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The Oregon Model of Behavior Family Therapy: From Intervention Design to Promoting Large-Scale System Change

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This paper reviews the evolution of the Oregon model of family behavior therapy over the past four decades. Inspired by basic research on family interaction and innovation in behavior change theory, a set of intervention strategies were developed that were effective for reducing multiple forms of problem behavior in children (e.g., Patterson, Chamberlain, & Reid, 1982). Over the ensuing decades, the behavior family therapy principles were applied and adapted to promote children's adjustment to address family formation and adaptation (Family Check-Up model), family disruption and maladaptation (Parent Management Training–Oregon model), and family attenuation and dissolution (Treatment Foster Care–Oregon model). We provide a brief overview of each intervention model and summarize randomized trials of intervention effectiveness. We review evidence on the viability of effective implementation, as well as barriers and solutions to adopting these evidence-based practices. We conclude by proposing an integrated family support system for the three models applied to the goal of reducing the prevalence of severe problem behavior, addiction, and mental problems for children and families, as well as reducing the need for costly and largely ineffective residential placements.

Keywords: parent training; treatment foster care; prevention; developmental models; peers

In the late 1950s, the effectiveness of treating children's behavior problems with even intensive residential interventions was called into question. Despite gains during treatment, returning children back into pathogenic environments meant losing treatment gains (Redl & Wineman, 1957). At the same time, a new science of behavior was taking hold (Skinner, 1954) with a strong emphasis on the observation of reinforcement for problem behavior in the natural environment. The application of reinforcement principles to improving the family environment of children with problem behavior was a promising application. There were four groups within the United States that led this effort using a coordinated set of strategies (Patterson, 2002): Sidney Bijou (Bijou & Baer, 1966), Connie Hanf (1968),

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Robert Wahler (Wahler, Winkel, Peterson, & Morrison, 1965), and Gerald Patterson (Patterson, 1965). These interacting research groups generated a set of core principles that remain central in today's parent training programs: (a) parents, not therapists, serve as the treatment agents; (b) parents learn to track and record behavior; and (c) parents apply contingency management with their children using positive reinforcement for positive child behavior and mild negative sanctions to discourage problem behavior.

In the most recent compendium of evidence-based psychotherapies (Weisz & Kazdin, 2010), all eight of the treatments for "externalizing disorders" have their roots in behavior family therapy innovations emerging from these four groups in the 1960s, and the following were directly derived: The Incredible Years (Webster-Stratton & Reid, 2010), Parent Management Training (Kazdin, 2010), Parent-Child Interaction Therapy (Zisser & Eyberg, 2010), Triple P Positive Parenting (Sanders & Murphy-Brennan, 2010), Parent Management Training–Oregon model (Forgatch & Patterson, 2010), and Treatment Foster Care, Oregon model (Smith & Chamberlain, 2010). In addition, family-based treatment for oppositional behavior by McMahon and Forehand (2005) is based on these basic behavior change principles applied to families. A search of Google Scholar for the term "behavioral parent training" yielded 1,520,000 scholarly articles on this topic.

The application of reinforcement principles to improving family life, in general, and children's mental health, in particular, is the major success story of behavior science in the 20th century. Of interest is the potential for a systematic integration of advances in behavioral family interventions to improve the mental health and well-being of children and adolescents in communities, especially those most vulnerable to pathogenic environments. This review provides an overview of the evolution of research within the Oregon group since the seminal publication by Patterson, Chamberlain, and Reid (1982) in addressing the unique needs of children and families across the spectrum of family disruption and contexts. Randomized trials are reviewed, as well as implementation success and failures. Reflection on the findings from these coordinated programs of research suggests next steps for applying behavior change principles to improve the lives of youth and families at the population level.

