

Multisystemic Treatment of Serious Juvenile Offenders: Long-Term Prevention of Criminality and Violence

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This article examined the long-term effects of multisystemic therapy (MST) vs. individual therapy (IT) on the prevention of criminal behavior and violent offending among 176 juvenile offenders at high risk for committing additional serious crimes. Results from multiagent, multimethod assessment batteries conducted before and after treatment showed that MST was more effective than IT in improving key family correlates of antisocial behavior and in ameliorating adjustment problems in individual family members. Moreover, results from a 4-year follow-up of rearrest data showed that MST was more effective than IT in preventing future criminal behavior, including violent offending. The implications of such findings for the design of violence prevention programs are discussed.

The prevention of violent criminal acts and other serious crimes perpetrated by youths has become a pressing issue on the national health care agenda, as the staggering fiscal and social costs of such crimes become evident (Children's Defense Fund, 1992). To address this issue, mental health professionals and policy makers have justifiably argued for the promotion of childhood programs that may prevent the development of violent behavior (e.g., Zigler, Taussig, & Black, 1992). Although primary prevention programs targeted at young children are certainly needed and promising programs are currently being examined (e.g., Tolan, Guerra, Van Acker, Huesmann, & Eron, 1994), the development of effective interventions with youths who are the most likely to perpetrate serious crimes has been relatively neglected. Clearly, as longitudinal studies graphically

demonstrate (e.g., Lewis, Lovely, Yeager, & Famina, 1989; Weisz, Martin, Walter, & Fernandez, 1991), serious juvenile offenders are, by far, at the greatest risk for committing additional serious crimes. Preventing or attenuating further criminal activity in such youths would favorably affect their lives, families, and communities.

Unfortunately, however, interventions with serious juvenile offenders historically have had little success. Several reviews of the delinquency treatment literature in the 1970s concluded that "nothing works" (Henggeler, 1989, p. 84). More recently, Kazdin (1987, p. 189) has described several empirically driven treatments as "promising" (e.g., behavioral parent training, cognitive-behavioral therapy), and Lipsey (1992) has argued that such structured, skill-oriented treatments have demonstrated the largest effects on juvenile offenders in general. However, in clinical trials with serious juvenile offenders, such treatments have failed to produce favorable long-term effects (Bank, Marlowe, Reid, Patterson, & Weinrott, 1991; Guerra & Slaby, 1990; Weisz, Walter, Weiss, Fernandez, & Mikow, 1990). Moreover, even favorable outcomes of these treatments with less severe antisocial behavior are mitigated by findings that university-based successes rarely extend to community settings (Weisz, Weiss, & Donenberg, 1992).

In consideration of the continued difficulty of even well-conceived treatments to produce lasting change in youth antisocial behavior, investigators have argued that the major limitation of such treatments is their relatively narrow focus and failure to account for the multidetermined nature of antisocial behavior (e.g., Borduin, 1994; Mulvey, Arthur, & Reppucci, 1990; Zigler et al., 1992). Overwhelming evidence supports a social-ecological view (Bronfenbrenner, 1979) in which antisocial behavior in youths is conceptualized as multidetermined (e.g., Heng-

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geler, 1989; Loeber & Dishion, 1983). For example, several sophisticated causal modeling studies (e.g., Elliott, Huizinga, & Ageton, 1985; Patterson & Dishion, 1985; Simcha-Fagan & Schwartz, 1986) have shown that delinquency is linked directly or indirectly with key characteristics of youths and the family, peer, school, and neighborhood systems in which youths are embedded. In light of the multidetermined nature of serious antisocial behavior, expecting even well-conceived office-based treatments to be effective is unrealistic.

Findings from recent primary and secondary prevention studies and a clinical trial with serious juvenile offenders support the contention that effective interventions must address the multiple causes of antisocial behavior and be delivered with ecological validity. Zigler et al. (1992) concluded in their review that delinquency can be prevented by early childhood intervention programs that promote children's competence across multiple systems in which they are embedded. Similarly, Olweus (1992) demonstrated that a large-scale, systemically oriented secondary prevention program (i.e., addressing individual, family, classroom, school, and community factors) produced significant reductions in bullying. Likewise, Henggeler and his colleagues (Henggeler, Melton, & Smith, 1992; Henggeler, Melton, Smith, Schoenwald, & Hanley, 1993) showed that multisystemic therapy using the family preservation model of service delivery doubled the survival rate (i.e., percentage of youths not rearrested) 2 years after treatment in a sample of violent and chronic juvenile offenders at imminent risk of incarceration. The common links of these diverse interventions are their attention to the multiple determinants of antisocial behavior and their delivery of services in the youths' natural environments.

The present study from the Missouri Delinquency Project examines the long-term effects of multisystemic therapy (MST; Henggeler & Borduin, 1990) on the prevention of criminal activity in a sample of predominantly serious juvenile offenders. The study builds on the recent MST trial noted earlier (Henggeler et al., 1992, 1993) as well as on previous clinical trials demonstrating the efficacy of MST in treating inner-city juvenile offenders (Henggeler et al., 1986), serious juvenile offenders living in rural areas (Scherer et al., 1994), abusive and neglectful parents (Brunk, Henggeler, & Whelan, 1987), and juvenile sexual offenders (Borduin, Henggeler, Blaske, & Stein, 1990). In addition to providing a needed replication of the recent trial of MST with serious juvenile offenders (Henggeler et al., 1992, 1993), the present study of MST contains several important methodological improvements including (a) a relatively large sample size to permit certain subgroup analyses (e.g., recidivism for MST completers vs. MST dropouts), (b) a longer follow-up period for rearrest, (c) observational measures of family relations, and (d) a comparison group that received a roughly equivalent number of treatment hours.

