Substance use treatment completion does not mediate the relationship between family treatment court participation and reunification: Results from five courts in the Southwestern U.S.

Margaret Lloyd Sieger [a,*], Jessica Becker [b], Jon D. Phillips [b], Cindy Nichols [b], Elizabeth J. Goldsborough [b], John Prindle [c]

[a] *University of Kansas School of Medicine, USA*
[b] *University of Connecticut School of Social Work, USA*
[c] *University of California Suzanne Dworak-Peck School of Social Work, USA*

ARTICLE INFO

ABSTRACT

Background: Family treatment courts (FTC) apply judicial theory and behavioral economics to increase parent substance use treatment completion and family reunification for families in foster care due to parental substance use disorder. Dozens of quasi-experiments and case studies suggest FTC programs outperform traditional child welfare courts. However, methodological limitations in earlier research limit causal inference.
Study purpose: The current study aimed to examine the relationship between FTC participation and family reunification, and to investigate whether substance use treatment completion mediates this relationship.
Methods: Foster care, substance use treatment, and FTC administrative records from 2018 to 2022 were probabilistically linked across six counties in a Southwestern U.S. state. The final sample included 200 FTC-involved and 1367 comparison child/caregiver dyads. To address selection bias, we applied inverse probability weighting based on propensity scores. The weights balanced the treatment and control groups based on fifteen covariates, including demographic characteristics, child welfare system involvement, and novel substance use treatment metrics such as caregivers' Addiction Severity Index scores, level of care recommendation, and primary substance of choice.
Results: Applying the weight, our logistic regression model revealed that FTC-involved dyads' odds of reunification were 66 % greater compared to dyads served in traditional settings (OR = 1.66, 95 % CI: 1.14–2.40). The mediation model revealed that the effect of FTC participation on reunification was independent of treatment completion.
Conclusions: FTC demonstrates its own treatment effect on family reunification, above and beyond substance use treatment experiences. These findings point to a "value added" for FTC participation. In an area of practice characterized by low rates of success, identifying effective, real-world interventions for families is significant.

1. Introduction

Parental substance use disorder (SUD) persistently contributes to child maltreatment and, as a result, child welfare system (CWS) involvement. While 2–10 % of children in the U.S. population live at home with a parent with an alcohol or drug use disorder, 15–25 % of screened-in referrals to child protective services (CPS) involve parental alcohol or drug "abuse" (Children's Bureau, 2024), and 6–33 % of foster care entries cite parental "alcohol or drug abuse" as a primary reason for removal (Children's Bureau, 2023). A recent linked data analysis found that the mothers of 75 % of children in foster care in Pennsylvania had a lifetime SUD diagnosis (Goldstein and Font, 2025). Rates of SUD increase at deeper levels of system involvement, with the highest rates found among families with children in foster care, followed by those receiving in-home services, and then all families reported to child welfare (Goldstein and Font, 2025; Seay, 2015). Among CWS-involved families affected by SUD, young children face increased risk. The proportion of newborns under 30 days old entering foster care due to

---

"parental drug abuse" (versus other reasons) climbed from 47 % in 2011–59 % in 2018 (calculated by the authors using AFCARS; Children's Bureau, 2012; 2018). This is troubling, as families with substance-related removals are at decreased odds of reunification and increased likelihood of termination of parental rights compared to families without parental SUD, particularly families with children under age 3 (Lloyd et al., 2017).

Parents succeeding in SUD treatment is a strong predictor of reunification for this population (Doab et al., 2015; Karoll and Poertner, 2001, 2003). Research conducted by Green et al. (2007) found that treatment completion was associated with a nine-fold increase in likelihood of reunification. Grella et al. (2009) found that mothers who completed treatment or spent at least 90 days in treatment were twice as likely to reunify compared to mothers who did not achieve these outcomes. Further, Choi et al. (2012) found that treatment progress doubled the likelihood of reunification and a higher ratio between services completed and services offered was associated with a nine-fold increase in likelihood of reunification. Most recently, Kyzer et al. (2014) tracked mothers in substance use treatment and found that mothers who graduated the program were 2.5 times more likely to have their children living with them at exit compared to non-graduates. Outside of completion as an endpoint, Huang and Ryan (2011) found that a 16-fold increase in reunification was found if the caseworker was rating the client as making adequate progress in substance use treatment. Each of these studies suggest that treatment completion not only increases reunification, but that a temporal order is important whereby treatment completion occurs prior to reunification.

Unfortunately, entering treatment, let alone completing treatment, is difficult in the CWS context. Findings from the Regional Partnership Grants (RPG), cross-system collaborative funding streams designed to improve substance use and family functioning outcomes for child welfare-involved families with parental SUD, noted that before RPG intervention, 29 % of adults enrolled in treatment and, of those, 18 % completed treatment. After RPG intervention, 36 % of adults enrolled in treatment and, of those, 28 % completed treatment (Strong et al., 2020). This amounts to a total of 5 % of adults completing treatment before RPG and 9 % completing treatment after RPG (p < .05). Although these rates significantly improved after the RPG intervention, they remain troublingly low.

Family treatment courts (FTCs) are specialty child welfare courts that, like criminal drug courts, apply theoretical principles and behavioral economics to increase parent substance use treatment completion and, in turn, family reunification (Lloyd, 2015). FTCs differ from criminal drug courts in several important respects: juvenile dependency cases are civil rather than criminal; the court must balance the needs of parents, children, and family members; and cases are bound by statutory timeframes to reduce the risk of children lingering in foster care. FTCs also depart significantly from traditional child welfare courts by using an interprofessional team to guide each case through a structured series of phases or milestones, typically aligned with time since removal, treatment intensity, and the level of child welfare involvement. Mechanisms of FTC effectiveness include that participants attend court frequently, interact with the judge, and engage in evidence-based drug testing, substance use treatment, adjacent therapies, and case management (Center for Children and Family Futures & National Association of Drug Court Professionals , 2019). If typical child welfare courts function in a manner that could be described as adversarial, detached, neutral, and based in precedent, FTCs are collaborative, responsive, supportive, and innovative (Center for Children and Family Futures, and National Association of Drug Court Professionals, 2019). Dozens of case studies published over a period of thirty years suggest FTC programs outperform traditional child welfare settings on these indicators. A meta-analysis in 2019 found that FTC participation was associated with a 75 % increase in reunification compared to services as usual (Zhang et al., 2019).

Despite these promising findings, methodological limitations in earlier research limit causal inference. Nearly every FTC program

currently and historically is voluntary, meaning that the treatment group opts in to the treatment. Reviewed in greater detail below, even the most rigorous FTC papers in print used quasi-experimental methods that account for treatment group differences in children involved in the FTC, but rarely adults. Given that FTC participation depends on the adult, including their needs and previous experiences, this lack of accounting for treatment group differences in adult characteristics obscures explanatory mechanisms. Moreover, prior studies have inadequately addressed the conceptual and empirical role of treatment completion in explaining FTC effects. Existing literature points to temporal order, such that treatment completion occurs on a trajectory towards reunification. However, no prior research has examined the mediating effect of treatment completion in explaining the connection between FTC participation and reunification. The current study aimed to overcome this limitation using linked child welfare and substance use treatment datasets combined with a novel propensity score weighting method to estimate FTC program effects on likelihood of reunification and whether that relationship, if observed, was fully or partially explained by treatment completion.

1.1. Existing FTC studies

We searched the literature for previous studies that employed quasi-experimental designs to assess child reunification and/or substance use treatment completion for FTC-involved families compared to a control group. We identified 15 studies that met these criteria (Table 1). Table 1 outlines each study, the methodologies used, propensity score variables used, and indicated findings.

Six studies created comparison groups consisting of families who did not receive FTC services but who (1) had CWS involvement due to parental substance use, and (2) lived in a similar geographic area. Nine studies used various propensity score matching procedures to create comparison groups (Bruns et al., 2012; Chuang et al., 2012; Gifford et al., 2014; Lloyd Sieger et al., 2021; Mersky et al., 2023; Pollock and Green, 2015; Sieger et al., 2023; Van Wormer and Hsieh, 2016; Worcel et al., 2008), three of which included caregiver substance use severity variables. Worcel et al. (2008) matched on caregiver's frequency of drug use, Bruns et al. (2012) matched on parent's substance use treatment history and drug of choice, and Van Wormer and Hsieh (2016) matched on caregiver treatment type. FTC participants were significantly more likely to complete treatment (Bruns et al., 2012; Van Wormer and Hsieh, 2016; Worcel et al., 2008) and reunify more quickly (Bruns et al., 2012; Chuang et al., 2012; Gifford et al., 2014; Lloyd Sieger et al., 2021; Mersky et al., 2023; Sieger et al., 2023; Van Wormer and Hsieh, 2016; Worcel et al., 2008) compared to matched comparison cases.

