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Quasi-Experimental Study of Functional Family Therapy Effectiveness for Juvenile Justice Aftercare in a Racially and Ethnically Diverse Community Sample

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Abstract

Functional Family Therapy (FFT) is an intensive community-based treatment program designed to reduce youth behavior problems such as violence, drug use, and other delinquency. Although there is evidence of FFT efficacy and effectiveness with predominantly White samples, there is very little evidence with racial/ethnic minority samples. In light of the over-representation of African American and Latino youth in the juvenile justice system, this study examined the effectiveness of FFT and an adaptation of FFT to probation supervision, called Functional Family Probation (FFP), among a predominantly Latino and African American sample of youth returning home from court-ordered out-of-home placements (OHP). Propensity score weighting was used to compare the likelihood of subsequent OHPs among youth receiving standard probation (Comparison group), and youth receiving FFT (with standard probation), youth receiving FFP (instead of standard probation), and youth receiving FFT in combination with FFP. Results indicated that youth receiving FFT (both with standard probation and FFP), relative to Comparison youth receiving standard probation only, had significantly lower likelihood of OHP during the first two months following release, but this advantage disappeared in later months. Youth receiving only FFP also had lower likelihood of OHP than Comparison youth in the first two months, though not significantly. These findings provide encouraging evidence of positive effects of FFT, in combination with FFP or standard probation, among a diverse sample of juvenile justice system-involved youth.

Keywords

evidence; propensity score; delinquency; probation; FFT; minority

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1. Introduction

Functional Family Therapy (FFT; Alexander & Parsons, 1982) is an intensive community-based treatment program designed to reduce youth behavior problems such as violence, drug use, and other delinquency. FFT focuses on family dysfunction as the root of delinquent behavior, and seeks to establish and maintain new patterns of family behavior and communication that reinforce more adaptive youth behavior (Alexander & Parsons, 1973). In recent years, FFT has become one of the most widely transported evidence-based family interventions (Henggeler & Sheidow, 2011), implemented in over 300 sites and serving over 20,000 families annually (FFF LLC, 2012). In the present study we examine the effectiveness of both FFT, and an adapted version of FFT known as Functional Family Probation (FFP), as implemented as an aftercare service by a juvenile justice department in a large U.S. city serving a predominantly racial/ethnic minority population.

1.1. Evidence for FFT and FFP Efficacy and Effectiveness

Taking an ecological perspective on determinants of behavior problems among youth, previous research has identified a consistent set of risk and protective factors at individual, family, peer network, school, and neighborhood levels of analysis. At the family level, characteristics such as discipline practices, maternal substance use, and parental stress have been linked to youth behavior problems including substance abuse, conduct disorder, and criminality (see Henggeler & Sheidow, 2011). FFT is one of a number of family-based interventions that have been developed to address these familial roots of youth problem behavior. In FFT, the family's focus is shifted away from the youth's problem behavior and onto the patterns of behavior between family members, with the aim of establishing more positive familial interaction patterns. FFT interventionists guide families through five stages (Engagement, Motivation, Relational Assessment, Behavior Change, and Generalization) and incorporate other evidence-based behavior change techniques, such as cognitive-behavioral therapy. FFT is commonly utilized by child-serving systems such as juvenile justice and child welfare, to prevent serious youth delinquency and out-of-home placement.

FFT is currently rated as "supported by research evidence" by the California Evidence-Based Clearinghouse (2014), as a "model" program by Blueprints, and as "effective" by both the Office of Juvenile Justice and Delinquency Prevention (OJJDP) and the Office of Justice Programs (Center for the Study and Prevention of Violence, 2014). Two early efficacy studies employing randomized designs demonstrated significant improvements in recidivism for youth receiving FFT as compared to youth in a client-centered family group program, a church-based psychodynamic program, or a no-treatment condition (Alexander & Parsons, 1973; Klein, Alexander, & Parson, 1977). Gordon and colleagues (1988) found significantly decreased re-offending for youth receiving FFT compared to unmatched comparison youth, and these benefits persisted over long term follow-up (Gordon, Graves, & Arbuthnot, 1995). However, the most recent efficacy study using an experimental design, which focused on marijuana use, internalizing and externalizing behavior, and family conflict as outcomes, did not demonstrate significantly greater improvements from FFT as compared to cognitive-behavioral therapy or a psycho-educational group intervention (Waldron, Slesnick, Brody, Turner, & Peterson, 2001).

In addition to efficacy trials, several FFT effectiveness trials have also been conducted. Slesnick & Prestopnik (2009) found that FFT for treatment of runaway youths' substance use was significantly more effective than conventional shelter-based substance use services. Other effectiveness trials have failed to demonstrate significantly greater improvements from FFT with respect to externalizing behaviors and substance use when compared to a group intervention for parents (Friedman, 1989), and with respect to criminal recidivism when compared to standard probation services (Sexton & Turner, 2011). The most recent effectiveness studies have begun to address fidelity, and have demonstrated that therapist adherence to the FFT model is positively related to outcomes (Sexton & Turner, 2011). When the FFT group was stratified by therapist adherence, youth in the high adherence group had significantly better outcomes than youth in the low adherence group. This effect was moderated by family risk such that adherence had a stronger effect for higher risk families (Sexton & Turner). Overall, Henggeler and Sheidow (2011) describe the efficacy results for FFT as promising, though effectiveness in community settings distal to intervention developers has not been demonstrated.

An adapted version of FFT, called Functional Family Parole (FFP), integrates the principles of FFT into probation supervision. FFP was originally implemented in Washington state in 2004, and subsequently in several other sites, and has been the subject of less research than FFT. The primary existing study of FFP employed a quasi-experimental design using propensity score methods and found favorable effects of FFP on recidivism and employment in comparison to a no-supervision condition (Lucenko, He, Mancuso, & Felver, 2011).

