

MODERATORS OF MULTISYSTEMIC THERAPY OUTCOME FOR CHILDREN
WITH CONDUCT DISORDERS

By

Nam Thanh Tran

Thesis

Submitted to the Faculty of the
Graduate School of Vanderbilt University
in partial fulfillment of the requirements

for the degree of

MASTER OF SCIENCE

in

Psychology

May, 2010

Nashville, Tennessee

Approved:

Professor Bahr Weiss

Professor Judy Garber

ACKNOWLEDGEMENTS

I would like to thank my advisor and mentor, Dr. Bahr Weiss, for taking me as his students, having confidence in my potential, encouraging and nurturing my passion for my area of interest, and providing enormous guidance and support that any novice needs throughout this process.

I would like to thank my wife and my son for their unwavering patience, support and sacrifices that have helped to motivate me to on my chosen path.

I would like to thank Dr. Judy Garber and Dr. Susan Han for reading and providing helpful feed back for the improvement of this manuscript.

Finally, I very gratefully acknowledge the support of the U.S. National Institutes of Health Fogarty International Center, through grant NIH D43 TW007769, for providing the support for me to pursue my PhD and masters training in clinical psychology at Vanderbilt University in the U.S.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	v
LIST OF FIGURES	vii
Chapter	
I. INTRODUCTION1	
Conduct disorder.....	1
Treatment of conduct disorder	4
MST therapy	8
Effectiveness of MST	10
Importance of assessing moderators	14
II. METHODS.....	19
Participants.....	19
Measures	20
Outcome measure.....	20
Potential moderators	21
Procedures.....	23
Analyses.....	24
III. RESULTS	25
Child demographic characteristics.....	25
Parenting behavior	27
Family functioning.....	32
Parental psychopathology	33
Summary of the results	33
IV. DISCUSSION	34
Strengths and Limitations	41
Future directions and Conclusions.....	42

APPENDIX.....	45
REFERENCES	72

LIST OF TABLES

Table	Page
1. Demographic characteristics	45
2. Relations between Child Age variables and CBCL, YSR, TRF externalizing psychopathology	46
3. Relations between Child Race variables and CBCL, YSR, TRF externalizing psychopathology	47
4. Relations between Child Sex variables and CBCL, YSR, TRF externalizing psychopathology	48
5. Relations between Authoritarian Parenting variables and CBCL, YSR, TRF externalizing psychopathology	49
6. Relations between Authoritative Parenting variables and CBCL, YSR, TRF externalizing psychopathology	50
7. Relations between Permissive Parenting variables and CBCL, YSR, TRF externalizing psychopathology	51
8. Relations between Father Firmness variables and CBCL, YSR, TRF externalizing psychopathology	52
9. Relations between Mother Firmness variables and CBCL, YSR, TRF externalizing psychopathology	53
10. Relations between Father Warmth variables and CBCL, YSR, TRF externalizing psychopathology	54
11. Relations between Mother Warmth variables and CBCL, YSR, TRF externalizing psychopathology	55
12. Relations between Father Psychological Control variables and CBCL, YSR, TRF externalizing psychopathology	56

13. Relations between Mother Psychological Control variables and CBCL, YSR, TRF externalizing psychopathology	57
14. Relations between Parents Firmness variables and CBCL, YSR, TRF externalizing psychopathology	58
15. Relations between Parents Warmth variables and CBCL, YSR, TRF externalizing psychopathology	59
16. Relations between Parents Psychological Control variables and CBCL, YSR, TRF externalizing psychopathology	60
17. Relations between Parents Adaptability variables and CBCL, YSR, TRF externalizing psychopathology	61
18. Relations between Parents Cohesion variables and CBCL, YSR, TRF externalizing psychopathology	62
19. Relations between Adolescents Adaptability variables and CBCL, YSR, TRF externalizing psychopathology	63
20. Relations between Adolescents Cohesion variables and CBCL, YSR, TRF externalizing psychopathology	64
21. Relations between PAI-Externalizing variables and CBCL, YSR, TRF externalizing psychopathology	65
22. Relations between PAI-Internalizing variables and CBCL, YSR, TRF externalizing psychopathology	66

LIST OF FIGURES

Figure	Page
1. Breakdown of moderator effect for child age.....	26
2. Breakdown of moderator effect for race.....	27
3. Breakdown of moderator effect for authoritative parenting.....	28
4. Break down moderator effect for mother and parent's warmth.....	30
5. Break down of moderator effect for mother firmness.....	31
6. Break down of moderator effect for family cohesion and adaptability.....	32
7. Break down of moderator effect for parent's psychopathology.....	33

CHAPTER I

INTRODUCTION

Conduct Disorder

Conduct Disorder (CD) is a complex set of linked behavioral and emotional problems in children and adolescents. Over the past century or so, different terms have been used and continue to be used to describe similar sets of problems, including antisocial behavior, acting out problems, externalizing behavior problems, disruptive behavior, and juvenile delinquency. Conduct Disorder itself is a formal mental health diagnosis characterized by repetitive and persistent of behavior in which the basic rights of others and / or major age-appropriate social norms or rules are violated (American Psychiatric Association, 1994). Children with Conduct Disorder may exhibit excessive levels of fighting or bullying; cruelty to animals or to people; destruction of their own or other people's property; fire setting; stealing, repeated lying; truancy from school and running away from home; unusually frequent and severe temper tantrums and defiant provocative behavior (BMA Board of Science, 2006). Children with Conduct Disorder vary widely in their presentation of symptoms, and both DSM-IV and ICD-10 subdivide Conduct Disorder into different subtypes. DSM-IV divides Conduct Disorder into childhood onset (onset before 10 years of age) versus adolescent onset (onset at 10 years of age or older). ICD-10 divides Conduct Disorder into socialized Conduct Disorder, unsocialized Conduct Disorder, Conduct Disorders confined to the family context, and

Conduct Disorder unspecified. Isolated antisocial or criminal acts are not sufficient for a diagnosis, which requires an enduring pattern of a range of difficult behavior for at least six months (WHO 1994; American Psychiatric Association 2000).

During the past few decades, Conduct Disorder has become one of the most prevalent if not the most prevalent mental health problems among young people. The prevalence of Conduct Disorder in general population ranges from less than 1% to more than 10% depending on the particular group assessed, with higher rates among males than females, and in urban as compared to rural settings (American Psychiatric Association, 2000). In a British survey of young people between the age of 11 and 15 it was found that Conduct Disorder occurred in about 7% of the population in overall (up from 6.2% in 1999), affecting 8.1% of males (8.6% in 1999) and 5.1% of females (3.8% in 1999) (Green et al., 2005). Conduct Disorder is particularly prevalent among young people in juvenile custody and is one of the most frequently diagnosed conditions in outpatient and inpatient mental health facilities for children. Research has estimated that the rates of Conduct Disorder diagnoses among clinic populations to be 37% in England, 36% in Scotland and 42% in Wales (Meltzer et al. 2004).

Two patterns of Conduct Disorder have been described, one involving onset during middle childhood with a persistent life course, vs. emergence during adolescence. Studies have shown that the long-term prognosis for Conduct Disorder is fair to poor, especially if symptom onset occurs before age 10 (Moffitt 1993). Early patterns of Conduct Disorder are highly stable, with half of the most antisocial boys at age 8 – 10 still being antisocial at age 14, and 43% remaining among the most antisocial at age 18 (Farrington, 1989). Richman et al. (1982) found that 62% of three year old children with conduct

problems continued to exhibit these problems at the age of 8, and half of all youths who initiated serious violent acts before the age of 11 continued this type of behavior until at least the age of 20, twice the rate of those who began their violent acts at the age 11 or 12 (Richman et al., 1982). Adult antisocial behaviors (generally diagnosed as Anti-social Personality Disorder) associated with childhood Conduct Disorder include theft, violence towards people and property, drunk driving, use of illegal drugs, carrying and using weapons and group violence (Farrington 1995). Conduct Disorder in childhood is also associated with a failure to complete schooling, joblessness and consequent financial dependency, poor interpersonal relationships and abuse of the next generation of the children (Robins, 1991). However, about 25% of the general population exhibit some conduct problems that start in mid to late adolescence, but these problems generally do not persist into adulthood (Moffitt, 2003), which suggests that late onset conduct disorder may represent more of a normal developmental phase.

The costs of Conduct Disorders, both in terms of the quality of life of those with Conduct Disorder (and those around them), and in terms of the resources necessary to mitigate the effects of Conduct Disorder, are quite high. In the U.K., the estimated annual cost per child per year if Conduct Disorder is left untreated is £15,270 (\$24,195); direct costs for all agencies (local education services, local authority social service and National health service) were £8,258 (\$13,084) and indirect costs (lost employment income for parents, additional housework and repairs, allowances and benefits) were estimated to be £7,012 (\$11,110), which is up to six times the costs for non Conduct Disordered youth (Knapp, 1999). A study by Scott (2001) found that two thirds of the total cost of Conduct Disorder was related to crime, and large costs were associated with

disrupted education, being in legal custody, and receiving social service benefits (Scott et al. 2001)

Treatment of Conduct Disorder

PCIT. For these reasons, developing effective treatments for Conduct Disorder is essential. At present, there are several interventions for treating Conduct Disorder that have some empirical support for their effectiveness. One such program is Parent-Child Interaction Therapy (PCIT) which is designed to help parents build a warm and responsive relationship with their child and to manage their child's behavior more effectively. Training is conducted in the context of a dyadic play situation. Parents are taught and given time to practice specific communication and behavior management skills with their child in the clinic playroom. The rationale for the program is that parents clearly have a tremendous influence on their young child's behavioral and emotional development, so they can foster healthy, constructive child development, or they can exacerbate behavior problems, depending on the parents' own behavior (Herschell, 2002). Several studies have examined the effectiveness of PCIT, with most utilizing observations of parent-child interactions and parent reports of child behavior and parent stress level. Positive short-term outcomes include significant post treatment declines in the number and intensity of child problems behaviors at home, generalization of positive results to the school setting, improved parental attitudes, significant reductions in parental stress levels, improved marital relationships, and improved behavioral interactions between parent and child (Herschell et al., 2002, Ware et al., 2003). However, although there are a relatively large number of studies of PCIT assessing immediate and short term

effectiveness, only a few studies have focused on longer term outcomes. Eyberg et al. (2001), for instance, examined one and two year outcomes of PCIT treatment. Twenty families completed the treatment program and 13 were available for a follow-up evaluation. At post treatment, 11 out of 13 families had significant improvement on both clinical observation and parents report measures. Treatment effects were maintained for 8 and 9 out of the 13 families at one and two year followed up assessment. An analysis of pretreatment demographic characteristics of those who participated in follow up assessment and those who did not participate revealed no significant differences. One limitation of this study is that no control group of conduct-disordered children and families was included, and thus the effects of natural maturation are confounded with the effects of treatment. Nevertheless, the results suggest that PCIT treatment may be successful in long-term effectiveness for many conduct disorder children and their family

A study conducted by Hood and Eyberg (2003) examined the maintenance of PCIT effects from three to six years after treatment. Twenty three of 50 parent – child dyads who had completed PCIT treatment and an initial assessment participated in the follow up evaluation. No significant differences in the characteristics of people who participated or who did not participate in the follow-up assessment were found. The authors concluded that “the children not only maintained their gains but also showed continuing behavioral gains with time. The mother’s confidence in their ability to control their child’s behavior was also maintained” (Hood & Eyberg, 2003, p.426). Another important study by Boggs et al (2004) compared PCIT treatment completers versus dropouts from one to three years post treatment . The authors concluded that “results indicated consistently better long-term outcomes for those who completed treatment than

for study dropouts” and among families not completing treatment parents saw little change among severe behavior problems (Boggs et al. 2004, p.2;18). These results are, of course, limited by the fact that families were not randomly assigned to complete or not complete treatment, and thus it is not clear whether it was completing treatment that was associated with better outcomes, or the characteristics that led families to complete treatment that were associated with better outcomes.

A study by Pade et al. (2006) examined immediate and longterm effects of a shortened, modified version of PCIT with 73 participants in the initial sample, with 23 participants available for the five to six year follow-up. These authors found that the shortened version of PCIT appeared to have some benefits similar to the traditional, longer version of PCIT. Child behaviors improved significantly immediately following treatment and some improvement was maintained at follow up.

Parent-training. Parent-training more generally is a form of intervention for conduct problems. The main goals of this approach are to help parents to improve their relationship with their child, and to improve their child’s behavior by teaching the parents more effective parenting behaviors. This is undertaken through training in behavior-management skills grounded in social learning theory. The efficacy of this approach is supported by at least 19 studies that have compared parent-training/education program with a control group. Using a vote-counting approach, 50% of all outcomes assessed in these studies showed a statistically significant improvement in child behavior for the group receiving parent-training, and the remaining 50% of outcomes were neutral (that is, no statistically significant difference was found between the control and the intervention

arms of the trials); however, the long-term effects of this approach are not well established (NICE, 2006).

Media-based parenting programs for the treatment of Conduct Disorder also have some evidence regarding their efficacy. In these programs, parenting training is delivered to parents via a videotape, the internet, a self-help manual, or a combination of these, with minimal input from professionals. Nine studies have assessed the effectiveness of this approach and have found that media-based parenting courses produce statistically significant improvements over waiting list controls (Montgomery, 2005).

Social skills training. Another form treatment for Conduct Disorder with some evidence regarding its efficacy is social skills training (SST), which is a positive, proactive intervention designed to teach children and adolescents specific positive social behaviors to replace less desirable ones. SST programs may utilize operant and social learning strategies such as observation, modeling, guided practice, rehearsal, and role playing (Lane et al. 2003). Other programs have been developed through cognitive learning theory and use such techniques as self-assessment, self recording and social problem solving (Olmeda & Kauffman, 2003). The literature suggests that SST, including cognitive-behavioral interventions, are an appropriate and effective form of treatment. For example, a study by Gollwitzer et al. (2006) examined the efficacy of the “Viennese Social Competence Training Program - ViSC” for preventing violence and aggressive behavior in school. The study found that the ViSC program had long-term effects with significant reductions and/or prevention of aggressive behavior. A study conducted by Grizenko et al. (2000) compared the effectiveness of traditional and modified social skill training. They found that the modified social skills training program, which takes into

account self/other perspective-taking, was more effective in improving behavior at school, and that some treatment gains were sustained at a nine month follow up.

