likely to reunify with their children, compared with those who were treated in programs that offered a low level of these services (ORs = 1.72, 1.96, respectively). The confidence intervals for these variables indicate that the effect of being treated in a program with a medium or high level of education/employment services increased the likelihood of reunification with children from approximately 12% greater to over three times greater, as compared with a program providing a low level of education/employment services.

#### 3.3.2. Mother-level variables

Among the mother characteristics, the effects for ethnicity, primary type of drug use, source of referral, and completion/90 days in CalTOP treatment were the same as in the previous model. The ASI scores had similar relationships with the outcome, with two exceptions. The alcohol severity score was significantly related to a lower likelihood of reunification (OR = 0.46), and the ASI psychiatric severity score was marginally significant (OR = 0.56, $p < .06$) in this model.

#### 3.3.3. Child-level variables

All of the variables entered for the children's characteristics were virtually identical in this model to the previous one (i.e., with family/children's services entered at the program-level), as would be expected because these were entered as fixed characteristics.

### 3.4. HLM predicting reunification: model including psychiatric/mental health services

An identical HLM model to the previous two was developed, except that variables for medium and high levels of psychiatric/mental health services (vs. low) were included at the program level. These variables were nonsignificant, indicating that there were no statistically significant effects on the dependent variable associated with being treated in programs that provided a greater number of these services. Relationships of variables entered at the mother and child levels with the dependent variable were similar to those in the previous two models.

## 4. Discussion

This study examined the relationship of mothers', children's, and treatment-related factors to child reunification following mothers' participation in drug treatment; importantly, although reunification accounted for the most frequent outcome among the children (44%), over half of the children did not reunify with their mothers (25% were adopted and 10% remained in placement, with the remainder in diverse types of other outcomes).

Several aspects of their mothers' treatment participation were related to reunification outcomes. The rate of treatment retention for at least 90 days (or completion) in this study (about 50%) was higher than that reported in previous studies with child-welfare-involved mothers; yet the relationship of treatment retention/completion to a greater likelihood of reunification is consistent with prior research. This finding reinforces the importance of sufficient time in treatment, particularly given the complex service needs presented by these mothers. Alternatively, this finding may reflect a self-selection effect, in that mothers who comply more with their treatment plan, as seen in their longer retention in treatment, are more likely to reunify with their children because of other attributes that predict retention, rather than reunification resulting from a treatment effect that can be attributable to longer retention or treatment completion. This confound (between participant characteristics that are associated with both the likelihood of retention and child reunification) is an inherent aspect of nonexperimental study designs, and thus, study findings should be qualified by this consideration.

An important finding from the study is that reunification was enhanced among mothers who were treated in programs that provided a broader range of employment/educational services, as well as family/children's services. Outcome studies of drug treatment have increasingly emphasized the provision of services that address the specific needs of participants and particularly the importance of providing a range of comprehensive services (i.e., "wraparound services") in addition to the core elements of drug treatment (Marsh, Cao, & D'Aunno, 2004; Pringle, Emptage, & Hubbard, 2006). In the past 10 to 15 years, specialized programs and services have been developed that aim to improve the parenting ability of substance-abusing mothers and to increase the coordination of treatment services with the child welfare system (Jansson, Svikis, & Beilenson, 2003; Moore & Finkelstein, 2001; Wingfield & Klempner, 2000). Yet access to programs that provide these more enhanced services remains limited. Fewer than half of all substance abuse treatment programs actually provide parenting or family-related services (Grella & Greenwell, 2004; Marsh, D'Aunno, & Smith, 2000), and these services are not uniformly available even in programs that are "specialized" to address the service needs of mothers (Olmstead & Sindelar, 2004; Smith & Marsh, 2002). Furthermore, family services and parenting interventions may not be implemented in ways that address the specific needs of treatment participants who are simultaneously involved with the child welfare system, such as their need for employment services (Kerwin, 2005).

The study findings showed that more severe impairments in functioning, particularly higher levels of employment and psychiatric severity, lessened the likelihood of reunification. In addition to the possible self-selection effect noted above, it may be the case that more disadvantaged mothers are also more likely to come to the attention of child welfare for possible child maltreatment and, from there, to be referred to treatment. Among the study sample, over half had prior contact with child welfare services, including children who had previously been placed into out-of-home care or adopted, suggesting the sustained nature of the problems that brought them to the attention of child welfare. Drug treatment services in the absence of other supportive services may be insufficient to address the economic, parenting, and other needs of these mothers. Child-welfare-involved mothers in treatment are typically younger and have more children than other mothers in treatment but are less likely to have employable skills or prior work history (Grella et al., 2006; Jones, 2004; Shillington, Hohman, & Jones, 2001). Further, because economic instability is often associated with other impairments that make it difficult to attain self-sufficiency (Jayakody, Danziger, & Pollack, 2000), substance-abusing mothers who enter into the child welfare system face multiple barriers to attaining economic self-sufficiency, which may be a key factor in determining parenting capability and child placement outcomes.

Although mothers whose primary substance was heroin or other opioids were a minority among the sample (10.5%), their likelihood of reunification was substantially less (by about 60%) compared with mothers who were primary alcohol users. Our prior research with the CalTOP sample showed that child-welfare-involved mothers who were heroin/opioid users were older (particularly compared with primary users of methamphetamine) and had longer treatment histories (Grella et al., 2006). Other research with mothers who are heroin/opioid users has shown substantial impairments in their functioning, often stemming from their long duration of drug use, residential instability, low levels of education and employment, and limited access to social support (Lundgren, Schilling, Fitzgerald, Davis, & Amodeo, 2003). Most of such mothers do not reside with their children and/or have frequent interruptions in their caregiving relationships (Schilling, Mares, & El-Bassel, 2004) and often display low levels of maternal involvement and bonding with children (Suchman & Luthar, 2000; Suchman et al., 2005). Clearly, heroin-using mothers face substantial obstacles to family reunification and suggest that substance abuse treatment participation itself may not be sufficient to address their broader range of impairments and corresponding service needs.