In a meta-analysis published in 2019, studies that used propensity score matching to create comparison groups produced the largest pooled effect size (*OR* = 1.98), whereas studies that used a contemporary comparison group (consisting of individuals from the same timeframe when the FTC was in operation) produced the smallest (*OR = 1.51*) (Zhang et al., 2019). This is likely because the comparison groups in studies using propensity score matching are more comparable to the FTC groups, as the matching process accounts for both subject and case characteristics. As a result, this approach yields a more credible estimate of FTC effects by constructing a comparison group that closely resembles the FTC group in key ways (Bruns et al., 2012; Chuang et al., 2012; Gifford et al., 2014).

There were multiple limitations in these previous studies, including small sample sizes, inability to rule out other explanations due to research design, unmeasured factors in comparison groups that affected the differences in outcomes, as well as selection bias. Studies that created control groups of participants from similar counties did not address the issue of selection bias. Furthermore, studies that employed propensity scoring approaches that relied on very few variables (Van Wormer and Hsieh, 2016) or variables related to only child characteristics (Gifford et al., 2014) did not address selection bias, as approximate

Table 1
Quasi-Experimental Studies Assessing Child Reunification and Treatment Completion Outcomes.

Citation	Location	Sample	Variables in Propensity Score Model	Findings
(Brook & McDonald, 2007)	Not specified	• TG: Children who participated in the FTC program (n = 60) from January 2000 to October 2004 • CG: Children of the same county whose parents did not participate in the FTC and were placed in foster cared for reasons related to parental alcohol or drug use in the same time period (n = 79)	N/A	Reunification: • FTC participants move more slowly to reunification; however, these results were not statistically significant • At 200 days, 32 % of the CG and 22 % of the TG group had reunified. At 400 days, 40 % of the CG and 30 % of the TG had reunified
(Boles et al., 2007)	Sacramento, CA	• TG: families (n = 573 parents and 861 children) ordered by court to receive treatment services from 2001 to 2005 • CG: similar families (n = 111 parents and 173 children) who received standard services 6 months prior to the intervention • 24 month follow-up	N/A	Reunification: • 42 % of the TG children had reunified vs. 27.2 % of the CG children at 24 months follow-up • Parents with heroin use had the lowest rates of reunification and parents with cannabis use had the highest rates Treatment Completion: • TG had higher satisfactory treatment discharges (65.1 %) compared to the CG (56.8 %)
Green et al., (2007)	Four sites	• TG: Children (originally 523 but reduced to 484 after excluding those never in foster care) across 250 parents enrolled in FTCs across four sites • CG: Children (originally n = 444 but reduced to 201 parents) with similar characteristics drawn from child welfare records (substance misuse as presenting concern for CPS) prior to FTC implementation • Entered between 1997 and 2001	N/A	Treatment Completion: • TG completed more substance use treatments (45 %) vs. the CG (34 %) • Reunification: • TG was more likely to be reunified with at least one of their children (57 %) vs. the CG (44 %)
Worcel et al., (2008)	Three sites	• TG: 301 cases in FTC treatment in three study sites over the four-year sampling period • CG: 736 untreated, eligible FTC cases at the same three FTC study sites over the same sampling period and 183 matched cases from the same time period from the two comparison counties (n = 919)	1) caregiver race 2) caregiver marital status 3) caregiver educational level 4) caregiver employment status 5) caregiver age 6) previous CPS involvement 7) parental risk factors 8) caregiver age of first drug use 9) previous termination of rights 10) type of child abuse allegation 11) number of children involved in the child welfare case 12) children's risk factors 13) whether an infant was involved in the case 14) caregiver's frequency of drug use	Treatment Completion: • TG were significantly more likely to spend more days in treatment (383.92 vs. 241.62) and have at least one completed treatment (64.8 % vs. 32.5 %) Reunification: • TG children had significantly increased likelihood of reunification (69.2 % vs. 38.7 %)
(Ashford, 2009)	Pima, Arizona	• TG: Parents in two zip codes enrolled in the FTC group (n = 33) from September 2001 to August 2003 • CG: Parents from similar zip code areas in the state who received treatment as usual (n = 45) and treatment refusal (n = 42) • Child outcomes assessed at 24 months from program entry	N/A	Treatment Completion: • 48 % of FTC group completed treatment compared to 26 % of treatment refusal group and 31 % of treatment-as-usual group Reunification: • 52 % of FTC had a child returned to one of the parents, compared to 39 % of treatment refusal and 30 % of the treatment as usual groups; however, this was not statistically significant
(Burrus et al., 2011)	Baltimore, MD	• TG: Families ordered by court to receive treatment services (n = 200) • CG: Families entering CPS 6 months prior to the intervention who received standard services between 2004 and 2005 (n = 200) • Followed for a 12-month period	N/A	Treatment Completion: • 64 % of TG completed treatment, a significantly larger percentage than the 36 % of non-program parents who completed treatment Reunification: • TG had significantly more reunifications (70 %) compared to the CG (45 %)
(Bruns et al., 2012)	A large Western city	• TG: 76 caregivers and 65 children of FTC participants • CG: Matched 76 caregivers and 76 children from a pool of eligible or similar participants	1) caregiver age 2) caregiver race 3) child age 4) number of prior CPS investigations 5) number of prior caregiver substance use treatment episodes 6) caregiver's primary drug of choice 7) whether the parent was in substance use treatment at index petition	Treatment Completion: • FTC parents had significantly more likely to be in treatment longer (108 vs. 44 days) and were more likely to successfully complete treatment (72 % vs. 54 %) Reunification: • TG children were significantly more likely to return home (55 % vs. 29 %)
Chuang et al., (2012)	Hillsborough, FL	• TG: Data on 95 caregivers that were enrolled in Hillsborough County FTC between 2007 and 2009 CG: Matched caregivers from a neighboring county without an FTC program (n = 424)	1) caregiver criminal history 2) caregiver age 3) caregiver sex 4) caregiver race/ethnicity: African American caregiver 5) caregiver race/ethnicity: Hispanic	Reunification: • 53 % of children in the TG group were reunified vs. 42 % of children in the CG

Table 1 (*continued*)

Citation	Location	Sample	Variables in Propensity Score Model	Findings
Pollock and Green, (2015)	Robeson, NC	• TG: Children whose caregivers enrolled in FTCs (n = 208) • CG: Matched children involved with child welfare in 10 other North Carolina counties (n = 169)	1) parental age 2) parental race/ethnicity 3) number of children in the home 4) type of maltreatment 5) risk assessment score 6) child age	Reunification: • Differences in time spent out of home until physical reunification was not statistically significant between the two groups • FTC children had fewer days to reunification, but this was not statistically significant Treatment Completion: • TG had a significantly higher treatment completion rate than the CG (75 % vs. 52 %) • TG had almost three times greater odds of completing treatment than the comparison group (OR = 2.8)
(Van Wormer and Hsieh, 2016)	Snohomish, WA	• TG: Treatment group consisted of open dependency cases in a rural Midwestern town participating in FTC program (n = 77) from 2009 to 2011 • CG: Matched caregivers (n = 77) participating in traditional court proceedings within the same county and time period	1) caregiver gender 2) caregiver race 3) caregiver treatment type (inpatient, outpatient, mental health) variable	Reunification: • A larger percentage of TG had their child returned (69 % vs. 62 %), and the percentage of TG that had their parental rights terminated was considerably lower than the comparison group (9 % vs. 30 %)
Gifford et al., (2014)	11 FTDC courts in North Carolina	• TG: Children of parents who were enrolled in 11 FTCs including those who completed (n = 215) and did not complete the program (n = 194) • CG: Matched children whose parents were referred to FTC program but did not enroll (n = 157) • Two-year follow-up period	1) child's race/ethnicity 2) Age at index maltreatment report 3) low or very low birth weight 4) prenatal care initiated after first trimester 5) No father listed on birth record 6) maternal education at child's birth is HS diploma 7) FTC parent is female 8) child's emotional or behavioral disability 9) child's other disability 10) parent < 25 at index maltreatment 9) Two parents home at time of removal 11) reason for removal 12) CPS year of report 13) substantiated maltreatment report	Reunification: • Children whose parents completed a FTC program were more likely to exit foster care by reunification compared to children whose parents were either referred but did not enroll or who enrolled but did not complete • Reunification rate was highest for those in the FTC completion sample (73 %), compared to the referred group (33 %) and those enrolled (24 %)
Harwin et al., 2018	London, UK	• TG: Cases enrolled in Family Drug and Alcohol Court (FDAC) between January 2008 and August 2012 (n = 140 mothers and 201 children) • CG: Three comparison local authority groups from London courts taking place in ordinary case proceedings without FTCs where parental substance misuse was a main factor for CPS report (n = 100 mothers and 149 children) during the same period • Followed for up to 5 years	N/A	Reunification: • Higher proportion of TG cases were reunified (37 %) and continued to live together at the end of the court proceedings versus the CG (25 %)
Lloyd Sieger et al., (2021)	Midwestern town	• TG: Consisted of open dependency cases in a rural Midwestern town (n = 91) • CG: Used propensity score matching on 11 variables to create comparison group (n = 146 children)	1) observation window 2) Census population density of a child's removal setting 3) child's age at foster care episode removal date 4) whether or not the removal was due to parent "drug abuse" 5) whether or not the removal was due to alleged or reported neglect 6) whether or not the removal was due to inadequate housing 7) whether or not the removal was due to alleged or reported sexual abuse 8) whether or not the removal was due to alleged or reported physical abuse 9) number of previous foster care episodes 10) dummy-coded child race variable for American Indian 11) dummy-coded child ethnicity variable for Hispanic	Reunification: • FTC children were 170 % more likely to reunify compared to the CG
Sieger et al., (2023)	Midwestern town	• TG: Any parent who had an open dependency case, under the jurisdiction of a court in the county with the FTC, involved substance use by the parent or guardian was offered participation in the FTC. All FTC children who experienced at least one foster care placement during the project period (n = 91) • CG: Used propensity score matching on 11 variables to create comparison group (n = 679)	1) observation window; (2) Census population density of a child's removal setting; (3) child's age at foster care episode removal date; (4) whether or not the removal was due to parent "drug abuse"; (5) whether or not the removal was due to alleged or reported neglect; (6) whether or not the removal was due to inadequate housing; (7) whether or not the removal was due to alleged or reported sexual abuse; (8) whether or not the removal was due to alleged or reported physical abuse; (9) number of previous foster care episodes; (10) dummy-coded child race variable for American Indian;	Reunification: • TG children spent on average, 361 fewer days in care compared to the CG