The LIFT (Linking the Interest of Families and Teachers) program combines parenting training and social skills training. This program was developed by the Oregon Social Learning Center. The intervention consist of three main components: Child management training for parents, social and problem solving skills training for students, and behavior management with the children during breaks / play time during the family therapy sessions. The effects of this approach with students of age 10 found that arrest rates at age 13 (two and a half years after the end of intervention) for the comparison group were 10.3% as compared to 4.1 % of the intervention group (Eddy et al., 2003)

MST Therapy

One of the best developed and evaluated and most widely disseminated programs designed for adolescents with Conduct Disorder is Multi-Systemic Therapy. MST is a family and home based treatment that focuses on changing how youth function across their different environments, including home, school and the neighborhood, in ways that promote positive social behavior and eliminate inappropriate behavior. MST is based on Bronfenbrenner's theory of social ecology, which views individual behavior as a function of a complex network of interconnected social systems in which the individual exists. According to its developers (e.g., Henggeler & Borduin, 1995) "MST is distinguished from other intervention approaches by its comprehensive conceptualization of clinical problems and the multi-faceted nature of its interventions" (p.121). MST therapists are guided by a set of nine treatment principles that offer general guidelines that direct case

conceptualization, treatment specification, and prioritization of interventions, and ongoing quality assurance to support treatment fidelity. It focuses on (a) working to empower parents to take control of the family and children by using the family's strengths to access and develop natural support systems, such as the extended family, friends and neighbors; (b) helping parents remove barriers such as high stress or difficult relationships with spouses / parents that interfere with the parent's capacity to function as effective parents and (c) teaching parenting skills, coaching parents on strategies to set and enforce curfews and rules in the home, on how to decrease the adolescent's involvement with deviant peers and at the same time promote friendship with pro-social peers, and (d) how to manage challenges presented by living in a stressful neighborhood where criminal activity, etc. may exist.

The target population of MST are chronic, violent or substance-abusing male and female juvenile offenders at risk for out of home placement and / or juvenile justice involvement. The average age of adolescents treated with MST is around 14 to 16 years of age, living in homes that are often characterized by multiple needs and problems. The typical treatment duration of MST services is approximately 4 months, with multiple therapist-family contacts occurring each week.

In comparison with other family or behavioral therapy approaches, some advantages of MST are that it explicitly targets factors in the adolescent and family's social networks that have been empirically linked with antisocial behavior. For example, MST's priorities include separating adolescents from deviant peer groups, enhancing school or vocational performance, and developing an indigenous support network for the family to develop and maintain therapeutic gains. MST programs have an extremely

strong commitment to removing barriers to service access by, for instance, meeting parents in their homes, and being available 24 hours a day. Third, MST services are more intensive than traditional family or behavioral therapies (e.g., several hours per week vs. the more typical one 50 minute session per week).

Effectiveness of MST

A number of studies have produced results indicating that MST is effective in reducing conduct problems in adolescents. Harpell (2006), in a review of the efficacy of MST, concluded that “MST is very powerful alternative to the usual legal and social service approach (e.g. justice system, day treatment programs) used in the treatment of adolescent Conduct Disorder” (p.80). The strongest and most consistent support for the effectiveness of MST comes from controlled studies that have focused on violent and chronic juvenile offenders. Importantly, results from these studies showed that MST outcomes were similar for youths across the adolescent age range (i.e., 12-17 years), for males and females, and for African-American vs. Euro-American youth and families.

Individual studies supporting the efficacy of MST include Henggeler et al. (1992), who assessed the efficacy of MST versus usual services provided by the Department of Youth Services. The youth were randomly assigned to receive MST (N=41) or usual services (N=43). The mean duration of treatment was 13 weeks. At a 59 week follow-up, analysis of re-arrest, self reported delinquency, and placement data indicated that youth who had received MST services showed significantly less aggressive behavior, fewer arrests and self reported offenses and had spent an average of 10 fewer weeks incarcerated. At 2.4 year follow-up, the ratio of re-arrest rates in the control vs. treatment

had doubled (Henggeler et al. 1992, 1993).

Borduin et al (1995) conducted a controlled study in Missouri to assess MST versus Individual therapy outcome for 176 juvenile offenders aged 11 to 17, at high risk for committing further offences. At post treatment, results of parental reports of personal psychiatric symptoms, child behavior, and family functioning (e.g. cohesion and adaptability) showed benefits better functioning for the families receiving MST. In contrast, individual therapy treatment produced no benefit or actual deterioration on these variables.

Ogden and Hagen (2006) examined the effectiveness of MST in comparison to regular services, with a two year post-baseline assessment focused on out of home and behavior problems. Seventy-five adolescents were randomly assigned to MST or regular services at three sites across Norway. Relative to the control group, antisocial adolescents assigned to receive MST showed decreased externalizing symptoms, internalizing symptoms, and out-of-home placements.

In another recent study involving 93 youth randomly assigned to MST or treatment as usual services, Timmons-Mitchell et al. (2006) reported significant effects for legal offense outcomes through an 18 month follow-up, and for a 6 month follow-up for ratings on the Child and Adolescent Functional Assessment Scale (CAFAS). Significant outcomes included reductions in re-arrest rates for MST vs. treatment as usual (66.7% vs. 86.7%, respectively), although time to re-arrest did not differ significantly for the two groups (135 days vs. 117 days, respectively). Adolescents and families in this study who received MST reported significantly more cohesion than non-MST families.

Another follow-up study (Schaeffer and Borduin, 2005) examined the long-term

effects of MST on criminal activity among 176 youth who had participated in either MST or treatment as usual (individual therapy) in randomized clinical trial. Results of this study indicated that MST participants had significantly lower recidivism rates at follow-up than did their counterparts who participated in individual therapy (50% vs. 81%). Moreover, MST participants had 54% fewer arrests and 57% fewer days of confinement in adult detention facilities than the participants that received individual therapy. This investigation, which included a 13.7 year follow-up, represents the longest follow-up to date in a MST clinical trial.

Henggeler et al. (2006) compared the effectiveness of MST with 161 adjudicated juveniles who met diagnostic criteria for substance abuse or substance dependence. This study assessed whether the integration of evidence-based practices such as MST enhances outcomes for youth going through juvenile drug court. Assessed after 12 months of services, youth who received the MST enhanced services showed better substance use outcomes; it was also found that drug court was more effective than family court at decreasing self reported substance use and criminal activity.

Stambaugh et al. (2007) examined outcomes for 320 youth with serious emotional disturbance at risk for out of home placement, at an 18 month follow up. One group received wraparound services only, one group received MST, and another group received both services. The MST only group showed greater clinical improvement than the other groups, including decreased symptoms and lower rates of out of home placement.

Letourneau et al. (2009) assessed the effectiveness of MST with a sample of 127 juvenile sexual offenders. Youth were randomized to receive MST or treatment as usual. Outcomes up to 12 months after the beginning of treatment were assessed. It was found

that, relative to youth who received treatment as usual, youth in the MST condition showed significant reductions in sexual behavior problems, delinquency, substance use and externalizing symptoms as well as out of home placement.

Thus, there is strong support for the effectiveness of MST. There is also support for MST in terms of cost effectiveness. Reviewing the evidence in this area, the Washington State Institute for Public Policy (2006) concluded that MST is one of the most cost-effective treatments for reducing serious criminal activity by adolescents. This review highlighted the importance of cost-effectiveness, stating that evaluations of cost-effective methods for conduct problems were important to reduce the future need for prison beds, save money, and lower crime rates. They estimated that the net taxpayers' benefits for using MST rather than juvenile justice placement was \$18,213 per youth, and that for every \$1.00 invested in MST implementation benefits \$5.27 was saved.

Limitations : In sum, then, there is fairly strong support for the efficacy of MST. There are, however, dissenting opinions, primarily that of Littel. In her systematic review paper, following guidelines developed by the Cochrane Collaboration and Campbell Collaboration she found that no difference in treatment effects from MST compared with usual services or alternative treatments (Littel, 2005). She concluded when pooled across studies of varying quality, results have tended to favor MST, but this was not replicated with more rigorous intent-to-treat analyses. She also provided some explanation for the different conclusions of her review in comparison with prior reviews (Littel, 2005). Those included (a) the tendency to select one most recent report per study, since it contained more complete outcome data than early reports on the same study, which might affect interpretation of results; (b) reports with statistically significant

findings are more likely to be published than those with non-significant findings; (c) the MST literature has paid too little attention to implementation, data collection, and analytic issues that can affect the internal validity of inferences drawn from findings of randomized experiments; and (d) most MST studies were conducted by its developers, who are less likely to be critical of their own programs and studies than independent researchers.

Importance of assessing moderators

Moderators are factors potentially interacting with the effects of treatment on outcome measures, and analyzed as interaction effects between baseline or pre-treatment values of the moderator and Treatment Group (Kraemer, 2002). Despite the relatively high level of support for the effectiveness of MST in regards to the treatment conduct disorder, little is known about subgroups from whom or conditions under which MST is less effective. That is, few moderators of the effects of MST have been identified. This is important for several reasons. First, moderators of treatment outcome can determine who should receive treatment (i.e., who will be successful in treatment), which is important given limited resources and an inability to treat everyone. For instance, given limited resources, it could help courts decide whether certain adolescents should be diverted to treatment vs. being incarcerated, based on how they were predicted to respond to treatment. Second, moderators of treatment outcome could help to identify for whom the program needs to be modified. For instance, if we found that MST was less effective for females than males, this would suggest that it needs to be modified to be more effective for females. And finally, moderators of treatment outcome can also help us

understand how treatment programs such as MST work, by understanding why it works for some groups of adolescents better than others. In short, research is needed to identify which factors moderate the effectiveness of MST in order to refine existing interventions, develop new approaches, and better understand the underlying causes of disorders.

An early study that identified moderators of MST treatment was conducted by Henggeler et al. (1997). The authors examined the relation between MST treatment fidelity to clinical outcomes at a 1.7 year follow up. Results indicated that low therapist adherence to treatment principles was related to worse outcomes (higher symptomatology, higher re-arrest rate) among youth receiving MST. Other studies investigating the transportation of MST to community settings have found similar results (Schoenwald, 2003). Using data from two different MST clinical trials with serious juvenile offenders and substance abusing offenders (Henggeler et al. 1997; Henggeler et al 1999, respectively). Huey et al. (2000) found that across both studies, therapist adherence to MST was associated with improved family relations and decreased association with delinquent peers which in turn were associated with reductions in delinquent behavior. Thus, one moderator of MST effects may be the fidelity with which it is implemented.

In a study assessing a broader range of moderators, Borduin et al. (1995) examined long term rates of criminal behavior and violent offending among 200 violent and chronic juvenile offenders who were assigned randomly to MST or individual therapy. Analyses examining potential moderators of MST effectiveness revealed no significant effects for participant age, race, social class, sex, or pre-treatment arrests on number of post-treatment arrests. Schaeffer (2001) used this same sample to study the moderators and

mediators of MST outcome at 10 years post-treatment. She found, as did Borduin et al. (1995), that effects of MST did not differ significantly across a variety of variables, including youth verbal ability, SES, age, sex, and race. This may not be surprising, given that MST provides interventions that are highly individualized, flexible and ecologically valid. However, in her study, one factor that did emerge as a moderator of MST effectiveness was single-parent family status, with single parent status associated with less improvement on several instrumental outcomes (i.e., factors related to target outcomes) relative to two parent families. Adverse effects of single parent status on MST outcomes were not found when this variable was examined separately and when it was examined as a function of several other variables (e.g., sex and race). Adolescent girls in single parent families showed less improvement in symptomatology and smaller decreases in peer aggression than did boys in single – parent homes, or boy and girls in two parent homes. In addition, among Euro-American families only single-parent status was associated with less improvement in family cohesion. Adolescents in single-parent families also showed less improvement on grades. Although MST was somewhat less effective with single parent families, these families still showed more improvement than did families assigned to usual services. Single parent status did not moderate the effectiveness of MST on ultimate outcomes (based on youth’s report of delinquent behavior and on arrest data collecting during follow-up episodes), which means that in the long run, adolescents from these families benefited equivalently from MST as youth from two parent families.

Results of this study also showed that high engagement in treatment at various stages of MST was related to positive instrumental outcomes (functioning from pre to

post treatment assessment), including improved grades, increased family cohesion and decreased adolescent symptomatology. Higher family adversity (e.g., maternal psychiatric history, maternal alcohol/drug use, and high number of children in the home) did not moderate MST effectiveness but was associated with dropping out of MST. In addition, a high level of engagement in MST mediated the effect of family adversity on treatment dropout. Thus, this study indicates that MST can be highly effective with families experiencing multiple stressors if concentrated efforts are made to actively engage such families in treatment.

In their discussion of the differences in MST's outcome in between Sweden and United States, Sundell et al. (2008) hypothesized that different socio-demographic contexts (e.g., rate of poverty, crime and substance abuse) might moderate the degree of improvement among young offenders receiving MST. In addition, they suggested that differences in the public social service systems for conduct disordered youths might also moderate effects on the rate of rehabilitation among young offenders. However, these hypotheses were not tested and need to be checked by future studies.

Overall, then there have been relatively few studies examining factors that moderate MST treatment outcomes. The few studies that have examined potential moderator of MST effectiveness have found no significant effects for participant age, race, social class, sex, or pretreatment arrests on post treatment arrests (Borbuin et al., 1995), but therapist adherence to MST and treatment fidelity have been found to moderate MST effectiveness (Henggeler, 1997; Huey, 2000). Single family status and the engagement of parents in treatment have been found to moderate MST effects, and time in treatment and drop out from treatment may be potential moderators. In addition, there is some evidence that

there may be higher order interactions among some of these factors (e.g., sex, race interact with single family status) (Schaeffer, 2001).

Thus, for this study, we hypothesized that demographic factors (e.g., sex, age, race) would not predict treatment outcome, based on the results of Borduin et al. (1995) and Schaeffer & Borduin (2005). However, we also hypothesized that family functioning and family relationships would moderate the effectiveness of MST, with better functioning families benefitting more from MST because they would have more psychological resources to benefit from the program, and would be able to be more engaged in treatment.

