A Quasi-experimental Evaluation of Family Centered Treatment® in the Maryland Department of Juvenile Services Community Based Non-residential Program: Child Permanency

Revised August 2021

Contact author:

Melonie B. Sullivan, PhD
Director of Research, Family Centered Treatment Foundation[a]
PO Box 225
Great Falls, VA 22066
703-757-6243
Melonie.Sullivan@familycenteredtreatment.org

Lori Snyder Bennear, PhD[b]
Assistant Professor of Environmental Economics and Policy
Nicholas School of the Environment and Earth Sciences
Duke University

[a] *The Family Centered Treatment Foundation, formerly FamiliFirst, is a non-profit agency devoted to the advancement of family preservation services. The Institute for Family Centered Services, IFCS, is the original provider of FCT. This research was originally conducted by FamiliFirst under contract to IFCS to provide its research and program evaluation services.*
[b] *Lori Snyder Bennear is an independent consultant under contract to FamiliFirst. Dr. Bennear is a renowned expert in statistical matching methods and their application to program evaluations.*

Abstract: In 2003, Maryland Department of Juvenile Services (DJS) and the provider of Family Centered Treatment® (FCT) instituted a pilot program where high-risk delinquent youth were diverted from group home programs to FCT services. Youth who would normally/usually have been removed from their family and placed in a group home setting were instead provided FCT services in their homes and community, with their family. This created a natural experiment to examine the effectiveness of FCT relative to treatment as usual in group homes. This study uses a quasi-experimental design and administrative data on MD DJS youth to examine Child Permanency outcomes of FCT. Child Permanency outcomes looked at whether the youth was placed out of home during the year following (FCT or group home) services, and the length of those out of home placements. Standard and propensity score matching methods were used to construct a comparison group. The results show that youth who went to group homes were twice as likely as those receiving FCT to be placed out of home again in the year following release from program services.

Revisions August 2021:

Since March 2021, this report has been revised as follows:

- To clarify that all model input and treatment outcome variables are measured at the individual child level.
- To redefine the outcome variables as to unambiguously show the impact of FCT treatment on child permanency: i.e., after treatment ends, the youth is either in some kind of out-of-home placement or not.
- A revised sample is used, and a new impact analysis is conducted.

1. Introduction

The *Maryland Department of Juvenile Services Non-Residential Community Based Program* supports adjudicated delinquents at risk of out-of-home placement or secure or locked detention and provides reunification services for youth returning from out-of-home placement. In support of a commitment to child permanency and child welfare, and in the face of budget cuts, a pilot program was implemented to provide Family Centered Treatment® (FCT) to adjudicated youth in their homes and communities as an alternative to costly out-of-home placements. The pilot is a diversion program; many youths who would otherwise be removed from their homes and interred in a restrictive residential setting, may instead remain in their home and receive FCT services. FCT is an intensive in-home treatment model adapted to work effectively with the specialty population of resistant delinquent youth. The overriding goal is to maintain youth in their homes and community, with their families, and divert them from further penetration into the juvenile, child welfare and/or adult systems. FCT has been recognized by the California Evidence Based Clearinghouse as a Family Stabilization Program with high Child Welfare Relevance and Promising Research Evidence.

The Annie E. Casey Foundation reported that more than 633,000 youth were living in out-of-home placements at some point in 2012 and that many of these youth did not belong in child welfare or juvenile justice placements. They ended up there because their communities had insufficient alternatives to help families resolve their conflicts or address teens' behavioral health issues. (see, e.g The Annie E. Casey Foundation, 2015). From a child welfare system perspective, studies estimate that up to 59% of first-time offenders in the juvenile justice system have a child welfare history (Halemba & Siegel, 2011).

The needs of youth in societal and multiple systems is complex. Research has shown a link between maltreatment and delinquency (Barth & Jonson-Reid, 2000; Widom, 1989). Children and youth with maltreatment histories are at twice the risk of juvenile court contact than those without (Stouthamer-Loeber, Loeber, Homish, & Wei, 2001). Once contact is made with the juvenile justice system, youth with child welfare histories are more likely to be detained for formal case processing (Conger & Ross, 2006) and are more likely to receive sanction of placement outside the home rather than probation (Ryan, Herz, Hernandez, & Marshall, 2007). The need for effective home and community interventions appears high.

The purpose of this study is to examine the impact of FCT on child permanency outcomes during the first 4.5 years of the field implementation of FCT with the population of high-risk delinquent youth in Maryland.

We use a quasi-experimental design to compare FCT treatment outcomes to those of the Group Homes from which youth receiving FCT are diverted. All youth in the FCT group are high-risk youth who would otherwise be placed in a Group Home, Therapeutic Group Home, or Committed Residential Placement (hereafter referred to as Group Homes or GH). When FCT cases are diversions from Group Homes, the two samples ("FCT youth" and "GH youth") are similar in terms of the risk factors that affect treatment outcomes. A combination of standard and propensity score matching using archival administrative data on identified risk factors is used to estimate average treatment effects.

We find that, in the first 4.5 years of implementation, the FCT program provides improved results compared to placement in Group Homes. During the first year following treatment, we find the proportion of youth in post-treatment out-of-home placements is significantly and substantially lower for youth

receiving FCT. Youth receiving Group Home services instead of FCT are twice as likely to experience another out-of-home placement in the year following their discharge from the group home.

In the following, Section 2 presents an overview of the General Treatment Model and its implementation with the MD DJS population. Section 3 presents the research design. Section 4 describes the data, the variables and their measurement, while Section 5 presents the results. Section 6 discusses possible design confounds and how this research meets conventional standards to support causal evidence. Conclusions follow in Section 7.

2. Family Centered Treatment®

2.1 General Model[1]

Family Centered Treatment® (FCT) is a model of treatment designed for use in the provision of intensive in-home services for youth and their families at especially high risk for disintegration. Treatment is conducted in natural settings (i.e., in the home, school, and/or community), and typically lasts six months, with several hours of contact in multiple sessions every week. FCT can be used with a variety of specialized need populations where the family system has been impacted and is in need of support or change.

The origins of FCT derive from practitioners' efforts to find simple, practical, and common-sense solutions for families faced with forced removal of their children from the home, or dissolution of the family, due to external and internal stressors and circumstances. The practice approach grew out of a desire and mission to create opportunities for change in families that were stuck in a downward spiral. Families served were most often those who had not responded to traditional services and, in the infancy of its practice, were referred to FCT as a "last resort."

The model was developed over a 20-year period of practice experience, and was refined based on research, experience, and client feedback. Client response and feedback were integral to defining what components of treatment are effective. Though FCT has evolved from applied success, critical components are recognizable as derivatives of major models of evidenced-based practice; the basic framework for treatment draws from components of the evidence-based models of *Eco Structural Family Therapy* (Aponte 1976, Aponte 1986, Minuchin 1981) and *Emotionally Focused Therapy* (Johnson and Greenberg 1985). While FCT is comprehensive and designed to address the operant issues of family functioning -- centering treatment on the family system -- it is also a treatment that integrates behavioral change with a primary emphasis on value change for participating family members. A fundamental premise of FCT is that long-term changes made by youth and their families are predicated upon their valuing the changes made, i.e., changes made for compliance or conformity are not sustainable after treatment ends.

Family Centered Treatment is structured into four phases:

- *Joining and Assessment*; the Family Centered Specialist (FCS) engages and gains acceptance by the family and works with them to identify areas that affect their functioning.
- *Restructuring*; the FCS and family use experiential practice to alter ineffective behavioral patterns among family members. This process includes techniques to modify the crisis cycle to more adaptive patterns of family functioning.
- *Value Change*; the emphasis on value change differentiates FCT from other

[1] This section draws heavily from Painter, Smith and Sullivan [2008].

behaviorally based methods. Through powerful emotional intervention techniques, family members integrate new behaviors into their personal value systems to create long term change. Giving to others or back to the community is integral to this phase.

- *Generalization*; with new skills for dealing with conflict and increased understanding of its own dynamics, the family continues its work, but the treatment is less intense and frequent. The focus is on practice, review of what has "worked" previously, and reversals.

These four phases provide the pattern for treatment. However, the model allows the flexibility to move back and forth between the restructuring and value change phases in order to respond to individual family dynamics. FCT practitioners transition the family from one phase of FCT into the next phase as the family demonstrates behaviors reflective of key indicators of change.

FCT practitioners must have a Master's degree in a related field, or a Bachelor's degree with 5 years of experience in a related field. They must complete The Wheels of Change© training program, which includes field training and competency evaluations. Fidelity to the treatment model and adherence to dosage standards are assured through case staffing and supervision at the team and individual levels.

A detailed exposition of the Family Centered Treatment model can be found at:

www.familycenteredtreatment.org/s/The-Definitive-Report-for-Family-Centered-Treatment-R2020-1.pdf

2.2 Implementing Family Centered Treatment in the Maryland DJS Non-Residential Community Based Program

A youth's involvement in the juvenile justice system is most often preceded by multiple factors such as: previous or current episodes of parental abuse and/or neglect; domestic violence; family history of mental illness; exposure to substance abuse; unidentified or untreated physical and/or psychological disorders; and/or a chronic lack of parental control or supervision. Youth frequently exhibit a wide variety of maladaptive behaviors, including law violations, gang involvement, school failure, excessive truancy, substance abuse, and school and community disruptions. Youth in this population may have emotional disorders and exhibit a range of behavioral problems including poor judgment, lack of self-esteem, difficulty with problem solving, and difficulty managing their anger. Family economic stressors often exacerbate an already malfunctioning system. Many of these youth are crossover youth; involved in, or at risk of being involved in, both the child welfare and juvenile justice systems.

The fundamental premise of FCT is that these eco-systemic factors can best be addressed in an intensive home-based environment with an emphasis on family systems' work to improve family functioning, to provide youth and their families' opportunities to successfully and independently function in the community at large, and to ensure the youth has no further involvement in the justice system. Strategies and interventions are provided to improve the delinquent youth's academic performance and attendance, or vocational skills and job opportunities, and to improve their level of functioning at home and in the community, enabling them to become responsible and productive members of society.

Program services include case management (assessments, development of individualized

service plans, linkages, coordination, and advocacy), supervision, group meetings, outreach services, crisis prevention/intervention services and community services. The Program is designed to maintain the youth in the community; thus, while the FCT model requires a minimum threshold of intensity and frequency of 2 multiple hour sessions per week, the level of service intensity is modified contingent upon the youth's progress. Emphasis is placed on ensuring proper linkages are made with community service providers, including community detention, electronic monitoring, substance abuse services when needed, and vocational/educational programs. Services are coordinated with mainstream community resources whenever appropriate, e.g., the Commission for Children, Youth and Families, the Department of Social Services, the Public School System, the Department of Family Services/Mental Health Authority, Maryland Health Partners, private health care and human services providers, and community organizations. All services are individualized and based on reliable assessment tools. The treatment plan is developed based on needs and desires of the family and youth, using a strengths-based model of intervention, rather than being dictated by the therapist.

