

Multisystemic Therapy: Clinical Foundations and Research Outcomes*

Terapia Multisistémica: Fundamentos Clínicos y Resultados de Investigación

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Abstract. Multisystemic therapy (MST) is an intensive family and community-based treatment for adolescents presenting serious antisocial behavior and their families. Using a home-based model of service delivery to overcome barriers to service access and a strong quality assurance system to promote treatment fidelity, MST therapists address known risk factors (i.e., at individual, family, peer, school, and community levels) strategically and comprehensively. The family is viewed as central to achieving favorable outcomes, and mediation research supports the emphasis of MST on promoting family functioning as the key mechanism of clinical change. Importantly, 22 MST outcome studies have been published, many of which are independent randomized clinical trials, and the vast majority, including those conducted in Europe, support the capacity of MST to reduce youth antisocial behavior and out-of-home placements. Such outcomes, combined with the advocacy of many juvenile justice stakeholders, have led to the transport of MST programs to more than 500 sites, including 10 nations in Europe.

Keywords: behavior problems, intervention, multisystemic-therapy, outcomes, randomized clinical-trial, serious juvenile offenders.

Resumen. La terapia multisistémica (TMS) es un tratamiento intensivo en el ámbito familiar y comunitario dirigido a adolescentes con comportamientos antisociales graves y a sus familias. Mediante un modelo de atención en el hogar para romper las barreras de acceso al servicio y un sistema de garantías sólido y de calidad para promover la fidelidad al tratamiento, los terapeutas de TMS abordan factores de riesgo conocidos (es decir, a nivel individual, familiar, de iguales y de la comunidad) de forma estratégica y exhaustiva. Se considera a la familia como un elemento fundamental para la obtención de resultados favorables y la investigación sobre variables mediadoras, apoya el énfasis que el TMS pone en promover el funcionamiento familiar como mecanismo clave para el cambio clínico. Es importante señalar que la mayor parte de los 22 estudios de resultados publicados, muchos de ellos ensayos clínicos aleatorios independientes y algunos realizados en Europa, confirman la capacidad de la TMS para reducir la conducta juvenil antisocial y el número de reubicación de menores fuera del hogar familiar. Dichos resultados, junto al apoyo de muchas de las partes implicadas en los procesos judiciales con menores, han propiciado la implementación de programas de TMS en más de 500 lugares, incluyendo 10 naciones europeas.

Palabras clave: ensayo clínico aleatorio, intervención, problemas de conducta, resultados, terapia multisistémica.

The primary purposes of this article are to provide overviews of the clinical foundations of multisystemic therapy (MST) and research regarding MST effectiveness and transport to community settings. MST was developed more than 30 years ago as a community-based treatment of adolescents with serious antisocial behavior and their families. The subsequent validation of MST has been supported by an extensive body of

research (e.g., 22 published outcome studies including 20 randomized trials), and MST programs have been transported to more than 500 sites worldwide. These sites, many of which are in Europe (i.e., Belgium, Denmark, England, Iceland, Northern Ireland, Netherlands, Norway, Scotland, Sweden, and Switzerland), provide intensive treatment services to more than 20,000 youths with serious antisocial behavior and their families annually. The specific locations of MST sites can be viewed at <mstservices.com>. The following overview draws substantively from Henggeler (2011), a recent review of MST research, and Henggeler, Schoenwald, Borduin, Rowland, and Cunningham (2009), which is the most recent and comprehensive description of MST clinical procedures.

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The MST Clinical Model

Extensive descriptions of MST treatment procedures are provided in clinical texts (e.g., Henggeler, Schoenwald et al., 2009; Henggeler, Schoenwald, Rowland, & Cunningham, 2002). This overview focuses on central aspects of the model that are viewed as essential to achieving desired clinical outcomes for youth and their families.

Views Family is Key to Effective Behavior Change

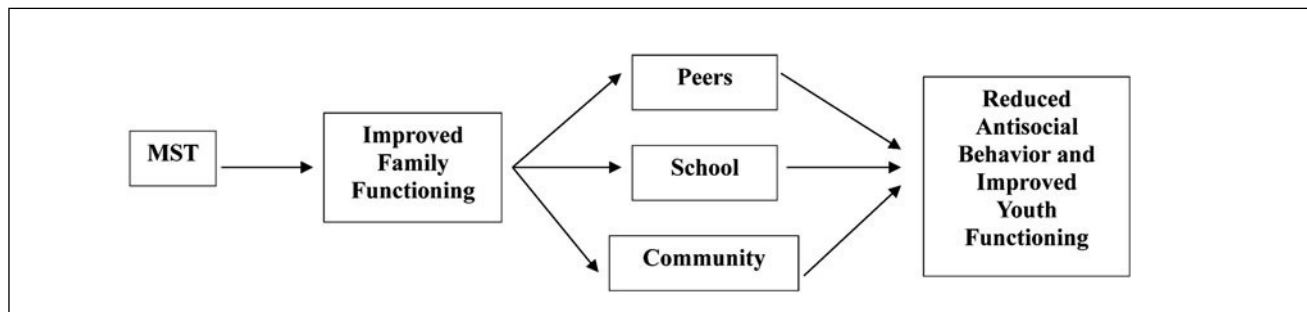
As described recently by Tuerk, McCart, and Henggeler (2012), families mandated to MST typically come from clinical populations historically labeled as “resistant” to interventions (e.g., juvenile offenders, substance abusing youth, juvenile sexual offenders). Indeed, many of the families referred to MST have experienced multiple failures in attempting to address the serious clinical problems presented by various family members. Against this backdrop, MST therapists strive to create strong collaborative relationships with their clients. It is assumed that treatment will not progress until the therapist and key family members (i.e., the youth’s caregivers or other adults who have decision-making authority) are engaged and ready to work on important therapeutic tasks, such as defining problems, setting goals, and implementing interventions to meet those goals. To facilitate this process, therapists utilize several core clinical strategies to enhance collaboration with families. These strategies are culled from various theoretical orientations and help create a climate of engagement while behavioral and systemic interventions are being implemented. The most common engagement strategies include identifying strengths across multiple systems, reflective listening, empathy, engendering hope, reframing, providing authenticity and flexibility, and positive communication.

