LONG-TERM EFFECTS OF MULTISYSTEMIC THERAPY ON
CAREGIVERS OF SERIOUS AND VIOLENT JUVENILE OFFENDERS

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by

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

LONG-TERM EFFECTS OF MULTISYSTEMIC THERAPY ON CAREGIVERS OF SERIOUS AND VIOLENT JUVENILE OFFENDERS

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and hereby certify that, in their opinion, it is worthy of acceptance.

________________________________________
Professor Charles M. Borduin

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Professor Sara Gable
To Mom and Dad. I couldn’t have done it without your support.
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ABSTRACT

This study examined long-term criminal and civil court outcomes for caregivers of serious and violent juvenile offenders who had participated in either multisystemic therapy (MST) or individual therapy (IT) in a randomized clinical trial (Borduin et al., 1995). Criminal and civil suit data for caregivers \( N = 292 \) from 176 families were obtained during a 26.4-year follow-up period. Intent-to-treat analyses showed that for caregivers in the MST condition, the rates of arrests for felonies and misdemeanors, respectively, were 97% and 66% lower than for caregivers in the IT condition. In addition, caregivers in the MST condition were sentenced to 70% fewer years of incarceration and 98% fewer years of probation than caregivers in the IT condition. Furthermore, caregivers in the MST condition were 52% less likely to be involved in a civil suit reflecting family instability than were caregivers in the IT condition. The present study represents the only follow-up to date of caregivers in an MST clinical trial and demonstrates that the positive impact of an evidence-based treatment for serious and violent juvenile offenders can extend to other family members. Implications of the findings for policymakers and service providers are discussed.
Introduction

Reviewers have identified a number of family-based treatment models that have shown effectiveness in reducing criminal activity among serious and violent juvenile offenders (Eyberg, Nelson, & Boggs, 2008; National Institutes of Health, 2006). However, the impact of such treatments on criminality in other family members has rarely been examined. This is unfortunate because treatments that involve the entire family are likely to have a positive effect beyond the individual offender and may be especially cost effective. Indeed, empirical evidence demonstrating the broader clinical benefits of family-based treatments for serious and violent juvenile offenders would be useful for policymakers and service providers to consider in their decisions about mental health interventions.

Caregivers of serious and violent juvenile offenders often hold favorable attitudes about criminality and frequently have histories of involvement in antisocial behaviors themselves (Besemer & Farrington, 2012; Bijleveld & Wijkman, 2009; Gorman-Smith, Tolan, Loeber, & Henry, 1998). These caregiver attitudes and behaviors represent environmental risks for further criminal activity in juveniles with histories of serious and violent offending (Dogan, Conger, Kim, & Masyn, 2007; Ge et al., 1996; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009). Although caregiver modeling of antisocial and aggressive behavior is probably one mechanism by which these risks are conveyed in the family environment (Loeber & Farrington, 1998; Sheehan & Watson, 2008), it also seems highly likely that caregivers with antisocial attitudes and behaviors possess cognitive and interpersonal deficits that interfere with their capacity for positive
parenting (Patterson, Reid, & Dishon, 1992; Simons, Wu, Conger, & Lorenz, 1994; Smith & Stern, 1997). Here, the criminal behavior of offspring might be linked more directly with caregiver-youth affective relations and the use of ineffective caregiver control strategies than with the modeling of caregiver deviance (Henggeler, 1989; Thornberry, Freeman-Gallant, & Lovegrove, 2009). To the extent that these barriers to effective parenting are amenable to treatment, they are a logical target of family-based interventions seeking to reduce or prevent criminality in serious and violent juvenile offenders.

Multisystemic therapy (MST; Henggeler & Borduin, 1990) is an intensive family- and community-based treatment that has demonstrated significant effects on the criminal activity of serious and violent juvenile offenders in more than a dozen clinical trials (Henggeler et al., 2009). MST focuses on caregivers as the primary conduits of change and empowers them to engage in effective parenting practices (e.g., monitoring, conflict management) that improve youth functioning across family, peer, school, and community contexts. It seems reasonable to suggest that changes in parenting practices that result from MST may also have benefits for caregivers’ own functioning. Indeed, several studies have found that caregivers of juvenile offenders who participated in MST demonstrated a greater reduction in psychiatric symptoms from pre- to posttreatment than did caregivers of offenders who participated in treatment-as-usual (e.g., Borduin et al., 1995; Borduin, Schaeffer, & Heiblum, 2009; Henggeler et al., 1997). Moreover, other studies have found that relative to alternative treatments, MST increased emotional warmth in caregiver-youth relations and in caregivers’ marital relations in families of juvenile offenders (Henggeler et al., 1986; Mann et al., 1990). However, it is not known
whether the positive effects of MST on caregivers extend to their own involvement in antisocial activities and persist beyond the end of treatment.