1.2. Evidence for FFT and FFP Efficacy and Effectiveness with Racial/Ethnic Minorities

As evidence for an intervention accumulates, attention tends to shift from the basic question of whether the intervention works to more specific questions about how participant characteristics relate to intervention effectiveness and what intermediate changes occur that explain the mechanism of intervention effectiveness (La Greca, Silverman & Lochman, 2009). The influence of participant race/ethnicity is an important consideration when assessing the evidence for an intervention. Interventions, such as FFT and FFP, that were developed without explicit consideration for race/ethnicity or other cultural diversity are referred to as *mainstream* interventions (Wilson, Lipsey, & Soydan, 2003), as distinguished from *culturally-responsive* interventions, which are designed specifically for relevance to a particular racial, ethnic, cultural or other group-based identity (Resnicow et al., 2000). When implementing mainstream interventions, it is important to evaluate effectiveness across diverse populations. This is particularly important for interventions delivered to youth involved in the juvenile justice system, where racial and ethnic minority youth are over-represented (Piquero, 2008).

Disproportionate contact with the juvenile justice system is well documented for African American youth. As described by Leiber and colleagues (2011), the Office of Juvenile Justice and Delinquency Prevention monitors states' relative rate index (RRI) at a number of decision points in the processing of juvenile cases (i.e., arrest, referral, diversion, detention, petition, adjudication, probation, placement, and waiver). RRIs compare the processing rates of racial/ethnic minority youth — defined as the number of minority youth at a given

decision point as a percentage of their number in the general population—to processing rates of White youth. Values of 1 indicate proportionality, and values greater than 1 indicate disproportionate minority contact (DMC). The most recent RRI values for African American youth at selected decision points are: arrest (RRI=2.1), detention (RRI=1.4), and placement (RRI=1.2; Puzzanchera & Hockney, 2013). Comparable values for Latino youth are not available from OJJDP. According to the National Council on Crime and Delinquency (2007), although there is evidence of Latino DMC, it is a relatively understudied topic because Latino ethnicity is not often identified separately from race in juvenile justice data systems. Nonetheless, the disproportionate involvement of racial/ethnic minorities in the juvenile justice system highlights the need for juvenile justice interventions demonstrated to be effective among minorities.

In their recent meta-analysis reviewing the evidence for mainstream intervention effectiveness among racial/ethnic minorities, Huey and Polo (2008) delineated three criteria for evidence with respect to racial/ethnic diversity: (1) whether the study was conducted among a sample comprising at least 75% racial/ethnic minorities [other meta-analyses have used lower thresholds for this criterion, e.g., Wilson and colleagues (2003) used 60%], (2) whether the study demonstrated effectiveness among a racial/ethnic minority subsample, and (3) whether tests of moderation of treatment effectiveness comparing White and minority individuals were non-significant. In the present study, we address the first criterion by using extensive juvenile justice system administrative data to examine the effectiveness of FFT and FFP among a racially and ethnically diverse sample of youth (<10% White).

There have been few studies that have produced evidence of FFT efficacy or effectiveness with majority non-White samples. The early efficacy studies (Alexander & Parsons, 1973; Klein, Alexander, & Parson, 1977) did not specify the racial/ethnic composition of their samples, though they were presumably White. Gordon and colleagues (1988) also did not report the race/ethnicity of participants, but described them as “lower and lower-middle class” and “residing in a culturally deprived rural area (Appalachia).” The most recent efficacy study by Waldron and colleagues (2001) did not find any significant effects of FFT on drug use, internalizing and externalizing behavior, or family conflict in a 62% non-White sample. Existing effectiveness studies were largely conducted among majority White samples – Friedman’s (1989) sample was 89% White and Sexton and Turner’s (2011) sample was 78% White. In an unpublished dissertation, Dunham (2010) sampled predominantly Latino and African American youth (95% non-White) and found no evidence of greater effectiveness for FFT versus services as usual on recidivism or crime severity, yet did observe significantly greater treatment completion among the FFT group. The only existing study demonstrating FFT effectiveness with a majority non-White sample found FFT significantly reduced substance use among a 71% non-White sample, primarily composed of Latino and American Indian youth (Slesnick & Prestopnik, 2009).

FFP has been the subject of much less research than FFT. The main existing FFP study was conducted among a 55% non-White sample primarily composed of Latino and African American youth and found favorable effects of FFP on recidivism and employment in comparison to a no parole condition (Lucenko, He, Mancuso, & Felver, 2011).

1.3. The Current Study

Because FFT and FFP are increasingly popular interventions for youth involved in the juvenile justice system, where ethnic minority youth are over-represented, their effectiveness for non-White youth and families is an essential consideration. This study offers a quasi-experimental evaluation of effectiveness of FFT and FFP (both independently and in combination), relative to standard parole supervision, as implemented by a juvenile justice department serving a large city with a predominantly non-White service population.

2. Methods

2.1. Interventions

In this study, youth eligible to receive FFT and FFP were ages 11–18 and recently released from a specific type of court-ordered out-of-home placement (OHP) for youth who do not pose a significant risk to the community, but who cannot remain in the home due to the circumstances of the child's case and home life (e.g., family risk, maltreatment history, child behavioral health needs). Settings for these placements may include relative or non-relative foster care, group homes, and psychiatric hospitals. Youth released from this type of placement (hereafter referred to as Placement) are all under probation supervision and are returning home to live with their families, thus a family-based intervention may be particularly helpful for promoting family re-integration.