An underlying assumption of MST, and hence the emphasis on family engagement, is that family-directed change across the youth’s social ecology is most likely to lead to sustainable outcomes such as those observed by Sawyer and Borduin (2011) for 22 years

post MST treatment. Therefore, consistent with the theory of social ecology (Bronfenbrenner, 1979) and longitudinal research on the determinants of antisocial behavior in youth (Lieberman, 2008), MST aims to decrease youth antisocial behavior by addressing those variables (i.e., risk factors) that are most strongly linked with problem behaviors (see MST theory of change depicted in Figure 1). Critically, however, the family is seen as the most important link in the treatment process. The MST therapist works to enhance the caregivers’ parenting skills (i.e., monitoring, supervision, affective relations) and then leverages these improvements in family functioning to facilitate key changes in the youth’s social network with the ultimate goal of surrounding the youth with a context that better supports prosocial behavior. Caregivers are often coached in how to disengage youth from antisocial peers and develop their relationships with more prosocial peers. Similarly, caregivers are often helped to develop collaborative relations with teachers and other community professionals (e.g., probation officers).

Importantly, the MST theory of change has been supported in mediational studies conducted in the U.S. and Europe. Mediation studies with serious juvenile offenders and substance abusing juvenile offenders (Huey, Henggeler, Brondino, & Pickrel, 2000) and with juvenile sexual offenders (Henggeler, Letourneau et al., 2009) have shown that MST (or therapist adherence to MST treatment principles) altered key family and peer risk factors for criminal behavior, and these changes in risk factors resulted in decreased adolescent antisocial behavior. Similarly, in the Netherlands, Dekovic, Asscher, Manders, Prins, and van der Laan (2012) observed a sequential pattern in which changes in parental sense of competence predicted changes in positive discipline, which, in turn, predicted decreases in adolescent externalizing problems. Qualitative research conducted in England has also supported the MST theory of change (Tighe, Pistrang, Casdagli, Baruch, & Butler, 2012) by delineating the impact of enhanced parenting skills and improved family relationships on youth outcomes. In addition, Tighe and colleagues observed two process of change in MST that had not been identified previously: the development of posi-

Figure 1. MST Theory of Change



ve goals and future aspirations by the youth, and concerns about the negative consequences of their behavior on the family. Together, these findings both support the centrality of family functioning in the MST theory of change and reflect the complexity of effective treatment of serious antisocial behavior in adolescents.

Uses Home-Based Model of Treatment Delivery

MST uses a home-based model of treatment delivery to further facilitate family engagement and remove barriers to service access. Key components of this approach include (a) provision of treatment at home, school, and other community locations; (b) appointments scheduled at the family's convenience, including evening and weekend hours; (c) 24-hour per day, 7-day per week availability of therapists to address crises that might threaten treatment success; (d) caseloads of four to six families per therapist to enable the provision of intensive services titrated to family need; and (e) the inclusion of two to four full-time therapists in each MST team to provide increased continuity of treatment (e.g., therapists can rotate an on-call schedule during evening, weekend, and holiday hours).

The home-based model of service delivery has been extremely effective at reducing the high rates of treatment dropout historically observed in the treatment of children and their families (Kazdin, 1996). For example, MST treatment completion rates have been greater than 95% in clinical trials with substance abusing juvenile offenders (Henggeler, Pickrel, Brondino, & Crouch, 1996) and youth presenting psychiatric emergencies (Henggeler, Rowland et al., 1999). Moreover, in 2010 the treatment completion rate was 84% among MST programs worldwide <www.mstinstitute.org>. Such evidence from clinical trials and the field attest to the power of the home-based model, especially when combined with the aforementioned MST clinical engagement strategies (Tuerk et al., 2012).

Integrates Evidence-Based Intervention Techniques

Many of the specific interventions delivered by MST therapists take advantage of the advances achieved by treatment developers and investigators in the broader fields of child, family, and adult psychotherapy (Weisz & Kazdin, 2010). In addition to the serious antisocial behavior presented by youth in MST programs, family members often present co-occurring problems that function as barriers to treatment success (e.g., caregiver mental health and substance abuse disorders), and therapists are trained to address any and all such barriers. Thus, therapists not only draw on structural (Minuchin, 1974), strategic (Haley, 1987),

and social learning (Munger, 1999; Robin & Foster, 1989) formulations to improve instrumental (i.e., supervision, discipline) and affective (i.e., warmth, conflict) aspects of family relations, but also integrate evidence-based interventions that are focused on broader social systems as well as individuals.