Present Study

The present study examined criminal outcomes (i.e., arrests, incarceration) for caregivers of serious and violent juvenile offenders who participated several decades earlier in a clinical trial of MST. Although prior follow-up studies of MST participants have focused on index offenses (i.e., primarily felonies), the present study will focus on a broader range of crimes (i.e., both misdemeanor and felony arrests) for caregivers. Indeed, although felony offenses generally pose a greater threat to public safety, misdemeanor offenses are more common and result in considerable costs to victims (e.g., property damage and loss, health care, lost productivity) and to the public treasury (e.g., police and court expenses; McCollister, French, & Fang, 2010).

This study also examined noncriminal outcomes among caregivers of former MST participants. To date, we know little about the long-term impact of MST on areas of adult functioning outside of involvement in (or avoidance of) criminal activities. However, research indicates that adults who engage in antisocial activities experience wide-ranging problems that collectively interfere with their ability to meet important life tasks (e.g., establish a family, manage finances; Herrick & Elliott, 2001; Sampson & Laub, 1990; Thompson & Petrovic, 2009; Yamaguchi & Kandel, 1985). In the present study, we used civil suits as indices of caregiver functioning in the domains of family relationships and financial responsibilities. These noncriminal outcome measures
provided a more detailed picture of the long-term developmental impact of MST on caregivers’ lives.

In summary, the current study examined criminal and noncriminal outcomes among caregivers of serious and violent juvenile offenders who participated on average 26.4 years earlier in the largest randomized clinical trial of MST (Borduin et al., 1995). Specifically, it was expected that relative to caregivers in an alternative treatment condition, caregivers in the MST condition would (a) be less likely to have been arrested for misdemeanor or felony offenses, (b) spent less time incarcerated or on probation, and (c) have been involved in fewer civil suits related to family instability or financial problems. As such, the present study represents the first follow-up of caregivers from an MST clinical trial and, to the authors’ knowledge, of any evidence-based treatment of delinquency.

**Method**

**Design**

The present study examined long-term criminal and civil court outcomes among caregivers of juvenile offenders who received either MST or individual therapy (IT) on average 26.4 years earlier in a randomized clinical trial (Borduin et al., 1995). The original trial used a pretest-posttest control group design, with random assignment to conditions and a 4-year follow-up for rearrests, to compare the effectiveness of MST versus IT.
Participants

Participants were caregivers (N = 292) from 176 families of serious and violent juvenile offenders who participated in the original clinical trial (Borduin et al., 1995). These caregivers were living in the same homes as the juvenile offenders during the clinical trial. The families were consecutively referred to the Missouri Delinquency Project between July 1983 and October 1986 and agreed to complete pretreatment and posttreatment assessment measures. Referrals to the project included all families in which the youth (a) had at least two arrests (i.e., convictions), (b) lived with at least one caregiver, and (c) had no evidence of psychosis or dementia. Families meeting these criteria were randomized by coin toss to either MST (n = 92) or IT (n = 84). The arrest histories of the referred youths attested to their serious criminal involvement; the youths averaged 3.9 arrests for felonies prior to referral (SD = 1.9), with 47.8% of the youths having been arrested for one or more violent crimes (e.g., sexual assault, assault and battery with intent to kill, aggravated assault).

The primary caregiver included biological mothers (89.5%); step-, foster, or adoptive mothers (8.0%); and biological fathers (2.5%). The majority of families in the original clinical trial had two caregivers (65.9%), were of lower socioeconomic status (63.4%; Class IV or V; Hollingshead, 1975), and were White (79.1%). The mean age of caregivers at the time of treatment was 40.3 years (SD = 7.61) and at the time of follow-up was 66.7 years (SD = 8.20). About two-thirds of the families had at least one caregiver with an arrest history (MST = 69.6%, IT = 70.2%). T tests and chi-square tests revealed that caregivers in the two treatment conditions (MST vs. IT) did not significantly differ in terms of demographic characteristics or pretreatment arrest histories.
**Treatment Conditions**

Families were randomized to treatment conditions and to therapists within each condition. The mean numbers of hours of treatment were 20.7 ($SD = 7.4$) for the MST condition and 22.5 ($SD = 10.6$) for the IT condition; these means were not significantly different. All analyses in the present study were by intent-to-treat.