Oregon Studies of Child Aggression

In the mid-1960s, the Oregon group studied primarily families seeking help to improve children's aggressive and disruptive behavior. This initiated a series of case studies focused on children with behavior problems. Over the next decade, the studies became more ambitious, with pre/post and follow-up data, larger samples, replications, and randomized controlled trials (Arnold, Levine, & Patterson, 1975; Fleischman & Szykula, 1981; Forgatch & Toobert, 1979; Patterson, 1974; Patterson et al., 1982; Patterson & Reid, 1970). Success in treating aggressive behavior in children fueled new efforts to apply the same behavioral principles to family intervention to treat multiple offender adolescents (Bank, Marlowe, Reid, Patterson, & Weinrott, 1991; Reid, 1976) and families referred for child abuse (Reid, 1986). The application of behavior therapy to families referred for chronic delinquency and child abuse, however, gave pause to the group, and suggested the need for a developmental model that provided an account for challenges of clinical work with these populations, as well as to guide improved treatment strategies. Incidental to the analysis of family contributions to the severity of problem behavior was the increasing realization within the group and the field (Capaldi & Patterson, 1991; Forgatch, Patterson, & Skinner, 1988; Patterson, 1982) that family dissolution and change were integral to children's progression from problem behavior to severe forms of delinquency, antisocial behavior, depression, and drug abuse in adolescence.

Family interaction had long been of interest to sociologists concerned with predicting which children would eventually be arrested for criminal behavior in adolescence; many of the criminology studies began in the 1930s (Loeber & Dishion, 1983). Interestingly, when home visitors described families of children who later became delinquent, they reported both overly harsh discipline as well as lax supervision as highly predictive. These early observations from a sociological perspective fit well with the direct observations of research that led to the formulation of the coercion model (Patterson, 1982). The coercion model provides a developmental perspective on how both harsh parenting as well as lax supervision might co-occur. As youth become more problematic, parents disengage from parenting (Patterson, DeBaryshe, & Ramsey, 1989; Patterson, Reid, & Dishion, 1992) and fail to track or monitor youth behavior in the community. Thus, the same parent can be both lax, and overly harsh, often after discovering a child's most recent escapade (e.g., stealing). Longitudinal research began to fill in the gaps as well as accounting for seemingly paradoxical findings of both clinical research and sociological research on delinquency.

Several research groups converged on an understanding of the longitudinal development and changes observed from childhood through adolescence (see Dishion & Patterson, in press, for a recent review).

Longitudinal models emerged that described the cascade of relatively minor problem behavior (often in early childhood) to more serious forms of deviance, including violence, sexual risk taking, and drug abuse. As shown in Figure 1, poor self-regulation and problem behavior in early childhood disrupts a child's entry into school. Poor relationships with peers and slow academic progress are associated with peer interactions that lead to growth in antisocial behavior in childhood (see Snyder et al., 2006). Such behavior can further undermine school adjustment and family engagement, which leads to more involvement in deviant peer groups (Dishion, Patterson, Stoolmiller, & Skinner, 1991). Deviant peer involvement is the strongest proximal predictor of escalations in multiple forms of problem behavior in adolescence. Adolescent self-organization within deviant peer groups often co-occurs with the waning of parent's ability to influence positive change (Dishion & Tipsord, 2011).

A Model-Based Family Intervention Model

A critical feature of the Oregon intervention model is the emphasis on supporting the behavior management skills of caregiving adults, including both daily social interaction processes (e.g., reinforcement patterns) but also improving tracking and monitoring of children's behavior. The term *family management* was used to describe a broader set of parenting behaviors than originally targeted in behavior management training (Patterson, 1982; Patterson et al., 1992). Figure 1 summarizes a vast body of evidence indicating that family management is a countervailing force to the cascading evolution towards more serious adjustment problems.

The cascade developmental model has strong implications for the design of interventions that are effective in reducing problem behavior at each stage of development. The covariation of disrupted family management with increasing levels of child and adolescent problem behavior is a unidirectional, recursive process. Family disruption is a dynamic process (Dishion, Forgatch, Van Ryzin, & Winter, 2012), and entails daily social interactions among multiple family members. Children and adolescents can disrupt family environments (Block, Block, & Gjerde, 1986; Forgatch & Stoolmiller, 1994). Children with multiple challenging behaviors "fail" many foster care placements, which in turn exacerbates behavior and well-being (Chamberlain et al., 2006).