The primary MST clinical text (Henggeler, Schoenwald et al., 2009), for example, includes chapters on peer interventions, strategies for promoting educational and vocational success, and individually-oriented interventions. Peer interventions include strategies for decreasing association with deviant peers and increasing affiliation with prosocial peers as well as social skill training procedures for socially rejected or neglected youth. The chapter on promoting educational and vocational success provides suggestions for engaging teachers and other school personnel, designing interventions that fit the school context, and cultivating effective family-school collaboration. The chapter on individually-oriented interventions describes several types of cognitive-behavioral techniques that have proven effective in treating adult depression and anxiety (Leahy, 2003) as well as childhood anxieties and the symptoms of posttraumatic stress disorder (Cohen, Mannarino, & Deblinger, 2006; March & Mulle, 2008), and several evidence-based pharmacotherapies are described as well (Daley, Xanthopoulos, Stephan, Cooper, & Brown, 2007). All interventions, however, are fully integrated into the broader MST treatment model and quality improvement system (discussed subsequently). Thus, for example, caregivers are actively engaged in the delivery of a cognitive-behavioral intervention for their adolescent's depression, outcomes are monitored continuously, the broader systemic context of the intervention is articulated, barriers to intervention delivery are removed, and the quality of therapist's work is assessed weekly.

Clinical Decision Making Based on Treatment Principles and Structured Analytic Process

As outlined recently by Schaeffer, McCart, Henggeler, and Cunningham (2010) and detailed in the primary MST treatment manual (Henggeler, Schoenwald et al., 2009), MST is highly individualized and does not follow a rigid manualized plan for treatment. Instead, nine treatment principles provide the underlying structure and framework upon which therapists build their interventions (see Table 1). The second treatment principle, for example, emphasizes that all aspects of MST must be strength-based. Therapists communicate an optimistic perspective to the family and other members of the youth's ecology throughout the assessment and treatment process. Therapists look for potential strengths within the contexts of the child (e.g., hobbies and interests, academic skills), family (e.g., problem-solving ability, affective

Table 1. MST Treatment Principles

1. **Finding the Fit:** The primary purpose of assessment is to understand the “fit” between identified problems and their broader systemic context and how identified problems “make sense” in the context of the youth’s social ecology.
2. **Positive and Strength Focused:** Therapeutic contacts emphasize the positive and use systemic strengths as levers for positive change.
3. **Increasing Responsibility:** Interventions are designed to promote responsible behavior and decrease irresponsible behavior among family members.
4. **Present-Focused, Action-Oriented and Well-Defined:** Interventions are present-focused and action-oriented, targeting specific and well-defined problems.
5. **Targeting Sequences:** Interventions target sequences of behavior within and between multiple systems that maintain the identified problems.
6. **Developmentally Appropriate:** Interventions are developmentally appropriate and fit the developmental needs of the youth.
7. **Continuous Effort:** Interventions are designed to require daily or weekly effort by family members, presenting youth and family frequent opportunities to demonstrate their commitment.
8. **Evaluation and Accountability:** Intervention effectiveness is evaluated continuously from multiple perspectives with MST team members assuming accountability for overcoming barriers to successful outcomes.
9. **Generalization:** Interventions are designed to promote treatment generalization and long-term maintenance of therapeutic change by empowering caregivers to address family members’ needs across multiple systemic contexts.

bonds), peers (e.g., prosocial activities, achievement orientation), school (e.g., management practices, prosocial after-school activities), and the neighborhood/community (e.g., concerned and involved neighbors, voluntary associations such as Boys and Girls clubs). Identified strengths then are leveraged in interventions. For example, a neighbor or extended family member might be enlisted to assist with monitoring the youth after school until a caregiver gets home from work. Importantly, the nine treatment principles are applied using an analytical/decision-making process that structures the treatment plan, its implementation, and the evaluation of its effectiveness. Specific goals for treatment are set at individual, family, peer, and social network levels. Moreover, as noted previously, the adolescent’s caregivers are viewed as key to achieving desired outcomes and as crucial for the generalizability and sustainability of treatment gains.

Figure 2 depicts the MST analytic process that serves as a broad road map for treatment planning and intervention. Early in the treatment process, the problem behaviors to be targeted are specified clearly from the perspectives of key stakeholders (e.g., family members, teachers, juvenile justice authorities), and ecological strengths are identified. Then, based on multiple perspectives, the ecological factors that seem to be driving each problem are organized into a coherent conceptual framework (e.g., the youth’s marijuana use seems to be associated with a lack of caregiver monitoring, association with substance using peers, and poor school performance). Next, the MST therapist, with support from other team members (other therapists, supervisor, consultant), designs specific intervention strategies to target those “drivers.” Strategies incorporate interventions from empirically-supported treatments noted previously. Importantly, these interventions are highly integrated and are delivered in conjunction with interventions that address other pertinent ecological drivers of the identified problems (e.g., supporting caregivers in advocating for more appropriate