**MST.** Interventions in this condition were based on the multsystemic approach to the treatment of behavior problems in adolescents and are explained in detail in a clinical volume (Henggeler & Borduin, 1990) and a treatment manual (Henggeler et al., 2009). The key components of MST fit closely with findings on the causes and correlates of serious and violent juvenile offending (for a review, see Loeber & Farrington, 1998). MST uses present-focused, action-oriented interventions to address individual (e.g., cognitive distortions) and systemic variables (e.g., low parental monitoring, deviant peer associations) that are linked with serious antisocial behavior in youths. Treatment is individualized and provided to youths and their caregivers in the natural environment (e.g., home, school, neighborhood) in a time-limited fashion. An overarching goal of MST is to empower caregivers with the skills and resources needed to independently address youth problem behaviors. For example, caregivers learn to communicate more effectively with the youth, set clear rules and expectations for the youth’s behavior, and monitor the youth’s activities and peer relations.

**IT.** Interventions in this condition were consistent with treatment-as-usual for juvenile offenders in the local judicial district and in the majority of other judicial districts as well (see Loeber & Farrington, 1998). All of the youths in this condition received individual therapy that focused on personal, family, and academic issues. This
therapy provided support, feedback, and encouragement for behavior change. Therapists’ theoretical orientations included a blend of psychodynamic (e.g., encouraging insight and expression of feelings), client-centered (e.g., developing a close relationship, providing empathy and warmth), and behavioral (e.g., providing social approval for school attendance and other prosocial behaviors) treatments. Although there were some differences in the therapists’ techniques (e.g., some therapists provided more warmth or were less directive than other therapists), all focused on intervening with the individual juvenile offender rather than with his or her social ecology (e.g., family members).

**Therapists**

Three female and three male graduate students (ages ranged from 23 to 31 years, $M = 26$) in clinical psychology provided MST. Each therapist had on average 1.5 years of direct clinical experience with youths prior to the study. Therapist supervision was provided by Charles M. Borduin in a 3-hour weekly group meeting and continued throughout the course of the investigation. During these meetings, the therapists and supervisor reviewed the goals and progress of each case, observed and discussed selected videotaped therapy sessions, and made decisions about how to best facilitate the family’s progress.

Three female and three male therapists (ages ranged from 25 to 33 years, $M = 28$) from local mental health outpatient agencies (including the treatment services branch of the juvenile court) provided IT. Each therapist had a master’s degree (or equivalent training) in either counseling psychology, social work, or another mental health-related field and had approximately 4 years of direct clinical experience with youths. Therapists
attended a 2.5-hr weekly case review with the juvenile court treatment coordinator to discuss the goals and progress of each case.

**Treatment Fidelity**

To ensure the fidelity of MST, therapists received training in the MST model and ongoing quality assurance. In addition to participating in group supervision meetings, MST therapists documented all therapeutic contact by completing notes that described the content of sessions and how much progress had been made in meeting the individualized treatment goals. Charles M. Borduin viewed selected videotapes of sessions with MST therapists to monitor in-session treatment adherence. Fidelity was examined in the IT condition by having therapists (1) attend weekly case reviews with the treatment coordinator from the Juvenile Court and (2) provide monthly reports on the nature of therapeutic contacts, who was present at the contacts, and youth progress in meeting the goals of treatment. In addition, Charles M. Borduin reviewed selected videotapes of sessions with IT therapists to monitor in-session treatment adherence. Although it was not possible to include an independent assessment of the integrity of either MST or IT, the therapists in both conditions completed a checklist for each of their cases to indicate the systems directly addressed during the course of treatment (i.e., individual, marital, family, peer, school). These checklists revealed that all MST cases received interventions in two or more systems ($M = 3.5$), whereas the vast majority (90.5%) of IT cases received interventions in only one system (always the individual adolescent).
Research Procedures

**Original outcome study.** Families referred to the treatment project were initially contacted by telephone or home visit and informed that a 1.5-hr research assessment would be conducted before the start of treatment and again after the end of treatment. Families were informed that participation in the research was voluntary and that refusing to participate or discontinuing participation would not jeopardize the receipt of treatment services or result in sanctions from the court. Families were also informed that arrest records and other public records would be obtained for individual family members at follow-ups. Family members provided written consent or assent for the research procedures. All procedures were approved by the Institutional Review Board of the University of Missouri. Only those procedures and measures relevant to the present study are described below.