FCT services are provided to youth and families across the state of Maryland from five geographically distinct regions. 100% of the qualifying referrals are accepted into the program, i.e., qualifying referrals are never refused services.

Services are expected to last 6 months, but services may be extended if need is determined by all collaterals. Cases may close early for several reasons. If treatment goals are met before the 6-month mark, there is an early successful completion of treatment and discharge. Unsuccessful early discharges occur when the family is non-compliant with services, or if the courts or an MD DJS worker remove the youth from FCT services because he/she offends early on during treatment.[2] Unsuccessful early discharges were observed in several cases in which the referred youth had a pending out-of-home placement that was unknown to the FCT provider, and the case was closed by MD DJS when the placement was affected.[3]

2.3 The Comparison Pool receives Group Home Services

The comparison pool[4] consists of all those youth assigned during the study period to one of three types of Restrictive Residential placements as defined by MD DJS[5] — Group Homes, Committed Residential Placements, or Therapeutic Group Homes.

Group Homes are licensed by the state of Maryland to provide treatment and housing for offending youth. Group Homes are considered community-based, in that most of the programs use community-based services and students attend local schools. In this sense Group Homes are similar to FCT. However, youth are separated from their family and other members of their immediate network, a key difference from the FCT model. All Group Homes provide a formal program of care, social work, health services and transition services for youth returning to their homes.

Therapeutic Group Homes (TGH) are similar to Group Homes but are licensed by the Mental

[2] It was not always understood that reoffending and acting out are natural and expected responses in the first phases of systemic change. As long as the youth is no threat to himself or community safety, it is counterproductive to remove him from FCT. (Marlatt, 2002)

[3] No attempt is made to eliminate early discharges from the analysis; this is effectively an intent-to-treat design.

[4] We will use "comparison pool" to refer to the unmatched sample of GH youth.

[5] Maryland Department of Juvenile Services *Residential Programs Sorted by Classification and Placement.*

Health Administration. Like group homes, therapeutic group homes provide a formal program of care, social work, and health services, but the emphasis in TGH is on provision of mental health services for youth who are emotionally or developmentally disabled. Most, but not all, youth in TGH continue to receive community-based ancillary services including the use of local schools. Like Group Homes, and in contrast with FCT, youth are separated from their family and immediate network and transition services for returning to the home are provided by the TGH.

The designation "Committed Residential Placement" has no meaning with respect to the level of care; it was initially formed for funding and accounting convenience but contains providers of Group Home and other restrictive residential services at that level of care. Because we are informed by Maryland DJS that FCT youth are often diverted from these types of placements, these youth are included in our comparison. Given that the level of care in this type of placement is similar to that of Group Homes, and therefore a placement for high-risk youth, these youth are a reasonable and conservative addition to the comparison pool.

All youth in the comparison pool are high-risk youth that receive a variety of services that are traditional alternatives to FCT. All youth in the FCT group are high-risk youth who would otherwise be placed in a Group Home, Therapeutic Group Home, or Committed Residential Placement (hereafter referred to as Group Homes). Therefore, the MD DJS Non-residential Community-Based program creates a natural experiment for assessing the effectiveness of FCT relative to "treatment as usual" in the restrictive residential setting.

3. Research Design

This study uses a quasi-experimental design to compare FCT treatment outcomes to the outcomes of the Group Home services identified by MD DJS as being those from which FCT youth are diverted.

A combination of standard and propensity score matching is used to estimate treatment effects on reported outcomes over the first year following treatment in FCT or discharge from group home services.[6] Model input and treatment outcome variables and their measurement are described in table 1 and in Section 4 below.

The first step in the analysis is to create the propensity score model so that an appropriate comparison group can be constructed from the larger comparison pool. The propensity score model is used to determine which children in the comparison pool were similar to FCT children and thus would make a suitable comparison group. Explanatory variables used in the propensity score model reflect the child's history with DJS and level of risk. These explanatory variables are proxies for the Maryland Department of Juvenile Services *Classification and Placement Assessment for Adjudicated Youth* (2004) or CPAAY, which is used in part to determine placements for adjudicated youth. [7]

The general selection model can be represented as:

$$y_i^* = \beta x_i + \varepsilon_i$$

where y_i^* is the probability of being placed into FCT and is not directly observed, x_i is a vector of explanatory variables, and ε_i is an error term. The

[6] Sullivan, Bennear and Painter (2008) provide a detailed exposition on using propensity score methodology to estimate treatment effects.

[7] See Appendix A for a reproduction of the documents used in the CPAAY. The scores from the record review (Figure A) map into the Classification and Placement Matrix (Table A), which suggests a placement for the youth being assessed.

observed counterpart to y_i^* is a dichotomous variable indicating whether the youth received FCT ($y_i = 1$) or treatment in a Group Home ($y_i=0$). The vector of explanatory variables are measured at the level of the individual youth and contains age at treatment intake, race, frequency and duration of out of home (OOH) placements and Detentions by category for the youth's entire history with DJS, whether or not the youth had an OOH placement the year before treatment, the number of days in OOH placements the year before treatment, the frequency of prior adjudications by offense category during the youth's entire history with DJS and for the year before treatment, and the number of offenses (arrests) the year before treatment. Section 4 and Table 1 provide detail.

FCT was provided across five geographically defined regions. *Region* is another variable that we expect is endogenous to the selection process, as community attitudes and politics may influence the decision to allow offenders to remain in the community, and local judiciary may be biased toward one type of placement relative to another. Moreover, geographical area is highly correlated with socio-economic status and other exogenous factors that can be expected to affect risk profiles and the success of treatment. For example, the Baltimore region covers the City of Baltimore, which has a higher concentration of serious juvenile offenders than other areas, and the well-documented demographic correlates of the inner-city crime "premium:" low income, low education levels, high density, high level of gang activity, etc. Finally, each region represents a different team of FCT supervisors and practitioners. For these reasons, we omit Region from the selection model and require exact matching of FCT youth with GH youth from the same region. The Maryland counties served by each region are documented in the Appendix.

Matching is implemented in STATA using the nearest-neighbor matching code (nnmatch.ado) developed by Abadie and Imbens (2001) based on their theoretical assessment of matching estimators (2008). Matching was implemented using the four closest matches for each FCT youth. The choice of four matches was done to reduce variance of the estimator without increasing the bias that might result from poor matches. To assess the robustness of estimates to matching methods, a sensitivity analysis is included which examines the results of one-to-one matching. The estimates are corrected for bias resulting from imperfect matches and robust standard errors are calculated (Abadie and Imbens 2001, 2008).

4. Data, Variables and Measures, and Summary Statistics

Data on youth demographics, offense and placement history were obtained from the Maryland Department of Juvenile Services ASSIST administrative database. The data contain a record for each service placement, offense, and adjudication event in the youth's history with MD DJS, beginning with their first referral to the juvenile system and up to events recorded on December 28, 2008, the date of the data export. Table 1A contains descriptions of the variables used as model inputs and as treatment outcomes, all measured at the individual child level. Table 1B provides details on how placement, offense and adjudication variables are constructed from the placement and offense types used in the ASSIST database.

The raw data for the treatment group (n=794) contains every youth who started and was subsequently discharged from FCT services during the pilot program period July 1, 2003 and December 31, 2007. The comparison pool consists of every youth documented by Maryland DJS as being discharged from Group Homes during the same time frame (n=1704). The data was trimmed as follows to a sample size of 313 for FCT youth and 764 for the comparison pool:

- The sample is restricted to youth aged 17 years or less at treatment/group home intake, in order to include only those youth who can be tracked through the juvenile system over a follow-up period of at least one year.[8]
- If a youth or family refused services within the first 1-3 visits or were removed from FCT by the courts or MD DJS within the first 1-3 visits, they were considered a "non-starter" and were not included in the sample.
- FCT was being provided to youth and their families in the MD DJS population before the implementation of the diversion program analyzed here, and those types of lower-risk referrals continued to occur along with higher-risk diversion referrals after the diversion program was in place. The data is not available to directly distinguish between the two types of referrals, so both the treatment group and the comparison pool are restricted to include only those youth who had any history of OOH placements prior to the start of treatment/comparison services. Limiting both the FCT group and comparison group to children with prior OOH placement(s) keeps only children likely to be considered higher-risk, and thus improves the comparability between the FCT group and the comparison group.[9]

We are interested in the impact of FCT from a child welfare perspective, focusing on the domain of Child Permanency and, more specifically, placement stability or avoidance of placement disruption for those served while remaining in their home. Outcome variables are measured "per child" and answer the following questions:

- Was the child removed from their home after discharge from the FCT or GH program services?
- How many days did the child spend out of home after discharge from the FCT or GH program services?

The Child Permanency outcome variable includes any out-of-home (OOH) placement during the year following discharge from FCT or the comparison program. OOH placements include all those in the juvenile and child welfare systems; if the youth is not in an OOH placement, he is at home. During the service period of the programs being compared, if the youth is in FCT, he is at home, and if he is in a group home, he is out of home. If a child is removed from the home while receiving FCT, he is discharged from FCT in the ASSIST database and a new placement entered with an admission date equal to the FCT release date (or the day after), and will be recorded as having an OOH placement during the follow-up period. In the measure of Permanency, OOH placements during the follow-up period may begin as early as the day of discharge from FCT or GH.

The follow-up period is measured as the first year (days 1-365) following discharge from FCT or group home services.

For the purposes of propensity score estimation and baseline equivalence analyses, data on OOH placement types are aggregated into groups according to level of care/restriction, where Group 2 placements are of the lowest level of

[8] While a significant portion of all youths treated during the study period aged out of the juvenile system, and are therefore not included in this study, we have no reason to believe that the age distribution of this sample is atypical. In other words, our results are valid estimates for the treatment effect for younger offenders who do not age out of the juvenile system in one or two years following placement. We cannot estimate treatment effects for older offenders using the existing data set.

[9] This fact was not considered in earlier analyses of this program, so it is expected there may be dissimilarities to earlier results in Sullivan, Bennear and Painter 2008 and Sullivan et al. 2012.

care/restriction and Group 5 placements are the highest level of care/restriction; table 1B provides a list of the type of programs in each placement group and measurements. Similarly, data on pre-treatment adjudications are aggregated by category of offense as defined in the MD DJS *Classification and Placement Matrix* (Appendix A), category 1 offenses being most serious and category 5 being least serious. An aggregation of offense categories into three groups is suggested by links to placement types by offense category in the matrix: category 1 adjudications; category 2 and 3 adjudications; and category 4 and 5 adjudications. Table 1B provides detail. Offense and placement variables are aggregated in this way in the matching exercise because youth with more serious offenses/more restrictive placements may be treated differently than those with less severe histories, and severity of history may be predictive of treatment success.

5. Results

5.1 Selection Model

Table 2 presents the probit estimates of the selection model discussed in Section 3, from which the propensity scores derive. The dependent variable is a binary variable indicating placement in FCT (FCT=1, GH=0). The Biracial race variable is omitted by the program (n=0 in FCT and n=4 in comparison pool), resulting in a loss of 4 observations for a sample of 1068.