Method

Design

A pretest-posttest control group design, with random assignment to conditions and a 4-year follow-up for arrests, was used to compare the effectiveness of MST with that of individual therapy.

Participants

Two hundred families with a 12- to 17-year-old adolescent offender were referred to the project by juvenile court personnel and agreed to participate in a pretreatment assessment session; five other families were referred to the project but did not agree to participate. Referrals to the project were made consecutively and included all families in which the youth (a) had at least two arrests, (b) was currently living with at least one parent figure, and (c) showed no evidence of psychosis or dementia. The arrest histories of the referred youths attest to their serious criminal involvement. The youths averaged 4.2 previous arrests ($SD = 1.4$), and the mean severity of the most recent arrest was 8.8 ($SD = 1.5$) on a 17-point seriousness scale (e.g., 1 = *truancy*; 4 = *disorderly conduct*, 8 = *assault/battery*, 11 = *grand larceny*, 13 = *unarmed robbery*, 17 = *murder*) developed by Hanson, Henggeler, Haeefe, and Rodick (1984). Moreover, all of the youths had been detained previously for at least 4 weeks. The mean age of the youths was 14.8 years ($SD = 1.5$); 67.5% were male; 70.0% were White, and 30.0% were African American; and 53.3% lived with two parental figures (biological parents, stepparents, foster parents, grandparents). The primary caretaker of the youths included biological mothers (88.0%), step-, foster, or adoptive mothers (6.5%), other female relatives (3.5%), or biological fathers (2.0%). Families averaged 3.1 children ($SD = 1.5$), and 68.8% of the families were of lower socioeconomic status (Class IV or V; Hollingshead, 1975).

Of the 200 families who completed pretreatment assessments, 24 (12%) subsequently refused to participate in treatment (hereafter referred to as "refusers"). The remaining 176 families were randomly assigned (using a coin toss) to MST ($n = 92$) or individual therapy (IT; $n = 84$). Of these, 140 (79.5%) completed treatment (hereafter referred to as "completers"), and 36 (21.5%) dropped out, defined as unilaterally terminating after the first session (with the youth or family) and before the seventh. Of the 36 youths and their families who dropped out of treatment (hereafter referred to as "dropouts"), 15 were from the MST condition and 21 were from the IT condition (dropout rates for MST [16.3%] and IT [25%] were not significantly different). We were not able to obtain posttreatment assessment data from the 36 dropouts or the 24 refusers; however, arrest data were obtained over the follow-up period for these youths. Analyses of variance (ANOVAs) and chi-square tests showed no between-groups differences in the criminal histories or demographic characteristics of MST completers, MST dropouts, IT completers, IT dropouts, and treatment refusers.

Posttreatment assessment batteries were completed by 90.9% ($n = 70$) of the MST completers and by 88.9% ($n = 56$) of the IT completers (these proportions were not significantly different). Research participation at postassessment was attenuated by the lack of incentives for the families to participate (i.e., funds were not available for payment of participants) and by the out-of-home placement of 6 youths (2 from MST, 4 from IT) in residential facilities of the Division of Youth Services of the Missouri Department of Social Services. However, the criminal histories and demographics of the cases that completed both pretreatment and posttreatment assessment batteries ($n = 126$) are essentially the same as described for the larger sample. Furthermore, the MST and IT cases that completed both pretreatment and posttreatment assessments did not differ on any demographic variable or measure of criminal history. Analyses of treatment effects on psychosocial measures are based on these cases.

Treatment Conditions

Families who completed the pretreatment assessment and agreed to participate in treatment were randomly assigned to conditions and to therapists within each condition. The mean numbers of hours of treatment were 23.9 ($SD = 8.2$; range, 5 to 49) for the MST completers, and 28.6 ($SD = 9.8$; range, 15 to 72) for the IT completers; these means

were significantly different, $F(1, 139) = 9.67, p < .01$. The MST dropouts and IT dropouts averaged 4.07 hr ($SD = 0.70$) and 4.29 hr ($SD = 1.01$), respectively, of treatment; these means did not differ significantly.

Multisystemic Therapy

Therapeutic interventions were based on the multisystemic approach to the treatment and prevention of behavior problems in children and adolescents (Henggeler & Borduin, 1990). The treatment and prevention emphases of MST fit closely with findings from multidimensional causal models of delinquent behavior (for a review, see Henggeler, 1989). Using interventions that are present-focused and action-oriented, MST directly addresses intrapersonal (e.g., cognitive) and systemic (i.e., family, peer, school) factors that are known to be associated with adolescent antisocial behavior. Moreover, because different combinations of these factors are relevant for different adolescents, MST interventions are individualized and highly flexible. Guidelines for designing and implementing MST interventions with antisocial adolescents and their families are described in detail elsewhere (Borduin & Henggeler, 1990; Henggeler & Borduin, 1990).

The provision of MST is consistent with family preservation models of service delivery (Nelson, 1991). To promote cooperation and enhance generalization, we usually held sessions in the family's home at a convenient time and in community locations (e.g., school, recreation center). In addition, services were time limited, with an overriding goal of empowering parents with the skills and resources needed to independently address the inevitable difficulties that arise in raising adolescents.