CHAPTER II

METHODS

Participants

In this study, data were used from Weiss, Han, Catron, Harris, Ngo & Caron (2010), which was an outcome study of the effects of MST. Participants for this study were selected from self-contained, Moderate Intervention Program (MIP) classrooms within the public schools. Students are placed into MIP classrooms because their conduct problems are sufficiently problematic such that they are judged to be unable to be educated in the general education system and / or because their behavior is so disruptive that it significantly interferes with the education of other students. Students may be placed in MIP directly from a general education classroom or as part of a transition process from a more or less restrictive educational placement (e.g., from an alternative school). However, although our participants were not obtained through the legal system, over 70% had court involvement at baseline. Based on data provided by the school system, students in MIP classrooms demonstrate significant conduct problems. For example, teacher ratings of MIP students' delinquent behavior on the Teacher Behavior Questionnaire (Catron & Weiss, 1994) are on average 1.8 standard deviations above that for students in general education classrooms.

Two hundred and thirteen families were approached for participation, and 164 of

these agreed to participate in the study, 91% completed the treatment program, 5% (6 control, 2 treatment) moved or were unable to be located prior to the final assessment, and 4% (2 control, 4 treatment) voluntarily withdrew prior to the end of the study. Eighty participants were assigned to the control group and 84 to the treatment group; within the treatment group, 3 families withdrew or moved prior to initiating treatment (see Table 1 for Consort Flowchart). At the beginning of project involvement, the mean age of the adolescents was 14.6 (s.d.= 1.3), 83% of the adolescents were male, and 59% were African-American and 40% Euro-American. Mean age of the primary caregiver was 40.8 years (s.d.=8.8) and median education of the primary caregiver was high school graduation. Seventy-seven percent of the primary caregivers were biological mothers and 6% were biological fathers, with 71% of the families headed by a single parent. Median family yearly income was about \$17,500. Based on parent-report Child Behavior Checklist (Achenbach, 1991b), at baseline 87% of our sample scored in the borderline clinical range or above for externalizing problems, with about 66% at or above the borderline clinical range for internalizing problems. Table 2 provides demographic information for the treatment and control groups. In this study, comparison group members were assessed on the same schedule as the treatment group members, but received no intervention from the study.

Measures

Outcome measures. Our primary outcome measures focused on adolescent conduct problems, as assessed by parent, adolescent, and teacher report. Parents

completed the Child Behavior Checklist (CBCL; Achenbach, 1991a), teachers completed the Teacher Report Form (TRF; Achenbach, 1991b) and adolescents completed the Youth Self-Report form (YSR; Achenbach, 1991c). These are broad-band measures of children's behavioral and emotional problems, in which parents, teachers and adolescents report on the adolescent in regards to 118 problems, rating each problem by circling 0 ("Not True"), 1 ("Somewhat or Sometimes True"), or 2 ("Very True or Often True"). Test – retest correlations over an 8 day interval for the CBCL, TRF and YSR and a 16 day interval for the TRF range from .78 to .93 for the social competence and adaptive functioning scales, from .60 to .96 for the syndrome scales and from .62 to .95 for the DSM-Oriented Scales (Achenbach & Rescorla, 2001). Cronbach's alphas ranged from .55 to .79 for the social competence and adaptive functioning scales, from .71 to .97 for the syndrome scales and from .67 to .94 for the DSM-Oriented Scales. The CBCL scales have a correlation of .81 with the Quay and Peterson (1983) Revised Behavior Problem Checklist (Achenbach, 1991a). The TRF scales have an average correlation of .83 with the Conners' Revised Teacher Rating Scale (Goyette, Conners & Ulrich, 1978), and four-month retest reliability of .66 (Achenbach, 1991b); the Internalizing and Externalizing YSR scales have an average one week retest reliability of .80, and correlate .40 and .44 respectively with comparable parent-report CBCL Internalizing and Externalizing scales (Achenbach, 1991a).

Potential moderators. Potential moderators focused on (a) child and parent demographic characteristics; (b) parenting behavior; (c) parent mental health problems (e.g., depression; antisocial and/or substance abuse problems), and (d) family relationships. To assess parenting behavior, the adolescent's primary caregiver

completed the Parental Authority Questionnaire (PAQ; Buri, 1991). The PAQ produces three scales: Authoritarian Parenting, Authoritative Parenting, and Permissive Parenting, and has established reliability and validity (Buri, 1991). In addition, to assess parenting behavior the adolescent and their primary caregiver were asked to complete the Child Report about Parent Behavior Inventory (CRPBI; Schaefer, 1965). The CRPBI uses a 3-point Likert-type questionnaire to assess children's (and parents') perceptions of parental Firm vs. Lax Control, support for Psychological Autonomy vs. Psychological Control, and parental Warmth. Children rated both parents on their behavior, whereas the primary caregiver rated themselves.

To assess parent mental health problems, parents reported on their own symptoms using the Personality Assessment Inventory (PAI; Morey, 1991). The PAI is a self-administered, objective inventory of adult personality and psychopathology; in the present study, the *Alcohol*, *Anti-social*, *Anxiety*, *Borderline Personality Features*, *Depression*, *Paranoia*, and *Positive Impression Management* sub-scales were used. To reduce the number of scales for analysis, we used the higher order *Internalizing* (*Anxiety*, *Depression*) and *Externalizing* (*Alcohol*, *Anti-social*, *Borderline Personality Features*, *Paranoia*) factors identified by Ruiz and Edens (2008).

To assess family relationships, parents completed the Family Adaptability and Cohesion Evaluation Scales-III (FACES-III; Olson, Portner & Lavee, 1985), which measures family functioning in regards to instrumental and affective relations. It produces two sub-scales, a *Family Cohesion* sub-scale and an *Adaptability* sub-scale.

Procedures

For safety reasons, all home assessments involved two research assistants; school assessments generally involved one research assistant. The large majority of parent assessments took place in the home, although on occasion assessments took places at other locations following the request of the parent. The research assistant read each measure to the parent, who followed along and selected an answer on their copy of the measure. Adolescents were individually administered the assessments at school, but also occasionally were assessed at home when more convenient for the family. Teachers were given assessment materials and completed the assessments on their own time. Primary outcome assessments occurred at four time points: (a) baseline, (b) 3 months, (c) 6 months, and (d) 18 months. Parents received \$50 per assessment, adolescents \$20, and teachers \$10 per adolescent per assessment. In addition, treatment fidelity information was collected via the Therapy Adherence Measure (TAMS) at 1, 2, 4 and 5 months via telephone interviews. Participants were assessed regarding the outcome measures at (a) time of entry into the project, and then (b) three, (c) six, and (d) eighteen months later. In addition, treatment group participants completed the fidelity and satisfaction measures at one, two, four and five months after baseline.

Analyses

A mixed models approach to hierarchical linear models (HLM; Raudenbush & Bryk, 2002) was used, with Group as a fixed between-subjects effect, and linear and quadratic effects of Time as random coefficients, within subject effect. The time points

consisted of one baseline assessment, the mid-treatment assessment, the post-treatment assessment and the follow-up assessment. The main effects for Time represented the extent to which the combined groups' rate of change differed from zero. The Group by Time interactions represented the extent to which the two groups' rates of change differed. We used intent to treat analyses, wherein all participants who were enrolled into the study and who provided data were analyzed, regardless of whether they completed treatment. In order to obtain the most complete yet parsimonious model, quadratic effects (the quadratic effect of time, and the interaction between the quadratic effect of time and treatment group) were first tested and if non-significant, dropped from the model, and the linear effect then analyzed.

CHAPTER III

RESULTS

Child demographic characteristics

Child age. The mixed model longitudinal analyses indicated a significant moderator effect of child age on children's report of their externalizing problems. Specifically, the Age x Treatment Group x Time x Time effect was significant ($F[1,109] = 4.04, p < .05$) for the YSR Externalizing Problems scale. As shown in Figure 1 below, for the younger children both treatment and control groups showed improvement of about .3 of a standard deviation out to 18 months, but rates of improvement were very similar. In contrast, for older age group, children in the control group only showed a small improvement whereas children in the treatment group showed substantial improvement (See Figure 1). Thus, this interaction indicated that the effect of treatment was larger for older children, primarily due to older treatment children showing more improvement than older control children.

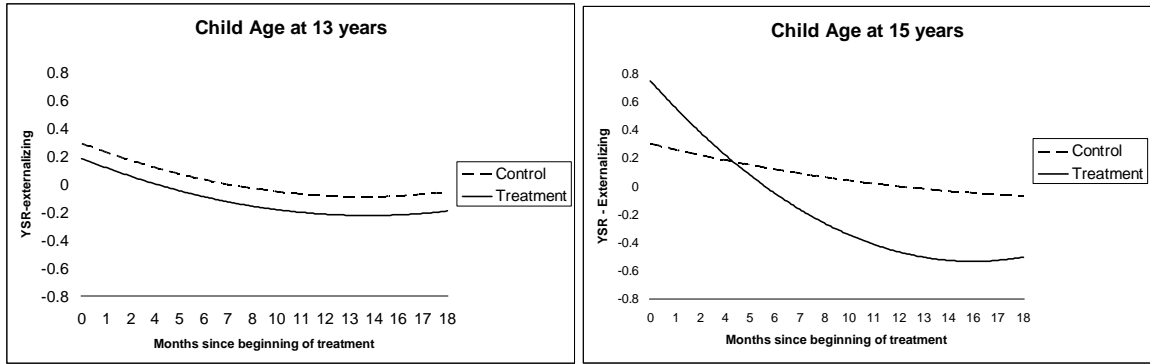


Figure 1: Breakdown of moderator effect for child age

Child race. Our analyses examined the extent to which the effects of treatment group varied as a function of child race. Because the number of Asian and Latino children was small (~1%), we dropped them from the sample and focused on the African American (59%) and Euro-American (40%) children. A significant moderator effect for race was found for externalizing problems on CBCL, Race x Treatment Group x Time ($F[1,129] = 4.71, p < .05$); the quadratic effect in this model was significant ($F[1,148] = 46.52, p < .0001$). As the Figure 2 indicates, this interaction suggests that although MST appears to be effect for both African-American and Euro-American youth, it is more effect with Euro-Americans. However, moderator effect for race was significant for eternalizing problems on CBCL, not on YSR or TRF.

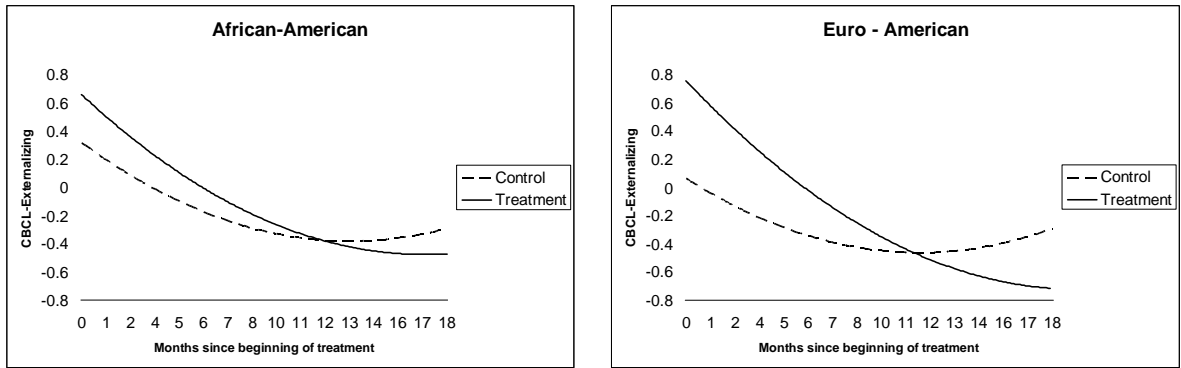


Figure 2: Breakdown of moderator effect for race

Child sex. There were no significant moderator effects for this variable.

Parenting behaviors

The central focus of MST is to help parents to use more adaptive parenting behaviors. In this study we used to measures of parenting behavior, the Parenting Attitudes Questionnaire (PAQ), with the Authoritative, the Authoritarian, and the Permissive Parenting scales, and the Children’s Report of Parenting Behavior Inventory (CRPBI), with the Firm Control, Psychological Control, and Warmth scales.

Authoritative parenting: In our analyses, we found significant moderator effects for authoritative parenting on the effect of treatment on children’s externalizing problems as assessed by the CBCL and YSR. For the CBCL, the Authoritative Parenting x Treatment Group x Time x Time effect was significant ($F[1,119] = 3.94, p < .05$), and for the YSR, the Authoritative Parenting x Treatment Group x Time effect was significant ($F[1,100] = 4.06, p < .05$), with the quadratic effect in this model also significant

($F[1,141] = 25.69, p < .0001$) Plotting the treatment and control groups' change across time at -1 and +1 standard deviation from the mean of Authoritative Parenting indicated that both of these interactions reflected minimal effect of MST at low levels of authoritative parenting, and a substantial treatment effect at high levels of authoritative parenting (see Figure 3).