Race has a positive impact on the probability of placement in FCT; Hispanics are more likely to be placed in FCT than Caucasians. The frequency of prior group 2 placements negatively impacts placement in FCT, while other OOH placements (except secure detentions) and community detentions are positive predictors of FCT placement, as are the number of days in prior group 2 and 3 placements. Youth with more days in prior type 4 and 5 placements and prior detentions of both types are less likely to be placed in FCT. Prior adjudications do not appear to predict placement in FCT vs. group homes, but the more arrests a youth had in the year preceding services, the more likely they were to be placed in GH.

5.2 Matching on Propensity Score and Region: Baseline Equivalence and Common Support

Baseline Equivalence: Tables 3A and 3B present the descriptive statistics and effect sizes (ES) on covariates for the treatment and matched comparison (GH) samples generated by the nnmatch procedure. Table 3A presents results given one match per treatment observation and Table 3B results of four matches per treatment observation (table 3B). The choice of four matches was done to reduce variance of the estimator without increasing the bias that might result from poor matches. The results of one-to-one matching are also presented to assess the robustness of estimates to matching methods. Matching is with replacement, as Abadie and Imbens (2006) have shown this produces matches of higher quality relative to matching without replacement. The estimates are corrected for bias resulting from imperfect matches and robust standard errors are calculated (Abadie and Imbens 2001, 2008).[10]

For the reader's convenience, tables 3A and 3B are color coded to show all covariates with ES>.05; all covariates with ES>.05 are coded yellow or green. Covariates coded yellow are

[10] When control "matches" are drawn for each treatment observation and these draws are done with replacement, the standard errors from traditional t-test of differences in means between the treatment and the matched control are downward biased. The sampling process essentially duplicates data for the control group giving a false sense of precision to the t-test estimates and making it more likely that the null hypothesis of no effect will be rejected even when the null hypotheses is true. The standard errors used in hypothesis tests on the matched control correctly account for the duplication in the control observations using Stata's *fweight* feature.

both statistically different across groups and have ES>.05.

Four matches per treated youth result in a group with more significant differences than with one-to-one matching. Significant differences occur with respect to race (African American and White) and history of group 3 and group 9 (secure detention) placements; treated youth have a history of more group 3 placements and days in group 3 placements, as well as days in secure detention. Treated youth also have more days in out of home placements in the year before treatment. Insignificant effect sizes greater than .05 also occur in the history of category 1 adjudications, and history of group 2, 3, 4 and 5 placements. Notably, the significant differences in risk factors are higher for the treated youth.

One-to-one matching results in significant differences in race (the proportion of African Americans is again higher in the treatment group), and the history of category 2 and 3 adjudications is significantly higher in the treated group. Most other covariates have ES>.05 under one-to-one matching, but only African American and history of category 1 and 2 adjudications are significant at p<.05.

Both matching procedures result in ES>.25 for Asian youth. This is an artifact of very small numbers: before and after matching, there are 2 Asian youth in the treatment group, and 4 in the comparison pool, reflecting 0.556% of the sample.

There is no statistical difference in propensity score for either matching procedure.

Common Support: Because FCT serves as a true alternative to Group Home placements, we expect that the two populations are relatively similar, and that good common support exists among the treatment and control groups. An examination of the distributions of the propensity score for the two groups confirms that there is adequate common support for matching to be a reasonable estimator. In Figure 1, the upper left histogram represents the distribution of the propensity score for the control group and the upper right histogram represents the distribution of the propensity score for the treatment group. [11] For common support, similar patterns in the distribution are required. For example, one does not want to observe that all treatment observations have a propensity score near one while all control observations have a propensity score near zero. In this data, the propensity score distribution for the treatment group is skewed right (more treated observations have higher propensity scores) and the distribution for the control group is skewed left (more control observations have lower propensity scores). However, there is significant overlap of the distributions, including the tails, so that adequate matches are found for observations with very high or very low values of the propensity score. This allows for reasonable matching on observable characteristics.

5.3 Child Permanency Outcomes: Restrictive Placements

The child permanency treatment outcomes measure whether the child had an OOH placement and the duration of OOH placements, where the OOH placement variable combines all types of OOH placements as defined by MD DJS and documented in the ASSIST database. These outcomes measure the stability of the in-home living situation and preservation of family relationships by the reduction of OOH placements and/or time spent in OOH placements. If a youth does not experience one of these placements in the year following his discharge from FCT or a group home, he is home with his family. If a youth is placed OOH, but the

[11] The histograms are the same for both one-to-one and four-to-one matching.

duration of those placements are reduced, child permanency is enhanced.

Because the matching methods used here do not fully balance the sample of treated and comparison youth at baseline, regression methods are used to control for differences in baseline covariates.[12] Following standards set by the *Title IV-E Prevention Services Clearinghouse* (2019), it is not clear whether all covariates with ES>.05 must be controlled, or only those that are statistically different across groups. Therefore, we present four sets of outcome estimates reflecting two matching standards (one- and four-matches per treated youth) and two matrices of covariates (either all with ES>.05 or only those significantly different with ES>.05). Outcomes are tested for the follow-up period of one year after date of release from FCT or group home services. The outcomes are (1) whether the youth was placed OOH (yes=1; no=0); (2) the number of days in an OOH placement for each youth; and (3) number of days in an OOH placement for each youth in an OOH placement.

Table 4 presents logit and OLS regression results for the 3 outcomes and 4 methods. These estimates incorporate the frequency weights resulting from the matching procedure using the Stata *fweight* option. For brevity, only the results on the treatment variable are presented in Table 4; the full models can be found in Appendix B.

Logit is used to estimate the odds ratio for an FCT youth experiencing an OOH placement in the year following release from FCT. Regardless of method, the FCT treatment has a statistically significant effect of reducing the number of OOH placements relative to the comparison group, with an odds ratio ranging from .50 to .52. These results suggest FCT reduces a youth's likelihood of being placed OOH in the year following treatment by half relative to the comparison group. Alternatively, results indicate that youth who are placed into group homes instead of FCT are twice as likely to experience a subsequent OOH placement in the year following discharge from GH services.

The results do not show a significant impact on time in OOH placements once a youth is placed out of home. There is a significant decrease in the average time spent in OOH placements for FCT youth (32 to 33 days fewer), but once the reduction in the number of OOH placements is accounted for, there is no significant difference in the length of OOH placements across the two groups.

6. Plausible Design Confounds

When treatment assignment is not random, a concern exists that there may be differences among treatment and control groups that are correlated with outcome measures. Matching on observables using either traditional matching or propensity score matching reduces but does not fully eliminate those concerns.

Matching is designed to ensure that the treatment and control groups look "alike" on observed characteristics, but a problem occurs if the treatment and control groups are so dissimilar that it is difficult to find appropriate matches. Because FCT serves as an alternative to Group Home placements for high-risk youth, we expect the two populations to be similar in those factors that affect treatment assignment and outcomes. In Section 5.2 above we show this research meets baseline equivalence and common support standards for causal inference.

Another potential confound is that there are unobservable characteristics that differ between youth assigned to FCT and youth assigned to

[12] With the exception of the Asian race variable, all baseline effect sizes are below .05 or within the statistical adjustment range of .05 < ES < .25.

Group Homes that explain the assignment to treatment and would also be correlated with subsequent outcomes. This is a difficult threat to disprove precisely because it involves hypotheses about unobservable characteristics. However, the nature of FCT is a diversion program of "last resort;" many families referred to FCT are those for whom all other services have been exhausted. FCT is not designed to treat the cream of the crop or to select only youth with, for example, particularly supportive family structures. Rather, a distinguishing characteristic of FCT is that 100% of qualifying referrals are accepted into FCT services. FCT serves as a direct substitute for Group Home services, so differences in family structure and other unobservables would not be expected among the FCT and GH groups.

Because the program studied here is a diversion from Group Homes to FCT, "refusal of offer of treatment" was identified as a potential confound when designing this study. The concern is that willingness to participate in treatment may be related to motivation or need for services, which may be related to outcomes. There was no data on responses to offers of FCT treatment, so we interviewed MD DJS managers and probation officers about how decisions about placement into FCT were being made in the field. We found it was not the case that all youth and families had their choice between FCT or Group Homes, especially in the early days of the pilot program analyzed here. Most judges, probation officers, and case managers were not familiar with FCT, or did not understand FCT, or, for example, believed in-home services threated community safety. Some staff were more likely to try something new, and some were more conservative. So, the majority of the youth in the comparison pool were in Group Homes because the courts or MD DJS personnel made that decision. Families can always refuse FCT, but there is a consequence; in this case, that the youth will be removed from the home and placed in a restrictive setting. There were some parents who were not willing to participate in FCT and preferred their child be placed out of home, but this was atypical. Moreover, if a youth was referred to FCT, the FCT practitioner would make every effort to meet with the family and introduce them to FCT. A high rate of joining with families is endemic to the FCT model, so if the family was introduced into FCT, the likelihood of refusing treatment is low. Therefore, we have no reason to believe that "refusal of offer of treatment" has a significant presence in this dataset.

Attrition is another often-cited threat to validity. In this study, every youth in the sample is followed in the same administrative dataset, over the same time period, so we have no reason to expect systematic attrition during the follow up period. Youths can't choose to leave the system; any attrition from that database is due to relocation, death, or transition into the adult system.[13] We have no reason to hypothesize that a systematic relationship exists among youth who die or relocate that would affect analysis results. Is there something about older juveniles that introduces a systematic bias between the treatment and comparison group if they are omitted? We can find no evidence to support this. If there is something about older youth that affects treatment outcomes, we can find no reason to presume that would have a systematic effect on treatment outcomes for younger youth.

We were unable to control for attrition during treatment. All youth included in the treated group did start FCT, i.e., the family agreed to begin services and the FCT practitioner did begin the first phase of treatment. But we were unable to distinguish between youth who completed services and those who were discharged early for noncompliance, refusal to continue, youth running away, etc. Assuming early discharges

[13] A youth may change his name, in which case he may be in the ASSIST database as two different observations, but we assume if this does occur that it is an insignificant proportion of the sample.

were not an issue for Group Homes (i.e., refusing to continue is not an option), we expect this may result in an underestimate of the effectiveness of FCT.

Finally, missing data is a potential confound. This study utilizes administrative data, and there are no missing values on age or gender. Four observations were dropped from the propensity score equation because there were only 4 Biracial youth in the sample and all were in the comparison group. There were nine missing values on propensity score.

7. Conclusion and Discussion

A previous analysis of this sample of youth found that FCT reduced restrictive residential placements in the juvenile justice system during the first year following treatment, but these results as presented weren't conclusive as to the impact on child permanency because the analysis looked at different OOH placement types as separate treatment outcomes. This led to an ambiguous interpretation of treatment effects because youth could move between placement types. It also didn't include foster care or other child welfare placements (as opposed to juvenile justice placements) in the measurement of outcomes. This study includes all types of OOH placements, and doesn't distinguish between different types of OOH placements in the estimation of treatment effects; the outcome examined is *all OOH placements*. The results show that youth receiving FCT are half as likely as youth receiving group home services to experience an OOH placement in the year following discharge from services.