It is critical to appreciate that parents often struggle with their own adversities, emotional adjustment, and relationships, and this can impact the caregiving environment they provide. The simple number of caregiver transitions (divorces, breakups, new partners, remarriages, etc.) has a strong linear correlation with the severity of emotional and behavioral adjustment problems (Capaldi & Patterson, 1991). Parent substance use and other problematic and addictive behavior disrupt parenting across generations (Pears, Capaldi, & Owen, 2007).

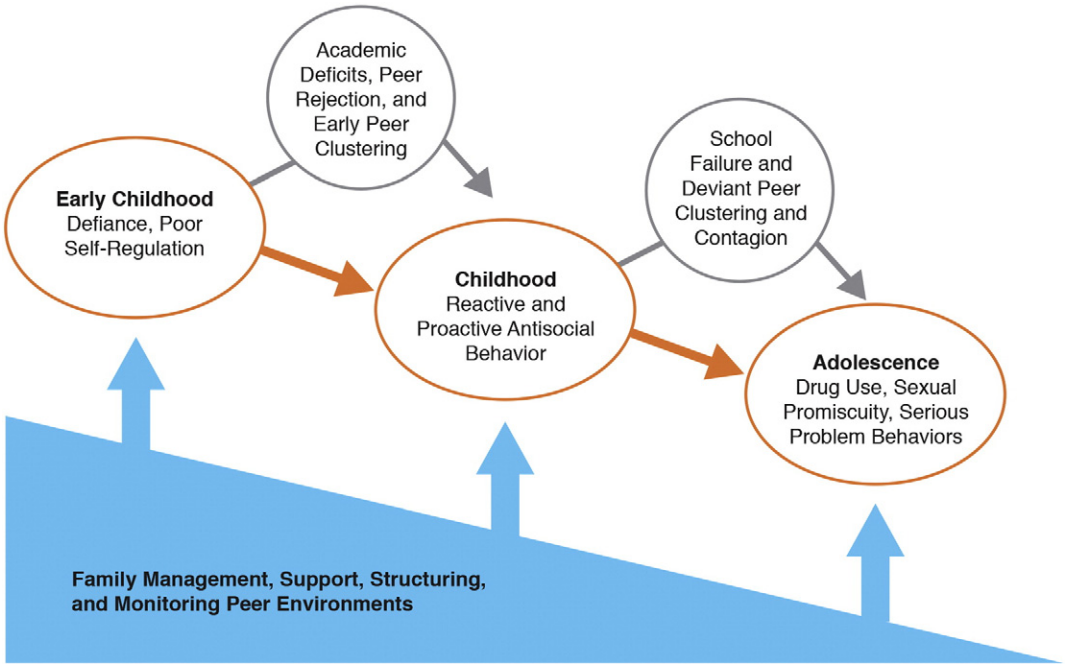

FIGURE 1 The Cascade Model. Developmental outcomes of early problem behavior and family management as a countervailing force.

As the Oregon group began the process of applying the behavior parent training principles to new populations that were mandated to treatment (child abuse, delinquent offending), we observed that the level of intactness of the family covaried with the severity of the clinical presentation. Over the past 30 years, since the publication of one of the earliest randomized trials on parent management training (Patterson et al., 1982), the Oregon group self-organized into three groups, each developing expertise in families at various stages of formation and disruption.

Figure 2 provides an overview of stages of disruption of family systems over time. It has often been observed that stress is a change agent in families, always related to change, some of which increases resilience, and others lead to family disruption and potential dissolution (caregiving environment changes, parents unavailable, foster care, etc.). Family formation includes the early stages of families that co-evolve with the birth and development of a child, or may involve the formation of a step-family following a divorce. Families in this stage are able to mobilize to address stressors, and often make changes on their own to improve the well-being of family members and children. At times, when stressors are left unattended, specific patterns of maladaption might occur, such as patterns of coercive conflict, marital conflict, betrayal or avoidance and dissatisfaction. Families experiencing repeated difficulties, disruption, and maladaptation often benefit from structure approaches to behavior change, and perhaps would be less responsive to interventions with a lighter touch. Finally, over time, families become weak, caregivers leave, become incarcerated, and are forced to give up their children, or the child and adolescent leave the home. When families attenuate and dissolve, family approaches to behavior parent training are less viable, primarily because of the correlated chaos and lack of a stable caregiving environment.