All youth released from Placement received probation supervision, either FFP or standard. The type of probation services was determined by provider availability/caseload -- if an FFP slot was not available, youth received standard probation supervision instead. In addition to probation supervision (either FFP or standard), some youth also received FFT. Referrals to FFT were based on probation supervisors' judgment that the family was capable of engaging in the intervention, and referred youth received FFT based on provider availability. Thus, there were four groups examined in this study: (1) youth who received FFT and standard probation (FFT), (2) youth who received FFP only (FFP), (3) youth who received FFT and FFP (FFT+FFP), and (4) youth who received standard probation supervision only (Comparison). The nature of services for each of these groups is described in more detail below.

FFT—FFT is an intensive, family-based intervention that seeks to strengthen family functioning and communication and consists of five phases: Engagement, Motivation, Relational Assessment, Behavior Change, and Generalization. FFT is provided by clinicians trained in the FFT model. In the present study, after a baseline functional assessment, youth and their families met weekly with the FFT interventionist. Successful completion of FFT occurred when the youth, family, and interventionist reached a mutual decision that the service was no longer needed. The average number of FFT sessions was 9.1, and the average time to completion was 4.2 months.

FFP—FFP is a probation supervision model that incorporates the family-focused, strengths-based principles of FFT. FFP was delivered by probation officers (POs) who guided youth and families through three phases (Engage and Motivate, Support and Monitor, and

Generalize). FFP POs carried a maximum caseload of 20. FFP POs met with youth an average of 8 sessions, and the average time to completion was 5.9 months.

Probation Services as Usual—Youth who received standard probation supervision were assigned a PO who carried between 75–150 cases. POs were required to conduct one face-to-face contact with the youth per month, which could occur at the probation office, at school, or in the community. Additional support services that could be incorporated included school-based services, programs focused on gang membership, gender-specific services, and drug and mental health courts. Data on number of contacts and duration of standard probation supervision were not available.

2.2. Data Sources and Sample

Data were extracted from administrative data systems for juvenile justice and child welfare departments. The intervention sample was limited to youth released from Placement and receiving FFT and/or FFP between July 1, 2007 and January 1, 2012, and was divided into three groups: youth receiving FFT and standard probation (n = 524), youth receiving FFP only (n = 216), and youth receiving both FFT and FFP (FFT+FFP; n = 539). The Comparison sample consisted of: (1) all youth released from Placement during the intervention period (07/01/07-01/01/12) who did not receive FFT or FFP (n=5,992), and (2) youth released from Placement during the 2006 federal fiscal year (10/01/05-09/30/06) prior to implementation of the tested interventions (n=1,442). This yielded a total of 7,434 Comparison youth.

2.3. Propensity Score Methods

Due to the observational nature of the data, propensity score methods were used to balance the four groups (FFT, FFP, FFT+FFP, and Comparison). We used a weighting approach appropriate for multiple treatment groups, which is an extension of standard propensity score weighting methods for two treatment groups (McCaffrey et al., 2013). The goal was to weight cases so that the covariate distribution in each group matched the covariate distribution of the overall sample of adolescents. This is known as an Average Treatment Effect (ATE) weighting strategy.

Propensity score weights were generated using a set of variables expected to be related to both group membership and recidivism outcomes, including: gender, race/ethnicity (African American, Latino, White, other), age at release from current Placement, age at first arrest, age at first felony, age at first OHP, count of prior arrests, count of prior OHPs, two variables representing geographic divisions of the service area, and counts of prior petitions of various types (i.e., battery, assault w/ deadly weapon, burglary, petty theft, robbery, and vandalism). In order to estimate propensity scores relative to each of the four groups, four propensity score models were fit. For each group, an indicator variable was created to denote membership (yes or no), and a propensity score model was fit for each of the four indicator variables, estimating each adolescent's probability of belonging to each group relative to the other groups. The propensity score weight for each youth was generated from his/her estimated propensity score for the group that he/ she was truly in. For example, if a given youth was truly in the FFT group, his final propensity score weight was obtained from

the propensity score modeling membership in the FFT group. Logistic regression was used to estimate the propensity score models. Propensity score modeling was conducted in R version 2.15.2 (R Development Core Team, 2008).

Consistent with recommendations in the propensity score literature (Stuart, 2010), we performed mean imputation for all variables with missing data. For variables with greater than 5% missingness we also created a missing data indicator that was included in the propensity score model. Missing data indicators were included for the following variables: age at first OHP, age at first felony charge, and the two variables representing geographic divisions of the service area. Including missing data indicators in the propensity score model ensures that groups are also balanced on the degree of missing data (D'Agostino & Rubin, 2000; Stuart, 2010).

To assess whether the estimated propensity score weights achieved sufficient balance on covariates across groups, we considered the absolute standardized mean difference (ASMD) statistic. The ASMD statistic compares the average value for a given covariate within a given treatment group to the average value among the overall population (the population each group is weighted to; McCaffrey et al., 2013). Ideally, the ASMD value is small, indicating that a given treatment group is similar to the overall population with respect to that covariate; typically, ASMD values smaller than 0.20 are considered to indicate good balance (Cohen, 1992). For each covariate, we calculated the ASMD for each group and then assessed the maximum ASMD across the four groups. Overall, we were able to achieve sufficient balance across the four groups: after weighting, the maximum ASMD for all covariates was less than 0.20. This indicates that the propensity score weighting markedly reduced group differences with regard to demographic characteristics, prior criminal behavior, and out-of-home placement history as reflected in the propensity scores, thereby reducing confounding in our outcome analysis. Descriptive statistics for the four groups before and after weighting are shown in Table 1.