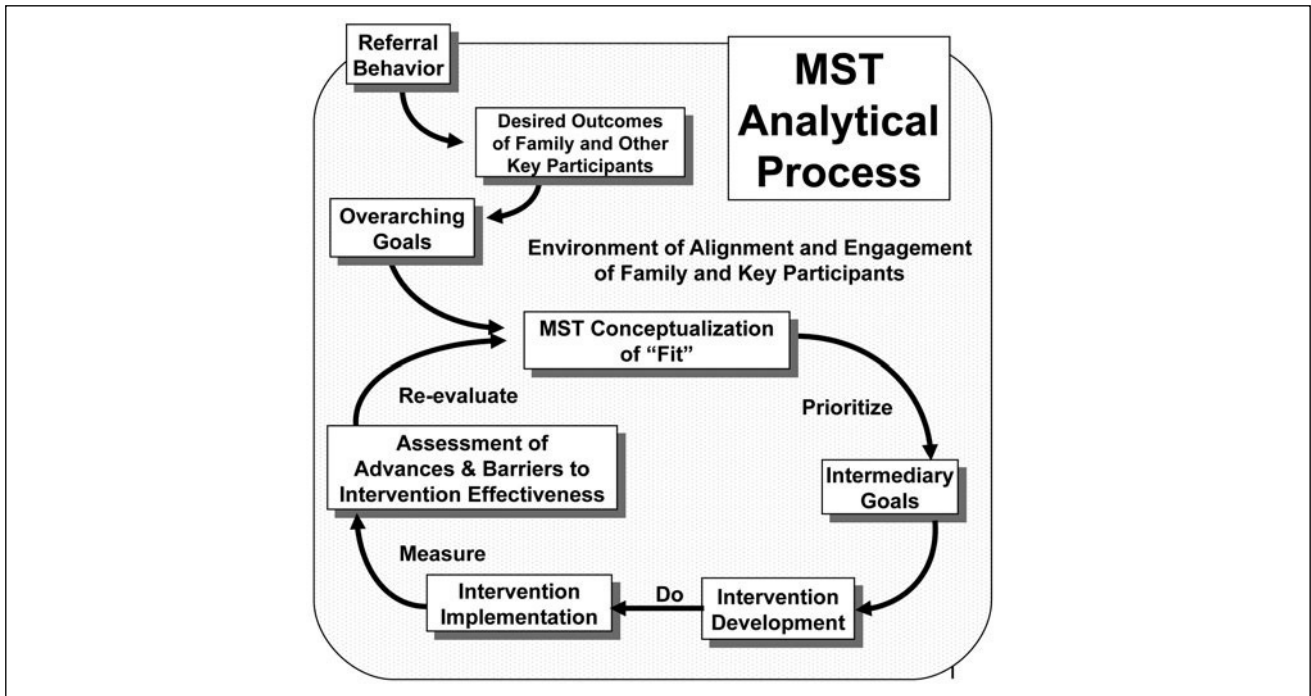
school services, connecting caregivers with the parents of the youth’s peers to support monitoring and supervision).

Intervention effectiveness is monitored continuously from multiple perspectives. When interventions are ineffective, identified drivers are reconceptualized, and modifications are made until an effective strategy is developed. This reiterative process reinforces two important features of the MST model. First, MST teams strive to never give up on youth and families, doing “whatever it takes” to help families reach treatment goals. Second, when interventions are not successful, the failure is the team’s rather than the family’s. In other words, when the team develops accurate hypotheses of the drivers, identifies barriers to implementation success, and delivers corresponding interventions appropriately, families tend to achieve their goals, and conduct problems among youth usually diminish.

Uses a Comprehensive Quality Assurance and Improvement System

The MST quality assurance and improvement system includes three broad interrelated components (i.e., training, organizational support, and implementation measurement and reporting) that are integrated into a feedback loop to support youth outcomes, therapist and supervisor fidelity to MST protocols, and the fidelity and sustainability of the MST program (Henggeler, Schoenwald et al., 2009). Training components include specification of treatment, supervisor, expert consultant, and program manuals; an initial 5-day orientation; quarterly booster training; weekly case supervision; weekly case consultation; and supervisor and consultant training. Organizational support for MST programs includes a program operations manual, extensive support for program development (e.g., needs assessment, site readiness review, staff recruitment and orientation training), ongoing imple-

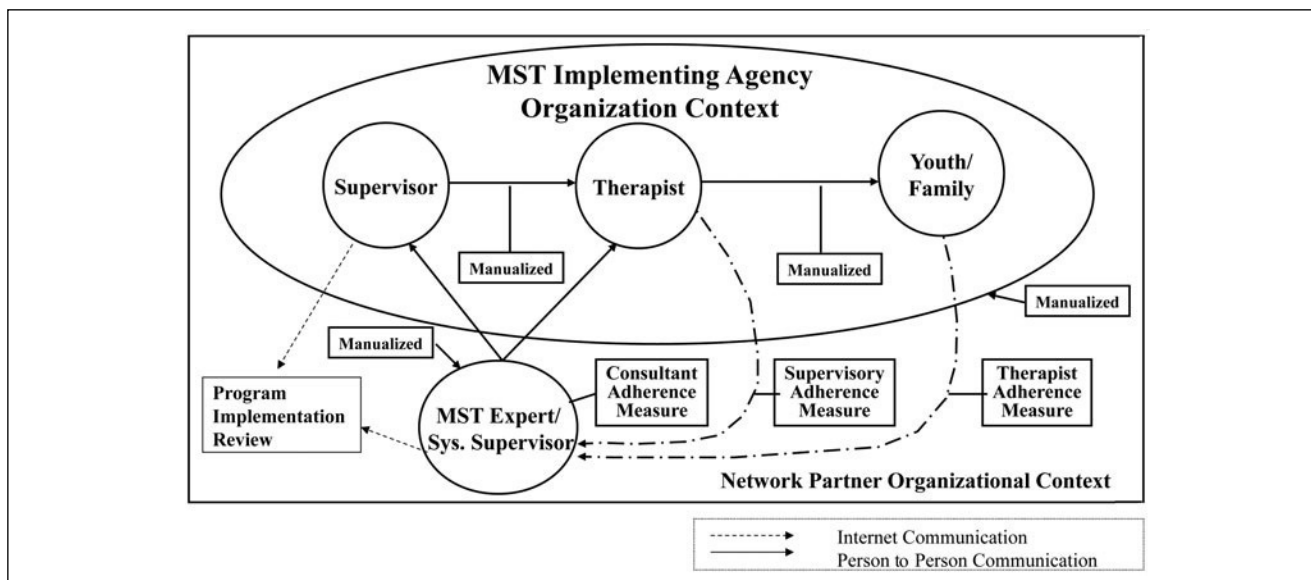
Figure 2.