As shown in Figure 2, the Oregon group organized around families' needs, with the Family Check-Up addressing the needs of intact families, some of whom may change with minimal support. Parent management training was most appropriate for disrupted or maladapting families, and treatment foster care was most appropriate to address the needs of children and families that are attenuated and dissolving, with the eventual goal of placing a child and adolescent back into the family origin or other permanent, safe, and secure caregiving environment. As shown in Figure 2, we see the link between optimal intervention strategies, family disruption, and youth adjustment as potentially dynamic, with the explicit goal of interventions returning families to adaptive homeostasis in which daily social interactions are minimally coercive and optimally positive and supportive. Note that all three intervention models described below are based on a common core

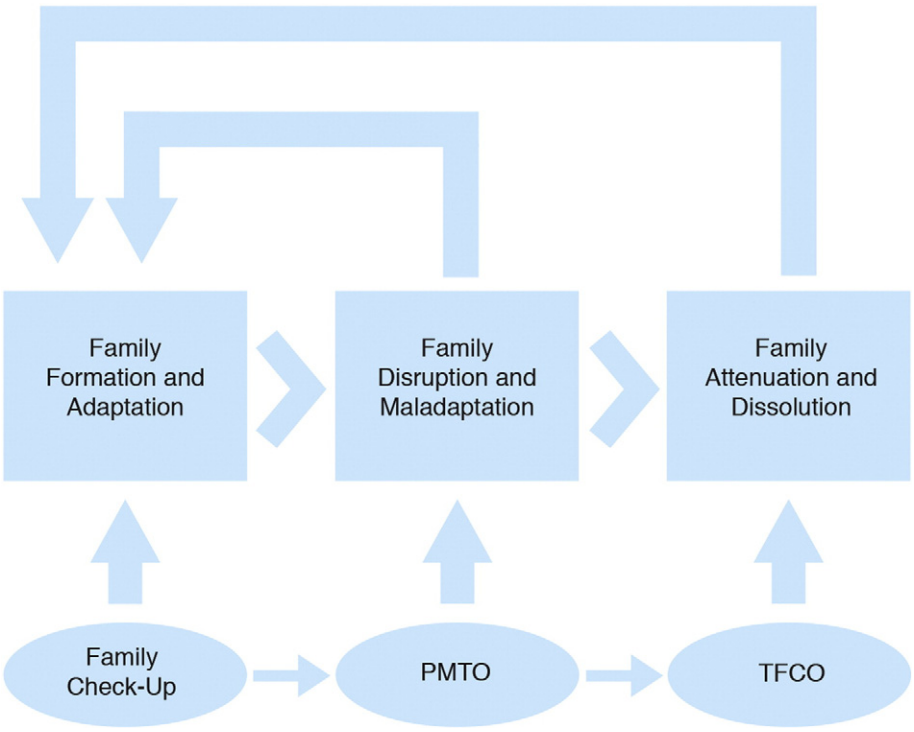

FIGURE 2 Innovations of behavioral parenting interventions addressing family disruption and reformation.

of behavior change principles and strategies. We briefly describe each intervention in turn, and summarize the key outcome studies involving randomization that link the intervention to improved social interactions in the caregiving environment, which in turn improves the behavior and adjustment of youth and family members.

