



Community-based and family-focused alternatives to incarceration: A quasi-experimental evaluation of interventions for delinquent youth



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ABSTRACT

Purpose: Prior research documented the efficacy of family-centered interventions at reducing juvenile delinquency. Parenting with Love and Limits® (PLL), a community-based and family-focused approach to treating juvenile offenders was piloted in Florida as part of the Florida Redirection Project enacted by the state legislature to divert youth from residential facilities to community-based services.

Methods: Using propensity score matching, all youth who completed the PLL program in Florida during the three-year period from fiscal years 2007–08 through 2009–10 (n = 92), were matched to similar risk youth who completed residential services during the same time period (n = 92) and compared to examine 12-month, post-intervention recidivism outcomes.

Results: Results revealed that youth completing PLL had, on average, lower rates of recidivism. The community-based intervention achieved lower rates of reconviction, felony conviction, and subsequent justice system placement (juvenile and adult) one year following the completion of services.

Findings: These findings suggest that community-based programs that integrate family-focused individual and group therapy may be an effective alternative to more restrictive, institutional placements for delinquent youth.

The use of community-based interventions has grown in the last decade as more states seek alternatives to costly residential commitment for juvenile offenders (Butler, Baruch, Hickey, & Fonagy, 2011; Gordon, Graves, & Arbuthnot, 1995; Henggeler, Melton, & Smith, 1992; Sexton & Turner, 2010; Winokur Early, Hand, Blankenship, & Chapman, 2012). These interventions vary in design and focus, and produced mixed results in reducing youths' subsequent offending. Identifying effective alternatives to residential placement, as well as the programming components associated with positive outcomes, are of critical importance to the field and juvenile justice systems facing growing budgetary constraints nationwide.

The convergence of economic restrictions and the growing body of empirical literature on effective treatment interventions for delinquent youth intensified demands for treatment program accountability and the implementation of evidence-based practices (Andrews et al., 1990; Lipsey, 1999). Embedded in this approach, juvenile justice systems began to match offender risks and needs to treatment interventions proven to reduce the likelihood of re-offending, and to address the individual needs of youth and their families (Andrews et al., 1990; Gendreau, 1996). Several states are now shifting from a reliance on

costly juvenile residential commitment to less expensive, community-based programming, particularly for those youth charged with non-violent crimes and who pose a diminished threat to public safety. In a more recent meta-analysis of 545 treatment programs, the Washington State Institute for Public Policy (Drake, Aos, & Miller, 2009) found a number of effective community-based treatment programs that were reasonably priced and demonstrated positive returns. Included among these were Multidimensional Treatment Foster Care, Functional Family Therapy, Adolescent Diversion Project, Multisystemic Therapy, and Family Integrated Transitions (Drake et al., 2009).

Building on this growing body of evidence-based practices, in 2004, the Florida Legislature implemented the Redirection Project creating a community-based platform for addressing the needs of delinquent youth. The project targeted non-violent offenders who would otherwise be subject to residential placement – 24/7, staff, and hardware secure facilities, focused almost exclusively on public safety, not rehabilitation. The Florida Legislature sought cost-effective and evidence-based community programming to serve this population of youth. Redirection services, initially implemented in 2004, diverted delinquent youth from confinement placement to probation. As part of their probation

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disposition under the Redirection program, these youth receive one of two treatment options initially: Multisystemic Therapy® (MST) or Functional Family Therapy (FFT). The Parenting with Love and Limits® (PLL) model was introduced as an additional alternative after the first year of the project. Placement in one of the three treatment options was based on funding, need and evidence of improvement. In 2007, there were roughly 40,000 youth on probation, 573 total in the Redirection project, and < 100 assigned to PLL (FDJJ, 2008). A multitude of studies examined the effectiveness of MST and FFT services in recent years. Less is known about the impact of the PLL community-based and family-centered system of care for delinquent youth and their families, and it is the latter program that is the focus of this study.

Evidence supports the use of family based therapy – both generic counseling and structured programming (Lipsey, Howell, Kelly, Chapman, & Carver, 2010). Lipsey and colleagues reported positive results in a meta-analysis of family programs, although not all had a significant effect on recidivism or other quality of life measures (2010). Model programs showed varying degrees of positive growth, “some no-name programs produced effects even larger than those found for the model programs” (Lipsey et al., 2010, p. 26). Given the mixture of research pertaining to family based interventions, more empirical inquiry is necessary to determine the specific characteristics that distinguish those services that work from those that do not, as well as those that are effective as juvenile reentry interventions.