**Present study.** Public records for caregiver arrests, sentencing, and civil suits were obtained within the state of Missouri. A national search of criminal records was not possible because fingerprints would have been needed to confirm individuals’ identities, and fingerprints were not obtained from individual family members at the time of the original study. However, it seemed likely that most caregivers, like their offspring (see Sawyer & Borduin, 2011; Wagner, Borduin, Sawyer, & Dopp, 2014), would still be residing in Missouri at long-term follow-up and that criminal and noncriminal outcomes for caregivers residing outside of Missouri would not differ systematically from those for caregivers living in Missouri. In addition, we assumed that between-group differences in arrest rates would be consistent regardless of whether caregivers resided in Missouri or elsewhere.
The present study used procedures similar to those of Schaeffer and Borduin (2005), Sawyer and Borduin (2011), and Wagner et al. (2014) to determine whether each individual resided in Missouri during the follow-up period and, thus, whether he or she was available to have a court record (i.e., arrests, sentencing, civil suits) in the state through May of 2015, when the follow-up was completed. Several steps were used to confirm residency. First, the local county website was searched for marriage certificates to determine whether caregivers had married, remarried, divorced, and/or changed their names since completing the original clinical trial. Second, state criminal records were searched, and crimes that had been committed after the end of treatment and that led to convictions were recorded. Third, a search of state driver’s license records was conducted for all caregivers whose names did not appear in state criminal records; a caregiver was considered to be a Missouri resident if he or she held a Missouri driver’s license. Fourth, property ownership was searched for caregivers for whom there were no arrest records or driver’s license records. Finally, death records were searched to confirm whether some caregivers had died and, if so, whether the caregiver had died in Missouri or another state; a caregiver was considered a Missouri resident if he or she had died in Missouri. If a caregiver died outside of Missouri, the caregiver was considered lost-to-follow-up. The length of follow-up was adjusted (i.e., shortened accordingly) for those caregivers who died in Missouri before the last date of follow-up. The average length of follow-up for all caregivers was 26.4 years.

Overall, caregivers from 81.3% (n = 143) of homes were located and confirmed to have resided in Missouri since the end of treatment, including 83.7% (n = 77) of the families in the MST condition and 78.5% (n = 66) of the families in the IT condition;
attrition rates did not differ significantly between conditions. The remaining 18.8% \((n = 33)\) of families for whom caregiver residency could not be confirmed were considered lost to follow-up (see Figure 1). There were no demographic differences between caregivers located at follow-up versus caregivers considered lost to follow-up. The demographic characteristics of caregivers who were located at follow-up, as well as \(T\) tests and chi-square tests that demonstrate no differences in these characteristics between the two conditions (MST vs. IT), are presented in Table 1.

**Measures**

Adult criminal and civil court records, which are freely available to the public in the state of Missouri, were obtained using an Internet database searched separately by two research assistants, both of whom were blind to each caregiver’s treatment condition. Court records were searched using caregivers’ names, known aliases, alternative first names (e.g., Dick for Richard), and alternative last names for female caregivers whose names may have changed due to marriage or remarriage (based on state-level court records and county-level marriage records).

Several steps were taken to reduce the possibility of false positives for caregivers whose names were present in court records. First, caregiver records were matched by year of birth, middle name or middle initial, and suffix (e.g., Sr.). Second, when the previous indicators were unavailable, caregiver records were matched based on similarity to cases that met the first search criterion, including previous addresses, court locations, and names of other individuals listed on the court docket (e.g., spouses). For cases in which caregivers could not be matched to records by this rule-out process, no information
was recorded. Thus, the data for the present study provided an under-estimate of court involvement in the state of Missouri.

Criminal record data were coded by crime classification (i.e., felony or misdemeanor) and date of arrest. In addition, sentencing data were recorded as numbers of days sentenced to (a) incarceration and/or (b) probation. For cases in which incarceration sentences were suspended in favor of probation, only days sentenced to probation were recorded, unless the terms of probation were violated and the incarceration sentence was executed. Only criminal arrests that resulted in convictions were included in the present study. Criminal cases that were dismissed or not yet disposed were not recorded. Traffic court records, which include minor traffic violations (e.g., speeding), were not included in the data set.