Youth receiving FCT are receiving services in their home and community, with their families. Youth being served in group homes are taken out of their homes, away from their families. Youth served in group homes are twice as likely as those receiving FCT to experience another out of home placement in the year after their time in the group home ends.

References

Abadie, Alberto, David Drukker, Jane Leber Herr, and Guido Imbens (2001) "Implementing Matching Estimators for Average Treatment Effects in Stata" The STATA Journal 1(1):1-18.

Abadie, Alberto, and Guido W. Imbens. 2006. "Large sample properties of matching estimators for average treatment effects." Econometrica 74, no. 1:235-267.

Abadie, Alberto and Guido Imbens (2008) "Bias Corrected Matching Estimators for Average Treatment Effects" Working Paper, Harvard University and the National Bureau of Economic Research.

Aponte, HJ (1976) "The family-school interview: an eco-structural approach" *Family Process,* 15(3): 303-311.

Aponte, HJ (1986) "If I don't get simple, I cry" *Family Process* 25(4): 531-48.

Barth, R. P., & Jonson-Reid, M. (2000). Outcomes after child welfare services: Implications for the design of performance measures. *Children and Youth Services Review, 22*, 763- 787.

Blanchard, Kenneth, Carew,D. and Parisi-Carew E.(2000). *The One Minute Manager Builds High Performing Teams.* New York, New York: William Morrow and Co.

Bureau of Governmental Research, University of Maryland College Park (2004), *Maryland Department of Juvenile Services Classification and Placement Assessment for Adjudicated Youth, Training and Operations Manual.*

Conger, D., & Ross, T. (2006). Project Confirm: An outcome evaluation of a program for children in the child welfare and juvenile justice systems. *Youth Violence and Juvenile Justice, 4,* 97–115.

Dejejia, R. H. and S. Wahba (1999) "Causal Effects in Non-Experimental Studies: Re-Evaluating the Evaluation of Training Programs," *Journal of the American Statistical Association* 94: 1053-1062.

Halemba, G., & Siegel, G. (2011). *The King County (Seattle, WA) Uniting for Youth cross- system prevalence study.* Pittsburgh, PA: National Center for Juvenile Justice.

Heckman, J.J., H. Ichimura, and P. E. Todd (1997) "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme," *Review of Economic Studies* 64: 605-654.

Holland, Paul. (1986) "Statistics and Casual Inference," *Journal of the American Statistical Association,* 81: 945-970.

Johnson, S.M. and L.S. Greenburg (1985) "Differential effects of experiential and problem solving interventions in resolving marital conflict," *Journal of Consulting and Clinical Psychology* 53(2): 175-184.

Marlatt, G.Alan, Ph.D., George A. Parks, Ph.D., and Katie Witkiewitz, Ph.C. (December 2002) "Clinical Guidelines for Implementing Relapse Prevention Therapy" *Addictive Behaviors Research Center Department of Psychology, University of Washington Seattle, WA*

Maryland Department of Juvenile Services, *Standard Operating Procedures for Admissions (Certificate of Placement Process),* www.djs.state.md.us/docs/cop_standard_operating_procedures.doc

Maryland Department of Juvenile Services, *Residential Programs Sorted by Classification and Placement,* MD DJS document.

Maryland Department of Juvenile Services, *Types of Programs/Facilities,* MD DJS document.

Minuchin, S. with H. Charles Fishman. *Family Therapy Techniques*. Harvard University Press, 1981.

OPPAGA, Florida Office of Program Policy Analysis and Government Accountability, *Redirection Pilots Meet and Exceed Residential Commitment Outcomes: $5.8 Million Saved,* Report No. 07-10, February 2007.

Painter, William E. Jr., L. "Bob" Smith and Melonie Sullivan, "Definition of Institute for Family Centered Services' Family Centered Treatment," unpublished manuscript, http://www.familycenteredtreatment.com/images/stories/pdfs/FCTDefinitiveReport.pdf

Rosenbaum, P. R. and D. B. Rubin (1983) "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika*, 70: 41-45.

Ryan, J. P., Herz, D., Hernandez, P. M., & Marshall, J. M. (2007). Maltreatment and delinquency: Investigating child welfare bias in juvenile justice processing. *Children and Youth Services Review, 29*, 1035-1050.

Senge,Peter, Kleiner A., Roberts C., Ross R. and Smith, B. (1994). *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization.* Currency Bantam Doubleday.

Stouthamer-Loeber, M., Loeber, R., Homish, D. L., & Wei, E. (2001). Maltreatment of boys and the development of disruptive and delinquent behavior. *Development and Psychopathology, 13*, 941–955.

Stroul, BA and SK Goldman (1990) "Study of community-based services for children and adolescents who are severely emotionally disturbed" *Journal of the Mental Health Administration* 17(1): 61-77.

Sullivan, Melonie B., Bennear, Lori Snyder, and Painter, William Jr., "A Quasi-experimental Examination of Family Centered Treatment®: Maryland Department of Juvenile Services Community Based Non-residential Program July 1, 2003 – December 31, 2005," Institute for Family Centered Services, Inc., Richmond VA, October 2008. http://www.ifcsinc.com/fct/pro_evidence.php

The Annie E. Casey Foundation (2015) Too Many Teens Preventing Unnecessary out-of-home placements https://www.aecf.org/resources/too-many-teens/

Wells, SJ (2000) "Elements of best practice in family centered Services" School of Social Work, University of Illinois Urbana-Campaign http://cfrcwww.social.uiuc.edu/pubs/Pdf.files/fcsbest.pdf

Wilson, Sandra Joe, Price, Cristofer S., Kerns, Suzanne E. U., Dastrup, Samuel R., and Brown, Scott R., (April 2019) “Title IV-E Prevention Services Clearinghouse Handbook of Standards and Procedures, Version 1.0,” OPRE Report 2019-576

Table 1A: Description of Youth-Level Variables

Model inputs and pretests	
Youthid	Unique youth identifier
Age at intake	Age at FCT or GH admission date
Region	Maryland geographical service regions, identified by county of residence at time of FCT or GH admission
Male	=1 if male; =0 if female
AAmerican	=1if AAmerican; =0 if not AAmerican
Hispanic	=1 if Hispanic; =0 if not Hispanic
White	=1 if White; =0 if not White
Asian	=1 if Asian; =0 if not Asian
History of placements by group* (Stata name: gpjfreq_before)**	Before FCT or GH admission date, the number of placements in youth's entire history with DJS, by placement $group_j$, j=2,3,4+5,7,9
History of days in placement by group (Stata name: gpjdur_before)	Before FCT or GH admission date, the number of days in placement over entire history with DJS, by placement $group_j$, j=2,3,4+5,7,9
OOH year before treatment (Stata name=OOH_year_bt)	=1 if placed OOH during the year (365 days) before FCT or GH admission date; =0 if not placed OOH during year before FCT or GH admission date.
Number of days OOH year before program services (Stata name=OOHdur_year_bt)	Number of days in any OOH placement during the year (365 days) before FCT or GH admission date
History of adjudications by offense type* (Stata name=adj_catk_before)	Before FCT or GH admission date, the number of adjudications over entire history with DJS, by offense $type_k$, k=1, 2+3, 4+5
Adjudications in year before treatment services by offense type (Stata name=adj_catk_year_bt	Number of adjudications in year (365 days) before admission to FCT or GH services, by offense $type_k$, k=1, 2+3, 4+5
Offenses in year before services by offense type	Number of offenses (arrests) in year (365 days) before admission to FCT or GH services, by offense $type_k$, k=1, 2+3, 4+5
Outcomes	
Placed OOH (Stata name=OOH_one	=1 if placed OOH during year (365 days) following date of release from FCT or GH
Days OOH (Stata name=OOHdur_one)	For each youth, the number of days in any OOH placement(s) during year (365 days) following date of release from FCT or GH
Days OOH, conditional on placement (Stata name=OOHdur_one_cond)	For each youth with an OOH placement, the number of days in an OOY placement for the year (365 days)following date of release from FCT or GH

*****See Table 1B. ** Stata name is the variable name as found in the Stata output presented in Apprendix B.

Table 1B: Definition and Measurement of Variables

			Measurements
	Placement Groups	**Placement Types**	
Child Permanency: Restrictive Placement Type Out-of-home (OOH) placements include all in groups 2, 3, 4, 5, and 9 Pending placements included only if they are spent OOH and in custody of DJS.	Group 2: Separation from family to lowest level of care	Foster Care; Treatment Foster Care; Structured Shelter Care (group setting). Respite and other shelters included only if youth is OOH and in custody of DJS	• By individual youth • By date of admission into placement • Number of placements by group over time period • Days spent in placement over time period
	Group 3: higher level of care, typically staff secure	Alternative Living Units; Committed-Redirect; Committed-Residential; Education Program-Residential; Group Homes, Impact Programs; Therapeutic Group Homes	
	Group 4 & 5: highest level orf care, typically hardware secure	Youth Centers; Residential Treatment Centers; Substance Abuse Youth Center; Wilderness Program; Intermediate and Advanced Academies. Psychiatric Hospital and Diagnostic Units included only if they lead to custody of DJS and OOH placement.	
	Group 9: Secure Detention (SD)	Detention Center, Reformatory	
	Group 7: Community Detention (CD):	Youth remains at home with Juvenile Service Supervision	
Child Well-being: Delinquent Behavior	**Offense (Arrests): Charge of violation of the law** **Offense Categories**	**Offense Types**	• By offense date • Number of offenses by youth over time period
	Category 1	Arson 1; Assault 1; Murder; Rape1; Robbery w/deadly weapon; Sex 1,2	
	Category 2	Burglary 1; DUI; DWI; Handgun Violation; Robbery; Sex 3	
	Category 3	CS w/Intent to Distribute; Felony Theft; CDS distribution; Unauth taking of a MV; Unauth use Misdemeanor; Unauth use Felony	
	Category 4	Assault 2; Burglary 2,3; CDS Possession; Sex 4; Traffic Violation Incarcerable; Violation of Probation	
	Category 5	Alcoholic Bev Violation; Burglary 4; Disturbing Peace; Drug Paraphernalia; False Report; Malicious Destruction; Misdemeanor Theft	
	Adjudication: Court decision to adjudicate youth on offense charge **Adjudication Categories**	**Adjudication Types**	• By adjudication date • Number of adjudications by youth over time period
	By category of offense	By offense type	
Follow-up period	Year 1		First 12 months (365 days) following date of release from FCT or Group Home

Table 2: Propensity Score Models
(t-statistics in parentheses)