We evaluated the impact of PLL services on recidivism in the juvenile and adult systems, and compared the outcomes to those of youth completing standard juvenile commitment sanctions over the same time period. Specifically, we examined youth diverted from residential placement as part of the Florida Redirection Project to PLL during the three-year period from July 1, 2007 to June 30, 2010 (n = 92). These youth were matched to a residential sample completing services during this three-year period (n = 92). The overarching questions guiding the research were first does the PLL alternative to residential commitment achieve lower rates of re-conviction than standard residential services? Second, does PLL result in lower rates of re-commitment, adult probation, or adult incarceration compared to standard juvenile residential commitment? And finally, is PLL a cost-effective alternative to more restrictive residential programs?

1. Prior research

Effective community-based family intervention programs have several salient features in common. First, they are firmly based on a therapeutic, theoretical footing such as Family Systems Theory, Social Systems Theory, or Ecological Systems Theory (Bronfenbrenner, 1979; Robinson, 2003 and Scattergood, Dash, Epstein, & Adler, 1998). The underlying factors present in a child's history and environment, including familial relations, unresolved trauma and unmet basic needs are all elements of the underlying ecology impacting the child's emotional and behavioral well-being. Interventions that address family functioning within this ecological context demonstrate positive outcomes among anti-social and delinquent youth (Gorman-Smith, Tolan, & Henry, 2000; Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986; McCord, 1980, 1991).

Programs that focus on family functioning tend to be strength-based with the goal of empowering parents to affect changes in their own lives. They focus upon improving parent-child communication and relationships, and especially upon parental functions that include monitoring, limit setting, and discipline (Conger & Simons, 1997 and Loeber & Farrington, 1998). These intermediate goals aim toward mitigating family risk factors and reducing anti-social behaviors resulting in arrest, detention, and court involvement. The strength-based approach implies that interventions take place not only with the individual and family, but services also focus upon other pro-social aspects of the child's life to leverage these protective assets. Such interventions target areas for treatment within the social ecology of the

individual and may include: normative and pro-social behavior reinforcement, close supervision, promotion of positive peer associations, clear and consistent limit-setting with follow-through on rule violations, instruction on developing positive work habits and academic skills, emphasis on supporting family members, and skill instruction for reducing familial conflict (Fisher & Chamberlain, 2000). Each of these functions can impact the individual and the family, as well as aspects of the youth's social environment including peer relations, school, employment, and the court system.

In the past decade, research focused on the implications of securing juvenile delinquents within correctional settings. Empirical evidence suggests that adolescents face a great deal of victimization from both their peers and correctional staff while behind bars. Beck and Rantala (2016) report in a six-year period there were 1686 substantiated claims of sexual violence within juvenile correctional facilities across the United States. Nearly 10% of these claims were from staff-on-youth sexual victimization (Beck & Rantala, 2016). Similarly, in interviews conducted with a sample of previously incarcerated youth (N = 62), Dierkhising, Lane, and Natsuaki (2014) found 77% experienced direct abuse during incarceration and nearly all (95%) witnessed at least one incident of abuse while detained. In addition the authors also found that such exposure to abuse impacted post release functioning. Dierkhising et al. (2014) found that experiencing or witnessing abuse while incarcerated was associated with increased likelihood of post-traumatic stress reactions, depressive symptoms, and recidivism upon release. Peer abuse was the most commonly cited form of abuse in the Dierkhising et al. (2014) study. Theoretically, this may be related to a cycle of violence approach within the juvenile justice system, outlined by DeLisi et al. (2009) who found that incarcerated juveniles who experienced traumatic events (e.g. being in serious danger, witnessing death or injury, sexual victimization) were more prone to sexual misconduct, suicidal ideations or behavior, and institutional infractions while confined. Such negative outcomes, coupled with the cost of incarceration, provide a basis for assessing community corrections and therapeutic alternatives in responding to juvenile offenders.

According to empirical reviews of juvenile offender treatment programs, community-based options are more effective at reducing recidivism than standard incarcerative interventions (DeLisi et al., 2009; Lipsey & Wilson, 1998). In a 1998 study, Lipsey and Wilson found that community-based programming had a slightly larger effect size, although not significantly so. However, in a study the following year Lipsey (1999) found that juvenile probation, parole, and community-based services had greater effect sizes than those found in institutional programs, in general. Further, the positive effects of targeted correctional treatments were larger in community-based programs than in residential programs (0.35 in the community versus 0.20 for residential), while the negative effects of ineffective programming were smaller in community settings (– 0.06 in the community versus – 0.15 in residential) (Andrews et al., 1990). Andrews and Bonta (2006) reached similar conclusions, and found that the mean effect sizes were larger in appropriate community-based programming than in appropriate institutional programming (0.35 versus 0.17, respectively).