Individual Therapy

The therapy provided in this condition was selected to represent the usual community treatment for juvenile offenders in our judicial district, and perhaps in many other judicial districts as well (see Henggeler, 1989). All of the offenders in this condition received individual therapy that focused on personal, family, and academic issues. The therapists offered support, feedback, and encouragement for behavior change. Their theoretical orientations were an eclectic blend of psychodynamic (e.g., promoting insight and expression of feelings), client-centered (e.g., building a close relationship, providing empathy and warmth), and behavioral (e.g., providing social approval for school attendance and other positive behaviors) approaches. Although there were some variations in the treatment strategies used by the therapists (e.g., some therapists provided less empathy or were more directive than other therapists), the common thread of their approaches was that the interventions focused on the individual adolescent rather than on the systems in which the adolescent was embedded.

Therapists

MST was provided by three female and three male graduate students (ages ranged from 23 to 31 years; $M = 26$) in clinical psychology. One of the therapists was Native American, and the others were White. Each had approximately 1.5 years of direct clinical experience with children or adolescents before the study. The six therapists served in the study for an average of 16 months (range, 12 to 24 months). Therapist supervision was provided by Charles M. Borduin in a 3-hr 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 or audiotaped therapy sessions, and made decisions about how best to facilitate the family's progress.

Interventions in the IT group were provided by three female and three male therapists (ages ranged from 25 to 33 years; $M = 28$) at local mental health outpatient agencies, including the treatment services branch

of the juvenile court. One of the therapists was African American, and the others were White. 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 adolescents. The six therapists voluntarily served in the study for an average of 17 months (range, 11 to 28 months). These therapists attended 2.5-hr weekly case reviews with the treatment coordinator from the juvenile court to discuss the goals and progress of each case.

Treatment Integrity

To sustain the integrity of MST, therapists documented each therapeutic contact by summarizing what transpired and how much progress had been made in meeting the goals of treatment; ongoing clinical supervision and feedback were provided throughout the investigation. To monitor the integrity of IT, therapists were required to provide monthly reports summarizing the nature of therapeutic contacts, who was present at the contacts, and adolescent progress in meeting the goals of treatment; and the project director (Charles M. Borduin) met periodically with the therapists to review selected videotapes of sessions and to ensure that the therapists adhered to their stated treatment plans. Adherence to these treatment plans was also promoted by the juvenile court treatment coordinator, who met weekly with the therapists in the IT condition.

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) and the general issues addressed in each identified system. These checklists revealed that, among the MST completers ($n = 77$), none of the cases had received interventions in only one system, 26 (33.8%) had received interventions in two different systems (most often family and school), and 51 (66.2%) had received interventions in three (most often family, school, and peer) or more systems. In contrast, among the IT completers ($n = 63$), 57 (90.5%) of the cases had received direct interventions in only one system (always the individual adolescent), and the other 6 cases (9.5%) had received interventions in two systems (always the adolescent and the family). The checklists revealed a virtually identical pattern of interventions for the cases that had dropped out of each treatment condition. Notwithstanding the limitations of using therapist reports to assess treatment integrity, the pattern of interventions reported by therapists in each condition suggests that each treatment was at least aimed at the intended systems.

Research Procedures

All families who were referred to the project were initially contacted by phone or a home visit. Families were informed that 1.5-hr research assessments would be conducted shortly before treatment began and shortly after treatment had ended. It was emphasized that the family's participation in the research was voluntary and that refusal to participate (or exercising the right to discontinue participation at any time) would not jeopardize the receipt of treatment services or result in any sanctions from the court. The adolescents remained under the jurisdiction of the court regardless of their families' decisions about participating in the research assessments or in treatment.

Research assistants received approximately 20 hr of training before their first family contact to standardize the assessment procedures and to recognize and attenuate circumstances (e.g., fatigue, reading problems) that threatened the validity of the assessments. The pretreatment assessment session was scheduled at the family's convenience either in their home or in a youth center in their neighborhood; the vast majority (91%) of the families in the MST and IT groups completed the

assessment in their homes. At the outset of the session, a research assistant explained the general procedure and purpose of the assessment and obtained written consent or assent from the family members. During each assessment, a series of self-report instruments and behavior rating inventories were administered in a random order to the parent (or parents) and adolescent. In addition, the parent (or parents) and adolescent were videorecorded as they discussed and jointly completed an unrevealed differences task. The posttreatment assessment was conducted at the same location and with the same measures as the pretreatment assessment within 1 week of the completion of treatment. Follow-up assessments using police and court records of adolescent criminal activity were conducted approximately 4 years after treatment had been completed.

One of the adolescent's teachers also completed a paper-and-pencil instrument before and after treatment. The teacher was randomly selected from a list of the adolescent's current teachers. The teacher was told that the adolescent was a participant in a study of adolescent socialization.

Outcome Measures

A multiagent, multimethod assessment battery was used to obtain outcome measures related to the instrumental and ultimate goals (Rosen & Proctor, 1981) of MST. Instrumental goals, which are theory driven, included improved individual adjustment of the adolescent and parent (or parents), improved family relations, and improved relations between the adolescent and his or her peers. Ultimate goals, which are common to all treatments of juvenile offenders, included decreases in the rate and seriousness of adolescent criminal activity.

Individual Adjustment

Psychiatric symptomatology. Symptomatology in mothers, fathers (when present), and adolescents was assessed through self-reports on the Symptom Checklist—90—Revised (SCL-90-R; Derogatis, 1983). The Global Severity Index, which represents the best single indicator of the respondent's psychiatric functioning, was used to provide an overall symptom score for each family member.