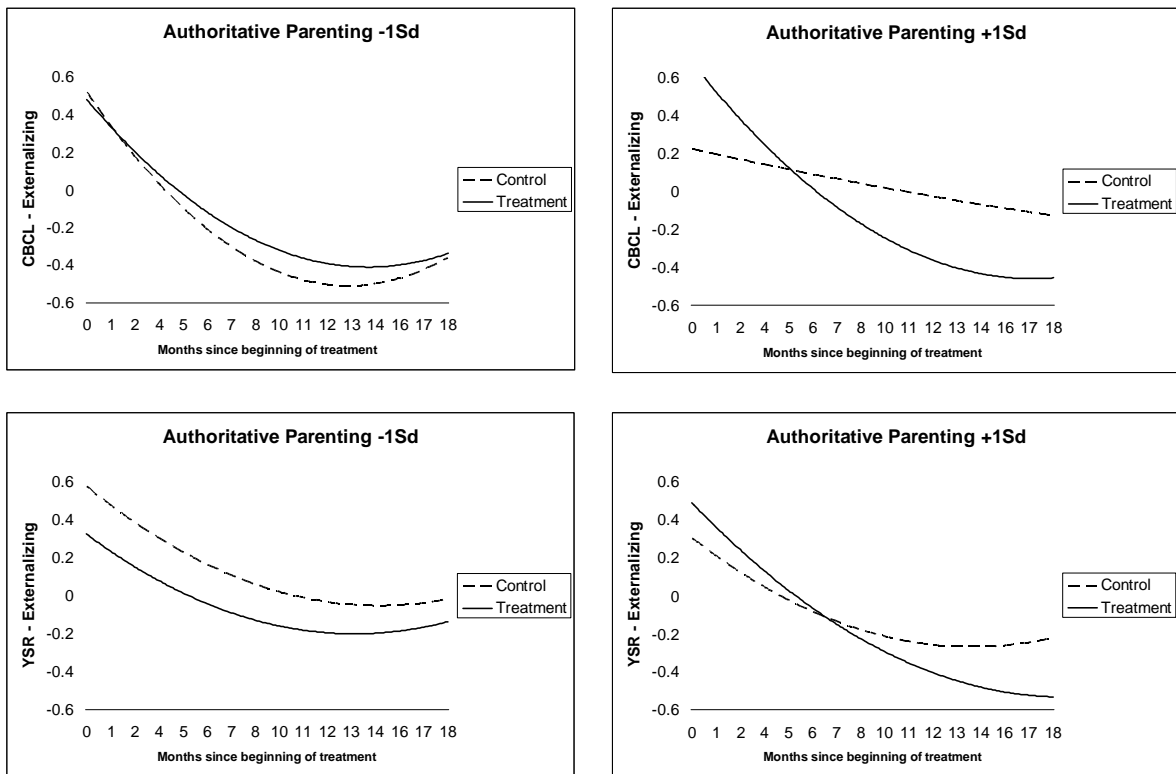


Figure 3: Breakdown of moderator effect for authoritative parenting

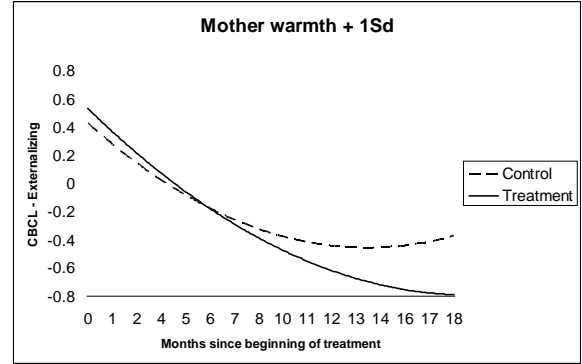
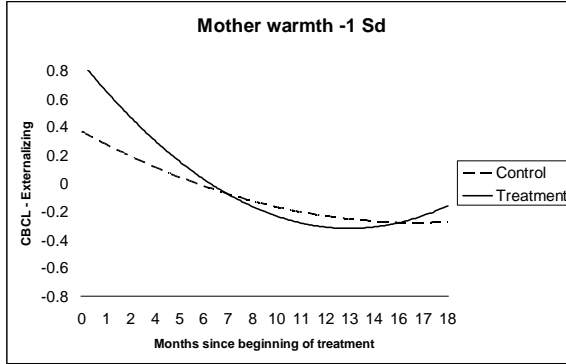
Authoritarian parenting and Permissive parenting. In the present study, there were no significant effects for PAQ authoritarian or PAQ permissive parenting.

Warmth: Analyses found significant moderator effects for mother's warmth (as reported by children on the CRPBI) for the CBCL externalizing scale, with Mother

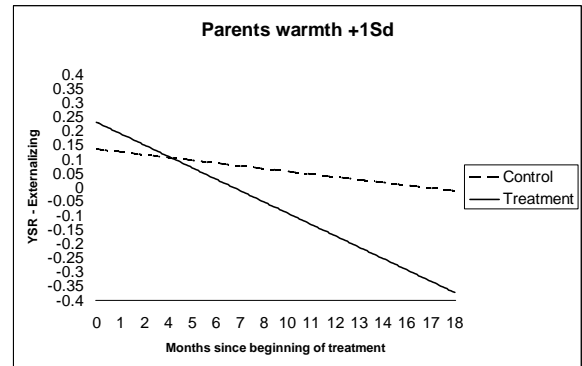
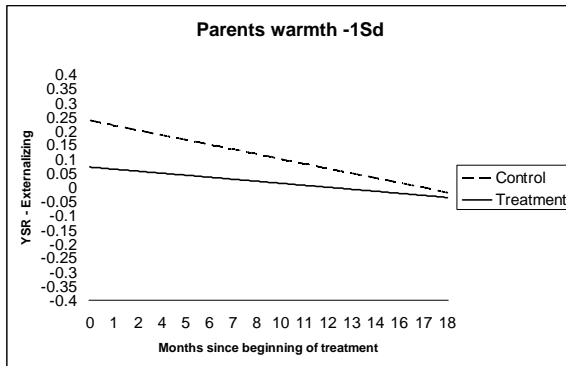
Warmth x Treatment Group x Time x Time ($F [1, 61] = 4.50, p < .05$). Figure 4 shows that although MST appears to be effective for both conditions (at ± 1 standard deviation from the mean of mother warmth), the rate of improvement is larger for adolescents with higher mother warmth. We also found significant moderator effects for parent's warmth (parent's self evaluation on the CRPBI) on YSR externalizing scale, with Parent's Warmth x Treatment group x Time ($F[1, 246] = 4.22; p < .05$), with a similar effect for this interaction, with a larger treatment effect at high warmth (See Figure 4b). However, we found the opposite finding for the moderator effect of parent warmth on TRF externalizing problems ($F [1, 57] = 6.15; p < .05$). As can be seen in the Figure 4c below, at low level of parent's warmth, the treatment group showed substantial improvement whereas the control group got deteriorated. In contrast, at high level of parent's warmth, the improvement's line for treatment group was fairly flat while control group showed small improvement.

No significant effect for father warmth was found for children's externalizing problems on any CBCL, YSR or TRF externalizing scales.

(a)



(b)



(c)

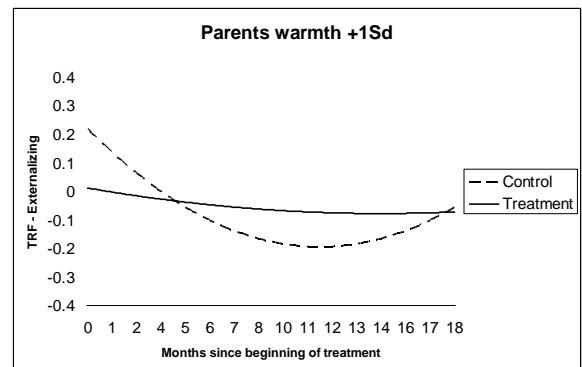
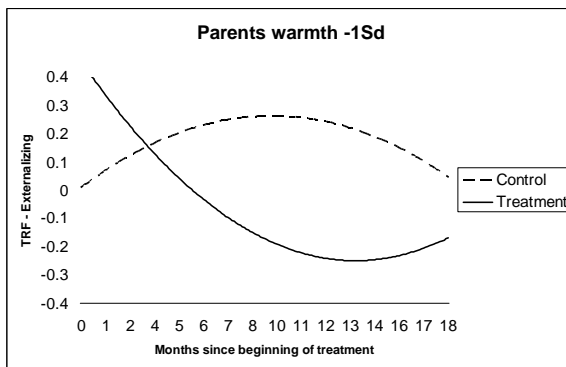


Figure 4: Break down of moderator effect for mother and parent's warmth

Firmness: The mixed model analyses revealed moderator effects of mother firmness on CBCL externalizing scale ($F[1, 63] = 6.92 p < .05$) with quadratic effect also significant in this model ($F[1, 133] = 60.99 p < .0001$). The same moderator effects were found on TRF externalizing scale (Mother firmness x Treatment group x Time – $F[1, 117] = 5.44 p < .05$). These results indicated that MST was more effective with higher mother firmness (see Figure 5)

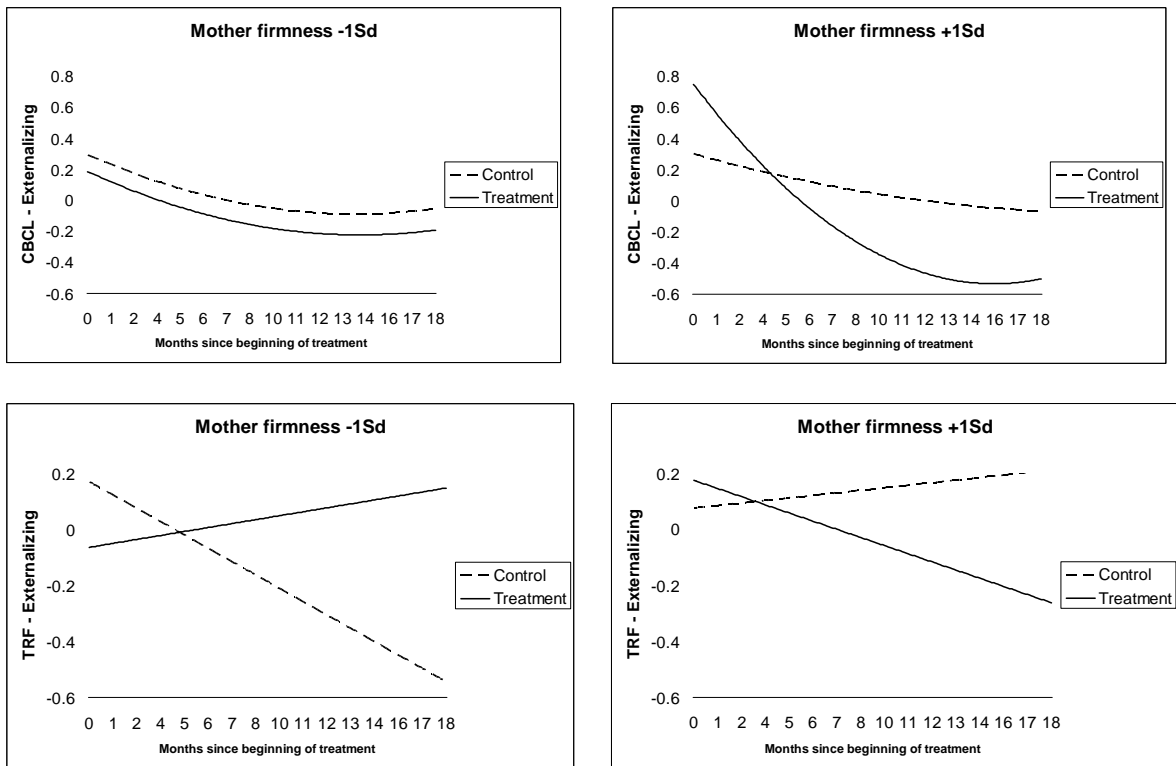


Figure 5: Break down of moderator effect for mother firmness

Psychological Control. In this study, there were no significant moderator effects for psychological control.

Family functioning

Analyses revealed significant moderator effects of FACES-III family cohesion on CBCL externalizing problems (Cohesion x Treatment group x Time with $F [1,126] = 5.30 p < .05$) with a significant quadratic effect ($F [1,149]=42.21, p<.0001$). FACES-III adaptability also had impact on MST effectiveness. The Adaptability x Treatment group x Time effect was significant ($F [1,104] = 7.94, p<.1$) and quadratic effect was significant ($F[1,141] = 28.83; p<.0001$; see Figures 6). Again, higher functioning families showed larger treatment effects.

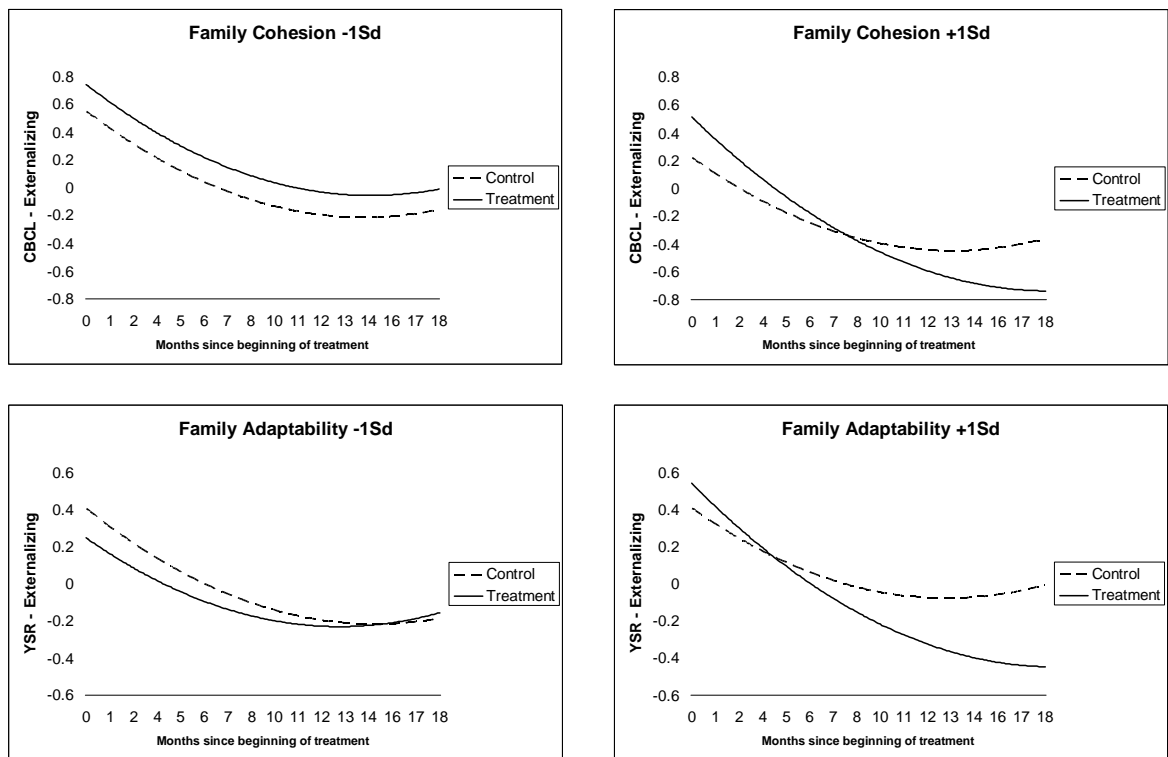


Figure 6: Break down of moderator effect for family cohesion and adaptability

Parental psychopathology

A significant moderator effect was found for PAI externalizing on YSR (PAI externalizing x Treatment group x Time x Time with $F[1,101] = 4.84, p < .05$). As Figure 7, better functioning parents showed a larger treatment effect. There were no significant effects for PAI internalizing.