In addition to positive outcomes, community-based approaches permit a family-focused approach to treatment that targets risk factors within the home, peer associations, and school settings. This is consistent with the Gluecks' seminal work in the 1950's demonstrating that family factors are linked to antisocial behavior among youth (Glueck & Glueck, 1950). Since that time, Patterson and his colleagues (1992) utilized an ecological systems framework to develop a social interactional, coercive family process model which mapped the developmental progression of antisocial boys into subsequent delinquency and crime, with a focus on the influence of poor parent family management skills (Patterson, Reid, & Dishion, 1992). Similarly, longitudinal research from Patterson, Forgatch, Yoerger, and Stoolmiller (1998) found that family relationships were critical in the growth of antisocial behavior in males. Meta-analytic reviews of delinquency

interventions likewise documented that negative parent-child bonds, relationships, and interactions, as well as and poor parenting practices, were associated with juvenile delinquency (Andrews & Bonta, 2006; Lipsey & Derzon, 1998). Family research highlights the role of parental/caregiver crime as a strong risk factor for at-risk youth as well (Eddy & Reid, 2002). However, while intra-familial dynamics and criminal involvement serve as strong risk factors, healthy familial dynamics have the potential to serve as powerful protective factors. Peter Greenwood (2008) noted, “the most successful community-based programs are those that emphasize family interactions, probably because they focus on providing skills to the adults who are in the best position to supervise and train the child” (pg.193).

A number of community-based rehabilitative programs that target family factors were been found to be effective. In a meta-analysis of 545 treatment programs, Drake et al. (2009) of the Washington State Institute for Public Policy identified community-based programs that demonstrated positive returns on investment. Included among these were Multidimensional Treatment Foster Care (MTFC), Functional Family Therapy (FFT), and Multisystemic Therapy® (MST). Andrews and Bonta (2006) likewise pointed to the effectiveness of these three family interventions in their review. They noted that these treatments effectively reduced relational and functional family risk factors. When programs addressed both risk factors, Andrews and Bonta determined that their mean effect size was quite large (0.39). Similarly, Lipsey and Cullen (2007) documented mean effect sizes, which ranged from 0.10 to 0.27 from meta-analytic studies of family-oriented, rehabilitation programs for juveniles, which represented reductions in recidivism rates of between 20 and 52%. This suggests that those treatments situated to affect the individual (e.g., problem-solving skills, criminal thinking, anti-social personality traits) also impact their families and their enduring social environment as well (e.g., relationships, communication, parental monitoring and parenting techniques) are more likely to be effective.

Although this catalogue of similarities among effective community-based family interventions is by no means exhaustive, another characteristic shared by these programs is a high level of attention toward treatment fidelity and quality of service delivery. Holsinger (1999), Lowenkamp, Makarios, Latessa, Lemke, and Smith (2010) and others (Mihalic, Fagan, Irwin, Ballard, & Elliot, 2002) emphasized that successful implementation depends upon fidelity—the degree of fit between the developer-defined elements of a program and its actual implementation in a given organization or community setting. Reviews of implementation fidelity, such as the Greenlight Project and statewide implementation of FFT in Washington, demonstrated the need to monitor implementation to achieve the improved outcomes promised by evidence-based programming (Barnoski, 2002; Wilson, 2007). They also highlighted the importance of developing relationships with the youth and family in order to improve retention and completion rates.

When implemented with fidelity, not only are community-based family interventions effective, but also they are also typically less costly, and result in positive returns on investment. For instance, Steve Aos, Miller, and Drake (2006) study compared the costs, savings and cost avoidance of various evidence-based interventions to treatment as usual in the community. They found that the marginal costs of providing such evidence-based interventions resulted in impressive net benefits. It is worth noting that Aos recommended “portfolios” of community-based prevention, rehabilitation and institutional interventions that provided options for the Washington State Legislature to minimize the need for prison expansions. Recent research provided further support for community based adolescent treatment programs as a cost effective means to approach treatment. For example, Vermeulen, Jansen, Knorth, Buskens, and Reijneveld (2017) found no distinct difference in regards to outcome when comparing Multisystemic Therapy approaches to what they called Treatment as Usual (e.g. intensive therapy). However, as Vermeulen and colleagues (2017) indicated Multisystemic Therapy cost about 50% less than the Treatment as Usual

approach. Given the variability in legislative funding for corrections and social services that can exist from year-to-year nationally, finding cost-effective approaches to juvenile delinquency is warranted.

2. Parenting with Love and Limits® model and residential services

Seeking cost-effective alternatives to traditional juvenile incarceration, the Florida Department of Juvenile Justice introduced the Parenting with Love and Limits® (PLL) program as an alternative to residential commitment in 2005. In residential facilities funds are focused on security as opposed to treatment or rehabilitation. Delinquent youth in commitment programs typically attend school and complete facility work assignments, and receive minimal “treatment” for emotional, substance or behavioral issues. Based upon a family systems framework, PLL, in contrast, is designed to reduce adolescent conduct disorders through family engagement in the service delivery process while keeping youth in their communities. PLL is a manualized program that integrates principles of a structural family therapy (SFT) with comprehensive fidelity procedures to ensure reliable implementation of individual and group family therapy delivered within the community (Sells, 1998; Sells, 2000; Sells, 2002; Sells, Smith, & Sprenkle, 1995). Similar programs grounded in Family Systems Theory found reduced conduct disorders and other troubled behaviors among adolescents (Labia & Rokutaini, 2002; Rowe, Parker-Sloat, Schwartz, & Liddle, 2003).