Table 1 (*continued*)

Citation	Location	Sample	Variables in Propensity Score Model	Findings
Mersky et al., (2023)	Midwest metropolitan area	• TG: Parents referred to an FTC in a Midwest metropolitan area (n = 266) • CG: Created with parents that did not participate in an FTC through propensity score matching (n = 266)	and (11) dummy-coded child ethnicity variable for Hispanic 1) parent age 2) parent gender 3) race/ethnicity categories 4) primary substance use type categories 5) marital/cohabitation status 6) number of children 7) child age 8) number of CPS reports per household	Reunification: • Participants of FTCs were 81 % more likely to reunify compared to non-participants

Notes. TG = treatment group. CG = control group.

differences between groups did not directly address characteristics of caregivers receiving treatment. While Worcel et al. (2008), Bruns et al. (2012), and Van Wormer and Hsieh (2016) matched on a few caregiver treatment characteristics, none controlled for level of addiction severity and substance type. Finally, no prior studies measured the mediating effect of substance use treatment completion.

1.2. Study aims

Given the limited number of previous quasi-experimental studies that address caregiver and case characteristics associated with selection into the treatment, and lack of research on the mediating effect of SUD treatment, the aims of the current study are:

(1) Apply a novel data linkage procedure for conducting quasi-experimental research on FTCs;
(2) Apply inverse probability weights to overcome selection bias;
(3) Measure the effect of FTC participation on substance use treatment completion and family reunification; and
(4) Probe for a mediation effect of substance use treatment completion on the relationship between FTC participation and family reunification.

2. Methods

2.1. Data Sources and Study Population

Data for this study come from six counties in a Southwestern state with operational FTCs from 2018 to 2022. Because two counties share an FTC, the study includes five FTCs in total. Three datasets were linked (procedures described below) to generate a sample of dyadic records that include information on child demographic and case characteristics, caregiver demographic and substance use treatment characteristics, and FTC participation status.

2.1.1. Child Welfare Records

Child welfare records are limited in the scope of information available on children's caregivers. The exception to this is if the caregiver is identified as a perpetrator in the child maltreatment allegation(s). Because families become FTC-involved as a result of the caregiver's substance use and maltreatment, we chose to link child welfare records to substance use treatment records based on the perpetrators' information. Our child welfare data extract included 7711 unique adult perpetrators, with removal dates as early as April 30, 2015, and return dates through May 25, 2023. Fig. 1 illustrates the datasets and corresponding sample sizes.

2.1.2. Substance Use Treatment and FTC Participation Records

The state's substance use and mental health agency provided data extracts on all substance use treatment admissions, as well as a list of all adults involved in FTC during the study timeframe across the six counties. Although the agency oversees both substance use and mental health services, only data on substance use treatment were used in this study. The treatment admission data set included 19,309 adults who

were admitted on or after July 7, 2016 and discharged on or before March 28, 2024.

The FTC extract, which includes admission dates beginning December 11, 2013, and discharge dates through April 10, 2023, included 393 adults. FTC records were deterministically merged with treatment records using a shared unique identifier (ID), resulting in the successful linkage of substance use treatment records for 377 FTC adults.

2.2. Data linkage and sample selection

2.2.1. Probabilistic and deterministic linking procedures

Child welfare perpetrator records and substance use treatment records were linked using probabilistic matching procedures (see Fig. 1). The goal of this linkage was to identify corresponding substance use treatment records for adults identified as perpetrators in the child welfare records, thus enabling integration of caregivers' substance use treatment variables in the outcome modeling. Linkage was conducted using Probabilistic Record Linkage for Families (PRLF), an application built on the Python RecordLinkage package that incorporates several machine learning algorithms of probability scoring (Prindle et al., 2024). Scoring accounts for dimensions of similarity and dissimilarity using first name, last name, birthdate, and sex. A match was retained if the probability score exceeded 0.70 using an XGBoost classifier model. In instances in which more than one potential match exceeded this threshold (n = 16), the record with the higher probability score was retained. This process yielded 831 linked adults, representing 10.8 % of perpetrators, 4.4 % of adult treatment records, and 95.9 % of FTC admission records.

These 831 records were then deterministically merged using a perpetrator ID variable to 9007 child foster care records. Each foster care record represents a unique perpetrator-child-referral combination, where the referral corresponds to a maltreatment report and subsequent foster care placement. Because a single perpetrator may be associated with multiple children, this merge yielded 2022 perpetrator-child dyads.

2.2.2. Treatment episode selection criteria

For perpetrators with multiple treatment episodes (up to three per perpetrator), we implemented a systematic approach to select the single episode most likely connected to the child welfare case, based on temporal alignment with the child's removal. Preference was given to treatment episodes that overlapped with the foster care placement period, as these likely reflect treatment initiated in response to the child welfare case. Overlap was defined as treatment episodes with admission dates before the child's return date and/or discharge dates after the child's removal date. When multiple episodes overlapped or none did, we selected the episode with the admission date closest to the removal date.

If no overlapping episodes existed in the data, we retained non-overlapping treatment episodes occurring within 90 days of removal, selecting the episode with the admission date closest to the removal date. These episodes are plausibly related to the child welfare case because treatment may begin shortly before removal as families try to address concerns leading to placement, or shortly after removal due to delays in treatment access, assessment, or caregiver readiness.
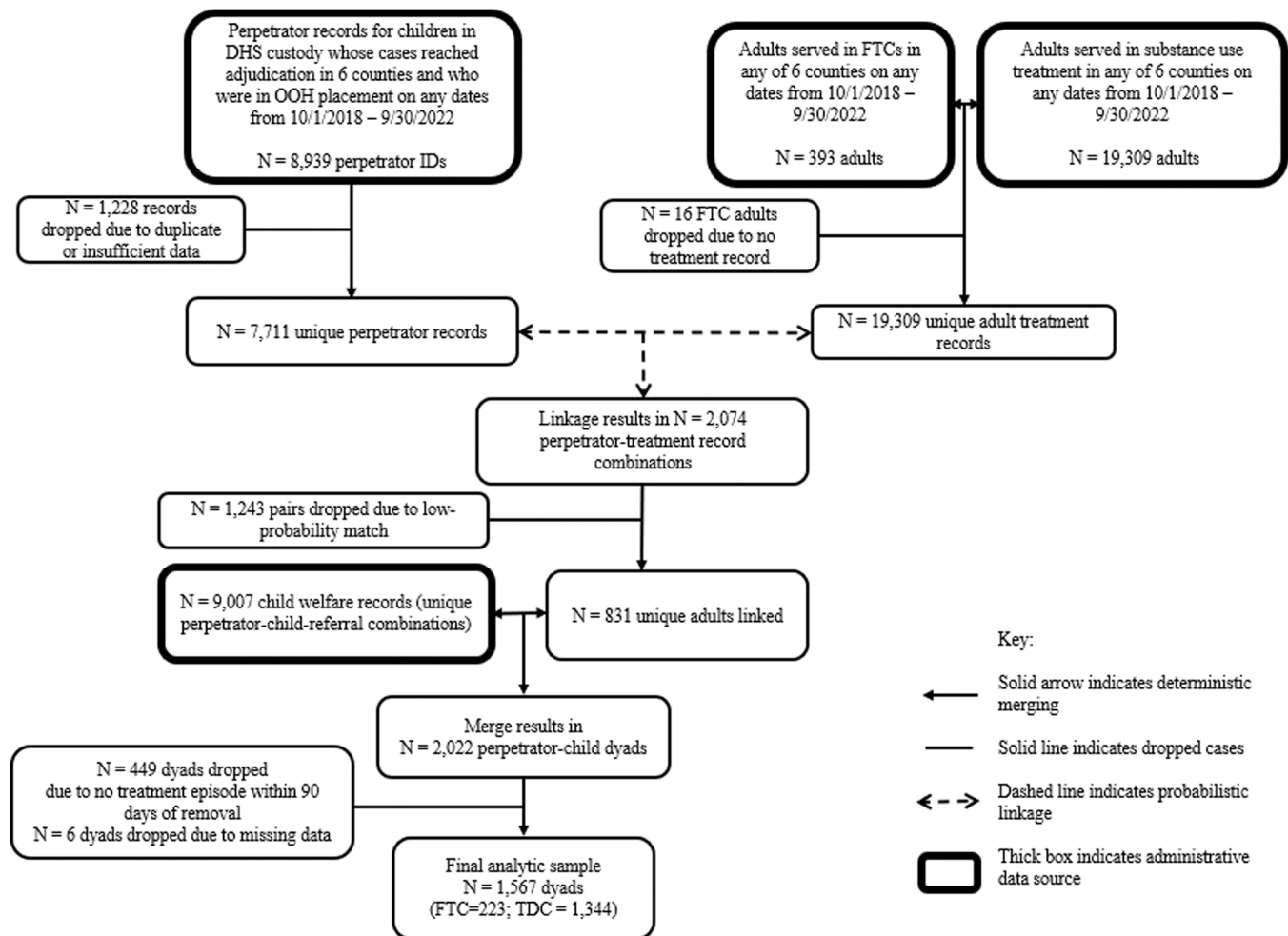
Fig. 1. Schema Linking Child Welfare, Family Treatment Court, and Substance Use Treatment Records for 6 Counties in a Southwestern State, 2018–2022.