2.4. Outcome Model Analysis Plan

The outcome in this study was occurrence of a subsequent out-of-home placement (OHP) following release from Placement. Subsequent OHPs included residential camp placements, juvenile justice secured facilities, and OHPs of the same type as Placement (youth who are not a risk to the community but for whom domestic factors necessitate removal). The period of observation for OHP began the date of release from Placement and ran through October 2012, the date the data were extracted from the administrative data system. Logistic regression was used to specify discrete time survival models examining the likelihood of OHP over time following release from Placement as a function of intervention type. The propensity score weights were incorporated into all analyses as probability weights, using the Complex Samples module in SPSS 19.0 (IBM Corp, 2010). Three dummy variables were used to contrast each of the intervention groups (FFT, FFP, FFT+FFP) with the Comparison group. All models included gender and race/ethnicity because they were of substantive interest. Additionally, we included one covariate from the propensity score model (age at current release) that was the least well-balanced as a result of weighting (weighted ASMD=0.19). Including a covariate in both the propensity score model and as a

covariate in the outcome model is known as a “doubly-robust” approach and helps ensure that the covariate is adequately controlled (Lunceford & Davidian, 2004; Robins, 2000). There were no missing data for any variables in the outcome model.

Outcome models with alternative specifications of time (general specification, and first-, second-, third-, and fourth-order polynomial) were compared. Additionally, the proportional hazards assumption for the intervention dummy variables was examined by inclusion of interactions with time. Covariates with *p*-values 0.20 or smaller were retained. Tests of statistical significance were conducted using the critical value of *alpha* for two-tailed tests of 0.05.

3. Results

Given the observational nature of the data, significant differences across groups were observed prior to propensity score weighting. Specifically, youth in the Comparison group were older at their first arrest, first OHP, and release from current OHP; additionally, they had a greater number of prior arrests and prior OHPs relative to the other groups. The FFT +FFP group had a higher percentage of African American youth and lower percentages of White and Latino youth compared to the other groups. As Table 1 shows, propensity score weighting significantly improved the covariate balance across the treatment groups—after weighting the max ASMD for all covariates was less than 0.20, indicating good balance.

The maximum period of observation for OHP following release from Placement was 2,670 days (i.e., elapsed days from the earliest Placement release date to the date administrative data were extracted). The presence of a large number of ties on OHP event timing in days precluded the use of continuous time event history analysis. Because the majority of OHPs occurred during the first three years following release, time was discretized to 30-day units and the range of time was restricted to the first 36 30-day units (i.e., 1080 days, or 2.96 years after release), which accounted for approximately 57% of event/censoring times for the sample of 8,713 cases.

Weighted cumulative rates of OHP through 36 months post-release were: Comparison = 36.4%, FFT = 33.6%, FFP = 39.2%, and FFT+FFP = 38.8%. These differences were not statistically significant. Monthly observed hazard for the four groups over the first 36 months is shown in Figure 1. Across groups, the hazard of OHP was generally highest immediately following release and was lower in later months. During the first three months, youth in the three intervention groups showed lower rates of OHP than youth in the Comparison group. From month 3 to approximately month 16, youth in the three intervention groups showed generally higher rates of OHP than youth in the Comparison group, with the FFT group showing the smallest increase relative to the Comparison group. After month 16, the OHP rates for all groups converged to a similar rate.

The somewhat erratic changes in observed hazard for FFP and FFT+FFP intervention groups suggested the need for a general specification of time. It was also clear that differences between intervention groups in the hazard of OHP changed over time (i.e., the proportional hazards assumption for intervention groups was not supported). We considered a series of survival models with various time specifications, and present the results from two

models. The similarity of results from both models suggests that our results are generally robust to the modeling choice of specification of time. The model that best represented intervention group differences in hazard over time with relative parsimony consisted of a third-order polynomial representation of time and interactions of the intervention group variable with all three time components (Model 1; Table 2).

The results from Model 1 indicate that each of the treatment groups had significantly lower odds of an OHP during the first 30 days, relative to the Comparison group. Specifically, youth in FFT showed approximately a 75% reduction in the odds of an OHP (OR=0.27, $p<0.001$), youth in FFT+FFP had approximately a 60% reduction in the odds of an OHP (OR=0.38, $p<0.001$), and youth in FFP had approximately a 50% reduction in the odds of an OHP (OR=0.49, $p=0.006$), during the first month. Additionally, older youth at release were less likely to have an OHP – a one year increase in age resulted in nearly a 40% reduction in the odds of an OHP (OR=0.62, $p<0.001$). African American youth were significantly more likely to experience an OHP relative to White youth (OR=1.60, $p=0.02$).

We also observed significant intervention by time interactions in Model 1, indicating that the relative performance of the intervention groups varied over time (see Figure 2). Results indicated that linear, quadratic, and cubic effects of time all interacted significantly with intervention. OHP incidence was significantly lower in the first month following release for all three intervention groups relative to the Comparison group, with the lowest rate in the FFT group. All three groups tended to lose this advantage in the next several months, demonstrating higher OHP incidence than the Comparison group (as indicated by significant Time X Intervention OR estimates greater than 1). This trend of higher incidence in intervention groups versus the Comparison group diminished over time (as indicated by significant $Time^2$ X Intervention OR estimates less than 1).

Although Model 1 was the best fitting model when parsimony was accounted for, it only provided a test of group differences with respect to OHP hazard in a single month (in this case, the first). For all later time points, the model produced tests of group differences in trends in change over time. As an alternative, a model with a general specification of time and non-proportional hazards for the intervention group variable offered a more direct test of group differences at each month. This model (Model 2) provided an estimate of OHP hazard for the reference group at each time point, an estimate of group differences in OHP hazard at a specified month, and estimates of the extent to which intervention group differences changed from the reference month to each of the other months (Table 3).

Model 2 used a general specification of time and interactions of time with the intervention group variable, which is a large number of parameters, so the range of time was limited to the first 12 months. This was also the period in which the bulk of group differences in OHP hazard occurred. The intercept was coded at Month 3 because group differences were not significantly different from zero at that month, making it a good candidate for the reference month. Of particular interest in Model 2 are the estimates for intervention group by month, which represent estimates of change in *group differences* at a given month from group differences at the reference month. A significant estimate for an intervention group in a

given month indicates a significant change in the difference between that intervention group and Comparison from Month 3 to the month in question.