Parenting with Love and Limits (PLL) combines a six-week, group parent education and group therapy program with 12 (2 sessions a week for six weeks) or more individual “family coaching” or family therapy sessions for delinquent youths and their parents/guardians. The program design is for juvenile offenders between the ages of ten to 18 years presenting with serious emotional or behavioral problems including depression, drug or alcohol abuse, extreme disrespect, threats or acts of violence, running away, and/or chronic truancy. Youths and their families attend groups together to receive instruction in a new skill each week by a licensed clinician. They also receive individual family coaching to practice the new skill during the week, typically within the home environment. A unique characteristic of the model is its emphasis on wound work and the need to address underlying traumas and unmet needs that have not been addressed or resolved. Families receive a minimum of six weeks of family therapy sessions, with additional sessions provided if and when the family is willing and able to address open wounds. The approach combines group and family therapy within a structural-strategic framework to address adolescents’ oppositional defiant or conduct disorder behavior problems through the modules outlined in Fig. 1. Staff monitors the entire program and implementation is reviewed for fidelity after each session (through a video monitoring and rating system, and family and therapist protocol checklists).

PLL was first piloted in Florida’s juvenile justice system as part of the larger Florida Redirection Project (Hand, Winokur, & Blankenship, 2010), which was launched in 2004, and intended to redirect lower risk offenders and youth charged with violations of probation from residential programs to community-based alternatives. While research on the positive results of family therapy approaches such as Multisystemic Therapy® (MST), Functional Family Therapy (FFT) and Brief Strategy Family Therapy® (BSFT) has grown (Aos, Barnoski, & Lieb, 1998; Barton, Alexander, Waldron, Turner, & Warburton, 1985; Henggeler, Cunningham, Pickrel, Schoenwald, & Brondino, 1996; Szapocznik & Williams, 2000), less is known about the effectiveness of the PLL program in reducing juvenile recidivism. While studies documented the positive impact of family therapy interventions in reducing troubling behavior (Lipsey et al., 2010), not all research presents encouraging results (Mitchell-Herzfeld et al., 2008). The current study seeks to fill a gap in the literature by employing a quasi-experimental design evaluation of the PLL program as it was implemented in Florida during fiscal year 2007–08 through 2009–10 to determine if this particular family intervention positively impacts families and children who

Week	PLL Group	PLL Individual Coaching
Week 1	Group 1: Venting	No coaching first week
Week 2	Group 2: Button Pushing + ➡	Coaching #1 – Deciding on the Problem to Fix Fast
Week 3	Group 3: Contracting + ➡	Coaching #2 – Writing a Loophole Free Contract
Week 4	Group 4: Putting the Contract Together as a Group + ➡	Coaching #3 – Present Typed Contract to Teenager with Role Plays to Practice
Week 5	Group 5: Creative Consequences + ➡	Coaching #4 – Relapse Prevention: Assess whether contract worked or tweak contract so it will work better
Week 6	Group 6: How to Start Liking Each Other Again - Restore Closeness	Coaching #5 – Wound Work: Produce a Wound Workbook and Role Play
Week 7	No Group	Coaching #6 – Relapse Prevention: Determine if Wounds Healed

Fig. 1. Parenting with Love and Limits® system of care overview.

Source: From Sells (1998). *Treating the tough adolescent: A step-by-step, family-based guide*. New York: Guilford Press.

would otherwise engage the residential placement.

3. Methods

The effectiveness of a juvenile justice program may be judged relative to its ability to successfully engage and complete youths through the program, its adherence to the underlying model of treatment, and its ability to serve various types of offenders. However, of paramount importance is the degree to which the program facilitates the prevention of further delinquent acts by the youth it has served. The change expectation being that the program will address youths' dynamic criminogenic risks and needs, as well as responsivity to behavioral change, thereby reducing their likelihood for subsequent involvement in the justice system. To this end, we examined recidivism outcomes for youths completing PLL compared to a matched sample of youths completing residential services in Florida. Outcomes for youth completing community-based PLL services (n = 92) during fiscal years 2007–08 through FY 2009–10 were compared to a matched sample of similar-risk youth completing residential commitment services. The comparison group was selected from the legislatively mandated population – youth disposed to residential placement. Juvenile demographic, prior history and subsequent offending were obtained from the FDJJ Juvenile Justice Information System (JJIS), while subsequent criminal court offending and sentencing data were obtained from the Florida Department of Law Enforcement (FDLE) and Florida Department of Corrections.