Treatment episodes that did not overlap and had admission dates more than 90 days before or after removal were flagged as unrelated to the child welfare case and their treatment variables were cleared. These dyads were considered to have missing treatment data for analysis, as the available episodes were less likely to reflect the relevant treatment context.

2.2.3. Exclusions and final analytic sample

We excluded 449 dyads for whom no treatment data were retained based on the selection criteria described above. An additional six dyads were excluded due to missing data: two lacked perpetrator race data and four lacked ASI scores, as these individuals were under the age of 18 and had instead been assessed using the Teen ASI. In total, 455 dyads (22.5 % of the merged sample) were excluded. The final analytic sample included 1567 dyads, comprising 223 in the FTC group (189 unique children and 113 unique caregivers) and 1344 in the traditional child welfare group (1156 unique children and 703 unique caregivers). Each observation (i.e., dyad) represents a unique perpetrator-child-referral combination.

Some children and perpetrators appear in multiple dyads, which were retained because each reflects a distinct treatment episode (with its own treatment completion status) and a separate foster care episode (with its own reunification outcome). Four records reflected two perpetrator-child duplicates. The duplicate dyads were retained because each was associated with a different referral number, indicating separate cases that occurred at different timepoints and may have differed in context, treatment needs, and the ages of caregiver and child.

2.3. Variables

2.3.1. Dependent variable

Reunification was derived from the placement exit reason variable from administrative foster care records. Originally recorded in eight categories, this variable was recoded into a binary indicator, where cases were coded as "1" if the exit reason was "Reunification" or "Reunified with Custodial Parent" and "0" for all other reasons: "Adoption," "Child Aged Out/Emancipation," "Custody to Relative," "Guardianship – Non-Relative," "Guardianship – Relative," and "Tribal Jurisdiction."

2.3.2. Mediator variable

Substance use treatment completion was derived from the treatment discharge type variable from administrative treatment admission records. Originally recoded in 12 categories, this variable was recoded into a binary indicator, where cases were coded as "1" for participants discharged as "Completed Court Treatment" or "Completed Treatment" and "0" for all other discharge types: "Administrative Discharge," "Broke Rules," "Death," "Did Not Begin Treatment," "Incarcerated," "Left Against Counselor Advice," "Medical," "Moved," "Transferred to another Treatment Facility," and "Treatment Incompatibility."

2.3.3. Independent variable

FTC participation was coded as "1" for participants enrolled in an FTC during the study period and "0" for participants enrolled in a traditional child welfare court.

2.3.4. Control variables

As recommended by Brookhart et al. (2006), variables that prior studies have found to be associated with the outcome of interest (reunification) were used to determine the propensity scores and inverse probability weights. Overall, the inverse probability weighting (IPW) model included seventeen covariates associated with reunification including caregiver and child demographics, child welfare case characteristics, and caregiver substance use treatment characteristics. Demographic covariates included continuous variables for child age and caregiver age, a three-category variable for caregiver race, and a binary indicator for caregiver sex. Child welfare covariates included a four-category variable for total number of allegations in the maltreatment report, a three-category variable for number of placements during the removal, and a binary indicator for kinship placement. Caregiver substance use treatment covariates consisted of a three-category variable for level of care recommendation; binary indicators for alcohol, cannabis, an opioid, and a stimulant as primary substances of choice; continuous Addiction Severity Index (ASI) scores across drug, employment, family, and psychiatric domains; and a four-category variable for number of lifetime treatment admissions. The decision to categorize certain continuous variables, such as number of allegations and placements, was made to limit the influence of outliers.

2.3.5. Inverse probability weighting (IPW)

To overcome the lack of randomization into the treatment condition (and subsequent differences between FTC and non-FTC dyads), inverse probability weights were applied to two modeling approaches: one estimating unstandardized coefficients and another calculating odds ratios to aid interpretability. These weights were derived in Stata, where propensity scores were calculated using logistic regression to estimate the probability of FTC participation based on demographic, child welfare, and treatment-related covariates. Inverse probability weights assigned greater weight to individuals who were less likely to be in their respective groups, thereby balancing covariate distributions between the FTC and non-FTC groups and reducing bias in the estimation of FTC participation effects. Two key metrics were used to assess covariate balance: the standardized difference in weighted means (standardized mean differences; SMDs) and the variance ratios of weighted variance (VRs). According to Rubin (2001), covariates are considered balanced when the absolute values of SMDs are below 0.25 and VRs fall between 0.5 and 2. Nguyen et al. (2017) recommended a more conservative threshold for SMDs, suggesting that covariates with absolute SMDs greater than 0.10 should be adjusted to address residual imbalance.

2.4. Institutional Review Board (IRB) Approval

This study was approved by the University of Connecticut (UConn) IRB, which served as the IRB of record under reliance agreements for collaborating institutions. A data use agreement among UConn, the state child welfare agency, and the state behavioral health agency was executed to ensure the privacy and confidentiality of the administrative records used in this research. Additionally, the study was reviewed and approved by the human subjects protection officer at the National Institute of Justice, the funding agency.

2.5. Analysis

Demographic, child welfare, and treatment characteristics of FTC and non-FTC caregivers and children were compared to assess differences between groups before and after applying inverse probability weights. Before weighting, chi-squared tests assessed differences in categorical variables, and one-way analysis of variance (ANOVA) was used to compare group means for continuous variables.

After weighting, survey-weighted analyses were conducted. Categorical variables were assessed using weighted proportions and chi-squared tests. Continuous variables were analyzed using weighted means and survey-weighted regression, as one-way ANOVA cannot be applied with survey weights.

To examine the relationship among FTC participation, treatment completion, and reunification, two models were estimated in Mplus that accounted for the inverse probability weights. The first model was a weighted logistic regression that assessed whether FTC participation predicted reunification. The second model was a weighted logistic mediation model that tested whether treatment completion mediated the relationship between FTC participation and reunification. To address imbalances remaining after applying the weights, both models included covariates with SMDs greater than 0.10, consistent with Nguyen et al.'s (2017) recommendation. The mediation model was tested with counterfactually-defined causal effects as recommended by Muthen and Muthen (2017). The maximum likelihood estimator was used and confidence intervals for the indirect effect of FTC participation on reunification were calculated using 10,000 bootstrap replications.

Post-hoc analyses indicated the models met most of the assumptions of logistic regression (i.e., absence of multicollinearity and outliers, linearity of the logit, and independence of errors; Stoltzfus, 2011). Post-hoc analyses did not reveal any evidence of multicollinearity or outliers among the predictor variables. Linearity of the logit was not tested as there were no continuous predictor variables. Because perpetrators could be associated with more than one child (i.e., in the case of siblings), we conducted a sensitivity analysis with one randomly selected observation from each perpetrator (n = 816). We omit these results below, but findings were substantively unchanged, suggesting that any intra-class correlation did not materially affect our conclusions.

3. Results

3.1. Unweighted descriptive characteristics

Table 2 compares demographic, child welfare, treatment characteristics, and key study variables for FTC and non-FTC caregivers and children prior to applying inverse probability weights. Results demonstrate several significant differences between the unweighted groups. FTC participants were younger, with caregivers averaging 30.1 years compared to 32.7 years ($p < 0.001$), and their children averaging 3.2 years compared to 4.2 years ($p < 0.001$). FTC participants were more likely to be White (70.9 % vs. 59.2 %) and less likely to be Black or Native[1] ($p = 0.004$), and were also more likely to be female (75.8 % vs. 69.1 %; $p = 0.042$).