Probit regression	Number of obs = 1,068						
	Wald chi2(24) = 156.04						
	Prob > chi2 = 0.0000						
Log pseudolikelihood = -529.393	Pseudo R2 = 0.1794						
Treatment = 1; GH=0			Robust				
		Coefficient	std. err.	z	P>|z|	[95% conf.	interval]
age_intake		0.0725627	0.0468381	1.55	0.121	-0.0192382	0.1643637
AAmerican		0.1008207	0.1052936	0.96	0.338	-0.1055511	0.3071924
Hispanic		0.4624723	0.2061033	2.24	0.025	0.0585172	0.8664273
Biracial		0	(omitted)				
Asian		-0.2221384	0.5578303	-0.4	0.69	-1.315466	0.8711888
Male		0.0232167	0.1130177	0.21	0.837	-0.198294	0.2447273
Days OOH year before service		0.0003556	0.0010935	0.33	0.745	-0.0017876	0.0024987
OOH year before service yes/no		0.0155478	0.203851	0.08	0.939	-0.3839929	0.4150885
No. group 2 placements in history		-0.5647523	0.0858951	-6.57	<.001	-0.7331037	-0.3964009
No. group 3 placements in history		0.3529775	0.1209099	2.92	0.004	0.1159984	0.5899567
No. group 4 and 5 placements in history		0.4801799	0.2149785	2.23	0.026	0.0588298	0.9015299
No. group 7 placements in history		0.1644222	0.0560005	2.94	0.003	0.0546632	0.2741812
No. group 9 placements in history		-0.0437761	0.047181	-0.93	0.353	-0.1362491	0.0486969
Days in group 2 placements in history		0.0026679	0.0011474	2.33	0.02	0.0004191	0.0049167
Days in group 3 placements in history		0.0013273	0.0008249	1.61	0.108	-0.0002896	0.0029442
Days in group 4 and 5 placements in history		-0.0018963	0.0008328	-2.28	0.023	-0.0035286	-0.000264
Days in group 7 placements in history		-0.002531	0.0012662	-2	0.046	-0.0050127	-0.0000493
Days in group 9 placements in history		-0.009934	0.0019225	-5.17	<.001	-0.013702	-0.006166
No of category 1 adjudications in history		0.194978	0.1566233	1.24	0.213	-0.111998	0.5019539
No of category 2 and 3 adjudications in history		0.0318559	0.0710345	0.45	0.654	-0.1073691	0.1710809
No of category 3 and 4 adjudications in history		-0.0450631	0.0400754	-1.12	0.261	-0.1236094	0.0334831
No of category 1 adjudications in year before services		-0.2452338	0.2057333	-1.19	0.233	-0.6484637	0.1579961
No of category 2 and 3 adjudications in year before services		0.0324555	0.0812778	0.4	0.69	-0.1268461	0.191757
No of category 3 and 4 adjudications in year before services		-0.0003689	0.0550311	-0.01	0.995	-0.1082277	0.10749
Number of offenses year before services, all categories		-0.0198983	0.0108448	-1.83	0.067	-0.0411537	0.0013571
_cons		-1.172343	0.7715759	-1.52	0.129	-2.684604	0.3399183

Table 3: Baseline Equivalency

Table 3A: One Match per Treatment Observation

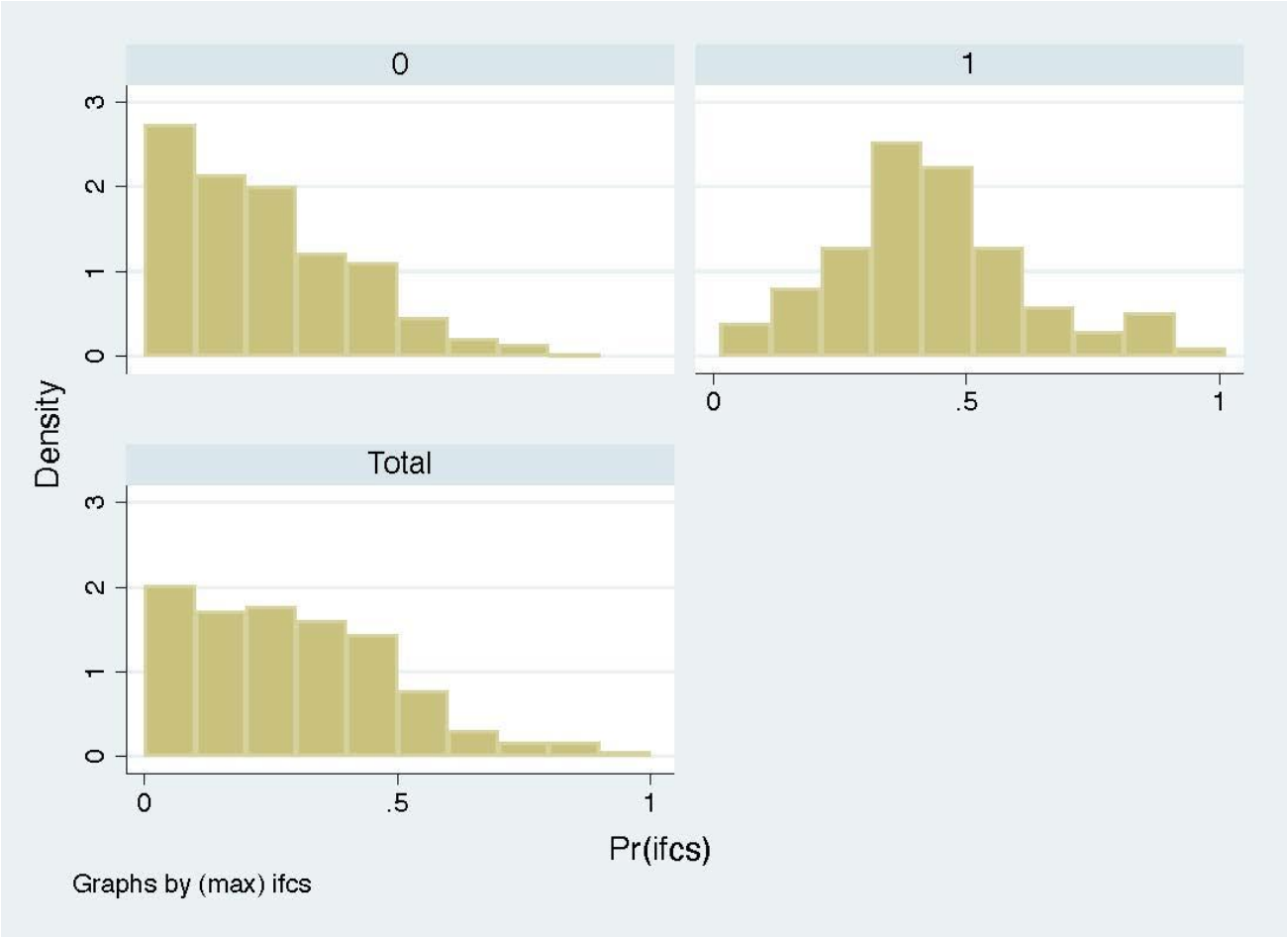
	Covariates	tx mean	tx standev	matched comparison mean	matched comparison standev	tx n	matched comparison n[a]	absolute effect size (binary) comparison n=323	absolute Hedge's g (continuous) comparison n = 323	p-values
	Propensity Score	0.4294	0.1880	0.4126	0.1699	312	323			0.240
Demographics	African Americn	0.6603		0.5820		312	323	0.202		0.042
	Asian	0.0064		0.0031		312	323	0.443		0.54
	Hispanic	0.0737		0.0960		312	323	0.175		0.31
	White	0.2596		0.3158		312	323	0.167		0.12
	Male	0.7724		0.7121		312	323	0.192		0.082
	Age at intake	15.3444	0.9455	15.3745	0.8379	312	323		0.034	0.67
Adjudication and Offense History	No of category 1 adjudications in history	0.2788	0.6282	0.2693	0.5726	312	323		0.096	0.84
	No of category 2 and 3 adjudications in history	0.3782	0.7336	0.2570	0.4516	312	323		0.055	0.012
	No of category 3 and 4 adjudications in history	0.1314	0.3745	0.1950	0.4817	312	323		0.058	0.064
	No of category 1 adjudications in year before services	0.0865	0.3339	0.0836	0.3469	312	323		0.009	0.91
	No of category 2 and 3 adjudications in year before services	0.5897	1.2673	0.5294	0.9131	312	323		0.055	0.49
	No of category 3 and 4 adjudications in year before services	1.1442	1.4239	1.2043	1.2317	312	323		0.045	0.57
	Number of offenses year before services, all categories	1.4295	1.2609	1.4706	1.4213	312	323		0.025	0.7
Placement History / Frequencies and durations	No. group 2 placements in history	1.7949	1.3065	1.7276	1.3899	312	323		0.016	0.53
	No. group 3 placements in history	17.7404	70.3804	15.4737	48.4184	312	323		0.200	0.64
	No. group 4 and 5 placements in history	59.1667	154.9440	39.1610	114.7217	312	323		0.147	0.064
	No. group 7 placements in history	29.1058	99.5549	43.0960	137.4258	312	323		0.031	0.14
	No. group 9 placements in history	47.4006	47.3674	51.1362	52.4858	312	323		0.050	0.35
	Days in group 2 placements in history	32.6859	33.6481	30.5820	29.4164	312	323		0.038	0.4
	Days in group 3 placements in history	0.1763	0.5418	0.1300	0.4116	312	323		0.147	0.23
	Days in group 4 and 5 placements in history	0.5897	1.2673	0.5294	0.9131	312	323		0.116	0.49
	Days in group 7 placements in history	1.9583	1.8431	2.0619	1.7327	312	323		0.075	0.47
	Days in group 9 placements in history	4.5994	5.4540	4.4830	3.9266	312	323		0.067	0.76
	Days OOH year before service	90.0449	106.3240	83.1486	91.0381	312	323		0.070	0.38
	OOH year before service yes/no	0.8880		0.8980		312	323	0.0635		0.68
	ES>.05									
	ES>.05 and groups are significantly different p<.05									

[a] Size of the comparison group is slightly greater than the treatment group because of the way the nnmatch procedure treats ties; if more than one youth in the comparison pool has the same propensity score and region as a treated youth, the procedure will use all matches as opposed to arbitratily throwing out observations.