In contrast, mothers who had more severe legal problems were actually more likely to reunify with their children as compared with others. This finding may stem from external mandates that encourage treatment participation among women who are simultaneously involved with the criminal justice system (although referral from the criminal justice system was not itself associated with reunification). Furthermore, mothers who were self-referred to treatment or referred by another individual (e.g., family or friend) were half as likely to be reunified with their children compared with mothers who were referred by another treatment provider. Thus, for treatment participation to influence reunification outcomes, it appears that the involvement of other service providers, such as through referral, monitoring, or supervision, is critical. This is also evident in the greater likelihood of reunification among mothers who had a history of referral to treatment in their child welfare case records (although we note that one limitation of the data obtained from child welfare records on referral to treatment is that these data do not necessarily correspond with referral to the current [CalTOP] treatment episode).

Several characteristics of children were associated with reunification, as would be expected from prior research; for example, newborns and very young children (less than 3 years) were less likely to be reunified, as were those who were in kin placements. Moreover, the more extensive the child's involvement in the child welfare system, as seen in longer time spent in the current placement episode, more moves within the episode, and more prior placements, the less likely the child was to be reunified with his or her mother. These aspects of children's placement history may reflect more problematic behavior of the children, which also makes them harder to parent, particularly for mothers who have psychological and other impairments, and lessens the likelihood of reunification, independent of the mother's treatment participation.

### *4.1. Study limitations*

The study findings are necessarily limited by some aspects of the study design. In particular, the data used to characterize services available within the treatment programs rely upon the self-report of the program administrator. We do not know whether the availability of these services nor the degree to which the individual participants actually received these services while in treatment was accurately reported. The study provides evidence of an association between program-level characteristics and reunification outcomes but does not explain the mechanisms of the observed association. That is, the program-level variables may be associated with other, unmeasured, characteristics of programs that are associated with child welfare outcomes, such as quality or training of staff, treatment orientation or approach, or the type of relationship between the treatment program and the child welfare agency, such as a greater degree of integration or coordination of services. Such relationships should be tested in future studies.

Further, given the naturalistic study design, findings on the relationships among mother, child, and program characteristics with child welfare outcomes are correlational. The study cannot address whether treatment in programs that provided more educational/employment or family/children's

services actually resulted in improved employment outcomes or parenting capabilities of the participants. As noted previously, there may be selection effects, in which mothers who are more likely to reunify with their children, for a variety of reasons, are also more likely to be referred to particular treatment programs and that mothers who are more likely to comply with treatment may also be more likely to reunify with their children, regardless of the treatment received. Experimental designs in which mothers are randomly assigned to different types of treatment programs or service configurations within programs would provide stronger evidence of causality. In addition, generalizability of study findings is limited by the specific characteristics of participants in the CalTOP evaluation study, as well as by the child welfare policies and practices within the California counties participating in the study. For example, close to half of the sample reported primary methamphetamine use, which is more typical of California treatment admissions than treatment participants in other states (Finnerty, 2004).

Yet this study has several advantages over previous studies of the relationship of substance abuse treatment to child welfare outcomes. Foremost is the use of administrative data, rather than self-report, to characterize the relevant aspects of mothers' and children's involvement with child welfare services. Further, the relatively large sample size of both mothers and children and the multisite nature of the CalTOP study provided considerable variability in characteristics at all three levels examined (mothers, children, and treatment programs), which enabled us to apply an analytic approach that capitalized on the multilevel nature of these data in relation to the outcome.

## 5. Conclusion

The findings from this study suggest that individual characteristics of either mothers or children do not account for all of the factors that may influence child welfare outcomes, but rather, characteristics associated with the type and intensity of services provided by programs may wield influence on their eventual likelihood of reunification. These findings have implications for policies directed at increasing the participation in treatment among substance-abusing parents who come into contact with the child welfare system, with the goal of improving the child welfare outcomes of these parents and their children. However, the imperative to place children into permanent placements as quickly as possible, as enacted in the federal Adoption and Safe Families Act (ASFA), has changed the context in which placement decisions are made and may limit the influence of mothers' treatment participation on placement outcomes (Green, Rockhill, & Furrer, 2006). One recent study of children of substance-abusing mothers in the child welfare system showed that following the implementation of ASFA, children spent less time in foster care, were placed into permanent settings more quickly, and were more likely to be adopted than to remain in long-term foster care (Rockhill, Green, & Furrer, 2007). Hence, maximizing the effectiveness of treatment for child-welfare-involved mothers, such as through the provision of enhanced family- and employment-related services, is even more critical given that decisions on placement outcomes may be determined by external mandates that limit the time required to observe the beneficial effects of treatment participation.

Although most children in this study who were placed into out-of-home care did not reunify with their mothers (over the study observation period), there were several characteristics of mothers, their children, and the treatment received by mothers that were related to the likelihood of their reunification that provided further evidence of the multiple service and treatment needs among substance-abusing mothers whose children are in out-of-home care. The study's findings provide evidence of the link between the type and intensity of treatment services provided within programs and the reunification outcomes of treatment participants. These findings support the importance of addressing a broad range of treatment needs of child-welfare-involved mothers, particularly their need to obtain skills to achieve economic stability and to improve their parenting ability, which are requisites to successful reunification with their children. Mothers' participation in substance abuse treatment may afford them a critical opportunity to address these needs, which may ultimately yield beneficial outcomes for themselves and their children.

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