mentation reviews (e.g., problem solving organizational and stakeholder barriers to implementation), and support for program and agency leadership. Implementation measurement and reporting is ongoing and includes validated measures of therapist, supervisor, and consultant adherence to respective protocols; and a web-based system to track critical aspects of performance, including youth outcomes. A pictorial representation of this quality assurance system is provided in Figure 3.

The validation of key components of the quality improvement system has been led by Schoenwald (e.g., Schoenwald, 2008, 2012), and the most critical aspect of this system is the link between therapist fidelity to MST treatment principles and youth outcomes. Therapist adherence to MST was first measured in a two-site effectiveness study with serious juvenile offenders in which a key aspect of the quality improvement system had been removed (Henggeler, Melton, Brondino, Scherer, & Hanley, 1997). In that

Figure 3. MST Quality Assurance/Improvement System



study, high therapist adherence predicted lower rates of arrests, incarceration, and youth symptoms. Examination of the associations between therapist adherence and youth outcomes in a subsequent trial with substance abusing juvenile offenders (Henggeler, Pickrel, & Brondino, 1999) produced less consistent results (Schoenwald, Henggeler, Brondino, & Rowland, 2000), but latent variable path analyses (Huey et al., 2000) replicated the associations reported for Henggeler et al. (1997). Therapist adherence improved family functioning, which decreased delinquent peer affiliation, which led, in turn, to decreased delinquent behavior. Therapist adherence was also associated with decreased rates of rearrest as well as increased social competence and resilience in a Swedish trial (Sundell et al., 2008). Findings from Schoenwald's transportability study that included almost 2,000 families also demonstrated significant associations between treatment fidelity and youth outcomes. Therapist adherence was associated with decreased externalizing and internalizing symptoms at post treatment (Schoenwald, Sheidow, Letourneau, & Liao, 2003) and decreased externalizing symptoms at 1-year follow-up (Schoenwald, Sheidow, & Chapman, 2009). Moreover, therapist adherence predicted decreased criminal charges at a 4-year follow-up (Schoenwald, Chapman, Sheidow, & Carter, 2009). Together, this body of work along with findings showing the roles that MST supervision (Schoenwald, Sheidow, & Chapman, 2009) and consultation (Schoenwald, Sheidow, & Letourneau, 2004) play in promoting therapist adherence, support the importance of focusing on treatment fidelity in promoting the effective transport of MST to community settings.

Thus, with the large-scale transport of MST programs nationally and internationally, the MST quality assurance and improvement system aims to assure that youth and families in MST programs in North America, Europe, and Australia receive the same high level of MST services. To meet the growing demand for MST, organizations with a strong record of starting and implementing MST programs collaborated with MST Services, which is licensed by the Medical University of South Carolina for the transport of MST technology and intellectual property, to become Network Partners. Network Partners are locally controlled organizations committed to making sure that the MST treatment model is followed with integrity. These organizations employ staffs that are fully trained in program development, and MST Services maintains working relationships with each partner that focuses on staff development, quality improvement, and quality assurance. Network Partners in Europe currently include: Norwegian Centre for the Studies of Conduct Problems and Innovative Practice; De Viersprong, Forensic Youth Psychiatry (Netherlands); MST Denmark; and MST-Sverige (Sweden).

MST Outcome Research

MST outcome research has transitioned from small efficacy studies in which an MST treatment developer provided all of the clinical training, supervision, and quality assurance for graduate student therapists to multisite transportability trials conducted internationally using community-based practitioners and with no involvement of an MST developer. This transition has produced a range of successes and failures, with both informing subsequent efforts to transport MST to community settings – primarily by contributing to the continuous refinement of the MST quality assurance and improvement system (Henggeler, 2011).

Efficacy Studies

Efficacy studies typically aim to optimize the probability of observing treatment effects by, for example, including highly motivated therapists with intensive training, supervision, and fidelity monitoring from the treatment developer and removing organizational barriers to treatment implementation (e.g., excessive productivity or administrative demands, concerns with interagency relations, policies on salary and comp time). The first two controlled evaluations of MST were conducted with doctoral students in clinical psychology as the therapists and Henggeler providing all the training and clinical supervision. The first MST outcome study used a quasi-experimental study with juvenile offenders (Henggeler et al., 1986) and demonstrated favorable decreases in behavioral problems and association with deviant peers for juvenile offenders and improved relations (e.g., increased warmth, decreased aggressive communications) for their families. The second evaluated the effectiveness of MST with maltreating families (Brunk, Henggeler, & Whelan, 1987) in a randomized design. MST was more effective than behavioral parent training at improving aspects of parent-child interactions that are associated with child maltreatment. These results were promising and set the stage for efficacy trials with serious juvenile offenders that included follow-ups for recidivism.