3.1. Measures

Measures of recidivism and standard follow-up periods were based on those used by the Florida Department of Juvenile Justice (FDJJ) in calculating annual outcomes of juvenile justice programs in Florida (FDJJ, 2010a) and as set forth in the FDJJ's *Common Definitions Report* (2010b). This promotes standard measurement across programs and enables policy-makers to compare the results reported here to program outcome measures reported by the FDJJ. Recidivism is operationalized

as any subsequent delinquent offense that results in adjudication, including adjudication withheld, or adult conviction within one year of completion from a program. This is in accordance with the official FDJJ definition, which it argues is preferable to other measures of programmatic outcomes because it "...provides a reliable indication that the youth was found to have committed the offense" (FDJJ, 2010b:23).

The FDJJ defines a completion as any youth who successfully finishes the program, is assigned to probation after release, discharged without supervision, or released after reaching the age of majority or their specific commitment term. This methodology follows that used by FDJJ in conducting its annual program outcome evaluations and focuses on those youth deemed to receive and complete services by program administrators and PLL therapists. This is in contrast to defining completions by probation start and end dates and/or those youth who received minimal treatment dosages and were later served by other providers or programs. Completions are the basis of program outcome comparison, as opposed to including all releases. This follows the methodology used by the FDJJ and examines only those youth who received and completed services, versus those who received minimal dosage and duration of services (FDJJ, 2010a, 2010b). Further, this technique isolated those who received the full intervention and provided a more valid assessment of PLL as opposed to a sample of delinquent youth who dropped-out, were escalated to other restriction levels and/or had multiple programs during the timeframe.

Additional outcomes include subsequent felony adjudications or convictions, juvenile commitment placements, adult probation sanctions, and adult incarceration within 12 months of program completion. These measures were likewise in keeping with statutory criteria outlined by the Florida Legislature in its enactment of the Florida Redirection Project and consistent with prior research (FDJJ, 2010a, 2010b; McMackin, Tansi, & LaFratta, 2004; Myner, Santman, Cappelletty, & Perlmutter, 1998).

Consistent with prior research we also examined the impact of demographic factors: gender (1 = male, 0 = female), race (1 = Black, 0 = White). Race was also included along with ethnicity, ethnicity (1 = Hispanic, 0 = White). Finally the study controlled for age factors

at time of arrest, disposition and youth outcomes (FDJJ, 2010a, 2010b). Controlling for prior record, the study also includes number of prior charges and adjudications and seriousness indicators in the statistical modeling. Seriousness index scores for prior referrals were also included as a measure of prior offense history. This measures offense gravity for both prior referral and arrest. A weighted system assigns point values to specific offense types, as crime seriousness increases, so does the seriousness score (FDJJ, 2010a, 2010b).

3.2. Sample

During its first year of implementation in Florida's juvenile justice system, 2005, FDJJ initially targeted PLL services toward a diversion population. Later, service delivery was directed toward a higher risk population of delinquent youth as a component of the Redirection Project in an effort to shift these offenders from residential commitment to community-based alternatives. This study focused on the latter group, and the outcome differences between the PLL treatment completions that were disposed as 'probation' cases to probation ($n = 92$) compared to a matched sample of residential completions (92). The attrition rate for this analysis is 25%, 122 families and youth started the PLL but did not complete the intervention.¹

3.3. Analysis

To ensure an equitable comparison between youth completing PLL and residential services, a propensity score matching (PSM) protocol was utilized to statistically control for inherent differences between the PLL completions and those completing the other services. In a typical application, PSM compensates for possible biases imposed under non-experimental conditions (e.g., lack of randomization) by modeling the selection process related to placement, then comparing outcomes for subjects with a similar likelihood of probation dispositions, but different actual rates of supervision placement. The study utilized Rosenbaum and Rubin's (1983) method to ensure an equitable comparison between youth completing probation services and residential programming. For the evaluation, the propensity score was calculated as the probability of a youth being assigned to PLL services versus the residential program using the probabilities produced by a logistic regression model.

The logistic regression model was based on the significant differences between all youth who completed PLL services ($N = 92$) and all youth who completed residential commitment program services² ($N = 11,861$) during the three-year period from July 1, 2007 to June 30, 2010. Standardized mean differences in the samples were examined to determine possible control variable for the matching procedure (Stuart, 2010). Table 1 presents the list of independent variables found to be significantly different between the two full samples and used in the logistic regression model for calculating the propensity scores. For the procedure to work, these differences need to be reduced to accomplish similar matched pairs.

It is important to note that the independent variables selected were those significantly related to recidivism outcomes and, more importantly, were not affected by the treatment of interest (Lipsey et al., 2010; Mitchell-Hertzfeld et al., 2008; Morris & Piquero, 2013; Ryon, Winokur Early, Hand, & Chapman, 2013). Although other social-risk variables such as current alcohol and drug use, aggression, and mental health problems could have been significantly different in the populations, they were not considered for inclusion due to their potential for

¹ The attrition rate for this analysis is 25%, 122 families and youth started PLL but did not complete the intervention.