FTC participants tended to have fewer maltreatment allegations overall ($p = 0.024$), and there were significant differences in placement patterns ($p = 0.031$). Children in FTC cases most commonly experienced 3–4 placements during removal (45.7 %), while placement patterns were more variable in the non-FTC group. They were also more likely to be placed with family members (59.2 % vs. 50.0 %; $p = 0.011$).

Treatment recommendations also differed significantly ($p < 0.001$). FTC participants were less likely to be referred to crisis or detox services or to outpatient care, and more likely to be referred to community living, halfway houses, or residential treatment. There were also significant differences in primary substance: FTC participants were less likely to report alcohol ($p < 0.001$) and more likely to report a stimulant ($p = 0.001$), with no significant differences in reporting cannabis or an opioid as their primary substance.

On the ASI, FTC participants scored higher on the drug ($p < 0.001$) and family ($p < 0.001$) domains, with no group differences on the employment or psychiatric domains. There were also significant differences in lifetime treatment admissions ($p = 0.031$), with FTC participants more likely to have 4–5 admissions and non-FTC participants more likely to have 6 or more.

---

[1] Native includes individuals identified as American Indian, Alaska Native, Native Hawaiian, or other Pacific Islander

Table 2

Unweighted Descriptive Characteristics for N = 1567 Caregiver-Child Dyads with Dual Foster Care and Substance Use Treatment Involvement, 2018-2022.

	FTC Dyads (N = 223)	Non-FTC Dyads (N = 1344)	
	Mean (SD) or n (%)	Mean (SD) or n (%)	p
Child age at removal	3.21 (3.71)	4.24 (4.27)	p < 0.001***
Caregiver age	30.07 (5.56)	32.66 (6.93)	p < 0.001***
Caregiver race			0.004**
White	158 (70.85)	796 (59.23)	
Black	40 (17.94)	314 (23.36)	
Native	25 (11.21)	234 (17.41)	
Caregiver female sex	169 (75.78)	928 (69.05)	0.042*
Total # of allegations			0.024*
1	149 (66.82)	787 (58.56)	
2	51 (22.87)	360 (26.79)	
3	21 (9.42)	138 (10.27)	
4 or more	2 (0.90)	59 (4.39)	
Total # of placements			0.031*
1–2	73 (32.74)	481 (35.79)	
3–4	102 (45.74)	495 (36.83)	
5 or more	48 (21.52)	368 (27.38)	
Any kinship placements	132 (59.19)	672 (50.00)	0.011*
Treatment level of care recommendation			p < 0.001***
Community living or residential treatment	88 (39.46)	252 (18.75)	
Crisis or detox	12 (5.38)	177 (13.17)	
Outpatient	123 (55.16)	915 (68.08)	
Primary substance of choice			
Alcohol	20 (8.97)	293 (21.80)	p < 0.001***
Cannabis	31 (13.90)	217 (16.15)	0.395
Opioid	34 (15.25)	159 (11.83)	0.151
Stimulant	134 (60.09)	639 (47.54)	0.001**
ASI domain scores			
Drug	6.83 (1.85)	6.28 (2.33)	p < 0.001***
Employment	4.93 (2.66)	4.71 (3.04)	0.302
Family	6.35 (2.05)	5.72 (2.52)	p < 0.001***
Psychiatric	5.26 (2.71)	5.08 (2.84)	0.375
# Lifetime treatment admissions			p < 0.031*
1	30 (13.45)	221 (16.44)	
2–3	62 (27.80)	407 (30.28)	
4–5	72 (32.29)	311 (23.14)	
6 or more	59 (26.46)	405 (30.13)	
Reunified by study end	112 (50.22)	490 (36.46)	p < 0.001***
Completed treatment	103 (46.19)	461 (34.30)	0.001**

* p < 0.05
** p < 0.01
*** p < 0.001

Finally, FTC participants were more likely to achieve family reunification (50.2 % vs. 36.5 %; $p < 0.001$) and to complete substance use treatment (46.2 % vs. 34.3 %; $p = 0.001$).

3.2. Weighted descriptive characteristics

Table 3 compares demographic, child welfare, treatment characteristics, and key study variables for FTC and non-FTC caregivers and children, after applying inverse probability weights using survey-weighted analyses. Results demonstrate greater balance of covariate distribution between the groups. No comparison remain significantly difference except for treatment level of care recommendation ($p < 0.001$) and lifetime treatment admissions ($p = 0.037$). FTC participants remained less likely to be referred to crisis or detox, more likely to have 4–5 treatment admissions, and less likely to have 6 or more admissions. While FTC participants were no longer significantly more likely to complete treatment, they remained significantly more likely to achieve family reunification (49.1 % vs. 36.5 %; $p = 0.006$).

Table 3 also presents the results of covariate balance diagnostics between FTC and non-FTC participants after weighting. As shown, the SMDs for all covariates were well below Rubin's (2001) threshold of 0.25, with absolute values ranging from 0.01 to a maximum of 0.11.

Most covariates also met Nguyen et al.'s (2017) more conservative threshold of 0.10; only one covariate slightly exceeded this criterion: total number of allegations (absolute SMD = 0.11). Similarly, VRs for all covariates fell within the acceptable range of 0.5–2, with values ranging from 0.66 to 1.16.

3.3. Weighted regression results

Following the recommendation of Nguyen et al. (2017), we included any covariate with an absolute SMD greater than 0.10 (see Table 3) as a control in the weighted regression models. Based on the balance diagnostics in Table 3, this applied to only one variable, total number of allegations.

3.3.1. Weighted logistic regression

Table 4 provides the results of the weighted logistic regression model. The findings indicate that the odds of reunification were 66 % greater for FTC participants compared to non-participants ($OR = 1.66$, $p = 0.008$).

3.3.2. Weighted mediation model

Figs. 2 and 3 illustrate the results of the weighted mediation model evaluating whether treatment completion mediates the relationship between FTC participation and family reunification. Fig. 2 provides the unstandardized coefficients and Fig. 3 presents odds ratios. The model revealed significant direct effects on reunification for both FTC participation ($\beta = 0.10$; $OR = 1.53$; $p = 0.019$) and treatment completion ($\beta = 1.04$; $OR = 2.82$; $p < 0.001$). This indicates that the odds of reunification were 53 % greater for FTC participants compared to non-participants, independent of treatment completion. Furthermore, the odds of reunification were 182 % greater for treatment completers compared to non-completers, independent of FTC participation. FTC participation was not found to have a significant direct effect on treatment success ($\beta = 0.34$; $OR = 1.41$; $p = 0.069$), nor was it found to have a significant indirect effect on reunification ($\beta = 0.02$; $OR = 1.09$; $p = 0.081$). Overall, the results of the mediation model do not provide evidence that treatment completion mediates the relationship between FTC participation and reunification.

4. Discussion

Thirty years of FTC research suggests FTCs outperform traditional settings for families with parental SUD. However, most previous research has been limited by selection bias and unmeasured caregiver-level factors. The current study applied two innovative research procedures—cross-system data linkage and IPW—to overcome these previous limitations. Results of our study suggest that FTCs significantly increase the likelihood of reunification versus traditional practice. We detected an odds ratio of 1.66, which means that the odds of reunification were 66 % greater for FTC-involved families compared to non-FTC-involved families. Of significance, the non-FTC families in our study were not significantly different from the treatment group on key "predictors" of not reunifying including caregiver SUD severity, "drug of choice", past child welfare involvement, child placement type, and child age. This effect size closely mirrors the pooled effect ($OR = 1.75$) measured in Zhang and colleagues' (2019) meta-analysis of 17 studies from 2004 to 2018, which included over 7000 individuals.

Our study adds to the literature by exploring whether treatment completion "explains" the effect of FTC on reunification. While studies have examined the effect of FTC on treatment completion as an outcome (Lloyd, 2015), and other (non-FTC) studies have explored treatment completion as a predictor of reunification (Kyzer et al., 2014), we did not locate any earlier studies that tested whether treatment completion mediates the path to reunification. Our study found that FTC participation and treatment completion independently increase likelihood of reunification. The FTC itself appears to function as an intervention with

Table 3

Weighted Descriptive Characteristics for N = 1567 Caregiver-Child Dyads with Dual Foster Care and Substance Use Treatment Involvement, 2018-2022.