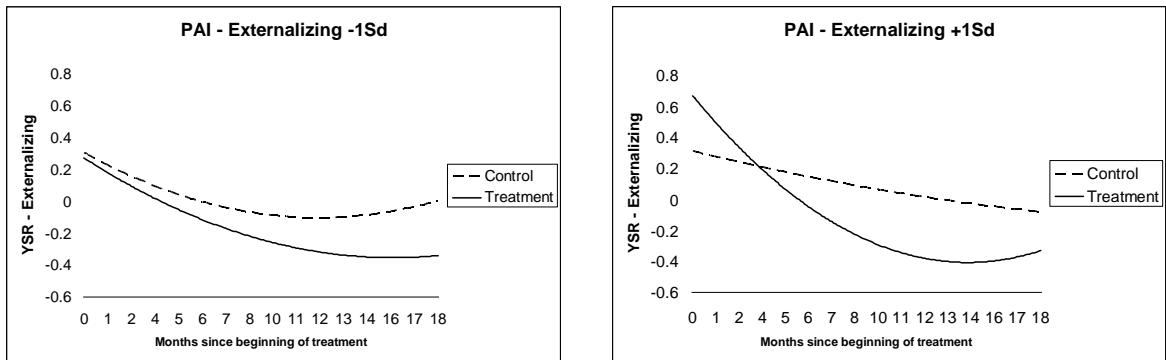


Figure 7: Break down of moderator effect for parent psychopathology

Summary of the Results

There were a number of significant moderator effects for MST. The results indicated that child age and child race moderated the effectiveness of MST, with older children and Euro-American children benefiting more from MST. In addition, a number of significant moderator effects were found for parenting behaviors, family functioning, and parent psychopathology. Of these ten significant moderator effects, nine showed MST more effective with better functioning families.

CHAPTER IV

DISCUSSION

The purpose of the current study was to identify variables that either positively or adversely affect outcome in MST. The data were part of a study carried out as part of a randomized study to compare the effects of MST and a control group of conduct disorder children. A number of assessment instruments were administered before and after the intervention, up to 18 months following the beginning of treatment. The present discussion primarily considers three issues: (a) theoretical explanations for our findings; (b) comparison of our results to those of other studies; (c) limitations of the present study and implications of these findings for the future research.

Based on results of previous studies (e.g., Borduin et al 1995, Schaeffer & Borduin, 2005, Harpell, 2006), we expected that demographic variables would not moderate treatment outcomes. However, we found that child age and race did moderate the MST effectiveness, at least as reported by some informants. Specifically, older adolescents and Euro-Americans benefitted more from MST. There are several possible explanations for the age interaction. The first is that MST intervention is an integrated treatment for each family, using problem-focused, empirically-validated treatments that target etiological factors (Henggeler & Borduin, 1995). The use of certain more intellectually complex interventions such as cognitive therapy might favor older children because they are more able to understand the fundamentals of cognitive techniques.

Second, it is possible that older children may be more fully aware of the consequence of their negative behavior, for instance, as they approach the age at which their behavior can result in prison sentences. Third, in general older children are more affected by deviant peer groups, and association with deviant peer is a powerful predictor of antisocial behavior in youth (Lahey, Moffitt and Caspi, 2003). Moving adolescents away from deviant peer groups is a major focus of MST (Henggeler, 2009) and hence MST may be effective with the older children.

In regards to the race effect, it is possible that the reason that Euro-Americans showed greater treatment effects than African-Americans, at least for parent-reports, could reflect the fact that African-American families face long and heavy legacy of centuries of racial discrimination. African-American families often face discrimination wherever they go and whatever they do (Snyder & Sickmund, 1999), which could reduce the effectiveness of intervention.

Overall, we found ten significant treatment moderators related to family or parent functioning, and nine of these showed that MST was more effective with better functioning families. In general, this may reflect better functioning families' ability to implement the therapist's recommendation, develop a stronger treatment alliance, or access useful resources.

In regards to the specific moderators, both higher levels of family cohesion (e.g., emotional bonding among family members; the desire for family members to help and support each other) and higher levels of family adaptability (i.e., the family's ability to be flexible and to adapt to change; a more egalitarian role sharing and rule making family

style) were associated with stronger treatment effects. One explanation for this finding is that in flexible and emotionally connected families, children may feel that they are a part of the family, and can participate in making decision or creating new rules for the family (Bornstein, 2002); thus, they may feel they have more of a sense of responsibility to regulate their own behavior. In addition, flexible families may find it easier to absorb and apply new parenting strategies than rigid families. That is, because these families have more able to adapt to change they may be able to gain more from the MST than lower functioning families. Families with higher cohesion may have parents who talk with their children more (Bornstein, 2002), which in turn may be related to parents behaving with their children in more understandable and sympathetic, although firm, ways, which is a goal of MST.

Parenting behavior – that is, how the parent treats the child – is an important aspect of family functioning. In this study, warmth (positive emotion) and firmness (control exerted by the parent to guide the child) were significant moderators of MST effectiveness. Warm parents are relatively accepting and nurturing of their children, and use positive reinforcement including praise, a smile, or a hug when interacting with their children. High warmth in the parent-child relationship may help to establish and maintain a positive mood during interactions with the child (Henggeler, 2009). This may increase the likelihood that the child will not automatically reject negatively to the parents' behavior, and set the stage for the development of empathy, and teach the child to value interactions with other people; this may make the child more likely to respond to MST interventions. In contrast, in parent-child relationships in low warmth families, there may be insufficient trust and the child may respond negatively automatically,

potentially creating a power struggle. (Henggeler, 2009) Thus, for these reasons high warmth might be expected to be associated with better MST outcomes.

Firm parenting behavior, as assessed by the CRPBI, refers to having clear rules and the parent adhering to and following through the rules with consequences for rule violation. The primary purpose of rules is to define and communicate what are desired and what are undesired behaviors, and to provide consequences for the violation of the rules (Henggeler, 2009). Thus, the potential for firm parenting behavior to have a main effect on child behavior is relatively obvious. A moderating effect might occur because parents who already had a sense of commitment to consistency and clarity with rules may be able to benefit more from MST by integrating suggestions for improvement into their parenting behavior. That is, parents who already are firm but who may be implementing rules with less than maximal effectiveness (e.g., providing inconsistent messages to the child) or who may have rules that are less than maximally adaptive (e.g., they may have a rule that the child must return by midnight on weekend nights, but that rule might be inappropriate for a 12 year old child) have adaptive rule structure in place (i.e., firmness) but not the content. Thus, MST might be more effective with such parents as compared to parents who do not have adaptive rule structure

One interesting question is why there were no moderating effects for father warmth and father firmness. One possible explanation is that fathers are relatively uninvolved with the children (e.g., the mother was the principal caregiver of the child approximately 75% of the time whereas the father was the principal caregiver about 5% of the time). Also, according to Parke (2000), mothers are more associated with caregiving whereas fathers are identified with playful interaction. Mothers on average

spend between 65 to 80 percent more time than fathers do in direct one-to-one interaction with their young children. Thus, the impact of father behaviors may be reduced because they spend relatively little time with the children.

Authoritative parenting (which as assessed by the PAQ involves having clear rules that are implemented consistently and firmly, but also discussing the rules and being open to input from the child, and being responsive to the reasonable needs and desires of the children) was found to be a moderator of MST effects. In contrast, the other two PAQ dimensions, authoritarian parenting (having rules that are arbitrary and strictly enforced without discussion, and expecting unquestioning authority to parental authority) and permissive parenting (which in the PAQ involves the belief that children develop and learn best when there are few family rules) did not moderate the effects of MST. These three PAQ results support the interpretation of the CRPBI firm parenting behavior interaction: Having a reasonable structure for rules already in place allows the parent to benefit more from MST.

Finally, the PAI externalizing problems factor moderated the effects of MST. This PAI factor assesses problems with alcohol, anti-social behavior, borderline personality features and paranoia. Individuals with high scores on this factor have a history of difficulties with persons in positions of authority, and have trouble following social conventions (Morey, 1991). The significant moderator effect reflected that at low levels of PAI externalizing problems, there was a relatively small treatment effect wherein both the treatment and control group improved but with the treatment group improving about .3 standard deviation more than the control group. However, at high

levels of PAI externalizing problems, the effect of treatment was much greater, with the treatment group improving about .8 of a standard deviation more than the control group.

One possible explanation is that parents who have low levels of the mental health problems as assessed by this PAI factor may be better able to improve on their own, and hence the difference in the rate of improvement between treatment and control is relatively small. But for parents with high levels of PAI externalizing, it is only with the help of a therapist that the parent is able to gain control and move their lives more adaptively. In addition, parents who have the forms of mental health problems assessed by this PAI factor likely lack social support (Parke, 2002) and the support provided by MST may be critical for such parents to turn their lives around and manage their children's conduct problems better.

In this study, treatment outcome was evaluated by the adolescents, parents and teachers. However, in all instances moderators were significant for some but not all of the informants. This could reflect several things. First, children's behavior is not consistent across different settings, and hence different informants may observe different behaviors in the different contexts (Webster-Stratton et al., 2001). Another possibility, suggested by Webster-Stratton et al. (2001) is that even when parent's efforts result in children changing their behavior at home, that such modifications may not always translate to their behavior at school, because of different contingencies and different peer and adult relationships. Thus, family functioning may moderate the effects of MST at home, but not at school, since for the most part the moderators involved family characteristics. For instance, in the present study we found that parent- and adolescent- but not teacher-report were involved in a significant moderator effect with PAQ Authoritative Parenting. One

possible explanation for this finding is that the moderating effects of parenting (e.g., allowing the parent to more easily implement MST strategies) influence the adolescent's behavior at home, but not at school.

As Figure 4 showed, there were differences between teacher vs. adolescent and parent report vis-à-vis the moderating effects of parent warmth. From the point of view of the teacher, adolescents whose parents showed higher warmth actually had a small negative treatment effect, with control group adolescents improving slightly more than treatment group adolescents. In contrast, adolescents whose parents showed lower warmth had a strong treatment effect. One reasonable explanation is that parent's warmth allows better implementation of MST in regards to impacting the adolescent's behavior at home (as discussed above) but that children who are familiar with warmth from their parents but face with harsh and possibly punitive discipline at school may be less responsive in regards to their school behavior to MST's interventions, because of the contrast between home and school.

Contrary to our expectations based on previous research, our study found significant moderator effects for age, race and parental psychopathology. It should be noted that samples of this present study were recruited within the public schools, not obtained through the legal system as other studies had done. Although children's conduct problems were sufficiently severe so that they were judged to be unable to be educated in the general education, and although over 70% of our sample had court involvement at baseline, it is possible that overall our participants' conduct problem were not as serious as those in previous studies, which could have had unknown effects on the demographic characteristics. In addition, adolescents obtained through the court fundamentally

experienced a different pressure to participate in the research, so parents in our study may have been more engaged in therapy, and the adolescents may have been more open.

Strengths and Limitations

There are several strengths and limitations of this study that should be noted, to help in interpretation of the findings, and to provide directions for future research. One strength was the use of participants who were not obtained through the legal system, which allows us to more broadly generalize the outcomes vis-à-vis adolescent conduct problems. However, this makes it more difficult to compare our results to most other studies of MST, which obtained their samples through the courts. One complication, if not directly a limitation, of the present study was variability in teacher data. In many cases, the teacher who completed the first assessment was not the teacher who completed the final assessment, because the assessment extended over more than a year and the adolescent may have moved schools or classrooms. In fact, in some instances students moved from the self-contained behavior classrooms to general education classrooms, and hence were assessed by teachers who may have had different behavioral standards. This may have increased the variability for the teacher reports.

Another limitation is that the data for this study were based on questionnaires rather than direct observation. Questionnaire assessments can be influenced by rater bias as well as by the actual behavior of the participant. Although multiple informants were included, this does not eliminate the problem of rater bias entirely.

Finally, as with virtually all tests of moderators, although participants were randomly assigned to treatment or control conditions, they were not randomly assigned to levels of the moderator variables. Thus, it is not possible to rule out third variable explanations.

Future Directions and Conclusions

The most notable finding of this study was that adolescents with conduct disorder may gain more benefit from MST if they have better family functioning. The main reason may be because better functioning families may have more skills to engage in and implement MST procedures. Parents in well functioning families tend to deliver consistent discipline, model better conflict resolution skills to their children which moderate the treatment outcome (Cumming et al., 2000). In addition, families with higher functioning may have a better attitude toward MST therapist and MST procedure. These parents may be more open and more willing to try new things, which then are ultimately reinforced by their success.

Because family functioning is viewed by MST as critical to the effective treatment of youth conduct disorder, MST focuses on improving family functioning. However, although the large body of evidence indicates that MST has been implemented equally successfully with youth and families from many different cultural backgrounds (Henggeler, 2008), the findings of this study (i.e., the significant moderator effect for race) suggest that MST therapists still may need to pay more attention to culture.

MST intervention is targeted, on using family strengths to obtain better family functioning. Theoretically, then, the MST process helps to improve family functioning which in turn helps youth improve their function across family, peer and school contexts (Henggeler, 2009). However, the primary finding of this study (that MST is more effective with higher functioning families) suggests that MST may not be sufficiently targeted successfully with all families. In particular, it may not be as effective for low functioning families. If this is correct, MST therapists need to consider preparing families more for therapy.

Future study should examine moderator effects of other aspects of family functioning, such like marital or adult partner relationships, adult intimacy (emotional bond between adults) and family's status (single families, divorce families and remarried families) to determine what aspects of family functioning have impact on MST effectiveness. In addition, the current study hypothesized that discrimination may underlie reduced treatment efficacy for African – Americans, it will be useful to include SES or perceived discrimination in analytic models with the race interaction to determine if discrimination does in fact explain the interaction. Similarly, with the age interaction, we hypothesized that MST may be more effective for older age groups because of a higher level of intellectual ability, it will be useful to include these factors to determine whether they explain the age effects.