² Florida operates low, moderate, high, and maximum restrictiveness level residential programs. Each level was included in the total with the exception of maximum restrictiveness level programs as they were deemed to serve a qualitatively more serious juvenile offender with a mandatory minimum length of 18 months of services.

Table 1
Independent variables identified as significantly different between samples.

	PLL	Residential	Pearson correlation/significance
Total completions	92	11,861	
Males	63 (68%)	10,010 (84%)	- 0.038 (0.00)
Blacks	36 (39%)	6304 (53%)	- 0.025 (0.01)
Hispanics	20 (22%)	1271 (11%)	0.031 (0.00)
Average age at release	16.5	17.1	- 0.043 (0.00)
Average number of prior charges	10.4	20.3	- 0.059 (0.00)
- Felonies	2.8	5.4	- 0.039 (0.00)
- Misdemeanors	4.4	5.7	- 0.026 (0.01)
Average prior adjudication seriousness index	7.6	22.3	- 0.068 (0.00)
Average number of prior adjudications	3.4	8.4	- 0.068 (0.00)
- Violent felonies	0.2	0.6	- 0.035 (0.00)
- Property felonies	0.3	1.6	- 0.038 (0.00)
- Other felonies	0.1	0.4	- 0.029 (0.00)
- Misdemeanors	1.6	2.8	- 0.043 (0.00)
- Other delinquent acts	0.9	2.4	- 0.042 (0.00)

being impacted by the treatment (Reinisch, Sanders, Mortensen, & Rubin, 1995; Stuart, 2010). Further, although collinearity exists in the model (there is some association among predictors within normal ranges), propensity score estimation (PSE) is robust to these associations focusing instead on the resulting balance of the covariates (Augurzyk & Schmidt, 2001). The inclusion of variables unassociated with selection into the treatment group, according to Stuart (2010), has little impact on the modeling process. However, the exclusion of important predictor variables increases the potential for bias in the PSM procedure (Stuart, 2010).

Using the same independent variables, the probabilities of the logistic regression model were used as the estimate of the propensity score. Each PLL completion was matched to the most equitable residential completion that had the exact same or closest score – this is also known as the nearest neighbor match. The initial sample compositions were presented in Table 1. As could be seen in the table, there were some differences between the total PLL completions ($n = 92$) contrasted to the residential comparison group ($n = 11,861$). Using 'nearest neighbor' techniques, the scores were then used to match PLL to residential completers during the study time period. The matching caliper was set to 0.03 allowing for the most comparable probation and residential groups. However, using a conservative matching criterion limited the number of clients with an exact match.

Standardized Mean Difference tests were used to determine if the procedure resulted in two groups that look more alike than the original comparison of PLL and all residential placements (Stuart, 2010). The PSM protocol resulted in samples that were more equitable, comparatively, with one significant difference remaining (i.e., average number of prior charges; 10.4 for PLL versus 14.5 for the residential match). The ability of PSM to address sampling bias is dependent on a number of factors including the baseline similarities in the two groups. PLL was initially developed as a diversionary program for low-risk delinquents. It was later modified for more serious juvenile delinquents who would otherwise be placed on probation and/or in residential commitment. The remaining difference between the probation eligible PLL and residential completers is likely an artifact of the initial PLL review and placement process. As originally intended for lower risk offenders, the first probation eligible PLL placements were likely more similar to diversion youth, than more serious supervision clients. This may help to explain the observed (Table 2) significant difference in the number of prior offenses after the PSM procedure. It is also possible the small sample size attributes to significance levels in the analyses, specifically in later models with insignificant findings (McDonald, 2014).

Additional analyses included descriptive statistics, logistic

Table 2
Sample comparisons for PLL and matched samples following PSM adjustments.

	PLL sample	Residential matched sample	Pearson correlation/significance
Total completions	92	92	
Males	63 (68%)	57 (62%)	0.07 (0.36)
Blacks	36 (39%)	30 (33%)	0.07 (0.36)
Hispanics	20 (22%)	26 (28%)	- 0.08 (0.31)
Average age at release	16.5	16.3	0.08 (0.30)
Average number of prior charges	10.4	14.5	- 0.14 (0.05)
- Felonies	2.8	5.1	- 0.13 (0.07)
- Misdemeanors	4.4	5.5	- 0.11 (0.14)
Average prior adjudication seriousness index	7.6	11.2	- 0.13 (0.08)
Average number of prior adjudications	3.4	4.5	- 0.14 (0.07)
- Violent felonies	0.2	0.2	- 0.06 (0.45)
- Property felonies	0.3	0.8	- 0.11 (0.14)
- Other felonies	0.1	0.1	0.04 (0.58)
- Misdemeanors	1.6	2.0	- 0.10 (0.16)
- Other delinquent acts	0.9	1.1	- 0.07 (0.36)