The three MST studies with the largest effect sizes have been conducted by Borduin and colleagues. Doctoral students in clinical psychology served as therapists, and Borduin provided all training and clinical supervision. In the largest of these studies ($N = 176$ violent and chronic juvenile offenders; Borduin et al., 1995), MST demonstrated extensive improvements in family relations and, most significantly, a 63% decrease in recidivism at a 4-year follow-up. Moreover, in one of the longest follow-ups in the child psychotherapy literature, Sawyer and Borduin (2011) showed that MST produced a 36% reduction in felony rearrests and a 33% reduction in days in adult confinement 22

years post treatment. Similarly strong results were observed in two randomized trials with juvenile sex offenders conducted by Borduin and colleagues. As shown in Table 2, the initial study (Borduin, Henggeler, Blaske, & Stein, 1990) demonstrated large MST reductions in sexual offending and other criminal offending at a 3-year follow-up. A larger subsequent study (Borduin, Schaeffer, & Heiblum, 2009) also demonstrated very substantive reductions in sexual offending and other criminal offending for MST through a 9-year follow-up. Additional MST outcomes included an 80% reduction in days sentenced to incarceration as well as improved family relations, peer relations, and academic performance.

In sum, these rigorous efficacy trials (e.g., randomized design, use of intent-to-treat analyses, long-term follow-up) clearly demonstrated the capacity of MST to achieve favorable outcomes with youth presenting very serious clinical problems and their families. The attainment of favorable clinical outcomes in university studies under near ideal conditions, however, is not the same as achieving such outcomes in community settings.

Effectiveness Studies

The first MST effectiveness study was a randomized trial conducted through a community mental health center with violent and chronic juvenile offenders at imminent risk of incarceration (Henggeler, Melton, & Smith, 1992). Therapists and the supervisor were employed by the mental health center, and Henggeler provided the initial training and ongoing consultation to support practitioner fidelity to the MST model. At a 59-week follow-up, youth in the MST condition evidenced a 43% reduction in recidivism and a 64% reduction in out-of-home placement.

Moreover, MST recidivism effects remained significant at a 2.4-year follow-up (Henggeler, Melton, Smith, Schoenwald, & Hanley, 1993). Similarly, Borduin recently provided ongoing consultation to a community-based randomized trial of MST for juvenile sex offenders (Letourneau et al., 2009). At 12-month follow-up, MST produced a 59% reduction in out-of-home placement and a 30% decrease in self-reported delinquency. Although treatment effects in these studies were not quite as powerful as those observed in the efficacy studies, this work demonstrated the successful transport of MST programs to community-based providers.

In the two preceding effectiveness studies, an MST treatment developer did not give direct supervision, but did provide ongoing expert consultation (i.e., weekly phone consultation focusing on treatment fidelity and achieving targeted outcomes – the role that the MST consultant plays in the current MST quality assurance and improvement system). Henggeler et al. (1997) examined the necessity of such consultation in the transport of MST. Therapists and supervisors in two community mental health centers received MST training, but not ongoing expert consultation. Participants again were serious juvenile offenders at imminent risk of incarceration and their families. Results at a 1.7-year follow-up from this randomized trial revealed that MST was effective in reducing incarceration (53% reduction, see Table 2), but not recidivism (26% reduction, not statistically significant). In anticipation of possible implementation problems, however, the investigators assessed therapist fidelity to MST using a newly developed adherence measure (Henggeler & Borduin, 1992). As noted previously, analyses showed a significant association between therapist fidelity and youth recidivism – higher

Table 2. MST Effects on Recidivism and Out-of-Home Placement

Study	Reduction in Recidivism	Reduction in Placements
Borduin et al.(1990)	72%	not assessed
Henggeler et al., (1992)	43%	64%
Borduin et al. (1995)	63%	57%
Henggeler et al. (1997)	26% ⁵	3%
Henggeler, Pickrel et al. (1999)	19%	50%
Henggeler, Rowland et al. (1999)	not assessed	49%
Ogden & Halliday-Boykins (2004)	no JJ system	78%
Rowland et al. (2005)	34%	68%
Timmons-Mitchell et al. (2006)	37%	not assessed
Stamburgh et al. (2007)	not assessed	54%
Ellis, Naar-King et al. (2008)	not appropriate	47%
Sundell et al. (2008)	0%	0%
Letourneau et al. (2009)	not assessed	59%
Borduin et al. (2009)	50%	80%
Glisson et al. (2010)	not assessed	53%
Butler et al. (2011)	41%	41%

JJ = juvenile justice.

treatment fidelity was linked with lower recidivism. These findings demonstrated the importance of including fidelity measures in clinical trials as well as the significance and value of the expert consultant role in MST programs.

Hybrid Efficacy-Effectiveness Studies with New Clinical Populations

Following the successful focus of MST developers on chronic and violent juvenile offenders in the early-mid 1990s, two research groups began to direct their attention to the adaptation and validation of MST for treating other serious clinical problems presented by adolescents and their families (i.e., serious emotional disturbance, substance abuse, physical abuse, and chronic health care problems). On the efficacy side of the efficacy-effectiveness continuum, these studies were conducted under the auspices of the investigators' respective academic departments. Therapists were typically hired off research grants, and the supervisors were usually faculty members trained in MST. Consistent with the central purpose of efficacy research, the primary aim of these studies was to determine whether the MST adaptation could be effective with the new population. On the effectiveness side of the continuum, participants reflected real world clinical populations, and, importantly, neither Henggeler nor Borduin provided ongoing clinical oversight. Thus, clinical outcomes were dependent on the guidance of a second generation of MST expert consultants.