Table 3B: Four Matchs per Treatment Observation[a]

	Covariates	tx mean	tx standev	matched comparison mean	matched comparison standev	tx n	matched comparison n	absolute effect size (binary) comparison n=1249	absolute Hedge's g (continuous) comparison n = 1249	p-values
	Propensity Score	0.4294	0.1880	0.4124	0.1602					0.11
Demographics	African American	0.6600		0.5860		312	1250	0.193		0.02
	Asian	0.0060		0.0030		312	1250	0.423		0.41
	Hispanic	0.0740		0.0780		312	1250	0.034		0.82
	White	0.2600		0.3300		312	1250	0.207		0.02
	Male	0.7720		0.7510		312	1250	0.071		0.43
	Age at intake	15.3444	0.9455	15.3020	0.9045	312	1250		0.046	0.46
Adjudication and Offense History	No of category 1 adjudications in history	0.1763	0.5418	0.1344	0.4229	312	1250		0.093	0.14
	No of category 2 and 3 adjudications in history	0.5897	1.2673	0.6064	1.2341	312	1250		0.013	0.83
	No of category 3 and 4 adjudications in history	1.9583	1.8431	1.9696	1.6607	312	1250		0.007	0.92
	No of category 1 adjudications in year before services	0.0865	0.3339	0.0768	0.3107717	312	1250		0.030	0.63
	No of category 2 and 3 adjudications in year before services	0.5897	1.2673	0.6064	1.234138	312	1250		0.013	0.08
	No of category 3 and 4 adjudications in year before services	1.1442	1.4239	1.2024	1.222878	312	1250		0.044	0.49
	Number of offenses year before services, all categories	4.5994	5.4540	4.6768	4.3096	312	1250		0.017	0.79
Placement History / Frequencies and durations	No. group 2 placements in history	0.2788	0.6282	0.2848	0.6060	312	1250		0.010	0.88
	No. group 3 placements in history	0.3782	0.7336	0.2704	0.4620	312	1250		0.204	0.001
	No. group 4 and 5 placements in history	0.1314	0.3745	0.1560	0.4334	312	1250		0.058	0.36
	No. group 7 placements in history	1.4295	1.2609	1.4736	1.3522	312	1250		0.033	0.6
	No. group 9 placements in history	1.7949	1.3065	1.7008	1.3029	312	1250		0.072	0.25
	Days in group 2 placements in history	17.7404	70.3804	13.7960	39.4327	312	1250		0.083	0.19
	Days in group 3 placements in history	59.1667	154.9440	33.4464	92.2008	312	1250		0.239	<0.001
	Days in group 4 and 5 placements in history	29.1058	99.5549	35.2384	123.1427	312	1250		0.052	0.41
	Days in group 7 placements in history	47.4006	47.3674	47.7848	50.5775	312	1250		0.008	0.9
	Days in group 9 placements in history	32.6859	33.6481	28.9144	27.4487	312	1250		0.131	0.039
	Days OOH year before service	90.0449	106.3240	77.4176	86.5653	312	1250		0.139	0.028
	OOH year before service yes/no	0.8878	0.3161	0.8848	0.3194	312	1250	0.018		0.88
	ES>.05									
	ES>.05 and groups are significantly different p<.05									

Figure 1A: Common Support, Year One Following Treatment



(0 refers to distribution of propensity scores for comparison group, 1 refers to distribution for treatment group.)

Table 4: FCT Treatment Outcomes for one year following discharge from services with sensitivity analysis over matching methods and models of statistical adjustment

Logit regression: dependent variable Placed OOH = 1

Matching method; estimation model	Treatment mean		Matched Comparison mean		odds ratio	S.E.	z	P>|z|	[95% conf.	interval	n
1 match; covariates SE>.05	0.587		0.715		0.522	0.095	-3.570	0.000	0.384	0.659	632.000
1 match; covariates SE.>05 and significant					0.503	0.089	-3.900	0.000	0.356	0.710	635.000
4 matches; covariates SE>.05	0.587		0.717		0.503	0.069	-4.980	0.000	0.384	0.659	1562.000
4 matches; covariates SE.>05 and significant					0.522	0.070	-4.820	0.000	0.401	0.680	1562.000

OLS Regression: Dependent variable Days in OOH placement conditional on being placed

Matching method; estimation model	Treatment mean	Treatment S.E.	Comparison mean	Comparison S.E.	Coef	S.E.	t	P>|t|	[95% conf.	interval	n
1 match; covariates SE>.05	91.670	119.625	121.502	123.482	-14.955	11.440	-1.310	0.192	-37.445	7.535	416.000
1 match; covariates SE.>05 and significant					-14.877	11.459	-1.300	0.195	-37.402	7.649	416.000
4 matches; covariates SE>.05	91.670	119.625	122.400	127.723	-14.021	9.485	-1.480	0.140	-32.633	4.591	1083.000
4 matches; covariates SE.>05 and significant					-13.424	9.511	-1.410	0.158	-32.086	5.238	1083.000

OLS Regression: Dependent variable Days in OOH placement

Matching method; estimation model	Treatment mean	Treatment S.E.	Comparison mean	Comparison S.E.	Coef	S.E.	t	P>|t|	[95% conf.	interval	n
1 match; covariates SE>.05	154.600	120.022	169.892	114.412	-32.023	9.543	-3.360	0.001	-50.765	-13.282	635.000
1 match; covariates SE.>05 and significant					-33.123	9.573	-3.460	0.001	-51.921	-14.325	635.000
4 matches; covariates SE>.05	154.600	120.022	170.379	120.545	-32.556	7.857	-4.140	0.000	-47.968	-17.144	1562.000
4 matches; covariates SE.>05 and significant					-31.580	7.915	-3.990	0.000	-47.106	-16.054	1562.000

Appendix A

Maryland Service Regions

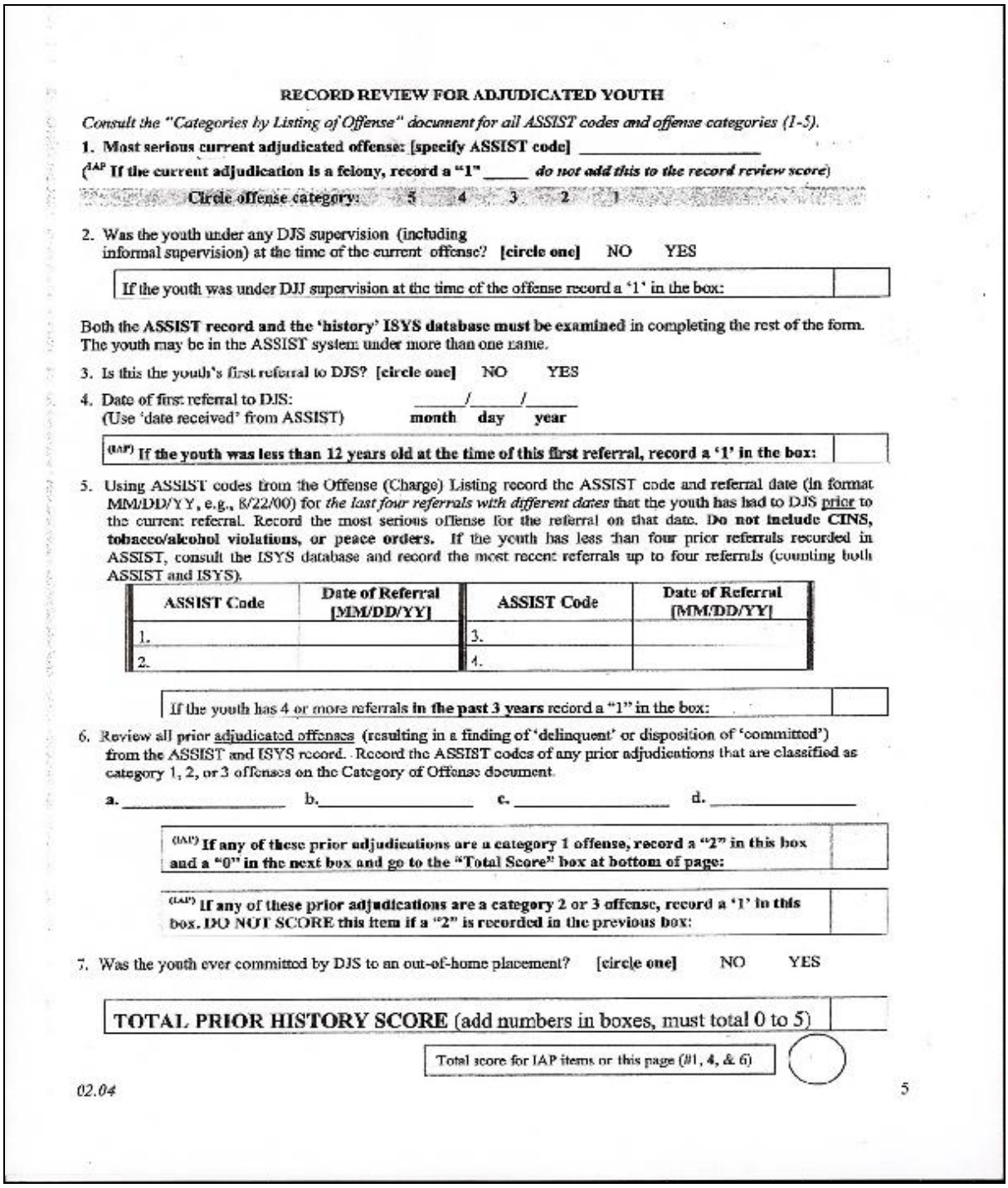
There are five geographically distinct Maryland regions; Baltimore, Montgomery, Southern Maryland, South Mountain, and Tri-County. Counties served by each region are as follows:

Baltimore	Montgomery	Southern Maryland	South Mountain	Tri-County
Anne Arundel[14] Baltimore City Baltimore County Cecil County Harford County Howard County Somerset County Wicomico County	Montgomery County	Prince George's County	Allegany County Carroll County Frederick County Washington County	Calvert County Charles County St. Mary's County

[14] Anne Arundel County is shared by the Baltimore Region (north part of the county) and the Southern Maryland Region (southern part of the county). The data on county of residence does not allow for identification of residence beyond the county level, so all Anne Arundel youth are assigned to the Baltimore Region.

Figure A: Record Review for Adjudicated Youth

Source: Bureau of Governmental Research, University of Maryland College Park (2004), *Maryland Department of Juvenile Services Classification and Placement Assessment for Adjudicated Youth, Training and Operations Manual*, Appendix A, p. 5.



RECORD REVIEW FOR ADJUDICATED YOUTH

Consult the "Categories by Listing of Offense" document for all ASSIST codes and offense categories (1-5).

1. **Most serious current adjudicated offense: [specify ASSIST code]** _____

(IAP **If the current adjudication is a felony, record a "1"** _____ ***do not add this to the record review score***)

Circle offense category: 5 4 3 2 1

2. Was the youth under any DJS supervision (including informal supervision) at the time of the current offense? **[circle one]** NO YES

If the youth was under DJJ supervision at the time of the offense record a '1' in the box:	

Both the **ASSIST record and the 'history' ISYS database must be examined** in completing the rest of the form. The youth may be in the ASSIST system under more than one name.

3. Is this the youth's first referral to DJS? **[circle one]** NO YES

4. Date of first referral to DJS: _____/_____/_____
(Use 'date received' from ASSIST) **month day year**

(IAP) **If the youth was less than 12 years old at the time of this first referral, record a '1' in the box:**	

5. Using ASSIST codes from the Offense (Charge) Listing record the ASSIST code and referral date (in format MM/DD/YY, e.g., 8/22/00) for *the last four referrals with different dates* that the youth has had to DJS prior to the current referral. Record the most serious offense for the referral on that date. **Do not include CINS, tobacco/alcohol violations, or peace orders.** If the youth has less than four prior referrals recorded in ASSIST, consult the ISYS database and record the most recent referrals up to four referrals (counting both ASSIST and ISYS).

ASSIST Code	Date of Referral [MM/DD/YY]	ASSIST Code	Date of Referral [MM/DD/YY]
1.		3.	
2.		4.	