APPENDIX

Table 1: Demographic characteristics

	Treatment Group	Control Group
Adolescent		
Mean age	14.6 (1.3)	14.5 (1.4)
% male	83%	83%
% African-American	56%	64%
% Euro-American	44%	36%
Primary caregiver		
Mean age	41.5 (9.5)	40.0 (8.0)
% biological mother	75%	78.8%
% biological father	3.6%	8.8%
% single parent / caregiver	67%	75%
Median education	13.0 (2.1)	12.3 (2.0)
Family		
Median annual income	\$17,500	\$17,500
# adults in household	1.8 (0.8)	1.8 (0.9)
# children in household	2.4 (1.4)	2.4 (1.4)

Table 2: Relations between Child Age variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	CHILD AGE * MONTH * TREATMENT	.001	.05
Q-CBCL	CHILD AGE * MONTH * TREATMENT	.0008	.02
	MONTH * MONTH	.004	46.63 ****
QT-CBCL	CHILD AGE * MONTH * TREATMENT	-.001	.02
	MONTH * MONTH	.01	42.37****
	CHILD AGE * MONTH * MONTH * TREATMENT	.0003	.09
L- YSR	CHILD AGE * MONTH * TREATMENT	.008	1.81
Q-YSR	CHILD AGE * MONTH * TREATMENT	.006	1.03
	MONTH * MONTH	.003	27.54 ****
QT-YSR	CHILD AGE * MONTH * TREATMENT	.02	4.64*
	MONTH * MONTH	.004	.24
	CHILD AGE * MONTH * MONTH * TREATMENT	-.002	4.04 *
L-TRF	CHILD AGE * MONTH * TREATMENT	.008	1.16
Q-TRF	CHILD AGE * MONTH * TREATMENT	.008	1.03
	MONTH * MONTH	.001	1.36
QT-TRF	CHILD AGE * MONTH * TREATMENT	.001	.04
	MONTH * MONTH	.006	.03
	CHILD AGE * MONTH * MONTH * TREATMENT	.001	.44

Notes: * =.05, ** =.01, *** =.001, **** =.0001

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale.

Table 3: Relations between CHILD RACE variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	CHILD RACE * MONTH * TREATMENT	.03	4.09 *
Q-CBCL	CHILD RACE * MONTH * TREATMENT	.03	4.71 *
	MONTH * MONTH	.004	46.52 ****
QT-CBCL	CHILD RACE * MONTH * TREATMENT	.02	.78
	MONTH * MONTH	.005	34.84****
	CHILD RACE * MONTH * MONTH * TREATMENT	.003	2.04
L- YSR	CHILD RACE * MONTH * TREATMENT	-.02	1.04
Q-YSR	CHILD RACE * MONTH * TREATMENT	-.01	.69
	MONTH * MONTH	.003	27.62 ****
QT-YSR	CHILD RACE * MONTH * TREATMENT	-.02	.92
	MONTH * MONTH	.005	22.30****
	CHILD RACE * MONTH * MONTH * TREATMENT	.001	.18
L-TRF	CHILD RACE * MONTH * TREATMENT	.04	2.67
Q-TRF	CHILD RACE * MONTH * TREATMENT	.02	1.8
	MONTH * MONTH	.001	1.41
QT-TRF	CHILD RACE * MONTH * TREATMENT	.02	.76
	MONTH * MONTH	.002	.73
	CHILD RACE * MONTH * MONTH * TREATMENT	.0006	.04

Notes: * =.05, ** =.01, *** =.001, **** =.0001

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale.

Table 4: Relations between Child SEX variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	CHILDSEX * MONTH * TREATMENT	.01	.39
Q-CBCL	CHILDSEX * MONTH * TREATMENT	.01	.34
	MONTH * MONTH	.004	46.96 ****
QT-CBCL	CHILDSEX * MONTH * TREATMENT	.009	.14
	MONTH * MONTH	.006	27.67****
	CHILDSEX * MONTH * MONTH * TREATMENT	.0005	.02
L- YSR	CHILDSEX * MONTH * TREATMENT	-.02	1.01
Q-YSR	CHILDSEX * MONTH * TREATMENT	-.02	.68
	MONTH * MONTH	.003	27.77 ****
QT-YSR	CHILDSEX * MONTH * TREATMENT	-.03	1.04
	MONTH * MONTH	.005	15.36****
	CHILDSEX * MONTH * MONTH * TREATMENT	.002	.35
L-TRF	CHILDSEX * MONTH * TREATMENT	.03	.69
Q-TRF	CHILDSEX * MONTH * TREATMENT	.05	1.99
	MONTH * MONTH	.001	1.57
QT-TRF	CHILDSEX * MONTH * TREATMENT	.06	2.06
	MONTH * MONTH	-.004	.24
	CHILDSEX * MONTH * MONTH * TREATMENT	-.002	.34

Notes: * =.05, ** =.01, *** =.001, **** =.0001

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale.

Table 5: Relations between AUTHORITARIAN PARENTING variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	Authoritarian * MONTH * TREATMENT	.004	.22
Q-CBCL	Authoritarian * MONTH * TREATMENT	.004	.22
	MONTH * MONTH	.004	42.60 ****
QT-CBCL	Authoritarian * MONTH * TREATMENT	.01	1.80
	MONTH * MONTH	.004	39.23****
	Authoritarian * MONTH * MONTH * TREATMENT	-.002	3.42
L- YSR	Authoritarian * MONTH * TREATMENT	-.01	2.53
Q-YSR	Authoritarian * MONTH * TREATMENT	-.02	3.54
	MONTH * MONTH	.003	27.60 ****
QT-YSR	Authoritarian * MONTH * TREATMENT	-.008	.46
	MONTH * MONTH	.004	.34
	Authoritarian * MONTH * MONTH * TREATMENT	-.001	1.46
L-TRF	Authoritarian * MONTH * TREATMENT	.006	.21
Q-TRF	Authoritarian * MONTH * TREATMENT	.003	.05
	MONTH * MONTH	.001	1.79
QT-TRF	Authoritarian * MONTH * TREATMENT	.002	.02
	MONTH * MONTH	.002	3.62
	Authoritarian * MONTH * MONTH * TREATMENT	.0001	.00

Notes: * =.05, ** =.01, *** =.001, **** =.0001

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale.

Table 6: Relations between AUTHORITATIVE PARENTING variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	Authoritative * MONTH * TREATMENT	.009	1.04
Q-CBCL	Authoritative * MONTH * TREATMENT	.01	2.27
	MONTH * MONTH	.004	40.49 ****
QT-CBCL	Authoritative * MONTH * TREATMENT	.02	5.21*
	MONTH * MONTH	.004	38.24****
	Authoritative * MONTH * MONTH * TREATMENT	-.003	3.94 *
L- YSR	Authoritative * MONTH * TREATMENT	.02	3.37
Q-YSR	Authoritative * MONTH * TREATMENT	.02	4.06 *
	MONTH * MONTH	.003	25.69 ****
QT-YSR	Authoritative * MONTH * TREATMENT	.01	.78
	MONTH * MONTH	.004	1.67
	Authoritative * MONTH * MONTH * TREATMENT	.001	.58
L-TRF	Authoritative * MONTH * TREATMENT	.007	.30
Q-TRF	Authoritative * MONTH * TREATMENT	.003	.06
	MONTH * MONTH	.001	1.85
QT-TRF	Authoritative * MONTH * TREATMENT	.006	.13
	MONTH * MONTH	.002	.20
	Authoritative * MONTH * MONTH * TREATMENT	-.0008	.12

Notes: * =.05, ** =.01, *** =.001, **** =.0001

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale.

Table 7: Relations between PERMISSIVE PARENTING variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	Permissive * MONTH * TREATMENT	-.01	1.83
Q-CBCL	Permissive * MONTH * TREATMENT	-.008	1.18
	MONTH * MONTH	.004	40.76
QT-CBCL	Permissive * MONTH * TREATMENT	-.01	1.53
	MONTH * MONTH	.004	38.40****
	Permissive * MONTH * MONTH * TREATMENT	.0003	.05
L- YSR	Permissive * MONTH * TREATMENT	.005	.31
Q-YSR	Permissive * MONTH * TREATMENT	.006	.52
	MONTH * MONTH	.003	27.35
QT-YSR	Permissive * MONTH * TREATMENT	.007	.36
	MONTH * MONTH	.003	3.88
	Permissive * MONTH * MONTH * TREATMENT	-.0005	.16
L-TRF	Permissive * MONTH * TREATMENT	.01	1.49
Q-TRF	Permissive * MONTH * TREATMENT	.01	1.76
	MONTH * MONTH	.001	2.44
QT-TRF	Permissive * MONTH * TREATMENT	-.008	.21
	MONTH * MONTH	.002	.48
	Permissive * MONTH * MONTH * TREATMENT	.004	3.42

Notes: * =.05, ** =.01, *** =.001, **** =.0001

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale.

Table 8: Relations between FATHER FIRMNESS variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	FFirm * MONTH * TREATMENT	-.02	3.16
Q-CBCL	FFirm * MONTH * TREATMENT	-.01	.79
	MONTH * MONTH	.006	43.43 ****
QT-CBCL	FFirm * MONTH * TREATMENT	-.01	1.01
	MONTH * MONTH	.007	34.53****
	FFirm * MONTH * MONTH * TREATMENT	.0002	.01
L- YSR	FFirm * MONTH * TREATMENT	-.004	.09
Q-YSR	FFirm * MONTH * TREATMENT	-.003	.05
	MONTH * MONTH	.002	9.11
QT-YSR	FFirm * MONTH * TREATMENT	.009	.30
	MONTH * MONTH	.002	3.09
	FFirm * MONTH * MONTH * TREATMENT	-.002	1.81
L-TRF	FFirm * MONTH * TREATMENT	-.02	.73
Q-TRF	FFirm * MONTH * TREATMENT	-.02	1.10
	MONTH * MONTH	.002	2.84
QT-TRF	FFirm * MONTH * TREATMENT	-.009	.10
	MONTH * MONTH	.003	3.14
	FFirm * MONTH * MONTH * TREATMENT	-.003	.76

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; FFirm = *CRBPI Firm Parenting Scale*, for fathers

Table 9: Relations between MOTHER FIRMNESS variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	MFirm * MONTH * TREATMENT	-.02	5.51
Q-CBCL	MFirm * MONTH * TREATMENT	-.02	6.92 *
	MONTH * MONTH	.004	60.99 ****
QT-CBCL	MFirm * MONTH * TREATMENT	-.03	6.57
	MONTH * MONTH	.005	52.31****
	MFirm * MONTH * MONTH * TREATMENT	-.00007	.00
L- YSR	MFirm * MONTH * TREATMENT	-.01	1.01
Q-YSR	MFirm * MONTH * TREATMENT	-.01	1.20
	MONTH * MONTH	.003	31.24
QT-YSR	MFirm * MONTH * TREATMENT	-.01	1.10
	MONTH * MONTH	.003	.82
	MFirm * MONTH * MONTH * TREATMENT	.0001	.01
L-TRF	MFirm * MONTH * TREATMENT	.04	5.44 *
Q-TRF	MFirm * MONTH * TREATMENT	.03	3.27
	MONTH * MONTH	.0003	.06
QT-TRF	MFirm * MONTH * TREATMENT	.03	3.26
	MONTH * MONTH	.002	1.26
	MFirm * MONTH * MONTH * TREATMENT	-.001	.15

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; MFirm = *CRBPI Firm Parenting Scale*, for mothers

Table 10: Relations between FATHER WARMTH variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	FWarm * MONTH * TREATMENT	.01	.99
Q-CBCL	FWarm * MONTH * TREATMENT	.01	1.49
	MONTH * MONTH	.006	46.93 ****
QT-CBCL	FWarm * MONTH * TREATMENT	.02	2.22
	MONTH * MONTH	.006	37.43****
	FWarm * MONTH * MONTH * TREATMENT	-.002	.81
L- YSR	FWarm * MONTH * TREATMENT	.02	2.06
Q-YSR	FWarm * MONTH * TREATMENT	.02	2.95
	MONTH * MONTH	.002	11.100
QT-YSR	FWarm * MONTH * TREATMENT	.004	.10
	MONTH * MONTH	.002	.70
	FWarm * MONTH * MONTH * TREATMENT	.003	3.58
L-TRF	FWarm * MONTH * TREATMENT	-.008	.16
Q-TRF	FWarm * MONTH * TREATMENT	-.0009	.00
	MONTH * MONTH	.002	2.34
QT-TRF	FWarm * MONTH * TREATMENT	-.002	.00
	MONTH * MONTH	.003	.00
	FWarm * MONTH * MONTH * TREATMENT	.0002	.00

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale. FWarm = *CRBPI Warmth Parenting Scale*, for fathers.

Table 11: Relations between MOTHER WARMTH variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	MWarm * MONTH * TREATMENT	.007	.65
Q-CBCL	MWarm * MONTH * TREATMENT	.02	3.70
	MONTH * MONTH	.004	60.60 ****
QT-CBCL	MWarm * MONTH * TREATMENT	.004	.13
	MONTH * MONTH	.005	55.97****
	MWarm * MONTH * MONTH * TREATMENT	.003	4.50 *
L- YSR	MWarm * MONTH * TREATMENT	.009	.74
Q-YSR	MWarm * MONTH * TREATMENT	-.009	--
	MONTH * MONTH	-.00009	--
QT-YSR	MWarm * MONTH * TREATMENT	-.02	--
	MONTH * MONTH	.001	--
	MWarm * MONTH * MONTH * TREATMENT	.003	--
L-TRF	MWarm * MONTH * TREATMENT	-.01	1.12
Q-TRF	MWarm * MONTH * TREATMENT	-.01	.35
	MONTH * MONTH	.006	.01
QT-TRF	MWarm * MONTH * TREATMENT	-.02	1.39
	MONTH * MONTH	.007	.01
	MWarm * MONTH * MONTH * TREATMENT	.001	1.33

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; MWarm = *CRBPI Warmth Parenting Scale*, for mothers.

Table 12: Relations between FATHER PSYCHOLOGICAL CONTROL variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	F-Psyc * MONTH * TREATMENT	-.01	1.63
Q-CBCL	F-Psyc * MONTH * TREATMENT	-.01	.99
	MONTH * MONTH	.006	45.32 ****
QT-CBCL	F-Psyc * MONTH * TREATMENT	-.02	1.78
	MONTH * MONTH	.007	36.05****
	F-Psyc * MONTH * MONTH * TREATMENT	.001	.53
L- YSR	F-Psyc * MONTH * TREATMENT	-.002	.04
Q-YSR	F-Psyc * MONTH * TREATMENT	--	--
	MONTH * MONTH	--	--
QT-YSR	F-Psyc * MONTH * TREATMENT	.002	--
	MONTH * MONTH	.002	--
	F-Psyc * MONTH * MONTH * TREATMENT	-.0007	.20
L-TRF	F-Psyc * MONTH * TREATMENT	-.03	2.28
Q-TRF	F-Psyc * MONTH * TREATMENT	-.03	1.88
	MONTH * MONTH	.002	1.55
QT-TRF	F-Psyc * MONTH * TREATMENT	-.03	1.79
	MONTH * MONTH	.003	.14
	F-Psyc * MONTH * MONTH * TREATMENT	.0009	.10

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; F-Psyc = *CRBPI Psychological Control Parenting Scale*, for fathers.