Adolescent behavior problems. Behavior problems in adolescents were assessed through mothers' reports (total score) on the 89-item Revised Behavior Problem Checklist (RBPC; Quay & Peterson, 1987). The measure discriminates between violent and nonviolent delinquents (Blaske, Borduin, Henggeler, & Mann, 1989) and predicts serious offense history in delinquents (Hanson et al., 1984).

Family Relations

Perceived family functioning. Parental and adolescent perceptions of family relations were evaluated with the 30-item Family Adaptability and Cohesion Evaluation Scales—II (FACES-II; Olson, Portner, & Bell, 1982), which assesses the constructs of *cohesion* and *adaptability*. Following the recommendations of Henggeler, Burr-Harris, Borduin, and McCallum (1991), we treated adaptability and cohesion as linear scales in subsequent statistical analyses. Family composite ratings of adaptability and cohesion were created by averaging together the scores of the individual family members on each scale.

Observed family interactions. Observational measures were based on the family members' videorecorded discussion on the nine-item Unrevealed Differences Questionnaire—Revised using procedures described in previous publications (Blaske et al., 1989; Mann, Borduin, Henggeler, & Blaske, 1990). Three reliable dimensions of family interaction derived from factor analysis were assessed. *Supportiveness* represents the observed encouragement and respect between members of a family dyad. *Verbal activity* reflects the amount of verbal activity between members of a dyad. *Conflict-hostility* reflects emotional nega-

tivity resulting from a clash of opposing interests and ideas within a dyad. For subsequent analyses, composite (factor) scores were derived from the variables constituting each factor.

Peer Relations

Maternal and teacher perceptions of the adolescent's peer relations were evaluated with the 13-item Missouri Peer Relations Inventory (MPRI; Borduin, Blaske, Cone, Mann, & Hazelrigg, 1989). The MPRI measures three factor analytically derived dimensions of peer relations: *emotional bonding*, *aggression*, and *social maturity*; the construct validity of these dimensions has been supported in studies of serious juvenile offenders (e.g., Blaske et al., 1989; Henggeler et al., 1992). For subsequent analyses, factor scores were derived from the mothers' and teachers' ratings on each dimension of peer relations and were averaged across the two groups of respondents (the mean *r* between mothers' and teachers' ratings was .39).

Criminal Activity

Juvenile court, local police, and Department of Public Safety (state police) records, collected an average of 3.95 years ($SD = 1.03$; range, 2.04 to 5.41) from the time of the adolescent's release from juvenile court supervision (i.e., probation), were used to obtain data on post-probation arrests. Arrest data for each offender were anchored by the point of release from probation (i.e., within 2 weeks of treatment termination for 96% of completers and an average of 6 months from the time of referral for dropouts and refusers) to provide a distinct beginning for the follow-up period for treatment completers, dropouts, and refusers. Adolescents with longer follow-up time periods were among the earlier participants in the project, whereas youths with shorter follow-ups were generally among the later referrals to the project.

Although we were able to track 189 (94.5%) of the adolescents to the end of the follow-up period, 11 adolescents were lost to follow-up after 2 to 3 years of tracking. Given that we had obtained follow-up data on each of the 11 adolescents (6 recidivists, 5 nonrecidivists) for approximately 2.5 years, we decided not to drop these adolescents from our follow-up sample.

Results

Preliminary Analyses

Pretreatment Comparability of Treatment Groups

Analyses were completed to examine whether participants assigned to MST ($n = 92$) and those assigned to IT ($n = 84$) differed at pretreatment on criminal history and demographic characteristics as well as on measures of individual adjustment, family relations, and peer relations. (These analyses collapsed across the treatment completers and dropouts in each condition.) ANOVAs and chi-square tests revealed no significant differences between participants in the two treatment conditions.

Attrition

ANOVAs were used to examine whether the MST completers ($n = 77$), MST dropouts ($n = 15$), IT completers ($n = 63$), IT dropouts ($n = 21$), and treatment refusers ($n = 24$) differed on any of the pretreatment assessment measures of individual adjustment, family relations, or peer relations (as noted previously, these groups did not differ in their criminal histories or

demographic characteristics). Across a large number of tests, no differences emerged.

Treatment Outcomes

Instrumental Outcomes

Repeated measures multivariate analyses of variance (MANOVAs) and ANOVAs were used to evaluate whether significant changes pre- to postassessment were experienced by the 70 MST youths and families or 56 IT youths and families who completed pretreatment and posttreatment assessments. Table 1 presents the means and standard deviations for the measures of instrumental outcomes (i.e., individual adjustment, family relations, peer relations) at pre- and posttreatment assessments. Significant MANOVAs for the effect of time were found on the measures of observed mother-adolescent relations, $F(3, 123) = 4.84, p < .003$; observed father-adolescent relations, $F(3, 62) = 7.08, p < .001$; and observed mother-father relations, $F(3, 60) = 7.84, p < .001$. MANOVAs for the interaction between treatment group and time were significant for the FACES-II, $F(2, 124) = 3.04, p < .05$; observed mother-adolescent relations, $F(3, 123) = 4.99, p < .003$; observed father-adolescent relations, $F(3, 62) = 3.42, p < .023$; and observed mother-father relations, $F(3, 60) = 2.98, p < .038$. The results of the ANOVAs for the effect of time and for the Treatment Group \times Time interaction are shown in Table 1. The following discussion addresses the results of the ANOVAs that showed a significant interaction effect, with within-group t tests used to evaluate change over time for each group.