THE FAMILY CHECK-UP

The Family Check-Up (FCU) was designed to support parents during key developmental transitions that are vulnerable to disrupted family management, child problem behavior, and emotional distress. This FCU is designed as both a preventive tool as well as an initial step (i.e., an intake process) for families seeking treatment. The FCU was initially developed at the Oregon Social Learning Center (OSLC) as a selected intervention for families of young adolescents in middle school (Dishion, Kavanagh, & Kiesner, 1999). Modeled after the Drinker's Check-Up (Miller & Rollnick, 2002), the FCU service model involves two to three sessions, including the following three components: (a) an initial interview, (b) the family assessment, and (c) a feedback session (see Dishion & Kavanagh, 2003; Dishion & Stormshak, 2007, for a review).

Within the initial interview, the parent consultant engages the caregiver in a reflective discussion of the current status of their family and their child's adjustment, providing opportunities for parent's discussion of hopes, need for change, as well as motivating engagement in a family assessment. The assessment phase includes brief questionnaires on child adjustment at home and school, parent adjustment, family context, and direct observations of parent-child interaction. All assessment data are automatically scored based on norms and summarized within a user-friendly "rainbow sheet" for easy interpretation by parents. The rainbow sheet summarizes the strengths and domains that need attention: Green suggests a domain, which is an area of strength (low alcohol use and substance use of parent); yellow suggests some concerns (marital satisfaction in the marginal range); and red suggests an area that needs attention. The feedback session focuses on parenting and family strengths and problem behaviors that were observed and linking the assessment to the parents' original concerns.

Motivational interviewing is the key therapist skill used to engage caregivers in change talk with respect to parenting. The FCU is also a key strategy for motivating and engaging caregivers in more intensive parent management training, especially when contact with parents comes through service settings like services for Women, Infants and Children (WIC), pediatric care, and schools, situations in which parents are not requesting intervention services. The FCU is also a useful tool for parents when receiving children home for residential treatment (e.g., Slavet et al., 2005), or for parents in treatment with their own mental health or substance use concerns (e.g., Uebelacker, Hecht, & Miller, 2006), considering their caregiving practices and need for additional parenting supports. The FCU is especially helpful for engaging families in evidence-based parent management sessions, groups (e.g., Dishion, Stormshak, & Kavanagh, 2011), or other evidence-based interventions for the child or parent. For instance, if a family is concerned about the opposition behavior of their 7-year-old son, as well as the depression of their 16-year-old adolescent, intervention services might focus on parent management of problem behavior, as well as problem solving with adolescents and cognitive behavioral therapy for the adolescent within individual sessions. In this sense, the results of the family assessment guide as well as motivate engagement in services following the feedback session.

The FCU model has been most empirically tested within the context of randomized trials to young families engaged in WIC, public school settings in early adolescence, community mental health agencies, and emergency room (ER) settings (see Table 1 for summary). The strength of the model is the ability to use it within service settings with large populations of children and families not seeking treatment. However, the challenge of evaluating the preventative impact of the intervention is that many of the families served do not require large changes. Table 1 summarizes the results to longitudinal randomized studies published in peer review journals, with a focus on linking the FCU to the prevention of the development of future *problem behaviors*, as well as the mediation of change through improvements in social interaction in the family.

As shown in Table 1, the effect sizes of the FCU model with high-risk families involved in WIC range between small (i.e., for children's inhibitory control) and large (parent reported oppositional and aggressive behavior). These studies also suggest improvements in family involvement (Shaw, Dishion, Supplee, Gardner, & Arnds, 2006) with high-risk families living in a large metropolitan area ($N = 120$, 2-year-old males only). Similarly, a larger prevention trial ($N = 731$, males and females) involving three unique communities (suburban, rural, and metropolitan) also screened as at risk within WIC revealed moderate effect sizes in the reduction of problem behavior between ages 2 and 4, and these effects were mediated by improvements in positive behavior support (Dishion et al., 2008). A follow-up study of the 2-year-olds to age 7.5 revealed that teachers