As shown in Table 3, FFT youth had a markedly lower hazard of OHP than Comparison youth in Months 1 and 2, and this difference was significantly larger than it was in the reference month (Month 3). Likewise, youth in the FFT+FFP group also had a significantly lower hazard of OHP than Comparison youth in Month 1. Youth in the FFP group also showed a lower hazard of OHP than Comparison youth at Months 1 and 2, but not by a significantly larger margin than in Month 3. As shown in Figure 3, the relative trends in OHP hazard among the groups began to change at Month 3. By Month 6, FFP youth had a significantly higher OHP hazard than Comparison, and this difference was significantly different than it was in Month 3. Similarly, the FFT+FFP group had a significantly higher hazard of OHP than Comparison youth in Month 9. Similar to Model 2, older youth had a significantly lower hazard of OHP (OR=0.68, $p<0.01$) and African American youth had a significantly higher hazard of OHP relative to White youth (OR=1.8, $p=0.01$).

The fitted survival function for OHP illustrates the cumulative effect of group differences in monthly hazard (Figure 4). Over the entire 12-month period, youth in the FFT group remained less likely to have an OHP than Comparison youth. However, by Month 6 as many FFP youth had experienced an OHP as Comparison, and by Month 9 as many FFT+FFP youth had experienced an OHP as Comparison youth.

4. Discussion and Conclusions

Functional Family Therapy (FFT) has become one of the most widely transported evidence-based family interventions (Henggeler & Sheidow, 2011) as a treatment for youth behavior problems such as conduct disorder, drug use, and criminal behavior. However, the bulk of evidence for FFT is based on efficacy studies. According to Henggeler and Sheidow, efficacy results have not been replicated in community settings absent the involvement of intervention developers. The adaptation of FFT to a probation supervision model, Functional Family Probation (FFP), has been subjected to less research, though findings are promising (Lucenko, He, Mancuso, & Felver, 2011). Furthermore, there is little evidence for effectiveness of either intervention with racial/ethnic minorities. Given the overrepresentation of minority youth in the juvenile justice system (Piquero, 2008), evaluating the effectiveness of FFT and FFP among ethnic minority samples is especially important. Thus, the purpose of this study was to test the effectiveness of FFT and FFP, both independently and in combination, at reducing subsequent out-of-home placements for youth, relative to standard probation services, when implemented in a large urban probation system serving a predominantly Latino and African American population.

Huey & Polo (2008) delineated three criteria for evidence for interventions with respect to racial/ethnic diversity: 1) whether the study was conducted among a sample comprising at least 75% racial/ethnic minorities, 2) whether the study demonstrated effectiveness among a racial/ethnic minority subsample, and 3) whether tests of moderation of treatment effectiveness comparing White and minority individuals were non-significant. In this study

we focused on the first criterion: approximately 60% of youth in our sample were Latino, nearly 30% were African American, and less than 10% were White.

Given the baseline differences in youth characteristics across treatment groups (including demographics and prior criminal history), we used propensity score weighting to balance treatment groups with respect to youth characteristics, thereby facilitating an unbiased comparison across groups. Ultimately, at the end of the 36-month outcome observation period, there were no significant differences in OHP hazard between any of the three intervention groups and Comparison -- the total percentage of youth with a subsequent OHP for the four groups was: Comparison = 36.4%, FFT = 33.6%, FFP = 39.2%, and FFT+FFP = 38.8%. Though the groups shared a common endpoint, there were potentially important differences in the patterns of change in OHP hazard over time. Specifically, occurrence of OHP was significantly lower for youth receiving FFT (FFT and FFT+FFP groups), relative to Comparison youth, during the first two months following release, but this advantage diminished by the third month. Hazard of OHP among FFP youth was also lower than for Comparison in the first month, but not significantly. The lower OHP hazard in earlier months for all three intervention groups versus Comparison youth was diminished in later months, particularly for youth receiving FFP (FFP and FFT+FFP groups). By Month 6, FFP youth had a significantly higher hazard of OHP than Comparison youth. Similarly, in Month 9, FFT+FFP youth had a significantly higher hazard of OHP than Comparison youth. For the FFT group, the initial advantage of lower OHP hazard diminished by Month 3, after which their hazard of OHP was very similar to that of Comparison youth.

One possible explanation of the diminishing effect among intervention youth is the duration of services. The average duration of FFT and FFP services in our sample was approximately 4 and 6 months, respectively. Notably, OHP hazard for the intervention groups begin peaking around 4 months, suggesting that youth may be particularly at-risk of OHP shortly after services are terminated. One limitation of our data is that we do not have individual-level data on duration of services for any of the youth in the Comparison group and for many of the intervention youth. Thus, we were unable to comprehensively examine the extent to which OHPs followed service completion. However, greater gains in prevention of OHP may be obtained by extending the duration of FFT and FFP services.

A possible explanation of the variability in OHP hazard for the FFP and FFT+FFP groups is variability in FFP implementation fidelity. Unfortunately, in this study we lacked data on FFT and FFP fidelity, so we were unable to examine this possibility. However, when presented with results, specifically the elevated OHP hazard in later months for groups receiving FFP, program staff suggested that fidelity to the FFP model may have been lacking, possibly due to greater difficulty in introducing a therapeutically-oriented model to probation officers, as opposed to the mental health clinicians who delivered FFT. Another possibility suggested by program staff was that, although FFT and FFP were introduced together, FFT was the primary focus of implementation attention and support early on, so fidelity of FFP may have been slower to develop. Inconsistent FFP fidelity could in part explain the observed variability in OHP hazard over time in the FFP groups. This hypothesis would be consistent with recent work by Sexton and Turner (2011) demonstrating the

importance of fidelity, which identified favorable effects of FFT only among interventionists with high adherence to the FFT model.