Civil suit records were classified as indicating family instability (i.e., divorce, paternity, and/or child support suits) or financial problems (i.e., account/credit, contract, and/or rent suits). Suits pertaining to family instability were recorded regardless of whether the caregiver was the petitioner (i.e., initiator of the suit) or the respondent (i.e., person against whom the suit was filed) because it was assumed that both petitioners and respondents would likely experience family conflict and instability surrounding such suits. Suits pertaining to financial problems were limited to those in which caregivers were respondents rather than petitioners because (a) I was interested in measuring caregivers’ failure to meet financial responsibilities and (b) there were almost no instances in which a caregiver had initiated a financial suit. As above, only cases resolved at the time of data collection were recorded.
Analytic Strategy

I conducted three sets of analyses to evaluate the impact of treatment group (MST vs. IT) on criminal and civil court outcomes for caregivers in each family. First, I used descriptive statistics to examine the percentages and relative odds of dichotomous outcomes (e.g., arrested vs. not arrested) for each group. Second, I conducted survival analyses to evaluate between-group differences in length of time to the first occurrence of a given outcome (i.e., arrests, civil suits). Third, I used negative binomial regression analyses to estimate between-groups differences on continuous outcomes (i.e., number of arrests, years sentenced, and civil suits). Negative binomial regression analyses also were used to evaluate the effects of potential moderators of treatment on criminal and civil court outcomes.

Households (i.e., families) were used as the unit of analysis because caregivers were nested within households. Indeed, of the 232 caregivers (from 143 households) located for the present follow-up, 79.6% resided in two-caregiver homes. In addition, collapsing data within households is consistent with the likelihood that caregivers function as a unit, whether in regard to their own behavior (e.g., criminal activity) or the socialization of their children (e.g., parenting practices). Furthermore, caregivers who live in the same home are likely to share the same attitudes and beliefs about criminality (Capaldi, Kim, & Shortt, 2004; Herrera, Wiersma, & Cleveland, 2011; Moffitt, Caspi, Rutter, & Silva, 2001). Thus, in two-caregiver households in the present study, the occurrence of a given outcome (e.g., arrest, civil suit) was based on at least one of the caregivers in the household having experienced the outcome, whereas the nonoccurrence
of a given outcome was based on neither caregiver having experienced the outcome. In single caregiver households, each outcome depended on the sole caregiver alone.

**Results**

**Likelihood and Relative Odds of Arrests and Civil Suits**

I calculated the percentages of arrests in the IT group versus the MST group. As described in Table 2, 10.6% of IT households (i.e., families) versus 0.0% of MST households had a caregiver who had been arrested at least once for a felony offense by the end of the 26.4-year follow-up period, $\chi^2 (1, N = 143) = 8.59, p = 0.003$. In contrast, there was not a significant difference between the MST and IT groups in the percentages of households with caregiver misdemeanors. Regarding civil suit outcomes, 25.8% of IT households versus 16.9% of MST households had a caregiver who had been involved in at least one suit related to family instability, $\chi^2 (1, N = 143) = 3.78, p = 0.05$. There was not a significant between-groups difference for caregiver involvement in suits related to financial problems.

To examine the relative odds of caregiver arrests and civil suits in IT households versus MST households, I calculated odds ratios. An odds ratio (OR) greater than 1.0 indicated higher odds for caregivers in IT households relative to caregivers in MST households. A confidence interval (CI) that did not include 1.0 indicated that results were unlikely to occur by chance (J. Cohen, 1994). The odds of a caregiver being arrested for felony offense was 10.48 times higher in IT households than in MST households, 95% CI [1.28, 86.18]. In contrast, for caregiver misdemeanor arrests, the odds ratio confidence interval included 1.0. In addition, although the odds of being involved in a family
instability suit was 2.32 times higher for caregivers in IT households than for caregivers in MST households, 95% CI [0.98, 5.51], this difference only approached statistical significance ($p = .052$).

**Survival Functions for Arrests and Civil Suits**

Survival analyses (Cox proportional hazards regressions; IBM SPSS for Windows, Version 21.0) were used to obtain cumulative survival functions (or survival curves) for caregiver criminal and civil suit outcomes in families of youths who received either MST or IT. The cumulative survival function represents the proportion of households with caregivers who survived any type of arrest or civil suit (i.e., were not arrested or involved in a civil suit, respectively) in each group by the length of time (in years) from release from treatment. Survival analyses are appropriate here because they model data that are censored (i.e., when some individuals in the sample do not experience an event, such as an arrest or civil suit; Keiley & Martin, 2005). A log-rank test (with the Kaplan-Meier estimator; Kaplan & Meier, 1958) revealed that the survival functions for the two groups on felony arrests were significantly different, $\chi^2 (1, N = 143) = 8.69, p = 0.003$, with caregivers in MST households at lower risk of arrest for felony offenses (i.e., more likely to survive) during follow-up than were caregivers in IT households (see Figure 2). The hazard ratio for treatment condition was 0.96, suggesting a large effect size for the lower risk of felony arrest observed for caregivers in MST households. The difference in survival probability between treatment conditions for misdemeanor offenses was not significant ($p = 0.19$).