Table 1
Intervention Outcome Studies for Family Check-Up

Authors	Targeted Population	Sample Size	Length of Follow-up	Randomized Comparison Group	Measurement Strategies	Analytic Framework	Mediating Variable	Effect Size on DV
Dishion et al., 2002	90% of three public middle schools	672	3 years	Controls (no intervention)	Student survey report of drug use	ITT		Small to medium
Dishion et al., 2003	90% of three public middle schools	72	3 years	Controls (no intervention)	Self-report drug use, observed monitoring at age 12 & 14	ITT	Improved parental monitoring	Medium to large
Slavet et al., 2005	Incarcerated adolescents	10	Immediate	N/A (feasibility trial)	Adolescents' confidence in ability to resist drug use, parents' confidence in ability to impact adolescents' risky behaviors	N/A		Medium
Shaw et al., 2006	Children of families in WIC at risk for future conduct problems at age 2	120	3 years	Controls (no intervention)	Parent report child problem behavior, observed parenting	ITT	Improved parental monitoring	Medium
Uebelacker et al., 2006	Community sample	32	3 months	N/A (feasibility trial)	Parent report of family functioning and depression	N/A		Medium
Connell et al., 2007	90% of three public middle schools	998	5 years	Controls (no intervention)	Adolescent report, court records of youth drug use and problem behavior	ITT, CACE		Medium to very large
Gardner et al., 2007	Children of families in WIC at risk for future conduct problems at age 2	120	1 year	Controls (no intervention)	Observation of proactive parenting and parent report child problem behavior	ITT	Improved proactive parenting	Small
Connell et al., 2008	Children of families in WIC at risk for future conduct problems at age 2	731	1 year	Controls (no intervention)	Parent report of externalizing and internalizing: co-morbidity	ITT		Small
Connell & Dishion, 2008	90% of three public middle schools	106	2 years	Controls (no intervention)	Adolescent report CDI depression	ITT, CACE		Medium to very large
Dishion et al., 2008	Children of families in WIC at risk for future conduct problems at age 2	731	3 years	Controls (no intervention)	Observation of parent positive behavior support and parent report child problem behavior	ITT	Improved positive behavior support	Small to medium
Connell, 2009	90% of three public middle schools	998	11 years	Controls (no intervention)	Self-reported tobacco use	CACE		Small to very large
Shaw et al., 2009	Children of families in WIC at risk for future conduct problems at age 2	731	3 years	Controls (no intervention)	Parent report of child problem behavior maternal depression	ITT	Reduced maternal depressive symptoms	Small
Stormshak, Connell, & Dishion, 2009	90% of three public middle schools	998	5 years	Controls (no intervention)	School records of attendance and grades for academic classes	CACE		Very large
Stormshak et al., 2010	80% of three public middle schools	377	4 years	Controls (no intervention)	Youth report of self-regulation (effortful control)	ITT	Improved self-regulation	Very small
Spirito et al., 2011	Adolescents treated in an emergency department after an alcohol-related event	125	1 year	Individual Motivational Interviewing for adolescent only	Youth report of alcohol use	ITT		Medium

(continued on next page)

Table 1 (*continued*)