Table 13: Relations between MOTHER PSYCHOLOGICAL CONTROL variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	M-Psyc * MONTH * TREATMENT	-.0008	.01
Q-CBCL	M-Psyc * MONTH * TREATMENT	-.0004	.00
	MONTH * MONTH	.004	51.99 ****
QT-CBCL	M-Psyc * MONTH * TREATMENT	.009	.69
	MONTH * MONTH	.005	45.14****
	M-Psyc * MONTH * MONTH * TREATMENT	-.003	3.61
L- YSR	M-Psyc * MONTH * TREATMENT	.007	.49
Q-YSR	M-Psyc * MONTH * TREATMENT	.004	.13
	MONTH * MONTH	.003	31.41
QT-YSR	M-Psyc * MONTH * TREATMENT	--	--
	MONTH * MONTH	--	--
	M-Psyc * MONTH * MONTH * TREATMENT	--	--
L-TRF	M-Psyc * MONTH * TREATMENT	.004	.04
Q-TRF	M-Psyc * MONTH * TREATMENT	-.006	.12
	MONTH * MONTH	.00	.00
QT-TRF	M-Psyc * MONTH * TREATMENT	.005	.06
	MONTH * MONTH	.001	1.77
	M-Psyc * MONTH * MONTH * TREATMENT	-.002	.93

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; M-Psyc = *CRBPI Psychological Control Parenting Scale*, for mothers.

Table 14: Relations between PARENTS FIRMNESS variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	P-Firm * MONTH * TREATMENT	-.00008	.00
Q-CBCL	P-Firm * MONTH * TREATMENT	.0004	.00
	MONTH * MONTH	.004	44.91 ****
QT-CBCL	P-Firm * MONTH * TREATMENT	.009	.98
	MONTH * MONTH	.004	43.61
	P-Firm * MONTH * MONTH * TREATMENT	-.001	1.64
L- YSR	P-Firm * MONTH * TREATMENT	-.007	.86
Q-YSR	P-Firm * MONTH * TREATMENT	-.007	.90
	MONTH * MONTH	.003	28.90 ****
QT-YSR	P-Firm * MONTH * TREATMENT	.004	.18
	MONTH * MONTH	.003	2.10
	P-Firm * MONTH * MONTH * TREATMENT	-.001	1.62
L-TRF	P-Firm * MONTH * TREATMENT	-.01	--
Q-TRF	P-Firm * MONTH * TREATMENT	-.01	--
	MONTH * MONTH	.001	--
QT-TRF	P-Firm * MONTH * TREATMENT	-.01	--
	MONTH * MONTH	.002	--
	P-Firm * MONTH * MONTH * TREATMENT	-.0003	--

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; P-Firm = *CRBPI Firm Parenting Scale*, for parents.

Table 15: Relations between PARENTS WARMTH variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	P-Warm * MONTH * TREATMENT	.006	.70
Q-CBCL	P-Warm * MONTH * TREATMENT	.01	2.76
	MONTH * MONTH	.004	51.73
QT-CBCL	P-Warm * MONTH * TREATMENT	.02	5.31
	MONTH * MONTH	.005	44.04****
	P-Warm * MONTH * MONTH * TREATMENT	-.002	2.72
L- YSR	P-Warm * MONTH * TREATMENT	.02	4.22 *
Q-YSR	P-Warm * MONTH * TREATMENT	--	--
	MONTH * MONTH	--	--
QT-YSR	P-Warm * MONTH * TREATMENT	.01	1.99
	MONTH * MONTH	.004	.01
	P-Warm * MONTH * MONTH * TREATMENT	.0006	.28
L-TRF	P-Warm * MONTH * TREATMENT	.004	.14
Q-TRF	P-Warm * MONTH * TREATMENT	.0007	.00
	MONTH * MONTH	.001	1.60
QT-TRF	P-Warm * MONTH * TREATMENT	-.02	2.29
	MONTH * MONTH	.002	.27
	P-Warm * MONTH * MONTH * TREATMENT	.005	6.15 *

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; P-Warm = *CRBPI Warmth Parenting Scale*, for parents.

Table 16: Relations between PARENTS PSYCHOLOGICAL CONTROL variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	P-Psyc * MONTH * TREATMENT	-.005	.51
Q-CBCL	P-Psyc * MONTH * TREATMENT	-.003	.15
	MONTH * MONTH	.004	38.75 ****
QT-CBCL	P-Psyc * MONTH * TREATMENT	-.01	1.10
	MONTH * MONTH	.004	32.58****
	P-Psyc * MONTH * MONTH * TREATMENT	.001	.93
L- YSR	P-Psyc * MONTH * TREATMENT	-.01	2.11
Q-YSR	P-Psyc * MONTH * TREATMENT	-.009	1.54
	MONTH * MONTH	.003	27.68 ****
QT-YSR	P-Psyc * MONTH * TREATMENT	-.01	1.56
	MONTH * MONTH	.004	4.54
	P-Psyc * MONTH * MONTH * TREATMENT	.0002	.05
L-TRF	P-Psyc * MONTH * TREATMENT	.02	3.84
Q-TRF	P-Psyc * MONTH * TREATMENT	.02	4.11
	MONTH * MONTH	.001	1.59
QT-TRF	P-Psyc * MONTH * TREATMENT	.01	1.43
	MONTH * MONTH	.002	11.50****
	P-Psyc * MONTH * MONTH * TREATMENT	.001	.30

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; P-Psyc = *CRBPI Psychological Control Parenting Scale*, for parents.

Table 17: Relations between PARENTS ADAPTABILITY variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	P-Adapt * MONTH * TREATMENT	.006	.62
Q-CBCL	P-Adapt * MONTH * TREATMENT	.009	1.51
	MONTH * MONTH	.004	48.41
QT-CBCL	P-Adapt * MONTH * TREATMENT	.01	1.04
	MONTH * MONTH	.005	42.02****
	P-Adapt * MONTH * MONTH * TREATMENT	-.0003	.08
L- YSR	P-Adapt * MONTH * TREATMENT	.02	6.39 *
Q-YSR	P-Adapt * MONTH * TREATMENT	.02	7.94 **
	MONTH * MONTH	.003	28.83 ****
QT-YSR	P-Adapt * MONTH * TREATMENT	.01	1.57
	MONTH * MONTH	.004	.39
	P-Adapt * MONTH * MONTH * TREATMENT	.0009	.67
L-TRF	P-Adapt * MONTH * TREATMENT	-.005	.18
Q-TRF	P-Adapt * MONTH * TREATMENT	-.007	.38
	MONTH * MONTH	.001	1.85
QT-TRF	P-Adapt * MONTH * TREATMENT	-.02	3.33
	MONTH * MONTH	.002	.43
	P-Adapt * MONTH * MONTH * TREATMENT	.004	3.53

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; P-Adapt = *FACES-III Adaptability Scale*, reported by parents.

Table 18: Relations between PARENTS COHESION variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	P-Cohes * MONTH * TREATMENT	.02	5.01 *
Q-CBCL	P-Cohes * MONTH * TREATMENT	.02	5.30 *
	MONTH * MONTH	.004	42.21 ****
QT-CBCL	P-Cohes * MONTH * TREATMENT	.02	5.43
	MONTH * MONTH	.004	37.99****
	P-Cohes MONTH * MONTH * TREATMENT	-.001	.67
L- YSR	P-Cohes * MONTH * TREATMENT	.01	3.74
Q-YSR	P-Cohes * MONTH * TREATMENT	.01	3.45
	MONTH * MONTH	.003	28.32 ****
QT-YSR	P-Cohes * MONTH * TREATMENT	.01	.87
	MONTH * MONTH	.004	.26
	P-Cohes MONTH * MONTH * TREATMENT	.0007	.37
L-TRF	P-Cohes * MONTH * TREATMENT	-.002	.05
Q-TRF	P-Cohes * MONTH * TREATMENT	-.004	.13
	MONTH * MONTH	.001	1.63
QT-TRF	P-Cohes * MONTH * TREATMENT	-.01	1.03
	MONTH * MONTH	.002	.01
	P-Cohes MONTH * MONTH * TREATMENT	.002	1.12

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; P-Cohes = *FACES-III Cohesion Scale* reported by parents.

Table 19: Relations between ADOLESCENTS ADAPTABILITY variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	Y-Adapt * MONTH * TREATMENT	.002	.08
Q-CBCL	Y-Adapt * MONTH * TREATMENT	.005	.41
	MONTH * MONTH	.005	72.93
QT-CBCL	Y-Adapt * MONTH * TREATMENT	-.0008	.01
	MONTH * MONTH	.005	65.31****
	Y-Adapt * MONTH * MONTH * TREATMENT	.001	.78
L- YSR	Y-Adapt * MONTH * TREATMENT	-.004	.31
Q-YSR	Y-Adapt * MONTH * TREATMENT	-.0003	.00
	MONTH * MONTH	.0003	33.49
QT-YSR	Y-Adapt * MONTH * TREATMENT	--	--
	MONTH * MONTH	--	--
	Y-Adapt * MONTH * MONTH * TREATMENT	--	--
L-TRF	Y-Adapt * MONTH * TREATMENT	-.01	1.40
Q-TRF	Y-Adapt * MONTH * TREATMENT	-.007	.48
	MONTH * MONTH	.0007	.46
QT-TRF	Y-Adapt * MONTH * TREATMENT	-.02	2.18
	MONTH * MONTH	.002	.96
	Y-Adapt * MONTH * MONTH * TREATMENT	.003	1.82

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; Y-Adapt = *FACES-III Adaptability Scale*, reported by youth.

Table 20: Relations between ADOLESCENTS COHESION variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	Y-Cohes * MONTH * TREATMENT	.0004	.00
Q-CBCL	Y-Cohes * MONTH * TREATMENT	.004	.32
	MONTH * MONTH	.004	68.97 ****
QT-CBCL	Y-Cohes * MONTH * TREATMENT	-.003	.12
	MONTH * MONTH	.005	63.54****
	Y-Cohes * MONTH * MONTH * TREATMENT	.001	.96
L- YSR	Y-Cohes * MONTH * TREATMENT	-.005	.52
Q-YSR	Y-Cohes * MONTH * TREATMENT	-.0008	.01
	MONTH * MONTH	.002	27.58 ****
QT-YSR	Y-Cohes * MONTH * TREATMENT	--	--
	MONTH * MONTH	--	--
	Y-Cohes * MONTH * MONTH * TREATMENT	--	--
L-TRF	Y-Cohes * MONTH * TREATMENT	-.003	.06
Q-TRF	Y-Cohes * MONTH * TREATMENT	.004	.15
	MONTH * MONTH	.0008	.59
QT-TRF	Y-Cohes * MONTH * TREATMENT	-.006	.14
	MONTH * MONTH	.002	.14
	Y-Cohes * MONTH * MONTH * TREATMENT	.002	.73

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; Y-Cohes = *FACES-III Cohesion Scale* reported by youth.

Table 21: Relations between PAI-externalizing variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	PAI-Ext * MONTH * TREATMENT	-.005	.35
Q-CBCL	PAI-Ext * MONTH * TREATMENT	-.006	.66
	MONTH * MONTH	.004	42.35 ****
QT-CBCL	PAI-Ext * MONTH * TREATMENT	-.003	.10
	MONTH * MONTH	.005	37.40****
	PAI-Ext * MONTH * MONTH * TREATMENT	-.0007	.35
L- YSR	PAI-Ext * MONTH * TREATMENT	-.004	.24
Q-YSR	PAI-Ext * MONTH * TREATMENT	-.009	1.34
	MONTH * MONTH	.003	28.60 ****
QT-YSR	PAI-Ext * MONTH * TREATMENT	.008	.50
	MONTH * MONTH	.004	4.28*
	PAI-Ext * MONTH * MONTH * TREATMENT	-.002	4.84 *
L-TRF	PAI-Ext * MONTH * TREATMENT	-.00004	.00
Q-TRF	PAI-Ext * MONTH * TREATMENT	-.001	.01
	MONTH * MONTH	.002	1.56
QT-TRF	PAI-Ext * MONTH * TREATMENT	-.008	.23
	MONTH * MONTH	.002	.00
	PAI-Ext * MONTH * MONTH * TREATMENT	.001	.27

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; PAI-Ext = PAI Externalizing scale.

Table 22: Relations between PAI-internalizing variables and CBCL, YSR, TRF externalizing psychopathology

Model	Factor	β	F
L- CBCL	PAI-Int * MONTH * TREATMENT	.002	.06
Q-CBCL	PAI-Int * MONTH * TREATMENT	-.0009	.01
	MONTH * MONTH	.004	41.49 ****
QT-CBCL	PAI-Int * MONTH * TREATMENT	-.004	.16
	MONTH * MONTH	.004	35.63****
	PAI-Int * MONTH * MONTH * TREATMENT	.0006	.27
L- YSR	PAI-Int * MONTH * TREATMENT	-.003	.19
Q-YSR	PAI-Int * MONTH * TREATMENT	-.009	1.30
	MONTH * MONTH	.003	30.87 ****
QT-YSR	PAI-Int * MONTH * TREATMENT	.006	.28
	MONTH * MONTH	.004	4.70*
	PAI-Int * MONTH * MONTH * TREATMENT	-.002	2.54
L-TRF	PAI-Int * MONTH * TREATMENT	.004	.13
Q-TRF	PAI-Int * MONTH * TREATMENT	-.0002	.00
	MONTH * MONTH	.001	1.71
QT-TRF	PAI-Int * MONTH * TREATMENT	-.01	.66
	MONTH * MONTH	.002	.12
	PAI-Int * MONTH * MONTH * TREATMENT	.002	1.32

Notes: * =.05, ** =.01, *** =.001, **** =.0001.

L-CBCL: Linear model on CBCL externalizing scale; Q-CBCL: Quadratic model without treatment group on CBCL externalizing scale; QT-CBCL: Quadratic model with treatment group on CBCL externalizing scale; L-YSR: Linear model on YSR externalizing scale; Q- YSR: Quadratic model without treatment group on YSR externalizing scale; QT- YSR: Quadratic model with treatment group on YSR externalizing scale; L-TRF: Linear model on TRF externalizing scale; Q- TRF: Quadratic model without treatment group on TRF externalizing scale; QT- TRF: Quadratic model with treatment group on TRF externalizing scale; PAI-Int = PAI Internalizing Scale.