I also used survival analyses to compare caregivers in MST and IT households on time to each type of civil suit (i.e., family instability, financial problems). As depicted in
Figure 3, caregivers in MST households were at lower risk of involvement in family instability suits than were caregivers in IT households, although this finding only approached statistical significance, $\chi^2 (1, N = 143) = 3.57, p = 0.059$. The hazard ratio indicated a large effect of treatment group on family instability suit involvement ($\beta = 0.97$). The difference in survival probability between treatment conditions for suits reflecting financial problems was not significant ($p = 0.29$).

**Number of Arrests, Years Sentenced, and Civil Suits**

I evaluated the impact of treatment condition on the number of caregiver criminal and civil suit outcomes in families of youths who received either MST or IT. Because the outcome variables in the present study are continuous, nonnormal, and nonnegative (i.e., there are no negative values), they are considered censored-dependent variables (Greene, 1993). In addition, the majority of the variables were overdispersed (i.e., variance exceeds mean). Accordingly, as recommended by Osborn and Tseloni (1998), negative binomial regression analyses were used to evaluate between-group differences in the number of (a) posttreatment arrests, (b) years sentenced to incarceration or probation, and (c) posttreatment civil suits. These differences were expressed as the relative rate of a given outcome among caregivers in IT households relative to caregivers in MST households. I computed all negative binomial regressions using R 3.1.2 (R Core Team, 2014). Treatment condition was dummy coded with IT equal to 1 and MST equal to 0.

Descriptive statistics and regression coefficients are presented in Table 3.

Regarding criminal outcomes, the results indicated that the estimated rates of felony arrests were 0.41 times greater for caregivers in IT households than for caregivers in MST households. In addition, results showed that the estimated rates of misdemeanor
arrests were 0.74 times greater for caregivers in IT households than for caregivers in MST households. Moreover, results demonstrated that the estimated rates of years sentenced to incarceration and probation, respectively, were 0.83 and 1.15 times greater for caregivers in IT households than for caregivers in MST households.

Regarding civil suit outcomes, results indicated that the estimated rate of involvement in family instability suits was 0.29 times greater for caregivers in IT households relative to caregivers in MST households. However, results indicated that estimated rates of caregiver involvement in financial problem suits did not significantly differ between groups.

Potential Moderators of Arrests, Years Sentenced, and Civil Suits

Negative binomial regression analyses were also used to evaluate the effects of potential moderators (age, race, socioeconomic status, gender, and pretreatment arrests) of MST effectiveness. These potential moderators were examined for all outcomes with significant or near significant treatment effects (i.e., numbers of felonies, misdemeanors, civil suits related to family instability, years sentenced to incarceration, and years sentenced to probation). For each regression analysis, a dummy variable that represented treatment group, the moderating variable, and the cross-product term of the treatment group and the moderating variable were entered simultaneously. Moderator variables that were continuous were centered around their means in each cross-product term. A significant regression coefficient for the cross-product term indicated whether MST was differentially effective with caregivers from divergent backgrounds. There were no significant moderators for any outcome variable. Thus, these results generally suggest that MST was equally effective with caregivers of divergent backgrounds.
Discussion

The present study represents the first follow-up of caregivers of serious and violent juvenile offenders who participated in an MST clinical trial. The results indicated that caregivers of MST participants were significantly less likely to be arrested for felony crimes than were caregivers of IT participants (0.0% vs. 10.5%) within 26.4 years of treatment termination. More specifically, caregivers in the MST condition had a rate of arrests for felonies that was 0.41 times lower than the felony arrest rate for caregivers in the IT condition. In addition, the rate of misdemeanor arrests was 0.74 times lower for caregivers of MST participants than for caregivers of IT participants. Furthermore, the number of years sentenced to incarceration or probation was 0.83 to 1.15 times lower for caregivers in the MST condition than for caregivers in the IT condition. Moreover, caregivers in the MST condition were 43.1% less likely to have been involved in a civil suit reflecting family instability. Importantly, consistent with conclusions from recent reviews regarding the cultural effectiveness of MST (e.g., Henggeler, 2011; Huey & Polo, 2008), the relative efficacy of MST was not moderated by measured demographic characteristics (e.g., race, gender, social class), suggesting that MST was not differentially effective with families from different backgrounds.