regression and independent samples *t*-tests. The descriptive statistics included baseline figures such as the total sample (and percentage) of juvenile offenders with a subsequent adult conviction/juvenile adjudication, felony adjudication or conviction, or subsequent commitment, adult probation or prison within one year of PLL and residential completion. The logistic regression analysis examined the association of the independent variables to recidivism and was utilized to calculate the odds to recidivate for the PLL sample compared to the matched residential sample. Per convention, independent samples *t*-tests were used to test for significant differences in the outcomes between the PLL and matched residential groups (Augurzky & Schmidt, 2001; Rosenbaum & Rubin, 1983; Stuart, 2010).

4. Results

As mentioned in the Methods section, in order to identify a comparative residential sample to use as an equitable assessment to the observed PLL outcomes, a propensity score matching (PSM) protocol was utilized to statistically control for any inherent differences between the samples. However, following the PSM adjustment, though the samples demonstrated a more unbiased demographic as a whole, one variable remained significantly dissimilar between the samples. This being the case, a logistic regression model was used to calculate the odds of recidivating given all the variables previously used in the PSM adjustment. The odds to recidivate (or expected recidivism rate) were then compared between samples to examine if one group was significantly more likely to recidivate than the other, given the underlying populations. Tables 3 and 4 present the results of the logistic regression analysis.

As demonstrated in Table 3, no one variable in the model demonstrated any significant impact as it pertained to the likelihood to recidivate. As illustrated in Table 4, given the underlying characteristics of the 184 completions examined, youth completing PLL had a 43% expected recidivism rate compared to a 46% rate for the residential sample. In other words, given the youth served, all things being equal, we would expect approximately 43% of the youth completing PLL to recidivate within one year of release and we would expect 46% of the matched residential sample to recidivate. The odds to recidivate were not statistically significantly different between the groups (*p* < 0.05). To be conservative in the comparison of the recidivism outcome, the expected recidivism rates were used as a baseline measure for each group to evaluate overall program effectiveness.

Table 3
Expected recidivism logistic model.

Variable	B	S.E.	Sig.	Exp(B)
Males	0.14	0.36	0.702	1.15
Blacks	0.51	0.38	0.179	1.66
Hispanics	0.15	0.41	0.719	1.16
Average age at release	- 0.06	0.14	0.670	0.94
Average number of prior charges	- 0.02	0.05	0.750	0.98
- Felonies	0.34	0.28	0.225	1.40
- Misdemeanors	0.16	0.13	0.211	1.17
Average prior adjudication seriousness index	- 0.02	0.31	0.943	0.98
Average number of prior adjudications	- 0.12	0.28	0.669	0.89
- Violent felonies	- 0.03	2.24	0.988	0.97
- Property felonies	0.25	1.28	0.844	1.29
- Other felonies	- 0.90	1.55	0.562	0.41
- Misdemeanors	0.42	0.45	0.353	1.52
Constant	3.20	2.07	0.122	

Nagelkerke R²: 0.203 overall classification: 71.2%.

Table 4
Expected recidivism for PLL and matched residential samples

	N	Expected recidivism	
		Odds	T (Sig)
PLL sample	92	43%	- 1.05 (0.30)
Matched residential sample	92	46%	

Table 5
Outcome results for PLL and matched residential samples.

	N	Re-adjudication/conviction		Felony re-adjudication/conviction		Subsequent commitment, adult probation, or prison	
		Rate	T (Sig)	Rate	T (Sig)	Rate	T (Sig)
PLL sample	92	41%	0.74	18%	1.73	16%	2.12
Matched residential sample	92	47%	(0.46)	29%	(0.09)	29%	(0.04)

Actual outcome differences between the PSM matched probation and residential pairs are presented in Table 5. The re-adjudication/conviction rates for PLL probation and the matched residential samples differed by 6 percentage points, with PLL demonstrating an overall lower rate. Further, the expected recidivism for the PLL sample was 43%, while the actual observed rate was 41%. This suggests that the PLL probation services had some effect at reducing subsequent criminal offending given the types of youth they served. Conversely, the observed recidivism rate for the residential group was a percentage point higher (47%) than the expected rate (46%) for the comparison sample. While the results are not statistically significant, they are substantively important, keeping 5% more PLL completers out of the system for at least one year.