Individual adjustment. As shown in Table 1, significant interaction effects were found for mothers' and fathers' reports of psychiatric symptomatology (*SCL-90-R*); mothers and fathers in the MST group showed decreases in their symptoms from pre- to posttreatment, whereas their counterparts in the IT group showed either an increase (mothers) or no change (fathers) in their symptoms. In addition, a significant interaction effect emerged for mothers' reports of adolescent behavior problems; mothers in the MST group reported a decrease in adolescent behavior problems from pre- to posttreatment, whereas mothers of youths receiving IT reported an increase in behavior problems.

Family relations. Significant interaction effects were observed for both measures of perceived family functioning (FACES-II). Families receiving MST reported increases in family cohesion and adaptability at posttreatment, whereas reported family cohesion and adaptability decreased in the IT condition.

On the observational measures, the analyses generally indicated that families in the MST group evidenced many more positive changes in their dyadic interactions than did families in the IT group. Specifically, in the MST group, mother-adolescent dyads, father-adolescent dyads, and mother-father dyads showed increased supportiveness and decreased conflict-hostility from pre- to posttreatment. In contrast, dyadic relations for families in the IT group either deteriorated (decrease in mother-adolescent supportiveness, increase in father-adolescent conflict-hostility) or showed no change (on measures of supportiveness and conflict-hostility).

Peer relations. The composite measures of adolescent peer relations (MPRI) did not show any significant interaction effects.

Ultimate Outcomes

Measures of ultimate outcome were based on arrest data that were collected during follow-up.

Survival functions. Survival analysis (based on the LIFE-TEST procedure; SAS Institute, 1991) was used to obtain the cumulative survival functions (or survival curves) for participants who were randomly assigned to the MST ($n = 92$) or IT ($n = 84$) groups, whose average follow-up periods were 1447.4 days and 1425.2 days, respectively. This analysis collapsed across treatment completers and dropouts in each group to provide a conservative test of treatment effects. The cumulative survival function represents the proportion of participants surviving arrest (i.e., not arrested) in each group by the length of time (in days) from release from probation. A log-rank test revealed that the survival functions for the two groups were significantly different, $\chi^2(1, N = 176) = 46.39, p < .0001$. As depicted in Figure 1, youths in the MST group were at lower risk of arrest (i.e., more likely to "survive") during follow-up than were youths in the IT group. By the end of 4 years (1,460 days), 71.4% of the youths in the IT group had been arrested at least once, compared with 26.1% of the youths in the MST group.

We conducted another survival analysis to compare MST completers and IT completers to each other, as well as to MST dropouts, IT dropouts, and treatment refusers. Thus, in this analysis, we included each of the adolescents ($N = 200$) who had participated in the pretreatment assessment. A log-rank test revealed that the overall set of differences between the survival functions for the five groups was highly significant, $\chi^2(4, N = 200) = 58.89, p < .0001$. Pairwise comparisons of the survival curves shown in Figure 2 revealed that the MST completers were at lower risk of arrest during follow-up than were IT completers, $\chi^2(1, N = 140) = 49.95, p < .0001$; MST dropouts, $\chi^2(1, N = 92) = 9.66, p < .002$; IT dropouts, $\chi^2(1, N = 98) = 40.98, p < .0001$; or treatment refusers, $\chi^2(1, N = 101) = 61.20, p < .0001$. MST dropouts also were at lower risk of arrest during follow-up than were treatment refusers, $\chi^2(1, N = 39) = 4.38, p < .04$; or IT dropouts, $\chi^2(1, N = 36) = 2.80, p < .09$, although the latter comparison only approached significance. IT completers were not significantly different from IT dropouts ($p = .34$), MST dropouts ($p = .15$), or refusers ($p = .28$).

At 4 years of follow-up, the overall recidivism rate for MST completers (22.1%) was less than one-third the overall rate for IT completers (71.4%), IT dropouts (71.4%), or treatment refusers (87.5%) and approximately one-half the overall rate for MST dropouts (46.6%).

Number and seriousness of arrests. Additional analyses examined the number of arrests and the seriousness (based on the 17-point seriousness scale noted previously) of those arrests among recidivists in the MST and IT groups (completers and dropouts were combined in each group). The first set of analyses revealed that recidivists in the MST group had been arrested less often ($M = 1.71, SD = 1.04$) during follow-up than their counterparts in the IT group ($M = 5.43, SD = 3.62$), $F(1, 82) = 10.36, p < .002$. In addition, a similar pattern emerged when

Table 1
Group Means, Standard Deviations, and *F* Values for Treatment Completers on Measures of Instrumental Outcomes