The results demonstrate that MST had long-lasting effects in reducing criminal activity (i.e., felonies and misdemeanors) and incarceration among caregivers of former participants. These findings extend those of previous follow-ups of the original clinical trial (Borduin et al., 1995) showing that youth offenders (Sawyer & Borduin, 2011) and their closest-in-age siblings (Wagner et al., 2014) who received MST were less likely to
be arrested and imprisoned for serious crimes more than two decades following treatment. Although the between-groups differences in criminal outcomes for caregivers in the present study are not as substantial as in the prior follow-ups of the youths and their siblings, it seems likely that some of the caregivers in the present study had already desisted from criminal offending at the time of treatment (see Farrington, Coid, & West, 2009). Nevertheless, the present results demonstrate that MST has long-term benefits for those caregivers whose criminal activity might otherwise continue in midlife and beyond. Moreover, the findings suggest that MST is an effective treatment for families in which more than one member is at high risk to engage in criminal behavior (see Farrington, Joliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001).

Civil court records indicated that caregivers of youths who participated in MST were involved in 51.7% fewer suits related to family instability (i.e., divorce, paternity, or child support) than were caregivers of youths who received individual therapy. The lower rates of civil suits linked with family instability is consistent with the emphasis that MST places on family interventions (Henggeler et al., 2009) and with previous studies of MST showing improved caregiver marital relations (e.g., Mann, Borduin, Henggeler, & Blaske, 1990) and caregiver-youth relations following treatment (e.g., Henggeler et al., 1986; Mann et al., 1990). Moreover, other evidence (see Burt et al., 2010; Laub & Sampson, 2001) suggests that positive family relations can act as natural social control for crime and points to a possible mechanism of change for the long-term influence of MST on caregivers. In contrast, MST did not have an effect on civil suits related to financial problems, suggesting that the benefits of MST may not generalize across all areas of caregiver functioning. Given the present results, however, it seems reasonable to
suggest that the positive effects of MST on caregivers are related to the emphasis that MST places on family affective relations and the removal of barriers to effective parenting (e.g., ineffective caregiver control strategies).

Now more than ever, policymakers are under pressure to address public concerns about crime with interventions that not only improve public safety but also save money. The preventive effects of MST on caregiver criminality and incarceration are important for policymakers to consider when allocating scarce financial resources to treatments for serious and violent juvenile offenders. A recent economic evaluation of the taxpayer and crime victim benefits associated with MST versus individual therapy estimated total cost benefits of $35,582 per juvenile offender and $7,798 per sibling (Dopp, Borduin, Wagner, & Sawyer, 2014). The relative efficacy of MST in reducing caregiver criminality and incarceration should result in even greater cost benefits of MST per family, creating a persuasive argument for increased funding for MST and other cost beneficial family interventions and decreased funding for individually-focused interventions like those in the alternative treatment condition.

The present study has several methodological limitations. First, we assessed criminal activity during the follow-up period using arrest records, which likely underestimate the actual number of crimes committed by offenders (e.g., Elliott, 1995; Farrington et al., 2009). Nevertheless, arrest records are one useful index of criminal involvement and likely provided an accurate estimate of the relative effectiveness of MST versus IT in reducing caregiver criminal activity. Second, the design of this study does not allow for an examination of whether the favorable results for caregivers in the MST condition were due to the specific effects of MST or the more general effects of a
family-based intervention. However, the results of this study are consistent with the notion that treatments that involve the entire family and that target key risk factors are ideally suited to have a positive impact beyond the targeted juvenile offender. Third, we were unable to confirm that caregivers maintained continuous residence in Missouri throughout the follow-up period and cannot rule out the possibility that a portion of caregivers may have committed crimes in other states. Even so, it seems unlikely that the rate of crimes committed outside of Missouri would differ systematically by treatment group. Moreover, complete follow-up data were available for the vast majority (81.3%) of the sample.

In summary, the current findings demonstrate that the positive effects of MST in reducing criminality extend to caregivers of juvenile offenders. Over the longest follow-up period ever examined in an MST clinical trial, MST produced lasting reductions for caregivers in a broad range of criminal outcomes and in civil suits related to family instability. Our results likely correspond to improved life outcomes for these caregivers, cost savings for taxpayers, and decreased risks of victimization for community members. Further, the present findings bode well for other evidence-based treatments of delinquency (e.g., Multidimensional Treatment Foster Care [Chamberlain, 2003]; Functional Family Therapy [Alexander & Parsons, 1982]), given similar clinical emphases (i.e., focus on key risk factors associated with delinquency, ecologically valid service delivery). As evidence-based treatments are disseminated more broadly, our findings should be considered by policymakers and service providers in the selection of interventions for serious juvenile offenders and their families. Furthermore, we hope that the favorable results of this study encourage researchers to examine whether other
treatment models for child and adolescent clinical populations produce benefits for caregivers.
References


Farrington, D. P., Coid, J. W., & West, D. J. (2009). The development of offending from age 8 to age 50: Recent results from the Cambridge Study in Delinquent Development. Monatsschrift fur Kriminologie and Strafrechtsreform (Journal of Criminology and Penal Reform), 92, 160-173.