If the youth has 4 or more referrals **in the past 3 years** record a "1" in the box:	

6. Review all prior adjudicated offenses (resulting in a finding of 'delinquent' or disposition of 'committed') from the ASSIST and ISYS record. Record the ASSIST codes of any prior adjudications that are classified as category 1, 2, or 3 offenses on the Category of Offense document.

a. _____ b. _____ c. _____ d. _____

(IAP) **If any of these prior adjudications are a category 1 offense, record a "2" in this box and a "0" in the next box and go to the "Total Score" box at bottom of page:**	

(IAP) **If any of these prior adjudications are a category 2 or 3 offense, record a '1' in this box. DO NOT SCORE this item if a "2" is recorded in the previous box:**	

7. Was the youth ever committed by DJS to an out-of-home placement? **[circle one]** NO YES

TOTAL PRIOR HISTORY SCORE (add numbers in boxes, must total 0 to 5)	

Total score for IAP items on this page (#1, 4, & 6) ( )

02.04 5

Table A: Classification and Placement Matrix

Category of Current Adjudicated Offense	History Score	Assessment Score		
		Low (<=2)	Moderate (3-6)	High (>=7)
Category 1: Arson 1; Assault 1; Murder; Rape 1, 2; Robbery w/a Deadly Weapon; Sex 1,2	2-5	Secure Confinement	Secure Confinement	Secure Confinement
	0-1	Special Program	Secure Confinement	Secure Confinement
Category 2: Burglary 1; DUI; DWI; Handgun Violation; Robbery; Sex 3	2-5	C-B Residential	Special Program	Secure Confinement
	0-1	Standard Probation Intensive or C-B Residential	C-B Residential	Special Program
Category 3: CS w/Intent to Distribute; Felony Theft; CDS distribution; Unauth. Taking of a MV; Unauth. Use misdemeanor; Unauth. Use Felony	2-5	Standard Probation Intensive or C-B Residential	C-B Residential	Special Program
	0-1	Standard Probation High or Intensive	Standard Probation Intensive	C-B Residential
Category 4: Assault 2; Burglary 2, 3; CDS Possession; Sex4; Traffic Violation Incarcerable; VOP	2-5	Standard Probation Moderate	Standard Probation High	Standard Probation High
	0-1	Standard Probation Low	Standard Probation Moderate	Standard Probation Moderate
Category 5: Alcoholic Bev. Violation; Burglary 4; Disturbing Peace; Drug Paraphernalia; False Report; Malicious Destruction; Misdemeanor Theft	2-5	Standard Probation Low	Standard Probation Moderate	Standard Probation Moderate
	0-1	Standard Probation Low	Standard Probation Moderate	Standard Probation Moderate

Source: Bureau of Governmental Research, University of Maryland College Park (2004), *Maryland Department of Juvenile Services Classification and Placement Assessment for Adjudicated Youth, Training and Operations Manual*, Appendix A, p. 12.

Appendix B: Statistical Adjustment Models
(See Table 1B for variable definitions by Stata name)

B1: One-to-one match
Impact analysis controlling for all covariates with .05 < effect size < .25

Dependent variable: Placed OOH = 1

Logistic regression — Number of obs = 632; LR chi2(17) = 76.02; Prob > chi2 = 0.0000; Log likelihood = -371.0523; Pseudo R2 = 0.0929

OOH_one	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
FCT	.5221664	.0949841	-3.57	0.000	.3655713	.7458403
AAmerican	.000011	.0061067	-0.02	0.984	0	.
Asian	(omitted)					
Hispanic	.0000189	.0104747	-0.02	0.984	0	.
White	9.81e-06	.0054392	-0.02	0.983	0	.
male	1.833666	.3715347	2.99	0.003	1.232682	2.727655
gp3freq_be~e	1.050945	.2199368	0.24	0.812	.6973401	1.583855
gp4_5freq_~e	.9228866	.3523763	-0.21	0.834	.4366594	1.950535
gp3dur_bef~e	1.000715	.001083	0.66	0.509	.9985944	1.00284
gp4_5dur_b~e	1.000377	.0014289	0.26	0.792	.9975806	1.003182
gp7dur_bef~e	1.000933	.0019734	0.47	0.636	.9970724	1.004808
gp9dur_bef~e	1.00616	.0034506	1.79	0.073	.9994191	1.012945
OOHdur_yea~t	.9987565	.0014914	-0.83	0.405	.9958377	1.001684
prop_OOH_y~t	1.531418	.5128702	1.27	0.203	.7943784	2.952298
adj_cat1_b~e	.9676396	.1930163	-0.16	0.869	.6545207	1.430553
adj_cat2_3~e	1.14213	.149244	1.02	0.309	.8840718	1.475514
adj_cat4_5~e	1.333075	.0888178	4.31	0.000	1.169883	1.519032
adj_cat2_3~t	.9588119	.1501226	-0.27	0.788	.7054391	1.303189

Dependent variable: Days in OOH placement conditional on being placed OOH

Source	SS	df	MS		
Model	502245.979	18	27902.5544	Number of obs	= 416
Residual	5183082.55	397	13055.6236	F(18, 397)	= 2.14
				Prob > F	= 0.0046
Total	5685328.53	415	13699.5868	R-squared	= 0.0883
				Adj R-squared	= 0.0470
				Root MSE	= 114.26

OOHdur_one~d	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
FCT	-14.95512	11.43957	-1.31	0.192	-37.44483	7.534587
AAmerican	146.0686	114.7955	1.27	0.204	-79.61445	371.7516
Asian	165.8158	133.8829	1.24	0.216	-97.39238	429.0239
Hispanic	166.2192	116.0525	1.43	0.153	-61.93507	394.3734
White	192.6358	115.1115	1.67	0.095	-33.6685	418.94
male	24.59902	14.50379	1.70	0.091	-3.914819	53.11285
gp3freq_be~e	13.82044	11.88124	1.16	0.245	-9.537576	37.17845
gp4_5freq_~e	-5.184452	19.73413	-0.26	0.793	-43.9809	33.612
gp3dur_bef~e	-.0068254	.0541507	-0.13	0.900	-.1132834	.0996325
gp4_5dur_b~e	-.0264686	.0949543	-0.28	0.781	-.2131447	.1602076
gp7dur_bef~e	.3164693	.1156836	2.74	0.007	.0890403	.5438984
gp9dur_bef~e	-.1976812	.199986	-0.99	0.324	-.5908451	.1954827
OOHdur_yea~t	.1447068	.103456	1.40	0.163	-.0586834	.3480969
prop_OOH_y~t	2.793221	23.84049	0.12	0.907	-44.07617	49.66261
adj_cat1_b~e	.8519757	11.62058	0.07	0.942	-21.99359	23.69755
adj_cat2_3~e	-15.3988	7.159881	-2.15	0.032	-29.47482	-1.322778
adj_cat4_5~e	.1095084	3.239884	0.03	0.973	-6.259966	6.478983
adj_cat2_3~t	21.63681	8.595552	2.52	0.012	4.738316	38.5353
_cons	-35.75411	117.7063	-0.30	0.761	-267.1598	195.6515

Dependent variable: Days in OOH placement

```
      Source |       SS       df       MS              Number of obs =     635
-------------+------------------------------           F( 18,   616) =    3.55
       Model |  894046.844    18  49669.2691           Prob > F      =  0.0000
    Residual |  8607432.72   616  13973.1051           R-squared     =  0.0941
-------------+------------------------------           Adj R-squared =  0.0676
       Total |  9501479.57   634  14986.5608           Root MSE      =  118.21
```

OOHdur_one	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
FCT	-32.02337	9.543357	-3.36	0.001	-50.76483	-13.28191
AAmerican	112.4607	118.5934	0.95	0.343	-120.4357	345.3572
Asian	195.7438	137.7173	1.42	0.156	-74.7085	466.1962
White	135.9484	118.7717	1.14	0.253	-97.29799	369.1949
Hispanic	137.4028	119.519	1.15	0.251	-97.31128	372.1168
male	34.52484	11.22211	3.08	0.002	12.48661	56.56307
gp3freq_be~e	13.98126	10.60328	1.32	0.188	-6.841701	34.80422
gp4_5freq_~e	-8.276774	17.33558	-0.48	0.633	-42.32079	25.76724
gp3dur_bef~e	.0145275	.0509421	0.29	0.776	-.0855137	.1145688
gp4_5dur_b~e	-.0085465	.0746365	-0.11	0.909	-.1551193	.1380263
gp7dur_bef~e	.2603672	.1010939	2.58	0.010	.0618367	.4588977
gp9dur_bef~e	.0451163	.1714692	0.26	0.793	-.2916188	.3818514
OOHdur_yea~t	.0517077	.0799361	0.65	0.518	-.1052725	.2086879
prop_OOH_y~t	15.82781	18.0639	0.88	0.381	-19.64649	51.3021
adj_cat1_b~e	-2.20269	10.08611	-0.22	0.827	-22.01001	17.60463
adj_cat2_3~e	-9.406833	6.512283	-1.44	0.149	-22.1958	3.382136
adj_cat4_5~e	7.762916	2.906578	2.67	0.008	2.054913	13.47092
adj_cat2_3~t	14.92878	7.668194	1.95	0.052	-.1301888	29.98775
_cons	-76.11616	120.1434	-0.63	0.527	-312.0564	159.8241

B2: One-to-one match
Impact analysis controlling only for covariates with significant differences across groups

Dependent variable: Placed OOH = 1

```
Logistic regression                             Number of obs   =        635
                                                LR chi2(7)      =      44.37
                                                Prob > chi2     =     0.0000
Log likelihood = -388.16334                     Pseudo R2       =     0.0541
```

OOH_one | Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
FCT	.5029334	.0886543	-3.90	0.000	.3560125	.7104861
AAmerican	.9414653	.1710808	-0.33	0.740	.6593652	1.344258
male	2.054665	.4010694	3.69	0.000	1.40148	3.012278
gp3freq_be~e	1.135525	.2289133	0.63	0.528	.7648937	1.685748
gp3dur_bef~e	1.00073	.0009637	0.76	0.449	.9988429	1.00262
gp9dur_bef~e	1.009425	.0031831	2.97	0.003	1.003205	1.015683
OOHdur_yea~t	.9983569	.0010121	-1.62	0.105	.9963753	1.000342

Dependent variable: Days in OOH placement conditional on being placed

```
      Source |       SS       df       MS              Number of obs =     416
-------------+------------------------------           F(  7,   408) =    2.66
       Model |  247864.226     7  35409.1751           Prob > F      =  0.0107
    Residual |   5437464.3   408  13327.1184           R-squared     =  0.0436
-------------+------------------------------           Adj R-squared =  0.0272
       Total |  5685328.53   415  13699.5868           Root MSE      =  115.44

------------------------------------------------------------------------------
OOHdur_one~d |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |  -14.87672   11.45864    -1.30   0.195    -37.40206    7.648619
   AAmerican |  -36.54748   11.97952    -3.05   0.002    -60.09676   -12.99821
        male |   29.73741   14.43636     2.06   0.040     1.358484    58.11633
gp3freq_be~e |   16.85172   11.67553     1.44   0.150    -6.099989    39.80343
gp3dur_bef~e |  -.0046005   .0500771    -0.09   0.927    -.1030419    .0938408
gp9dur_bef~e |  -.1370239   .1886127    -0.73   0.468    -.5077979      .23375
OOHdur_yea~t |   .0620282   .0746227     0.83   0.406    -.0846649    .2087212
       _cons |   163.0709   15.09084    10.81   0.000     133.4054    192.7364
------------------------------------------------------------------------------
```