Measure	Multisystemic therapy completers (<i>n</i> = 70)		Individual therapy completers (<i>n</i> = 56)		Repeated ANOVA <i>F</i>	
	Pre	Post	Pre	Post	Time	Group × Time
Individual adjustment						
<i>SCL-90-R</i> (z scores)						
Mother						
<i>M</i>	0.12	-0.15 ^a	0.04	0.20 ^b	0.31	4.16 [*]
<i>SD</i>	1.02	0.97	1.17	1.26		
Father						
<i>M</i>	0.06	-0.07 ^a	0.06	0.19	0.05	4.44 [*]
<i>SD</i>	0.90	0.77	1.05	1.09		
Adolescent						
<i>M</i>	0.03	-0.15	-0.05	-0.07	6.02 [*]	0.36
<i>SD</i>	0.94	0.79	0.98	1.03		
RBPC (z scores)						
<i>M</i>	0.17	-0.54 ^a	-0.15	0.64 ^b	0.33	4.97 [*]
<i>SD</i>	0.74	0.81	0.80	0.85		
Family relations						
FACES-II (mean of mother, father, and adolescent z scores)						
Cohesion						
<i>M</i>	-0.11	0.14 ^b	0.11	-0.08 ^a	0.42	3.83 [*]
<i>SD</i>	0.86	0.88	0.82	0.74		
Adaptability						
<i>M</i>	-0.03	0.13 ^b	0.04	-0.16 ^a	0.58	5.49 [*]
<i>SD</i>	0.72	0.86	0.85	0.71		
Observational measures (factor scores): mother-adolescent						
Supportiveness						
<i>M</i>	-0.09	0.23 ^b	0.10	-0.14 ^a	1.78	6.42 ^{**}
<i>SD</i>	1.01	0.90	0.99	0.93		
Verbal activity						
<i>M</i>	-0.05	-0.16	0.05	0.26	2.65	3.07
<i>SD</i>	1.03	1.05	0.97	0.94		
Conflict-hostility						
<i>M</i>	0.09	-0.54 ^a	-0.11	-0.22	14.13 ^{***}	5.30 [*]
<i>SD</i>	1.01	0.76	0.98	0.85		
Observational measures (factor scores): father-adolescent						
Supportiveness						
<i>M</i>	0.06	1.06 ^b	-0.07	0.23	19.91 ^{***}	9.18 ^{**}
<i>SD</i>	1.03	1.27	0.97	0.90		
Verbal activity						
<i>M</i>	0.10	0.70	-0.12	0.26	13.01 ^{***}	1.31
<i>SD</i>	1.07	1.04	0.90	0.94		
Conflict-hostility						
<i>M</i>	0.15	-0.63 ^a	-0.18	0.27 ^b	0.68	6.66 ^{**}
<i>SD</i>	0.93	0.82	1.06	0.79		
Observational measures (factor scores): Mother-father						
Supportiveness						
<i>M</i>	-0.01	0.79 ^b	-0.09	0.31	17.49 ^{***}	6.33 ^{**}
<i>SD</i>	1.00	1.03	1.06	0.82		
Verbal activity						
<i>M</i>	0.12	0.10	-0.15	-0.22	0.85	1.65
<i>SD</i>	0.94	0.86	1.07	1.03		
Conflict-hostility						
<i>M</i>	0.27	-0.54 ^a	-0.04	-0.03	2.24	4.34 [*]
<i>SD</i>	0.96	0.57	1.11	1.03		

(table continues)

Table 1 (continued)

Measure	Multisystemic therapy completers (n = 70)		Individual therapy completers (n = 56)		Repeated ANOVA F	
	Pre	Post	Pre	Post	Time	Group × Time
Peer relations						
MPRI (mean of mother and teacher factor scores)						
Peer bonding						
M	0.24	0.34	0.41	0.44	0.34	0.76
SD	1.52	1.07	1.24	1.13		
Peer aggression						
M	-0.15	-0.11	0.10	0.32	0.08	1.56
SD	2.02	1.88	1.74	1.65		
Peer maturity						
M	0.04	0.17	-0.07	0.24	0.92	0.14
SD	1.87	1.81	2.19	1.88		

Note. The univariate *dfs* for each measure are as follows: mother *SCL-90-R* and observed mother-adolescent relations (1, 123); father *SCL-90-R* and observed father-adolescent relations (1, 64); adolescent *SCL-90-R*, RBPC, *FACES-II*, and MPRI (1, 125); observed mother-father relations (1, 62). *SCL-90-R* = *Symptom Checklist-90-Revised*; RBPC = Revised Behavior Problem Checklist; *FACES-II* = Family Adaptability and Cohesion Evaluation Scales-II; MPRI = Missouri Peer Relations Inventory.

* Significant decrease from pretreatment to posttreatment. * Significant increase from pretreatment to posttreatment.

* $p < .05$. ** $p < .01$. *** $p < .001$.

the comparison included treatment completers only; recidivists who had completed MST had fewer arrests ($M = 1.57$, $SD = 0.85$) during follow-up than did recidivists who had completed IT ($M = 4.41$, $SD = 3.89$), $F(1, 60) = 10.42$, $p < .002$. Other between-groups comparisons (e.g., treatment completers vs. dropouts, dropouts vs. refusers) of recidivists revealed no significant differences on number of arrests.

The second set of analyses indicated that recidivists in the MST group had been arrested for less serious crimes ($M = 5.17$, $SD = 5.01$) during follow-up than their counterparts in the IT group ($M = 9.40$, $SD = 3.37$), $F(1, 82) = 20.10$, $p < .0001$. Similarly, when completers only were compared, the analysis showed that recidivists who had completed MST had been arrested for less serious offenses ($M = 6.35$, $SD = 4.67$) than

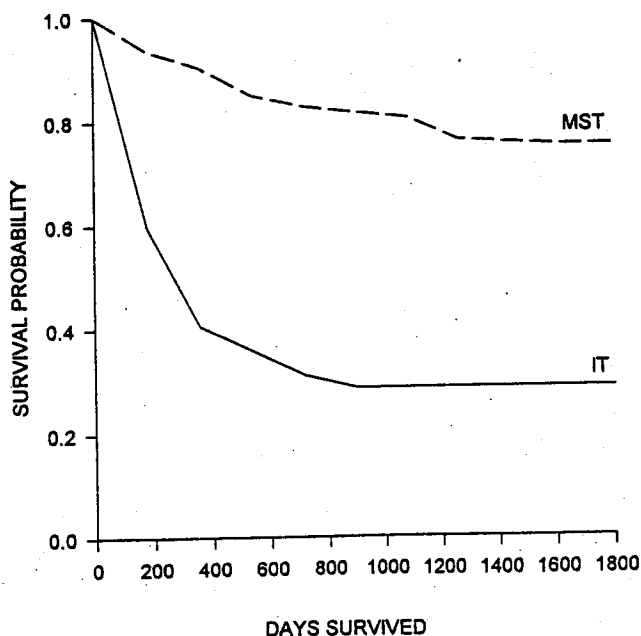


Figure 1. Survival functions for multisystemic therapy (MST) and individual therapy (IT) groups. Completers and dropouts are combined in each group.