Footnotes

1In the present study, two-caregiver households included both married and unmarried individuals who were living and raising children together.
Figure 1. Flow diagram of families from referral to follow-up.
Figure 2. Survival functions for caregivers in multisystemic therapy (MST) and individual therapy (IT) households on time to first felony arrest following treatment.
Figure 3. Survival functions for caregivers in multisystemic therapy (MST) and individual therapy (IT) households on time to first family instability civil suit following treatment.
Table 1

*Demographic Characteristics of Caregivers Located at Follow-Up*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MST</td>
<td>IT</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M$</td>
<td>67.3</td>
<td>65.8</td>
</tr>
<tr>
<td>$SD$</td>
<td>8.4</td>
<td>6.5</td>
</tr>
<tr>
<td>Female gender (%)</td>
<td>60.7</td>
<td>55.7</td>
</tr>
<tr>
<td>Social class$^a$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class V</td>
<td>19.7</td>
<td>13.0</td>
</tr>
<tr>
<td>Class IV</td>
<td>10.3</td>
<td>20.9</td>
</tr>
<tr>
<td>Class III</td>
<td>30.8</td>
<td>34.8</td>
</tr>
<tr>
<td>Class II</td>
<td>30.8</td>
<td>23.5</td>
</tr>
<tr>
<td>Class I</td>
<td>8.5</td>
<td>7.8</td>
</tr>
<tr>
<td>Race (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>16.2</td>
<td>27.0</td>
</tr>
<tr>
<td>White</td>
<td>83.8</td>
<td>73.0</td>
</tr>
</tbody>
</table>

*Note.* Sample sizes for therapy conditions are as follows: individual therapy (IT; $n = 115$); multisystemic therapy (MST; $n = 117$). For age, $df = 230$; for social class, $df = 4$; for gender and race, $df = 1$. For all $T$ and $\chi^2$ values, $ps > .05$.  

$^a$Based on Hollingshead’s (1975) Four-Factor Index of Social Status.
Table 2

*Percentages and Odds of Arrests and Civil Suits During Follow-Up by Therapy*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Variable</th>
<th>%</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Criminal arrests</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any felony</td>
<td>10.48</td>
<td></td>
<td>[1.28, 86.18]</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>10.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MST</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any misdemeanor</td>
<td>1.71</td>
<td></td>
<td>[0.76, 3.85]</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>25.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MST</td>
<td>16.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Civil suits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Family instability</td>
<td>2.32</td>
<td></td>
<td>[0.98, 5.51]</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>25.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MST</td>
<td>13.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Financial problems</td>
<td>0.68</td>
<td></td>
<td>[0.33, 1.41]</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>25.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MST</td>
<td>33.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Sample sizes for therapy conditions are as follows: individual therapy (IT; *n* = 66); multisystemic therapy (MST; *n* = 77). OR = odds ratio; CI = confidence interval.
Table 3

*Descriptive Statistics and Negative Binomial Regression Results for Criminal and Civil Suit Outcomes*

<table>
<thead>
<tr>
<th>Variable</th>
<th>MST</th>
<th>IT</th>
<th>Regression coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Crime type (number)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any felony</td>
<td>0.00</td>
<td>0.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Any misdemeanor</td>
<td>0.25</td>
<td>0.61</td>
<td>0.74</td>
</tr>
<tr>
<td>Adult sentencing (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incarceration</td>
<td>0.00</td>
<td>0.01</td>
<td>0.70</td>
</tr>
<tr>
<td>Probation</td>
<td>0.31</td>
<td>0.77</td>
<td>1.06</td>
</tr>
<tr>
<td>Civil suits (number)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family instability</td>
<td>0.14</td>
<td>0.39</td>
<td>0.29</td>
</tr>
<tr>
<td>Financial problems</td>
<td>0.71</td>
<td>1.46</td>
<td>0.68</td>
</tr>
</tbody>
</table>

*Note.* IT = individual therapy; MST = multisystemic therapy. Sample sizes for therapy conditions are as follows: IT (n = 66); MST (n = 77).

†p = .06 † p < .05.  ** p < .01  *** p < .001