	FTC Participants (N = 223)	Non-FTC Participants (N = 1344)	SMD	VR	p
	Mean or Weighted % (Linearized SE)	Mean or Weighted % (Linearized SE)			
Child age at removal	3.70 (0.34)	4.09 (0.11)	−0.09	0.86	0.280
Caregiver age	32.16 (0.89)	32.28 (0.19)	−0.02	1.05	0.902
Caregiver race			−0.03	0.93	0.790
White	60.98 (4.78)	60.94 (1.33)			
Black	24.79 (4.76)	22.63 (1.14)			
Native	14.24 (3.31)	16.43 (0.99)			
Caregiver female sex	67.81 (4.85)	70.10 (1.24)	−0.05	1.05	0.641
Total # of allegations			−0.11	0.79	0.436
1	63.75 (4.11)	59.89 (1.34)			
2	24.89 (3.64)	26.22 (1.20)			
3	9.85 (2.26)	9.81 (0.80)			
4 or more	1.51 (1.06)	4.08 (0.52)			
Total # of placements			−0.04	0.84	0.092
1–2	32.89 (4.33)	36.06 (1.32)			
3–4	46.11 (4.50)	36.78 (1.33)			
5 or more	21.00 (3.29)	27.17 (1.22)			
Any kinship placements	46.28 (4.36)	51.17 (1.37)	−0.10	1.00	0.286
Treatment level of care recommendation			−0.01	1.16	p < 0.001***
Community living or residential treatment	26.60 (3.21)	21.43 (1.19)			
Crisis or detox	3.56 (1.17)	12.96 (0.92)			
Outpatient	69.85 (3.43)	65.60 (1.33)			
Primary substance of choice					
Alcohol	23.61 (5.27)	19.96 (1.06)	0.09	1.13	0.474
Cannabis	14.98 (2.87)	15.75 (0.99)	−0.02	0.96	0.801
Opioid	14.70 (2.75)	12.49 (0.94)	0.07	1.15	0.422
Stimulant	45.06 (4.27)	49.25 (1.38)	−0.08	0.99	0.352
ASI domain scores					
Drug	6.39 (0.17)	6.36 (0.06)	0.01	0.68	0.860
Employment	4.85 (0.19)	4.74 (0.08)	0.04	0.66	0.612
Family	6.01 (0.17)	5.81 (0.07)	0.08	0.72	0.282
Psychiatric	5.21 (0.19)	5.11 (0.08)	0.04	0.78	0.622
# Lifetime treatment admissions			0.02	0.81	0.037*
1	12.01 (2.86)	16.04 (1.00)			
2–3	30.39 (4.32)	30.69 (1.28)			
4–5	33.58 (4.34)	22.75 (1.14)			
6 or more	24.02 (3.42)	30.51 (1.27)			
Reunified by study end	49.05 (4.49)	36.53 (1.33)			0.006**
Completed treatment	42.38 (4.42)	34.57 (1.31)			0.081

SMD = standardized mean differences; VR = variance ratio of weighted variance. According to Rubin (2001), SMD < 0.25 and a VR between 0.5 and 2 indicate acceptable balance. According to Nguyen et al. (2017), variables with SMD > 0.1 should be included as controls to address residual imbalance.
* p < 0.05 ** p < 0.01

an independent treatment effect on reunification.

This finding is clinically significant because caregivers with SUDs severe enough to result in the loss of custody of one or more children are historically at great disadvantage for completing treatment or reunifying with their children (Akin et al., 2015; Brook and McDonald, 2009; Brook et al., 2010; Lloyd et al., 2017; Traube et al., 2015). Most studies on the topic find that child welfare-involved caregivers face barriers to referral, enrollment, and completion of treatment. One study of over 10,000 caregivers in New Jersey with substance "abuse" found that 59 % were referred for treatment (n = 6436), 40 % of those enrolled (n = 2575),

Table 4

Results of the weighted logistic regression examining the likelihood of family reunification (n = 1567 Caregiver-Child Dyads).

	OR	SE	95 % CI	p
FTC	1.66	0.31	1.14–2.40	0.008**
Total # of allegations (ref. = 1)				
2	1.13	0.14	0.88 – 1.45	0.34
3	0.92	0.17	0.64–1.32	0.64
4 or more	0.57	0.18	0.31 – 1.04	0.067

Interpret odds ratios as follows: (OR-1)*100 = % change in outcome, e.g., (1.66–1)*100 = 66 % increase in likelihood of reunification among FTC group, controlling for covariates.

* p < 0.05 **p < 0.01

and 55 % completed treatment (n = 1416). This amounts to 12.9 % of the total sample having completed treatment (Traube et al., 2015). Likewise, children removed due to caregiver substance use are significantly less likely to reunify compared to children removed for other reasons; particularly in cases involving infants or toddlers (Lloyd et al., 2017). A study of over 32,000 children in a Midwestern state found that children under age 4 removed due to caregiver drug use spent close to twice as long in foster care compared to children age 4 + without a drug removal (median 992 days vs. 566 days). Both younger and older children with drug removals were significantly less likely to reunify than their peers without drug removals (Lloyd et al., 2017).

This finding that FTC increased reunification irrespective of treatment completion is also novel and significant because it suggests that the "complementary" and family services embedded in the FTC model (Children and Family Futures & National Association of Drug Court Professionals, 2019) may increase family health and child safety independent of substance use treatment. These findings align with the harm reduction framework, which conceptualizes substance use as existing along a continuum and prioritizes safety, health, and well-being without requiring abstinence or treatment participation as prerequisites for support (Substance Abuse and Mental Health Services Administration, 2023). Although FTCs are not traditionally harm reductionist, as programs typically conceptualize recovery as substance abstinence, only one of the eight FTC Best Practice Standards relates specifically to substance use treatment (CFF & NADCP, 2019). The remaining Standards relate to the therapeutic and high-quality operations of the court, child welfare, and case management systems. Furthermore, FTC best practices support other harm reduction approaches including integrating clients using medications for opioid use disorder, responding to return to use with treatment adjustments rather than sanctions, and engaging caregivers who are still using in (supervised) child visitation and therapeutic interventions (CFF & NADCP, 2019). Based on our findings, these non-treatment related components are independently associated with a positive effect on reunification.

While the current study is unable to distinguish which elements of FTC practice contribute to the observed independent treatment effect of the model, we do know from earlier child welfare studies that families' non-treatment related needs (i.e., employment, housing, domestic violence, mental health conditions) create barriers to reunification (Bowen and Walton, 2015; Lloyd, 2018a, 2018b). Additionally,
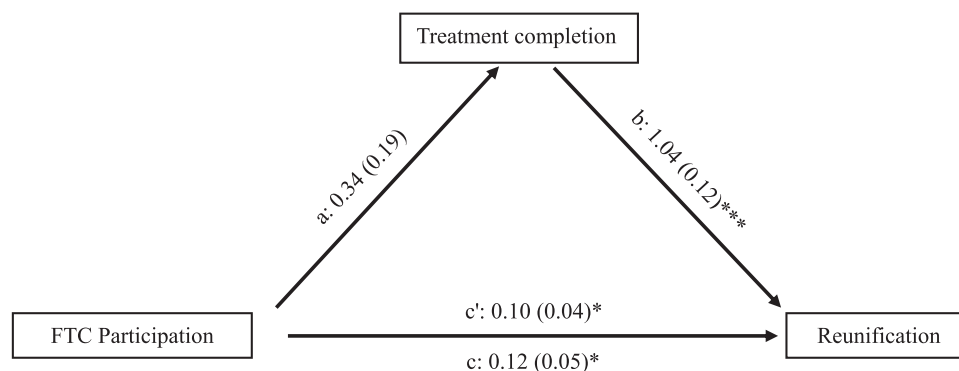

Fig. 2. Results of mediation model with unstandardized coefficients and standard errors (N = 1567 Caregiver-Child Dyads). Notes: Presented coefficients are unstandardized with standard errors in parentheses. a is the direct effect of FTC participation on treatment completion, b is the direct effect of treatment completion on reunification, c' is the direct effect of FTC participation on reunification, and c is the total effect of FTC participation on reunification. To aid in interpretation, exponentiated coefficients (odds ratios) are presented in figure 4. * p < 0.05 *** p < 0.001.
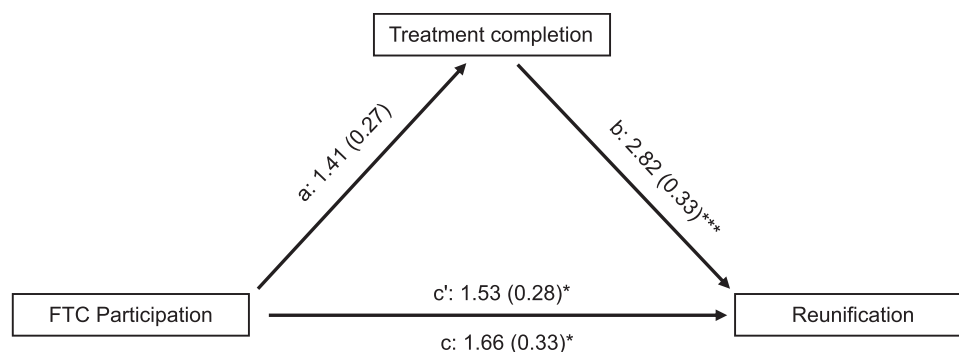

Fig. 3. Results of mediation model with exponentiated coefficients (odds ratios) and standard errors (N = 1567 Caregiver-Child Dyads). Notes: Presented coefficients are exponentiated (odds ratios) with standard errors in parentheses. a is the direct effect of FTC participation on treatment completion, b is the direct effect of treatment completion on reunification, c' is the direct effect of FTC participation on reunification, and c is the total effect of FTC participation on reunification. Interpret as follows: (OR-1)*100 = % change in outcome, e.g., (1.66–1)*100 = 66 % increase in likelihood of reunification among FTC group, controlling for treatment completion status. * p < 0.05 *** p < 0.001.

untreated trauma in children can contribute to placement instability, which can prolong or derail reunification (Clark et al., 2020; Kisiel et al., 2009). Untreated trauma in caregivers can impair judgment and decision-making, hinder emotion regulation and attachment, and compromise executive functioning, all of which can interfere with reunification (Thompson, 2018). It is likely, then, that the "active efforts" used in FTC to both provide trauma-informed, wraparound supports to families and increase the capacity of local service systems to address social needs are key ingredients.