In examining the other subsequent offending measures, felony conviction rates were lower (by 11 percentage points) for youth completing PLL compared to their matched residential counterparts. While the statistical results are statistically significant, they do represent substantively important findings as they are actual difference as opposed to predicted changes. PLL youth likewise had a substantially lower rate (16%) of subsequent commitment, adult probation or incarceration compared to the matched residential sample. This was the

most significant difference between the samples and the one that ultimately translates to the highest cost savings. Finally, while the other measures were not statistically significant, PLL completers were significantly less likely to re-enter a residential facility, be placed on juvenile or adult probation, or sent to adult prison. Assessing 3 unique measures of delinquent youth, only one outcome is significant – the most important one – return to residential facilities or adult prison. The significant versus substantive argument should also be considered in light of a very small sample size. This demonstrates that despite these non-significant findings at earlier stages of the justice continuum, completing PLL protects youthful offenders who finish the program at further stages in the decision making process – commitment, probation or prison time – a significant and substantive finding.

5. Summary and conclusions

The current evaluation sought to examine the relative effectiveness of the Parenting with Love and Limits® program in reducing subsequent reoffending and involvement in the juvenile and criminal justice systems, as compared to residential programming. The PLL program was piloted in Florida for youth initially slated for commitment but placed in the community as part of the mandated state-wide diversion Redirection program. If found to be effective, PLL represents a significantly less expensive dispositional option for moderate risk youth compared to residential services - \$4426 per youth and \$34,774 per youth - respectively (Hand et al., 2010).

Using propensity score matching, youth completing PLL probation were compared to a sample of similar risk youth who completed residential services over the same time period. The proximity score matching procedure mitigated some of the inherent sampling bias between the two groups. Although there is always some sampling error with a quasi-experimental design of this kind, the independent variables that were controlled for between samples were those most prominently recognized as correlating to recidivism outcomes independent of program services (Lipsey, 1992). As an additional precaution to the introduction of sample bias, logistic regression was used to compare the influence of the same underlying preexisting measures on the odds to recidivate. The odds were used as a baseline measure to examine the degree to which the observed recidivism rates differed from what would be expected if the samples were indeed the same. Employing both of these statistical procedures, the results observed can be more attributable to the services received rather than the underlying populations.

The results suggest that PLL may be a more appropriate intervention than low, moderate, or high-risk residential commitment both in terms of outcomes and cost. Of the 92 youth who completed PLL services, 41% recidivated less than the predicted recidivism rate of 43%, and six percentage points less than the rate of the matched residential group. Further, subsequent felony conviction rates and rates of juvenile and adult correctional placement following release were significantly lower for the PLL youth compared to the matched residential group. The results suggest that PLL may be an effective alternative to residential confinement for lower to moderate risk youthful offenders.

Cost savings is an important factor for consideration given the relative expense of the two interventions - approximately \$4500 for PLL and \$35,000 for residential placements. On each of the outcome measures examined, PLL outperformed the matched residential comparison. At a cost savings of roughly \$30,000 dollars, exploring the use of PLL for appropriate juvenile offenders would appear financially prudent even if the recidivism rates were equal for the PLL and residential completers. The additional therapeutic benefits of family-focused interventions minus the detrimental conditions and impact of residential confinement (Beck & Rantala, 2016; DeLisi et al., 2009; Dierkhising et al., 2016), warrant further investigation into the PLL model to document dosage and duration measures, as well as model fidelity relative to client outcomes.

While these results point to a promising community-based

alternative to commitment programs, the current study was limited in ways that should be addressed by future research. First, the overall sample size of youth completing PLL probation services in its first few years of operation in Florida was small, and placement was potentially biased by the original use of PLL as a diversion program. Following preliminary outcomes on PLL diversion completions, the FDJJ began targeting PLL services to probation youth as an alternative to commitment. As such, diversion youth were no longer served by PLL after fiscal year 2008. Future research should expand to other jurisdictions where PLL has been implemented with larger samples of youth to further evaluate the effectiveness of the intervention and assess external validity and generalizability of outcomes across varying national and international clinical sites.

In addition to small sample sizes, the evaluations reported here did not include examination of those youth and families who failed to engage in the PLL program. It will be important to determine the nature and extent of differences between these families and those who successfully completed PLL services. Differential attrition rates among youth with various demographic backgrounds and criminogenic risks and needs may point to a need to refine the PLL model of care. Furthermore, while the preliminary outcomes reported here are generally more positive for PLL compared to residential programming, future inquiry should examine outcomes relative to implementation fidelity, as others documented the important connection between treatment integrity and effective reductions in antisocial behaviors among adolescents (Lowenkamp et al., 2010). Research should also seek to clarify the impact of community-based interventions such as PLL for low, moderate, and high-risk delinquent youths.

The initial evaluations presented here provide a preliminary look at the effectiveness of Parenting with Love and Limits® in reducing recidivism and subsequent justice system placement among adolescents completing services. The results provide support for the use of therapeutic models that engage the adolescent's family in the rehabilitative process. As states across the nation face growing budget constraints and struggle to maintain effective service delivery for delinquent offenders, community-based alternatives such as Parenting with Love and Limits®, may offer cost-effective alternatives to residential care for moderate-risk court-involved youth.

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