The incorporation of propensity scores in our analyses reduces the possibility that the observed group differences are due to pre-existing differences in demographic and juvenile justice involvement variables. However, as in all propensity score analyses, bias from unmeasured or omitted variables may still be present. We were limited to variables that were available in the administrative data system. Omitted variables that differ between intervention groups and are related to OHP may still confound the present findings. For example, variables such as socioeconomic status, prior maltreatment, and psychiatric diagnosis could be expected to predict OHP and may have differed significantly between intervention groups, particularly given that referral to FFT was based on judgments of the family's ability to engage in services. However, to the extent these variables are also related to the demographics and prior juvenile justice involvement variables that were included in the propensity score model, the current results are not confounded by these factors.

Notably, African American youth were at greater risk for a subsequent OHP relative to White youth. Future research on FFT and FFP should examine relative intervention effects among racial/ethnic subgroups. While it is important to have evidence that an intervention is effective overall in a racially and ethnically diverse sample, tests of racial/ethnic moderation would provide the most direct examination of the influence of race/ethnicity on intervention effectiveness (Huey & Polo, 2008). In this study, propensity scores were generated for the purpose of examining outcome differences between the four intervention groups. Examining moderation of intervention effects by race/ethnicity would require that intervention X race/ethnicity subgroups were balanced by propensity scores, and these subgroups were not sufficiently balanced in this analysis to test moderation.

Nevertheless, the findings for FFT observed here suggest positive initial effects of FFT when combined with standard probation supervision, as compared to youth receiving standard probation supervision alone. Given the over-representation of racial and ethnic minority youth in the juvenile justice system, it is important to know that FFT and other interventions for delinquent youth are effective for racial/ethnic minorities. Although there is a considerable body of evidence suggesting FFT efficacy and effectiveness, the evidence is based primarily on efficacy studies with White samples. In this study, FFT was implemented in a large public juvenile justice system which can reasonably be expected to present the gamut of implementation challenges typical of efforts to change practice within organizational and system context. Furthermore, the present evidence of effectiveness of FFT with a predominantly Latino and African American sample, in combination with prior research, adds to the promise of FFT as a mainstream intervention.

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Highlights

- Functional Family Therapy (FFT) is a widely used treatment for youth problem behaviors.
- The bulk of evidence for FFT is based on predominantly White samples.
- We examined FFT effectiveness in a predominantly Latino and African American sample.
- Relative to matched comparisons, FFT youth had fewer out-of-home placements initially.
- By 36 months, youth across all groups had similar out-of-home placement rates.

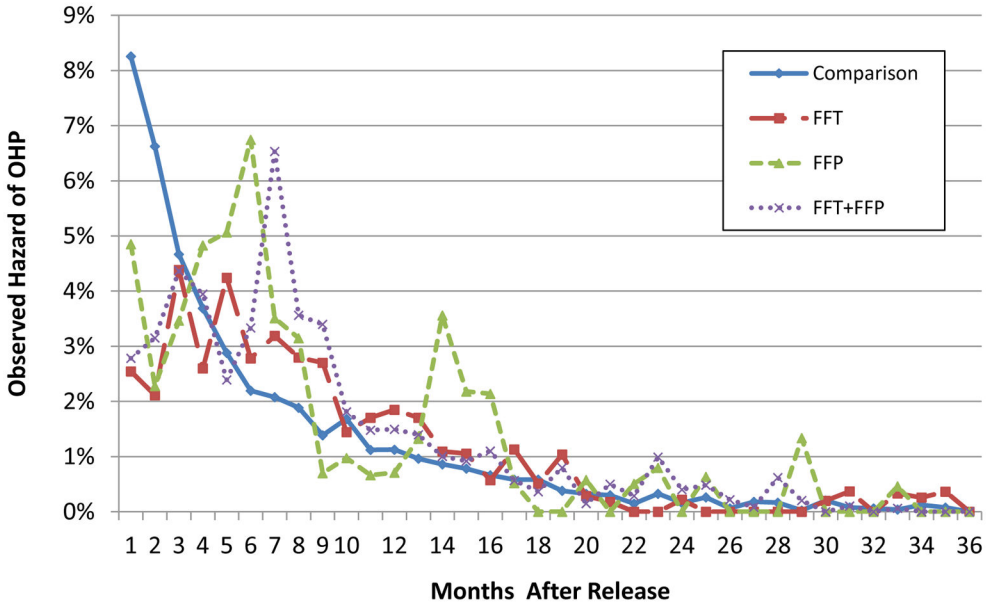

Figure 1.
Weighted observed hazard of OHP for intervention and comparison groups.

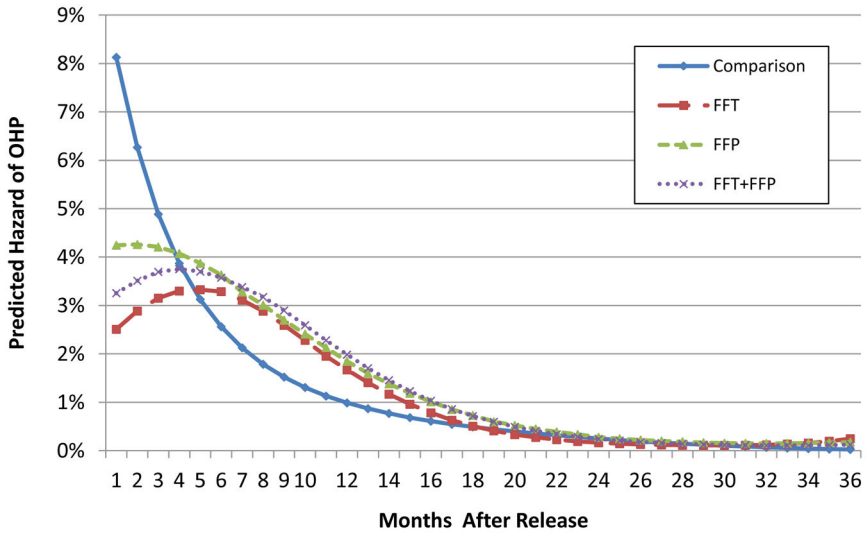

Figure 2.