REFERENCES

- Achenbach, T.M. (1991a). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T.M. (1991b). *Manual for the Teacher's Report Form and 1991 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T.M. (1991c). *Manual for the Youth Self-Report Form and 1991 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T.M., & Rescorla, L.A. (2001). *Manual for the ASEBA school-age forms & profiles*. Burlington: University of Vermont Research Center for Children, Youth, & Families.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)*. Washington, DC: American Psychiatric Association.
- BMA Board of Science (2006) *Child and Adolescent Mental Health. A Guide for Healthcare Professionals*. London: British Medical Association.
- Boggs, S., Eyberg, S., Edwards, D., Rayfield, A., Jacobs, J., Bagner, D., & Hood, K. (2004). Outcomes of Parent-Child Interaction Therapy: A comparison of treatment completers and study dropouts one to three years later. *Child & Family Behavior Therapy, 26*, pp. 1-21
- Bornstein, M. H. (Ed.). (2002). *Handbook of parenting: Social conditions and applied parenting (Vol. 4, 2nd edition)*. Mahwah, NJ: Erlbaum.
- Buri, J.R. (1991). Parental Authority Questionnaire. *Journal of Personality and Social Assessment, 57*, pp. 110-119.
- Catron, T. & Weiss, B. (1994). The Vanderbilt School-Based Counseling program. *Journal of Emotional and Behavioral Disorders, 2*, pp. 247-253.
- Connor D. F. (2002) *Aggression and Antisocial Behavior in Children and Adolescents: Research and Treatment*. New York: Guilford Press
- Connor, Daniel F., Ford, Julian D., Albert, David B. and Doerfler, Leonard A (2007).

Conduct Disorder Subtype and comorbidity, *Annals of Clinical Psychiatry*, 19(3), pp. 161 — 168

- Cummings, E. M., Davies, P. T., & Campbell, S. B. (2000). *Developmental psychopathology and family process: Theory, research, and clinical practice*. New York: Guilford Press.
- Eddy, J. M., Reid, J. B., Stoolmiller, M. and Fetrow, R. A. (2003) 'Outcomes during middle school for an elementary school-based preventive intervention for conduct problems: follow-up results from a randomized trial.' *Behavior Therapy* 34, pp. 535–552.
- Eyberg, S., Funderburk, B., Hembree-Kigin, T., McNeil, C., Querido, J., & Hood, J. (2001). Parent-child interaction therapy with behavior problem children: One and two year maintenance of treatment effects in the family. *Child & Family Behavior Therapy*, 23, pp. 1-20.
- Farrington, D. (1989) Early predictors of adolescent aggression and adult violence. *Violence and Victims*, 4, pp. 79–100.
- Farrington, D. P. (1995) 'The twelfth Jack Tizard memorial lecture. The development of offending and antisocial behaviour from childhood: key findings from the Cambridge study in delinquent development.' *Journal of Child Psychology and Psychiatry* 36(6), pp. 929–964.
- Gollwitzer, M., Eisenbach, K., Atria, M., Strohmeier, D., and Banse, R., (2006) Evaluation of Aggression- Reducing effects of the “Viennese Social Competence Training”. *Swiss Journal of Psychology*, 65 (2) pp. 125-135
- Goyette, C.H., Conners, C. K. & Ulrich, R. F. (1978). Normative data on the revised Conners Parent and Teacher Rating Scales. *Journal of Abnormal Child Psychology*, 6, pp. 221-236.
- Green, H., McGinnity, A., Meltzer, H., Ford, T. and Goodman, R. (2005) *Mental Health of Children and Young People in Great Britain, 2004*. Office for National Statistics on behalf of the Department of Health and the Scottish Executive. London: Palgrave Macmillan.
- Grizenko, N., Zappitelli, M., Jean-Philippe Langevin, Sophie Hrychko, Amira El-Messidi, David Kaminester, Nicole Pawliuk, Marina Ter Stepanian, (2000) Effectiveness of a Social skills training program using self/other Perspective-taking: A nine month follow up. *American Journal of Orthopsychiatry*, 70(4)

- Henggeler, S. W., Melton, G. B., Brondino, M. J., Scherer, D. G., & Hanley, J. H. (1997). Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination. *Journal of Consulting and Clinical Psychology, 65*, pp. 821–833.
- Henggeler, S. W., Chapman, J. E., Rowland, M. D., Halliday-Boykins, C. A., Randall, J., Shackelford, J., et al. (2008). Statewide adoption and initial implementation of contingency management for substance abusing adolescents. *Journal of Consulting and Clinical Psychology, 76*, pp. 556–567.
- Henggeler, S. W., Melton, G. B., & Smith, L. A. (1992). Family preservation using multisystemic therapy: An effective alternative to incarcerating serious juvenile offenders. *Journal of Consulting and Clinical Psychology, 60*, pp. 953-961.
- Henggeler, S. W., Melton, G. B., Smith, L. A., Schoenwald, S. K., & Hanley, J. H. (1993). Family preservation using multisystemic treatment: Long-term follow-up to a clinical trial with serious juvenile offenders. *Journal of Child and Family Studies, 2*, pp. 283-293
- Henggeler, S. W., Pickrel, S. G., & Brondino, M. J. (1999). Multisystemic treatment of substance abusing and dependent delinquents: Outcomes, treatment fidelity, and transportability. *Mental Health Services Research, 1*, pp. 171–184.
- Henggeler, S.W., Colleen A. Halliday-Boykins, Phillippe B. Cunningham, Jeff Randall, Steven B. Shapiro, and Jason E. Chapman (2006). Juvenile Drug Court: Enhancing outcomes by Integrating Evidence- Based Treatments. *Journal of Consulting and Clinical Psychology, 74(1)*, pp. 42-54.
- Henggeler, S.W., Schoenwald, S.K., Borduin, C.M., Rowland M.D., Cunningham P.B., (2009). *Multisystemic therapy for antisocial behavior in children and adolescents. (2nd)*. New York: The Guilford Press.
- Herschell, A., Calzada, E., Eyberg, S., & McNeil, C. (2002). Parent-child interaction therapy: New directions in research. *Cognitive and Behavioral Practice, 9*, 9-16.
- Hood, K., & Eyberg, S. (2003). Outcomes of parent-child interaction therapy: Mothers' reports of maintenance three to six years after treatment. *Journal of Clinical Child and Adolescent Psychology, 32*, pp. 419-429.
- Huey, S. J., Henggeler, S. W., Brondino, M. J., & Pickrel, S. G. (2000). Mechanisms of change in multisystemic therapy: Reducing delinquent behavior through therapist adherence and improved family and peer functioning. *Journal of Consulting and Clinical Psychology, 68*, pp. 451– 467

- Jody Harpell, Jac Andrews (2006) A current review of Multisystemic Therapy: A social ecological approach to the treatment of conduct problems among adolescents. *Developmental Disabilities Bulletin*, 34(1&2), pp.80-106.
- Knapp M, Scott S, Davies J. (1999) The cost of antisocial behaviour in younger children. *Clinical Child Psychology Psychiatry*, 44, pp. 457-473
- Kraemer H.C., Wilson T.G., Fairburn C.G., Stewart Agras W. (2002) Mediators and moderators of Treatment Effects in Randomized Clinical Trials. *Archive general Psychiatry* 59, pp. 877-883
- Lahey, B. B., Moffitt, T. E. and Caspi, A. (2003) *Causes of Conduct Disorder and Juvenile Delinquency*. New York: The Guilford Press.
- Lane, K. L., Wehby, J., Menzies, H. H., Doukas, G. L., Muntont, S. M., & Gregg, R. M. (2003). Social skills instruction for students at risk for antisocial behavior: The effects of small-group instruction. *Behavioral Disorders*, 28, pp. 229–248.
- Letourneau E.J., Henggeler S.W., Borduin C.M., Schewe P.A., McCart M.R., Chapman J.E., (2009). Multisystemic Therapy for Juvenile Sexual Offenders: 1-Year Results From a Randomized Effectiveness Trial. *Journal of Family Psychology* 23, (1), pp. 89 – 102.
- Mark W. Fraser, Maeda J. Galinsky, Paul R. Smokowski, Steven H. Day, Mary A. Terzian, Roderick A. Rose, and Shenyang Guo - Social Information-Processing Skills Training to Promote Social Competence and Prevent Aggressive Behavior in the Third Grade. *Journal of Consulting and Clinical Psychology*, 73(6), pp. 1045–1055
- Maughan, B. and Rutter, M. (1998) ‘Continuities and discontinuities in antisocial behaviour from childhood to adult life.’ *Clinical Child Psychology* 20, pp. 1–47
- Meltzer, H., Lader, D., Corbin, T., Goodman, R. and Ford, T. (2004) *The Mental Health of Young People Looked After by Local Authorities in Scotland*. London: Office for National Statistics.
- Moffitt TE (1993) Adolescence-limited and life-course-persistent anti-social behavior: A developmental taxonomy. *Psychological Review*, 100, pp. 674–701
- Montgomery, P. (2005) *Media-based Behavioural Treatments for Behavioural Disorders in Children*. Oxford: The Cochrane Library.
- Morey, L.C. (1991). *Personality Assessment Inventory - Professional Manual*. Florida,

USA: Psychological Assessment Resources, Inc.

- National Institute for Health and Clinical Excellence (NICE - 2006). *Parent-training/education programmes in the management of children with conduct disorders*. London (UK): National Institute for Health and Clinical Excellence (NICE) pp 49. (Technology appraisal guidance; no. 102).
- Ogden, T., & Hagen, K. A. (2006). Multisystemic therapy of serious behaviour problems in youth: Sustainability of therapy effectiveness two years after intake. *Journal of Child and Adolescent Mental Health*, 11(3) pp. 142-149
- Olmeda, R. E., & Kauffman, J. M. (2003). Sociocultural considerations in social skills training research with African American students with emotional or behavioral disorders. *Journal of Developmental and Physical Disabilities*, 15, 101–121
- Pade, Hadas, Taube, Daniel O., Aalborg, Annette E. and Reiser, Paul J.(2006). An Immediate and Long-Term Study of a Temperament and Parent-Child Interaction Therapy Based Community Program for Preschoolers with Behavior Problems. *Child & Family Behavior Therapy*, 28(3), pp. 1 — 28
- Parke, R. D. (2002). *Fathers and families*. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 3. Status and social conditions of parenting* (2nd ed., pp. 27–73). Mahwah, NJ: Erlbaum.
- Quay, H.C. & Peterson, D. R. (1983). *Interim manual for the Revised Behavior Problem Checklist*. Coral Gables, FL: University of Miami.
- Raudenbush, S.W. & Bryk, S.A. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Newbury Park, CA: Sage Publications.
- Richman, N., Stevenson, J. and Graham, P. J. (1982) *Pre-school to School: A Behavioural Study*. London: Academic Press.
- Robins, L. N. (1966) *Deviant Children Grown Up: A Sociological and Psychiatric Study of Sociopathic Personality*. Baltimore, MD: Williams and Wilkins
- Robins, L. N. (1991) Conduct disorder. *Journal of Child Psychology and Psychiatry*, 32, pp. 193–212.
- Ruix, M.A., Edens, J.R., (2008) Recovery and replication of internalizing and externalizing dimensions within the Personality Assessment Inventory. *Journal of Personality Assessment*. 90(6), pp. 585-592

- Schaefer, E.S. (1965). Children's reports of parental behavior: An inventory. *Child Development, 36*(2), pp. 413-424.
- Schaeffer, C. M. (2001). *Moderators and mediators of therapeutic change in multisystemic treatment of serious juvenile offenders*. PhD dissertation. University of Missouri, Columbia
- Schaeffer, C.M., & Borduin, C.M. (2005). Long-term follow-up to a randomized clinical trial of multisystemic therapy with serious and violent juvenile offenders. *Journal of Consulting and Clinical Psychology, 73* (3), pp. 445-453.
- Schoenwald, S. K., Letourneau, E. J., & Halliday- Boykins, C. A. (2005). Predicting therapist adherence to a transported family-based treatment for youth. *Journal of Clinical Child and Adolescent Psychology, 34*(4), pp. 658–670.
- Scott, S., Knapp, M., Henderson, J. and Maughan, B. (2001) Financial cost of social exclusion: follow up study of antisocial children into adulthood. *British Medical Journal 323*, pp. 191.
- Snyder, H.N., & Sickmund, M. (1999). *Juvenile offenders and victims: 1999 national report*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.
- Stambaugh L.F.; Mustillo S. A.; Burns B. J.; Stephens R. L.; et al (2007) Outcomes From Wraparound and Multisystemic Therapy in a Center for Mental Health Services System of Care Demonstration Site. *Journal of Emotional and Behavioral Disorders; 15* (3) pp. 143-155.
- Sugai, G. & Lewis, T. J. (1996). Preferred and promising practices for social skills instruction. *Focus on Exceptional Children, 29*, pp. 11–26
- Sundell, K., Hansson, K., Löfholm, C. A., Olsson, T., Gustle, L. H., & Kadesjö, C. (2008). The transportability of multisystemic therapy to Sweden: Short-term results from a randomized trial of conduct disordered youth. *Journal of Family Psychology, 22*, pp. 550–560.
- Timmons-Mitchell, J., Bender, M.B., Kishna, M.A., & Mitchell, C.C. (2006). An independent effectiveness trial of multisystemic therapy with juvenile justice youth. *Journal of Clinical Child and Adolescent Psychology, 35*, (2), pp. 227-236.
- Ware, L., Forston, B., & McNeil, C. (2003). Parent-child interaction therapy: A promising intervention for abusive families. *The Behavior Analyst Today, 3*, pp. 375-382.
- Washington State Institute for Public Policy (2006). *Evidence-Based Public Policy*

Options to Reduce Future Prison Construction, Criminal Justice Costs, and Crime Rates. Olympia, WA: Evergreen State College.

Webster-Stratton, C., Hollinsworth, T., & Kolpacoff, M. (1989). The long-term effectiveness and clinical significance of three cost-effective training programs for families with conduct problem children. *Journal of Consulting and Clinical Psychology*, 57, 550–553.

Weiss, B., Han, S., Harris, V., Catron, T., Ngo, V.K. & Caron, A. (2010). *An Independent Evaluation of the MST Treatment Program.* Unpublished manuscript, Vanderbilt University, Nashville, TN.

WHO (1994) ICD-10: International Statistical Classification of Diseases and Related Health Problems: Tenth Revision. (2nd edition) Geneva: World Health Organization.