Dependent variable: Days in OOH Placement

```
      Source |       SS       df       MS              Number of obs =     635
-------------+------------------------------           F(  7,   627) =    5.55
       Model |  554290.797     7  79184.3995           Prob > F      =  0.0000
    Residual |  8947188.77   627  14269.8385           R-squared     =  0.0583
-------------+------------------------------           Adj R-squared =  0.0478
       Total |  9501479.57   634  14986.5608           Root MSE      =  119.46

------------------------------------------------------------------------------
  OOHdur_one |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |  -33.12293   9.572568    -3.46   0.001    -51.92111   -14.32476
   AAmerican |  -25.11441   9.976342    -2.52   0.012     -44.7055   -5.523321
        male |   40.91771   11.16562     3.66   0.000     18.99117    62.84426
gp3freq_be~e |   17.09016   10.49407     1.63   0.104    -3.517625    37.69794
gp3dur_bef~e |   .0233833   .0479783     0.49   0.626    -.0708343    .1176008
gp9dur_bef~e |   .2164142   .1624837     1.33   0.183    -.1026639    .5354924
OOHdur_yea~t |  -.0303679   .0572585    -0.53   0.596    -.1428097    .0820738
       _cons |   97.58213   12.22377     7.98   0.000     73.57765    121.5866
------------------------------------------------------------------------------
```

B3: Four matches per FCT youth
Impact analysis controlling for all covariates with .05 < effect size < .25

Dependent variable: Placed OOH = 1

```
Logistic regression                               Number of obs   =       1562
                                                  LR chi2(13)     =     129.40
                                                  Prob > chi2     =     0.0000
Log likelihood = -901.35465                       Pseudo R2       =     0.0670

------------------------------------------------------------------------------
OOH_one | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |   .5030294    .069445    -4.98   0.000     .3837797     .659333
   AAmerican |   .3936149   .0967335    -3.79   0.000     .2431549    .6371769
       Asian |   .3870184   .3629083    -1.01   0.311     .0615967    2.431676
       White |   .4841025   .1228705    -2.86   0.004     .2943697    .7961255
gp3freq_be~e |    1.03633   .1673319     0.22   0.825     .7551929    1.422125
gp4_5freq_~e |    1.00839   .2355623     0.04   0.971     .6379487    1.593937
gp9freq_be~e |   1.587149   .1100125     6.66   0.000     1.385534    1.818103
gp2dur_bef~e |   .9991701   .0014323    -0.58   0.562     .9963668    1.001981
gp3dur_bef~e |   1.000758   .0008638     0.88   0.380     .9990663    1.002452
gp4_5dur_b~e |   .9982608   .0009733    -1.79   0.074     .9963549     1.00017
gp9dur_bef~e |   .9970952   .0029924    -0.97   0.332     .9912475    1.002977
OOHdur_yea~t |   1.000677   .0012895     0.53   0.599     .9981533    1.003208
adj_cat1_b~e |   1.448593   .2112884     2.54   0.011     1.088409    1.927972
------------------------------------------------------------------------------
```

Dependent variable: Days in OOH placement conditional on being placed

```
      Source |       SS       df       MS              Number of obs =    1083
-------------+------------------------------           F( 13,  1069) =    6.76
       Model |  1194796.17    13  91907.3973           Prob > F      =  0.0000
    Residual |  14528282.2  1069  13590.5353           R-squared     =  0.0760
-------------+------------------------------           Adj R-squared =  0.0648
       Total |  15723078.4  1082  14531.4957           Root MSE      =  116.58

------------------------------------------------------------------------------
OOHdur_one~d |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |    -14.021   9.485163    -1.48   0.140    -32.63265    4.590653
   AAmerican |   28.21975   13.05225     2.16   0.031     2.608817    53.83068
       Asian |   33.58169   60.57076     0.55   0.579    -85.26937    152.4328
       White |   77.38285    13.7284     5.64   0.000     50.44518    104.3205
gp3freq_be~e |   21.97067   8.889281     2.47   0.014     4.528251    39.41309
gp4_5freq_~e |  -12.40288   12.53761    -0.99   0.323    -37.00401    12.19824
gp9freq_be~e |  -.7093344   3.529367    -0.20   0.841    -7.634607    6.215938
gp2dur_bef~e |   .2784855   .1064388     2.62   0.009     .0696327    .4873383
gp3dur_bef~e |  -.0718487   .0414497    -1.73   0.083    -.1531806    .0094832
gp4_5dur_b~e |  -.0419066   .0656124    -0.64   0.523    -.1706503    .0868372
gp9dur_bef~e |   .1443484    .178413     0.81   0.419     -.205731    .4944279
OOHdur_yea~t |   .1006292   .0864057     1.16   0.244    -.0689148    .2701733
adj_cat1_b~e |  -6.286711   7.518964    -0.84   0.403    -21.04031    8.466891
       _cons |   114.0575   13.23168     8.62   0.000     88.09452    140.0206
------------------------------------------------------------------------------
```

Dependent variable: Days in OOH placement

```
      Source |       SS       df       MS              Number of obs =    1562
-------------+------------------------------           F( 13,  1548) =    8.19
       Model |  1613029.84    13  124079.219           Prob > F      =  0.0000
    Residual |  23448234.1  1548   15147.438           R-squared     =  0.0644
-------------+------------------------------           Adj R-squared =  0.0565
       Total |  25061263.9  1561  16054.6213           Root MSE      =  123.07

------------------------------------------------------------------------------
  OOHdur_one |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |  -32.55581   7.857257    -4.14   0.000     -47.9678   -17.14381
   AAmerican |  -5.459185   12.12179    -0.45   0.653    -29.23606    18.31769
       Asian |   5.636047   52.01362     0.11   0.914    -96.38854    107.6606
       White |   34.61676   12.67746     2.73   0.006     9.749949    59.48357
gp3freq_be~e |   18.83005   8.176045     2.30   0.021     2.792756    34.86734
gp4_5freq_~e |  -6.521834   11.85467    -0.55   0.582    -29.77474    16.73108
gp9freq_be~e |    13.9439   3.190349     4.37   0.000     7.686038    20.20176
gp2dur_bef~e |   .0892828   .0799904     1.12   0.265    -.0676182    .2461837
gp3dur_bef~e |  -.0514178    .040609    -1.27   0.206    -.1310722    .0282366
gp4_5dur_b~e |  -.1076066   .0536173    -2.01   0.045    -.2127768   -.0024364
gp9dur_bef~e |  -.0438498   .1590286    -0.28   0.783    -.3557841    .2680845
OOHdur_yea~t |   .1131592   .0711887     1.59   0.112    -.0264772    .2527956
adj_cat1_b~e |    5.02122   7.091411     0.71   0.479    -8.888566    18.93101
       _cons |   82.46387   12.22458     6.75   0.000     58.48538    106.4424
------------------------------------------------------------------------------
```

B4: Four matches per FCT youth
Impact analysis controlling only for covariates with significant differences across groups

Dependent variable: Placed OOH = 1

```
Logistic regression                             Number of obs   =       1562
                                                LR chi2(7)      =      69.73
                                                Prob > chi2     =     0.0000
Log likelihood = -931.19387                     Pseudo R2       =     0.0361

------------------------------------------------------------------------------
OOH_one | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |   .5224348   .0703197    -4.82   0.000     .4012919    .6801485
   AAmerican |   .5638961   .1308872    -2.47   0.014     .3577871    .8887374
       White |   .5865318   .1424948    -2.20   0.028     .3643314    .9442489
gp3freq_be~e |   1.146593    .172684     0.91   0.364     .8535185      1.5403
gp3dur_bef~e |    1.00115   .0007897     1.46   0.145     .9996036    1.002699
gp9dur_bef~e |   1.011691   .0022385     5.25   0.000     1.007313    1.016088
OOHdur_yea~t |   .9980707   .0006428    -3.00   0.003     .9968116    .9993314
------------------------------------------------------------------------------
```

Dependent variable: Days in OOH placement conditional on being placed

```
      Source |       SS       df       MS              Number of obs =    1083
-------------+------------------------------           F(  7,  1075) =    9.86
       Model |  949000.219     7   135571.46           Prob > F      =  0.0000
    Residual |  14774078.1  1075  13743.3285           R-squared     =  0.0604
-------------+------------------------------           Adj R-squared =  0.0542
       Total |  15723078.4  1082  14531.4957           Root MSE      =  117.23

------------------------------------------------------------------------------
OOHdur_one~d |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |  -13.42365   9.510923    -1.41   0.158    -32.08573     5.23843
   AAmerican |   28.67085   12.52797     2.29   0.022      4.08881    53.25289
       White |   77.71561   13.40125     5.80   0.000     51.42004    104.0112
gp3freq_be~e |   23.21568   8.585507     2.70   0.007     6.369433    40.06194
gp3dur_bef~e |  -.0664868   .0392004    -1.70   0.090    -.1434048    .0104312
gp9dur_bef~e |    .062184   .1261427     0.49   0.622    -.1853297    .3096978
OOHdur_yea~t |   .0782236   .0477173     1.64   0.101     -.015406    .1718531
       _cons |   116.1613   12.95713     8.97   0.000     90.73719    141.5855
------------------------------------------------------------------------------
```

Dependent variable: Days in OOH placement

```
      Source |       SS       df       MS              Number of obs =    1562
-------------+------------------------------           F(  7,  1554) =   10.13
       Model |  1094011.68     7  156287.383           Prob > F      =  0.0000
    Residual |  23967252.2  1554  15422.9422           R-squared     =  0.0437
-------------+------------------------------           Adj R-squared =  0.0393
       Total |  25061263.9  1561  16054.6213           Root MSE      =  124.19

------------------------------------------------------------------------------
  OOHdur_one |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         FCT |  -31.58007   7.915486    -3.99   0.000    -47.10623   -16.05391
   AAmerican |    5.98358    11.6842     0.51   0.609    -16.93489    28.90205
       White |   41.35051   12.39746     3.34   0.001       17.033    65.66802
gp3freq_be~e |   23.93734   7.952884     3.01   0.003     8.337828    39.53686
gp3dur_bef~e |  -.0206718   .0389532    -0.53   0.596    -.0970781    .0557344
gp9dur_bef~e |   .4234967   .1148006     3.69   0.000     .1983163    .6486771
OOHdur_yea~t |  -.0250163   .0381856    -0.66   0.512     -.099917    .0498844
       _cons |    89.1441   12.01692     7.42   0.000     65.57301    112.7152
------------------------------------------------------------------------------
```