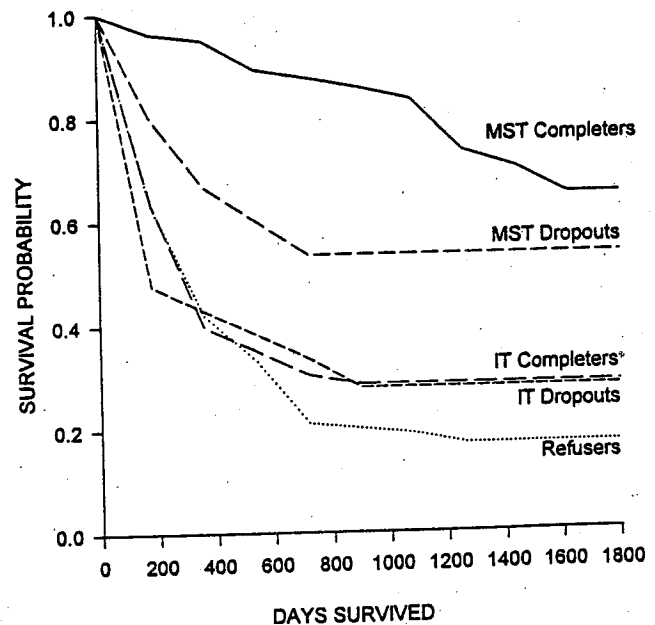


Figure 2. Survival functions for multisystemic therapy (MST) completers, MST dropouts, individual therapy (IT) completers, IT dropouts, and treatment refusers.

civilians who completed IT ($M = 9.67$, $SD = 3.38$), $F(1, 60) = 12.80$, $p < .001$. Thus, MST was more effective than IT in reducing the number and seriousness of crimes among those youths who were arrested.

Arrests for violent crimes. In light of our considerable interest in preventing violent offending in this high-risk sample, a hierarchical multiple regression analysis was used to evaluate the effect of treatment on violent offending. The number of arrests for violent crimes (i.e., rape, attempted rape, sexual assault, aggravated assault, assault and battery) during follow-up served as the dependent variable, and the independent variables, in order of entry, were (a) the number of arrests for violent crimes before treatment and (b) treatment group (coded as a dummy variable, MST or IT, that collapsed across treatment completers and dropouts in each group). This regression analysis revealed that, even after the effect of pretreatment arrests for violent crimes was controlled, treatment group was a highly significant predictor of arrests for violent crimes during follow-up, $F(2, 173) = 11.74$, $p < .0008$. Youths who participated in MST were less likely to be arrested for violent crimes following treatment than were youths who participated in IT. When this analysis was repeated using treatment completers only, treatment group was again a significant predictor, $F(2, 137) = 8.66$, $p < .003$, with MST completers having a lower likelihood of violent offending during follow-up than IT completers.

Factors associated with ultimate outcome. Hierarchical multiple regression analyses were used to evaluate the effects of potential moderators (age, race, social class, gender, pretreatment arrests) of MST effectiveness. The dependent variable was the number of posttreatment arrests. For each regression, a dummy variable representing treatment group (collapsing across treatment completers and dropouts in each group) was the first variable entered, the moderating variable was entered second, and the cross-product term of the treatment group and the moderating variable was entered last. The significance of change in R^2 for the cross-product term indicated whether MST was differentially effective with youths and families from different backgrounds. In no case did the cross-product term contribute a significant portion of additional variance. Thus, for example, MST was equally effective with youths of different gender and ethnic backgrounds. A similar pattern emerged when these analyses were repeated using treatment completers only.

Discussion

The findings clearly demonstrate the impact of MST on key family correlates of antisocial behavior and on individual adjustment in family members. At posttest, MST had highly favorable effects on perceived family relations (increased cohesion and adaptability) and observed family interactions (increased supportiveness and decreased conflict-hostility across family dyads). Moreover, MST resulted in decreased symptomatology in parents (based on self-reports) and decreased behavior problems in the youths (based on parental reports). Most importantly, however, MST produced long-standing change in youths' criminal behaviors. Youths treated with MST were significantly less likely than comparison counterparts to be rearrested within 4 years after treatment termina-

tion, and, when rearrested, had committed significantly less serious offenses. In addition, the relative efficacy of MST (as reflected in the number of posttreatment arrests) was not moderated by measured demographic characteristics (i.e., race, gender, age, social class, pretreatment arrests), suggesting that MST was not differentially effective with youths and families of divergent backgrounds.