Youth with serious emotional disturbance. Two studies evaluated an adaptation of MST for treating serious emotional disturbance in adolescents (Henggeler, Schoenwald et al., 2002). Using a randomized design, Henggeler, Rowland et al. (1999) evaluated this MST adaptation (i.e., lower caseloads, psychiatric support, integration of evidence-based pharmacotherapy, addition of crisis caseworker) as an alternative to the inpatient hospitalization of youth in psychiatric crisis (i.e., suicidal, homicidal, psychotic). In comparison with the hospitalization condition, MST was more effective at decreasing youth psychiatric symptoms and preventing hospitalization (73% reduction) and other out-of-home placements (49% reduction) at post treatment and at reducing rates of attempted suicide at a 16-month follow-up (Huey et al., 2004). In contrast with significant long-term outcomes for MST with juvenile offenders, but consistent with other evidence-based treatments of childhood internalizing disorders (Weersing & Weisz, 2002), the favorable MST symptom and out-of-home placement outcomes dissipated by the 16-month follow-up (Henggeler et al., 2003). A second randomized trial compared MST with Hawaii's intensive continuum of care in treating youth with serious emotional disturbance

(Rowland et al., 2005) and replicated the short-term findings of Henggeler, Rowland et al. (1999). At 6 months post referral, youth in the MST condition had a greater decrease in psychiatric distress and a 68% reduction in days in out-of-home placement.

Juvenile offenders with substance use disorders. Additional support for the capacity of second generation MST experts to sustain effective MST implementation was obtained in two randomized trials with substance abusing juvenile offenders. In the first, MST was compared with usual community services in the treatment of juvenile offenders who met diagnostic criteria for a substance abuse disorder (Henggeler, Pickrel, & Brondino, 1999). Findings at an 11-month follow-up showed that MST was more effective than usual services at decreasing youth substance use and out-of-home placement (50% reduction), but not recidivism (19% reduction, nonsignificant). At a 4-year follow-up (Henggeler, Clingempeel, Brondino, & Pickrel, 2002), however, MST participants evidenced decreased violent crime and increased marijuana abstinence. More recently, in a relatively complex four condition study (Henggeler et al., 2006) with substance abusing juvenile offenders, MST enhanced the drug related outcomes of juvenile drug court, but did not seem to improve criminal or placement outcomes in comparison with juvenile drug court. The fact that all youth in the MST conditions also were enrolled in juvenile drug court clouds interpretations of the MST-related findings (e.g., drug court enrollment includes intensive surveillance, which, in turn, is linked with an increased probability of being arrested). Nevertheless, the overall results of the MST psychiatric and substance abuse trials support the capacity of second generation MST experts to achieve favorable outcomes with very challenging clinical populations, which, in turn, has favorable implications for the effective transport of the model.

Physically abused adolescents. Building on findings from the early efficacy trial with maltreating families (Brunk et al., 1987), Swenson and colleagues developed an adaptation of MST for child abuse and neglect (MST-CAN; Swenson, Penman, Henggeler, & Rowland, 2010) and evaluated its effectiveness in comparison with a group-based parent training approach in a randomized design (Swenson, Schaeffer, Henggeler, Faldowski, & Mayhew, 2010). Consistent with effectiveness research, both interventions were delivered by therapists employed at a community mental health center. MST-CAN was more effective than parent training in reducing youth mental health symptoms, caregiver emotional distress, and parenting behaviors associated with maltreatment; and at increasing caregiver social support. At 16-months post baseline, youth in the MST-CAN condition were also less likely to be placed out of the home and spent 63% fewer days in placement. Although youth in the MST-CAN condition experienced a lower rate of reabuse

(4.5% vs. 11.9% for the comparison condition), this difference was not statistically significant.

Adolescents with chronic health care conditions.

A pediatric research group has adapted and tested MST for youth with serious health care problems. Along with several uncontrolled trials (e.g., Ellis, Naar-King, Cunningham, & Secord, 2006), Ellis and Naar-King have published three randomized trials of MST health care adaptations. A second generation MST expert served in the consultation role in each of these trials. In a randomized pilot study, Ellis et al. (2004) showed that MST was more effective than standard care in improving metabolic control and preventing hospital admissions among adolescents with poorly controlled type 1 diabetes. These findings were replicated in a larger randomized trial (Ellis et al., 2005) – at 7 months post recruitment the adolescents with poorly controlled type 1 diabetes showed improved metabolic control and decreased inpatient admissions relative to youth in usual care. In addition, a 12-month follow-up showed that decreases in hospitalization were sustained (43% decrease), though favorable outcomes for metabolic control dissipated. Most recently, Naar-King et al. (2009) demonstrated favorable outcomes for an MST adaptation for primary obesity. In comparison with a family group weight management program, MST was more effective at decreasing youth percent overweight, body fat, and body mass index.