Weighted predicted hazard of OHP for intervention and comparison groups based on Model 1.

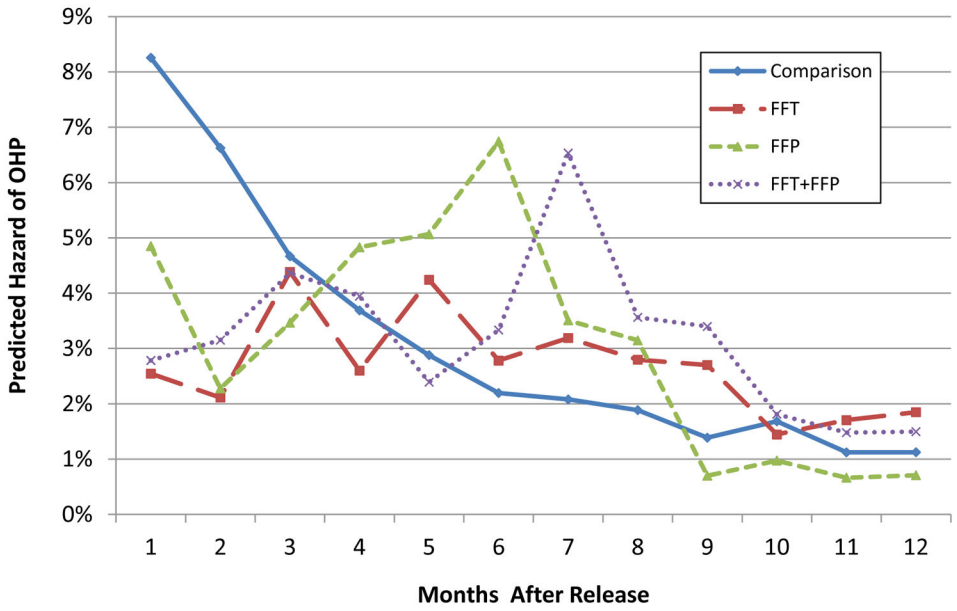

Figure 3.
Predicted hazard of OHP for intervention and comparison groups based on Model 2.

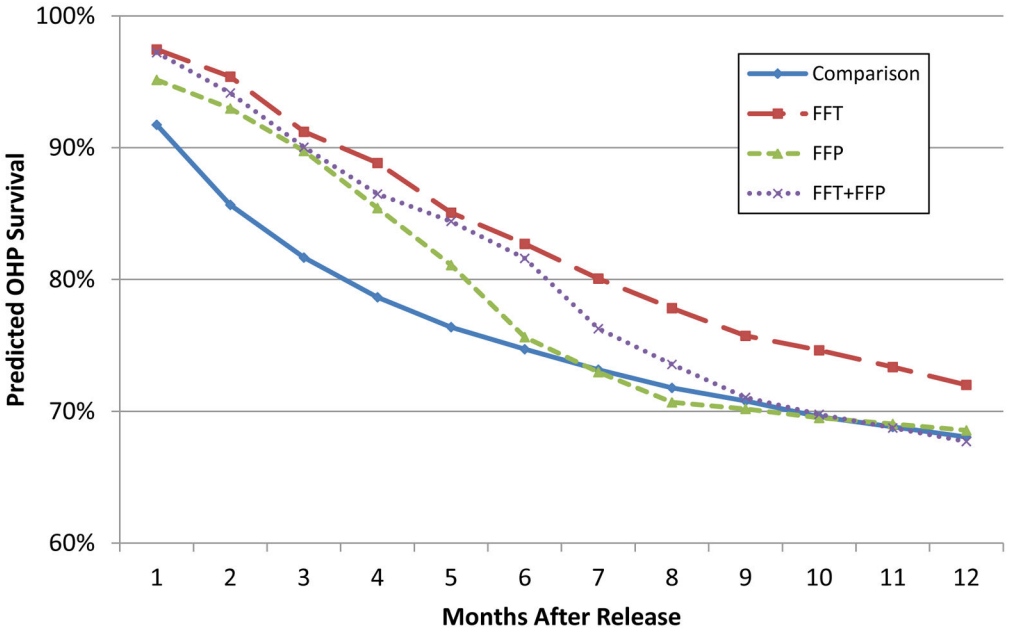

Figure 4.
Predicted OHP survival for intervention and comparison groups based on Model 2.

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Table 1

Sample characteristics for intervention and comparison groups.