Our finding that FTC has its own treatment effect is also theoretically significant. Treatment courts are based on tenets of therapeutic jurisprudence, a framework positing that the practice of the law—the act of court itself—is not benign but has therapeutic or antitherapeutic effects on the participants (Lens et al., 2016; Winick, 2013). Treatment courts are designed to leverage practices that enhance therapeutic effects, including positive interactions between the judge and participants, demonstration of prosocial behaviors and interactions among the FTC team, frequent hearings to enhance familiarity and relational bonds between the FTC team and among participants, and a family-friendly and trauma-informed atmosphere. Our findings provide empirical support for therapeutic jurisprudence in a family court context, illustrating that the court program itself has an impact on reunification readiness.

It is important to note that although we demonstrated a significant, independent effect of FTC on reunification—a heartening finding when increasing numbers of children enter foster care with parental SUD—the fact remains that FTCs meet a tiny portion of the total need. Furthermore, some studies suggest that, similar to criminal drug courts (Cheesman II et al., 2023; Ho et al., 2018), the population who enter FTCs does not always mirror the surrounding child welfare population (Breitenbucher et al., 2018). Our study observed racial disproportionality such that White caregivers constituted 70.9 % of the FTC population compared to 59.2 % of the overall child welfare population. To our knowledge, no studies have documented the mechanisms for disproportionality at program entry in FTC programs. In criminal drug courts, one prior study documented that 50 % of potential participants who were Black were excluded due to "unsuitability", including the type of criminal offense (i.e., violent vs. non-violent crime), despite the fact that recidivism rates for these types of crimes do not differ (Clevenger and Meyer, 2023). Entry into FTC requires that a caregiver be referred, meet with the coordinator, engage in pre-entry screening, that their case be reviewed and accepted by the treatment court team, and that the caregiver plea-in to the program. Even small differences at each of these moments could accumulate to result in the observed disparity. The FTC Best Practice Standards can aid in reducing disparities by ensuring consistency throughout the entire referral pathway (CFF & NADCP, 2019). Additionally, the standards direct individual court programs to routinely gather and review data on racial/ethnic equity to understand mechanisms causing disproportionality in their own system (CFF & NADCP, 2019).

Additionally, although we observed a significant association between FTC and reunification, controlling for treatment completion, the largest effect size in our model was the direct path from treatment completion to reunification. The odds of reunification were 187 % greater for caregivers who completed treatment compared to those who did not ($OR = 2.87$, $p < 0.001$), controlling for FTC participation. This finding corresponds with extensive earlier research outlined in the introduction regarding the importance of treatment completion in reunification decisions for families with parental SUD.

4.1. Limitations

Our study is limited in several ways. First, the sample was restricted to one state and only five FTCs, limiting generalizability to other regions and jurisdictions. Second, while robust, the research design cannot match the rigor of a randomized controlled trial, and estimates should not be interpreted as causal. Although IPW improved the balance between the FTC and non-FTC participant groups, unobserved confounders may still bias the results. While our treatment dataset included two trauma-related measures for caregivers, both were excluded due to substantial missing data (49 % for trauma assessment scores and 20 % for Adverse Childhood Experiences [ACE] scores). Prior research has shown that trauma exposure can influence both substance use treatment engagement and child welfare outcomes (Clark et al., 2020; Kisiel et al., 2009; Thompson, 2018). Treatment readiness and criminogenic risk, understudied yet important concepts in child welfare and FTC research, may also contribute to FTC participation and reunification but were not measured in the current study. We were likewise unable to control for access to other concurrent supports and services.

Probabilistic matching procedures were used to link child welfare and treatment records, which may have introduced measurement error due to potential mismatched or unlinked records. Additionally, because reunification was measured as a child-level outcome rather than a dyad-level outcome in the available administrative data, it was not always possible to identify which specific caregiver was the subject of reunification. For children with both FTC and non-FTC caregivers, both dyads would be classified as achieving reunification if the child reunified, even if reunification occurred with only one caregiver. Similarly, we cannot be certain the reunification occurred with the caregiver represented in the linked treatment data.

Finally, the study period coincided with the COVID-19 pandemic, which significantly disrupted maltreatment reporting, court operations, and treatment delivery, potentially affecting the findings.

5. Conclusion

Our rigorous quasi-experiment found that the odds of reunification were two-thirds greater for FTC-involved families compared to matched controls ($OR = 1.66$). Additionally, we found that substance use treatment completion did not mediate the relationship between FTC participation and reunification, suggesting that the FTC program exerts an independent treatment effect unrelated to the effect of substance use treatment. These findings underscore the importance of integrating harm reduction principles in FTC settings. Our finding that White caregivers were disproportionately over-represented in the pre-weighted treatment group points to ongoing concerns related to equitable and equivalent referrals and entries into these programs. For FTCs to truly meet the needs of this population, programs must continue to strengthen best practice standards implementation, including ongoing fidelity monitoring.

CRediT authorship contribution statement

John Prindle: Writing – review & editing, Visualization, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Elizabeth J. Goldsborough:** Writing – original draft, Visualization, Methodology. **Jon Phillips:** Writing – original draft, Visualization, Supervision, Software, Project administration, Methodology, Formal analysis, Conceptualization. **Cindy Nichols:** Writing – original draft, Visualization, Methodology. **Margaret Lloyd Sieger:** Writing – original draft, Supervision, Resources, Project administration, Methodology, Funding acquisition, Data curation, Conceptualization. **Jessica Becker:** Writing – original draft, Visualization, Software, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

Funding

Declaration of Competing Interest

Acknowledgements

References

Akin, B.A., Brook, J., Lloyd, M.H., 2015. Examining the role of methamphetamine in permanency: a competing risks analysis of reunification, guardianship, and adoption. Am. J. Orthopsychiatry 85 (2), 119.

Bowen, E.A., Walton, Q.L., 2015. Disparities and the social determinants of mental health and addictions: opportunities for a multifaceted social work response. Health Soc. Work 40 (3), e59–e65.

Breitenbucher, P., Bermejo, R., Killian, C.M., Young, N.K., Duong, L., DeCerchio, K., 2018. Exploring racial and ethnic disproportionalities and disparities in family treatment courts: findings from the regional partnership grant program. J. Adv. Justice 1 (1), 35–51.

Brook, J., McDonald, T., 2009. The impact of parental substance abuse on the stability of family reunifications from foster care. Child. Youth Serv. Rev. 31 (2), 193–198. https://doi.org/10.1016/j.childyouth.2008.07.010.

Brook, J., McDonald, T., Gregoire, T., Press, A., Hindman, B., 2010. Parental substance abuse and family reunification. J. Soc. Work Pract. Addict. 10 (4), 393–412.

Bruns, E.J., Pullmann, M.D., Weathers, E.S., Wirschem, M.L., Murphy, J.K., 2012. Effects of a multidisciplinary family treatment drug court on child and family outcomes: results of a quasi-experimental study. Child Maltreatment 17 (3), 218–230. 〈http://search.proquest.com/docview/1151707180?accountid=14556〉.

Center for Children and Family Futures, & National Association of Drug Court Professionals. (2019). *Family Treatment Court Best Practice Standards*. 〈https://www.wicourts.gov/courts/programs/problemsolving/docs/ftcstandards.pdf〉.

Cheesman II, F.L., B, M.D., Genthon, K.J., 2023. Racial differences in drug court referral, admission, and graduation rates: findings from two states and eight counties. J. Ethn. Crim. Justice 21 (1), 80–102. https://doi.org/10.1080/15377938.2023.2193952.

Children and Family Futures, & National Association of Drug Court Professionals, 2019. Family treatment court best practice standards (In.). Office of Juvenile Justice & Delinquency Prevention, Washington, D.C.

Children's Bureau, 2012. Administration on children, youth and families, administration for children and families. Adoption and Foster Care Analysis and Reporting System (AFCARS), Foster Care File 2011, Version 6 [Dataset]. U. S. Department Of Health And Human Services. National Data Archive on Child Abuse and Neglect. Https://doi.org/10.34681/CE1A-YJ74.

Children's Bureau, 2023. The AFCARS report: preliminary FY 2022 estimates as of May 2023. The AFCARS Report, Issue. 〈https://www.acf.hhs.gov/sites/default/files/documents/cb/afcars-report-30.pdf〉.