During follow-up, youths who dropped out of MST were at higher risk of arrest than were MST completers (who averaged almost 20 more hours in treatment) but were at lower risk of arrest than were IT dropouts (who received about the same amount of treatment as MST dropouts) or treatment refusers. It is possible that a short dose (i.e., approximately 4 hr) of involvement in MST may help to reduce the risk of later criminal activity for some juvenile offenders. Such a suggestion is consistent with other research indicating that 48% to 58% of psychotherapy patients show measurable improvement in four to seven sessions, regardless of the ultimate duration of treatment (Howard, Kopta, Krause, & Orlinsky, 1986). Caution must be expressed about this suggestion, however, because it does not explain why MST dropouts were at lower risk of arrest than were IT dropouts. Perhaps some of the youths and families in the MST group decided to drop out of treatment because they had obtained needed skills or resources, although the therapist believed otherwise. Certain features of MST may have also contributed to the relatively lower risk of rearrest among MST dropouts. Indeed, in contrast to individual therapy, MST focuses on youths' social systems throughout treatment and intervenes directly in those systems. Moreover, from the outset of treatment, MST attempts to empower family members and, within a context of support and skill building, emphasizes the need for behavior change across key systems linked with antisocial behavior. Measurement of a broader range of factors (e.g., family expectations of treatment, therapist-family relationship) may enhance our understanding of outcomes among MST dropouts.

The effectiveness of MST in reducing criminal activity in high-risk youths has important implications regarding the design of violence prevention programs for such youths. If, as suggested earlier, a major shortcoming of most interventions for preventing and treating delinquency has been their neglect of the multiple determinants of antisocial behavior, then the success of MST may be linked with its comprehensive nature; that is, the results of MST may be due to its explicit focus on ameliorating key social-ecological factors associated with delinquency, including behavior problems, parental disturbance, problematic family relations, association with deviant peers, and poor school performance. This proposition is supported, in part, by instrumental outcomes demonstrating significant effects on youth behavior problems, parental symptomatology, and family relations.

On the other hand, favorable changes in adolescents' peer relations were not observed, which was unexpected in light of the central role of peer relations in causal models of delinquency, the clear intent of MST to decrease youths' association with antisocial peers, and earlier findings regarding the capacity of MST to improve peer relations (Henggeler et al., 1986, 1992). Perhaps, in the present study, criminal behavior was influenced primarily by strengthening the family so that the deleterious effects of association with deviant peers were buffered. Alternatively, relevant peer relations constructs may not have been

tapped adequately because of the dearth of well-validated measures in the literature. At any rate, the effect of MST on peer relations of juvenile offenders should be clarified by several clinical trials that are currently in progress. Similarly, current clinical trials are also examining whether improved school performance is associated with favorable long-term outcome as posited by the MST model. Taken together, findings from these studies should elucidate the linkages between changes in juvenile offenders' extrafamilial systems and changes in their antisocial behavior after MST.

A second implication of the present findings for the design of violence prevention programs pertains to the accessibility and ecological validity of services. Traditionally, as Melton and Pagliocca (1992) emphasized, mental health services for juvenile offenders either have been inaccessible (i.e., office based) or have provided interventions that have little bearing on the natural ecology of youths (e.g., residential treatment centers, incarceration). In contrast, by using the family preservation model of service delivery, MST was provided in natural community contexts (e.g., home, school, recreation center). The delivery of services in the natural ecology of youths has several advantages including the promotion of family cooperation and the acquisition of more accurate data regarding the assessment of identified problems and the results of treatment interventions (Henggeler & Borduin, 1990). Indeed, two independent American Psychological Association (APA) Task Force reports have emphasized the importance of providing children's mental health services that both recognize the natural ecology of the child and diminish barriers to access (Henggeler, 1994; Roberts, 1994).

As described earlier, we are contending that the favorable results of this study were largely due to two crucial aspects of MST: its comprehensive nature and ecologically valid delivery. However, it must be noted that the design of this study confounds the examination of this issue, as the comparison treatment (i.e., office-based individual therapy) was neither comprehensive nor delivered in adolescents' natural ecologies. A study, for example, that compared the effects of MST with the effects of a less comprehensive home-based treatment (e.g., Homebuilders; Kinney, Haapala, & Booth, 1991) would address the issue of whether both comprehensiveness and ecological validity are necessary conditions of success. Moreover, therapist motivation and commitment may have been confounded in this study. Indeed, as described elsewhere (Henggeler & Borduin, 1990), therapist characteristics such as motivation, social facility, intelligence, and flexibility are viewed as crucial to successful outcome in MST. Nevertheless, one can safely assume that these characteristics are not sufficient for favorable outcome with delinquents, as many previous studies that did not obtain favorable long-term results must have had motivated and competent therapists. Thus, although the design of this study did not permit a determination of the critical conditions of positive therapeutic outcome, we suggest that successful interventions for serious antisocial behavior in youths must be comprehensive, ecologically valid, and delivered with skill and persistence.

In conclusion, the results of this study indicate that a comprehensive intervention, addressing the multiple determinants of antisocial behavior in youths' naturally occurring systems, can successfully reduce criminal activity and violent offending

in serious juvenile offenders. When considered along with other findings regarding MST, conclusions from recent APA Task Force reports, and federal (Center for Mental Health Services, RFA No. SM 94-01) and foundation (e.g., England & Cole, 1992) initiatives to reform mental health services for youths, the present findings have clear implications. The restrictive, narrowly focused, and family-blaming practices that have dominated children's mental health services have not been effective. For the optimization of positive outcomes in the treatment and prevention of serious clinical problems, current practices must be changed to emphasize child-centered, family-focused, comprehensive, flexible, and ecologically valid services.

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