	Unweighted				Weighted				Max ASMD[b]	
	FFT	**FFP**	**FFT+FFP**	**Comp.**	**FFT**	**FFP**	**FFT+FFP**	**Comp.**	**Unweig.**	**Weight.**
Number of youth	524	216	539	7,434	280[a]	161[a]	262[a]	7338[a]	--	--
Race / Ethnicity										
White	7.3%	7.4%	5.6%	8.2%	8.3%	6.7%	8.0%	7.9%	0.09	0.04
African American	24.0%	26.4%	38.6%	28.5%	29.2%	29.2%	28.0%	28.8%	0.22	0.02
Latino	65.3%	63.4%	53.4%	60.9%	59.6%	61.3%	61.1%	60.7%	0.15	0.02
Other race/ethnicity	3.4%	2.8%	2.4%	2.4%	2.9%	2.8%	2.9%	2.5%	0.06	0.03
Male	78.1%	73.6%	77.6%	78.7%	77.3%	78.8%	73.9%	78.4%	0.12	0.11
Age at current release	16.5	16.5	16.5	17.1	16.8	16.9	17.0	17.0	0.42	0.19
Age at first arrest	14.4	14.3	14.4	14.6	14.5	14.5	14.6	14.6	0.21	0.10
Age at first OHP	15.7	15.5	15.6	15.8	15.6	15.7	15.9	15.8	0.20	0.17
Age at first felony	14.7	14.6	14.7	14.9	14.7	14.8	14.9	14.9	0.22	0.11
Count of prior arrests	2.1	2.1	2.2	2.4	2.2	2.3	2.5	2.3	0.17	0.08
Count of prior OHPs	1.3	1.5	1.4	1.9	1.8	1.9	2.0	1.8	0.35	0.10
Counts of prior petitions (by type):										
Assault deadly weapon	0.15	0.20	0.19	0.17	0.20	0.15	0.19	0.17	0.07	0.07
Battery	0.17	0.20	0.19	0.21	0.22	0.21	0.28	0.20	0.07	0.17
Burglary	0.20	0.20	0.20	0.23	0.26	0.21	0.30	0.23	0.14	0.10
Petty theft	0.21	0.33	0.34	0.30	0.26	0.35	0.36	0.30	0.09	0.05
Robbery	0.17	0.19	0.14	0.19	0.16	0.18	0.18	0.18	0.10	0.12
Vandalism	0.19	0.21	0.27	0.21	0.27	0.21	0.21	0.22	0.07	0.05

[a] Effective sample sizes (McCaffrey, Ridgeway, & Morral, 2004).

[b] Maximum value of the Absolute Standardized Mean Difference among the four groups with respect to the overall population.

Table 2

Logistic regression predicting time to first OHP following release (Model 1).

	OR	95% CI for OR	p
Demographics			
Age at release (years)	0.62	[0.59, 0.65]	0.00*
Female	0.75	[0.55, 1.02]	0.06
African American (ref: White)	1.60	[1.08, 2.39]	0.02*
Latino (ref: White)	1.35	[0.91, 1.99]	0.14
Other race/ethnicity (ref: White)	1.24	[0.66, 2.31]	0.50
Group Effects			
FFT (ref: Comparison)	0.27	[0.17, 0.43]	0.00*
FFP (ref: Comparison)	0.49	[0.29, 0.81]	0.01*
FFT+FFP (ref: Comparison)	0.38	[0.24, 0.59]	0.00*
Time Effects			
Time (30-day units from release)	0.76	[1.01, 1.01]	0.00*
$Time^2$	1.01	[1.00, 1.00]	0.00*
$Time^3$	1.00	[0.59, 0.65]	0.00*
Group by Time Interactions			
FFT X Time	1.55	[1.32, 1.83]	0.00*
FFP X Time	1.35	[1.11, 1.63]	0.00*
(FFT+FFP) X Time	1.45	[1.20, 1.75]	0.00*
FFT X $Time^2$	0.97	[0.96, 0.98]	0.00*
FFP X $Time^2$	0.98	[0.96, 1.00]	0.02*
(FFT+FFP) X $Time^2$	0.98	[0.96, 0.99]	0.00*
FFT X $Time^3$	1.00	[1.00, 1.00]	0.00*
FFP X $Time^3$	1.00	[1.00, 1.00]	0.03*
(FFT+FFP) X $Time^3$	1.00	[1.00, 1.00]	0.01*

* denotes $p < 0.05$

Table 3

Logistic regression for hazard of OHP using general specification of time (Model 2).

		OR	95% CI for OR	*p*
Demographics				
Age at current release		0.68	[0.64, 0.72]	0.00*
Female		0.81	[0.57, 1.14]	0.22
African American (ref: White)		1.80	[1.13, 2.87]	0.01*
Latino (ref: White)		1.55	[0.98, 2.44]	0.06
Other race/ethnicity (ref: White)		1.37	[0.67, 2.80]	0.39
Time Effects				
Month 1 (ref: Month 3)		1.79	[1.54, 2.07]	0.00*
Month 2		1.43	[1.22, 1.67]	0.00*
Month 4		0.79	[0.66, 0.95]	0.01*
Month 5		0.62	[0.51, 0.76]	0.00*
Month 6		0.47	[0.38, 0.59]	0.00*
Month 7		0.45	[0.36, 0.57]	0.00*
Month 8		0.41	[0.33, 0.52]	0.00*
Month 9		0.30	[0.23, 0.40]	0.00*
Month 10		0.37	[0.29, 0.48]	0.00*
Month 11		0.25	[0.19, 0.33]	0.00*
Month 12		0.25	[0.19, 0.34]	0.00*
Group Effects by Month†				
Month 1 (ref: Month 3)	FFT (ref: Comparison)	0.32	[0.13, 0.80]	0.02*
	FFP	0.79	[0.23, 2.77]	0.71
	FFT+FFP	0.35	[0.16, 0.76]	0.01*
Month 2	FFT	0.33	[0.12, 0.86]	0.02*
	FFP	0.45	[0.12, 1.75]	0.25
	FFT+FFP	0.50	[0.15, 1.62]	0.25
Month 6	FFT	1.35	[0.54, 3.35]	0.52
	FFP	4.39	[1.26, 15.33]	0.02*
	FFT+FFP	1.63	[0.64, 4.15]	0.31
Month 9	FFT	2.09	[0.35, 12.49]	0.42
	FFP	0.67	[0.12, 3.89]	0.66
	FFT+FFP	2.61	[1.08, 6.30]	0.03*

*denotes $p < 0.05$

†Intervention estimates are shown only for months significantly different from the reference month.