Children's Bureau, 2024. Child maltreatment 2022. U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families.

Children's Bureau, Administration on Children, Youth And Families, Administration For Children And Families, U. S. Department Of Health And Human Services, 2018. *adoption and foster care analysis and reporting system (afcars), foster care file 2018*, version 3 [Dataset]. National Data Archive on Child Abuse and Neglect. https://doi.org/10.34681/9wtj-h578.

Choi, S., Huang, H., Ryan, J.P., 2012. Substance abuse treatment completion in child welfare: does substance abuse treatment completion matter in the decision to reunify families? Child. Youth Serv. Rev. 34 (9), 1639–1645.

Chuang, E., Moore, K., Barrett, B., Young, M.S., 2012. Effect of an integrated family dependency treatment court on child welfare reunification, time to permanency and re-entry rates. Child. Youth Serv. Rev.

Clark, S.L., Palmer, A.N., Akin, B.A., Dunkerley, S., Brook, J., 2020. Investigating the relationship between trauma symptoms and placement instability. Child Abus. Negl. 108, 104660. https://doi.org/10.1016/j.chiabu.2020.104660.

Clevenger, H.C., Meyer, B.L., 2023. Racial equity in your treatment court: why and how to achieve it. Supreme Court of Ohio. 〈https://www.supremecourt.ohio.gov/docs/JCS/specDockets/conference/2023/materials/LunchPlenary.pdf〉.

Doab, A., Fowler, C., Dawson, A., 2015. Factors that influence mother–child reunification for mothers with a history of substance use: a systematic review of the evidence to inform policy and practice in Australia. Int. J. Drug Policy 26 (9), 820–831.

Gifford, E.J., Eldred, L.M., Vernerey, A., Sloan, F.A., 2014. How does family drug treatment court participation affect child welfare outcomes? Child Abus. Negl.

Goldstein, E.G., Font, S.A., 2025. Prevalence and treatment of maternal substance use disorder in child welfare. , e250054-e250054 JAMA Health Forum 6 (3). https://doi.org/10.1001/jamahealthforum.2025.0054.

Green, B.L., Rockhill, A., Furrer, C., 2007. Does substance abuse treatment make a difference for child welfare case outcomes? A statewide longitudinal analysis. Child. Youth Serv. Rev. 29 (4), 460–473.

Grella, C.E., Needell, B., Shi, Y., Hser, Y., 2009. Do drug treatment services predict reunification outcomes of mothers and their children in child welfare? J. Subst. Abus. Treat. 36 (3), 278–293.

Ho, T., Carey, S.M., Malsch, A.M., 2018. Racial and gender disparities in treatment courts: do they exist and is there anything we can do to change them. J. Adv. Justice 1 (1), 5–34.

Huang, H., Ryan, J.P., 2011. Trying to come home: substance exposed infants, mothers, and family reunification. Child. Youth Serv. Rev. 33 (2), 322–329.

Karoll, B.R., Poertner, J., 2001. Judges', caseworkers', and substance abuse counselors' indicators of family reunification with substance-affected parents. Child Welf. 81 (2), 249–269.

Karoll, B.R., Poertner, J., 2003. Indicators for safe family reunification: how professional differ. J. Soc. Soc. Welf. 30, 139.

Kisiel, C., Fehrenbach, T., Small, L., Lyons, J.S., 2009. Assessment of complex trauma exposure, responses, and service needs among children and adolescents in child welfare. J. Child Adolesc. Trauma 2, 143–160.

Kyzer, A., Conners-Burrow, N.A., McKelvey, L., 2014. Environmental risk factors and custody status in children of substance abusers. Child. Youth Serv. Rev. 36 (0), 150–154. https://doi.org/10.1016/j.childyouth.2013.11.020.

Lens, V., Katz, C.C., Suarez, K.S., 2016. Case workers in family court: a therapeutic jurisprudence analysis. Child. Youth Serv. Rev. 68, 107–114. https://doi.org/10.1016/j.childyouth.2016.06.027.

Lloyd, M.H., 2015. Family drug courts: conceptual frameworks, empirical evidence and implications for social work. Fam. Soc. 96 (1), 49–57.

Lloyd, M.H., 2018a. Health determinants, maternal addiction, and foster care: current knowledge and directions for future research. J. Soc. Work Pract. Addict. 18 (4), 339–363. https://doi.org/10.1080/1533256X.2018.1517009.

Lloyd, M.H., 2018b. Poverty and family reunification for mothers with substance use disorders in child welfare. Child Abus. Rev. 27 (4), 301–316. https://doi.org/10.1002/car.2519.

Lloyd, M.H., Akin, B.A., Brook, J., 2017. Parental drug use and permanency for young children in foster care: a competing risks analysis of reunification, guardianship, and adoption. Child. Youth Serv. Rev. 77, 177–187. https://doi.org/10.1016/j.childyouth.2017.04.016.

Lloyd Sieger, M.H., Becker, J., Brook, J., 2021. Family treatment court participation and permanency in a rural setting: outcomes from a rigorous quasi-experiment. Child Fam. Soc. Work 26 (4), 540–549. https://doi.org/10.1111/cfs.12836.

Mersky, J.P., Lee, C.P., Liu, X., Janczewski, C.E., 2023. Impact of a family treatment court on child permanency and safety. Child Abus. Negl. 146, 106512. https://doi.org/10.1016/j.chiabu.2023.106512.

Muthen, L.K., Muthen, B.O., 2017. Mplus: statistical analysis with latent variables: user's guide (Version 8) (In.). Authors.

Nguyen, T.-L., Collins, G.S., Spence, J., Daurès, J.-P., Devereaux, P.J., Landais, P., Le Manach, Y., 2017. Double-adjustment in propensity score matching analysis: choosing a threshold for considering residual imbalance. BMC Med. Res. Methodol. 17 (1), 78. https://doi.org/10.1186/s12874-017-0338-0.

Pollock, M.D., Green, S.L., 2015. Effects of a rural family drug treatment court collaborative on child welfare outcomes: comparison using propensity score analysis. Child Welf. 94 (4), 139–159.

Prindle, J., Suthar, H., Putnam-Hornstein, E., Foust, R., 2024. Probabilistic record linkage for families (PRLF): a discussion of the development and validation of this Open-Source linkage tool. Int. J. Popul. Data Sci. 9 (5).

Rubin, D.B., 2001. Using propensity scores to help design observational studies: application to the tobacco litigation. Health Serv. Outcomes Res. Methodol. 2 (3-4), 169–188.

Seay, K., 2015. How many families in child welfare services are affected by parental substance use disorders? A common question that remains unanswered. Child Welf. 94 (4), 19–51.

Sieger, M.L., Nichols, C., Becker, J., Brook, J., 2023. Cost analysis of a rural family treatment court: is this enhanced approach "worth it"? Juv. Fam. Court J. 74 (4), 5–20. https://doi.org/10.1111/jfcj.12247.

Strong, D., Cole, R., D'Angelo, A.V., Henke, J., & Xue, Y. (2020). *RPG Child and Family Outcomes: Fifth Annual Report to Congress*. 〈https://www.mathematica.org/publications/rpg-child-and-family-outcomes-fifth-annual-report-to-congress〉.

Substance Abuse and Mental Health Services Administration (SAMHSA), 2023. Harm reduction framework (In.). Center for Substance Abuse Prevention, Washington, D.C.

Thompson, E.A., 2018. Addressing birth parent trauma: pathway to reunification. In: Strand, V.C., Sprang, G. (Eds.), Trauma Responsive Child Welfare Systems. Springer International Publishing, pp. 181–199. https://doi.org/10.1007/978-3-319-64602-2_11.

Traube, D.E., He, A.S., Zhu, L., Scalise, C., Richardson, T., 2015. Predictors of substance abuse assessment and treatment completion for parents involved with child welfare one State's experience in matching across systems. Child Welf. 94 (5), 45–66. ⟨https://www.jstor.org/stable/48623462⟩.

Van Wormer, J., Hsieh, M.-L., 2016. Healing families: outcomes from a family drug treatment court. Juv. Fam. Court J. 67 (2), 49–65. https://doi.org/10.1111/jfcj.12057.

Winick, B.J., 2013. Problem solving courts: therapeutic jurisprudence in practice. In: Wiener, In.R.L., Brank, E.M. (Eds.), Problem Solving Courts: Social Science and Legal Perspectives. Springer, pp. 211–236.

Worcel, S.D., Furrer, C.J., Green, B.L., Burrus, S.W.M., Finigan, M.W., 2008. Effects of family treatment drug courts on substance abuse and child welfare outcomes. Child Abus. Rev. 17 (6), 427–443. ⟨http://search.proquest.com/docview/61726682?accountid=14556⟩.

Zhang, S., Huang, H., Wu, Q., Li, Y., Liu, M., 2019. The impacts of family treatment drug court on child welfare core outcomes: a meta-analysis. Child Abus. Negl. 88, 1–14. https://doi.org/10.1016/j.chiabu.2018.10.014.