Together, these sets of findings support the generalizability of MST to a range of serious clinical problems presented by adolescents and their families as well as the potential viability of using second generation MST experts to support the larger scale transport of the model. Next, independent replication studies that included 3rd generation MST experts (i.e., experts trained by second generation experts and not directly associated with MST developers) are reviewed.

Independent Replications and Transportability Trials

Several independent replications of MST have been conducted in Europe and the U.S. The first was a four-site randomized trial conducted by Ogden and colleagues in Norway with youth presenting serious antisocial behavior and their families. In comparison with usual child welfare services, youth in the MST condition had decreased externalizing and internalizing symptoms, a 78% reduction in out-of-home placements, and increased social competence at 6 months post recruitment (Ogden & Halliday-Boykins, 2004). A 24-month follow-up (Ogden & Hagen, 2006) showed that MST effects on youth internalizing symptoms and out-of-home placements (56% decrease) were sustained. Importantly, this study also demonstrated site effects, where MST implementation fidelity and corresponding youth outcomes were substantially

lower in one of the four sites. Subsequently, a benchmarking study that included the three MST adherent sites in Norway (Ogden, Hagen, & Anderson, 2007) showed that outcomes from mature MST programs were equal to or superior to those achieved in successful randomized trials. Similar results were observed in a benchmarking study conducted in New Zealand (Curtis, Ronan, Heiblum, & Crellin, 2009).

More recently, Butler, Baruch, Hickley, and Fonagy (2011) conducted an independent randomized trial of MST with juvenile offenders in England. In comparison with an intensive control condition (i.e., a tailored range of extensive and multicomponent evidence-based interventions), MST improved parenting and reduced self-reported and parent reported delinquency and psychopathic symptoms. In addition, offenses and placements were each reduced by 41% during the last 6 months of the 18-month follow-up. A large and complex MST randomized trial is currently being conducted by these investigators across multiple sites in England.

Three successful independent replications have also been conducted in the U.S. In the first (Timmons-Mitchell, Bender, Kishna, & Mitchell, 2006), juvenile felons at imminent risk of incarceration were randomized to MST versus usual services conditions. At about 12 months post recruitment, youth in the MST condition showed improved mood and school/work functioning, and decreased substance use. Moreover, at about 2 years post recruitment, youth in the MST condition evidenced a 37% decrease in rearrests. The second replication (Stambaugh et al., 2007) used a quasi-experimental design to compare the effectiveness of MST versus Wraparound (Burns & Goldman, 1999) for youth with serious emotional disturbance at risk for out-of-home placement. Results at an 18-month follow-up showed that MST was more effective at decreasing youth symptoms, improving youth functioning, and decreasing out-of-home placements (54% decrease). In the third (Glisson et al., 2010), 14 rural Appalachian counties were randomized to receive MST programs or not, and 615 juvenile offenders at risk of out-of-home placement and their families participated. Counties were also randomized to an organizational intervention in a 2 (MST vs. usual services) x 2 (organizational intervention vs. usual services) design. Outcome analyses showed that MST was associated with a 53% reduction in the odds of out-of-home placement. In addition and consistent with aforementioned findings for youth with serious emotional disturbance (Henggeler et al., 2003), when MST was delivered in the sites that also received organizational interventions, treatment effects on symptom reduction (externalizing and internalizing symptoms combined) were observed at 6 months post recruitment, but dissipated by 18 months post recruitment.

In contrast with the five successful independent replications, a four-site randomized trial conducted in

Sweden with youth meeting diagnostic criteria for conduct disorder failed to replicate favorable MST outcomes (Sundell et al., 2008). At 7-months post recruitment, analyses comparing MST with usual child welfare services revealed no MST effects across a broad array of outcome measures. Several potential explanations were offered for this failure to replicate, the most viable of which pertain to the low treatment fidelity observed for the MST therapists, the strength of interventions received by the comparison group relative to juvenile justice services in the U.S. (i.e., youth in the MST condition showed decreases in symptoms similar to those observed in other MST clinical trials, but youth receiving Swedish services showed much larger decreases in symptoms than observed in U.S. control groups), and a poor match between the immigrant families (47% of sample) and Swedish therapists. Similarly, MST effects were not observed at a 2-year follow-up (Lofholm, Olsson, Sundell, & Hansson, 2009) and, as expected given the lack of treatment effects, MST was not cost-effective (Olsson, 2009). Recently, based adherence and outcome measures for 973 families that received MST in Sweden during and since the study (i.e., 2003-2009), Sundell (2012) observed that MST adherence scores and outcomes across multiple sites have improved dramatically. These findings support the view that the failure of the randomized was due, at least in part, to poor treatment adherence during the introduction of MST to Sweden.

Conclusion

Research in Europe and the U.S. has demonstrated the capacity of MST to be effective in treating youths presenting serious antisocial behavior and their families. Across cultures, the family is critical to achieving favorable clinical outcomes for children, and MST interventions have produced high levels of family engagement in treatment and changes in the types of family functioning (e.g., positive parenting, supervision, monitoring) that are key mediators of therapeutic change. Research has also demonstrated the critical importance of therapist adherence to MST treatment principles in achieving favorable youth outcomes. When fidelity is high, treatment success is enhanced; and when fidelity is low, success is endangered. This relationship between treatment fidelity and youth outcomes is the basis for the intensive MST quality assurance system, which is being implemented effectively by several Network Partners in Europe.

Author's note

Dr. Henggeler is a board member and stockholder of MST Services, LLC, the Medical University of South Carolina-licensed organization that provides training in MST.

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