Authors	Targeted Population	Sample Size	Length of Follow-up	Randomized Comparison Group	Measurement Strategies	Analytic Framework	Mediating Variable	Effect Size on DV
Stormshak et al., 2011	80% of three public middle schools	593	2 years	Controls (no intervention)	Youth report of deviant peers, alcohol, and antisocial behavior	CACE		Large to very large
Van Ryzin & Dishion, 2012	90% of three public middle schools	998	7 years	Controls (no intervention)	Youth report conflict, antisocial behavior, deviant peers, and direct observation of family conflict	ITT	Reduced parent-child conflict	Medium to large
Fosco, Frank, Stormshak, & Dishion, 2013	80% of three public middle schools	593	3 years	Controls (no intervention)	Youth report of self-regulation, antisocial behavior, drug use	ITT	Self-regulation	Very small
McEachern et al., 2013	Children of families in WIC at risk for future conduct problems at age 2	435	3 years	Controls (no intervention)	Parent report of life satisfaction and child problem behavior	ITT	Reduced child behavior problems	Small
Caruthers, Ryzin, & Dishion, 2014	90% of three public middle schools	998	5 years	Controls (no intervention)	Youth report of parent relationships, monitoring, high-risk sexual behavior and deviant peer involvement	ITT	Improved parent relationships and monitoring	Small
Chang, Shaw, Dishion, Gardner, & Wilson, 2014	Children of families in WIC at risk for future conduct problems at age 2	731	5 years	Controls (no intervention)	Observation of parent positive behavior support and parent report inhibitory control	ITT	Increased inhibitory control	Small
Dishion et al., 2014	Children of families in WIC at risk for future conduct problems at age 2	731	5 years	Controls (no intervention)	Parent and teacher report of problem behavior	ITT, CACE		Small to large
Nelson, Van Ryzin, & Dishion, 2015	90% of three public middle schools	998	12 years	Controls (no intervention)	Youth report of tobacco, cannabis, and alcohol use	ITT		Small to medium
Sitnick et al., 2014	Children of families in WIC at risk for future conduct problems at age 2	731	3 years	Controls (no intervention)	Observation of parent-child coercion and positive engagement at 2, 3, 4, and 5 years	ITT	Reduced parent-child coercion	Very small
Smith et al., 2014	Combined two prevention trials in public middle schools	1193	2 years	Controls (no intervention)	Youth report of ethnicity, family conflict, and antisocial behavior	ITT	Reduced family conflict	Small
Leijten et al., 2014	Children of families in WIC at risk for future conduct problems at age 2	731	5 years	Controls (no intervention)	Parent report of service utilization at age 7	ITT		Small
Reuben, Shaw, Brennan, Dishion, & Wilson, 2015	Children of families in WIC at risk for future conduct problems at age 2	731	6 years	Controls (no intervention)	Maternal report of depression and child behavior problems, observed coercion	ITT	Reduced maternal depressive symptoms	Very small
Veronneau, et al., in press	90% of three public middle schools	998	12-13 years	Controls (no intervention)	Self-reported tobacco, alcohol, and cannabis use	ITT, CACE		Medium to very large

reported intervention youth to be less oppositional in school, parents continue to rate fewer behavior problems, and effect sizes increased from small to large, depending on the number of years participants engaged in the yearly FCU intervention service (Dishion et al., 2014).

In an intensive analysis of observed family interaction as a mediator of long-term outcomes, Sitnick et al. (2014) found that long-term reductions in children's aggressive and oppositional behavior was mediated by yearly improvements in parents' observed positive behavior support as well as coercive conflict. Finally, Shaw also found moderate effects on reductions in maternal depression in early childhood, in both studies (Shaw et al., 2006; Shaw, Connell, Dishion, Wilson, & Gardner, 2009). It is worth noting that similar effect sizes were observed in the first study by Shaw and colleagues (Shaw et al., 2006) as the larger multisite trial, yet the latter study also offered follow-up parent training sessions for 70% of the families. In addition, we found that coercive family interactions in the WIC families did not change, unless they were provided with videotaped feedback on their interaction practices (Smith et al., 2014). These findings suggest that the FCU model on its own, without parent management training, may have limitations with respect to improving more entrenched, coercive family interaction dynamics. Videotaped feedback and rehearsal are key components of several versions of parent management training (Forgatch & Patterson, 2010; Zisser & Eyberg, 2010).

The results to two independent randomized trials in public middle school involve young adolescents and their families representing over 90% of the school population in high-risk neighborhoods (summarized in Table 1). The first (Dishion & Kavanagh, 2003) involved 998 sixth-grade students who were randomized to middle school as usual, versus middle school with family support. Family support was offered at multiple levels, with the FCU as the selected intervention delivered within a Family Resource Center in the school building. As shown in Table 1, we found that at age 14, random assignment of the high-risk students to receive the FCU showed reductions in drug use from ages 11 to 14 (Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002). In this study, we developed an observational measure of parent monitoring. Between the ages of 12 and 14, improvements in observations of parent monitoring significantly mediated intervention effects on adolescent drug use (Dishion, Nelson, & Kavanagh, 2003). Youth were followed to age 26–27, and we recently reported reductions in marijuana, alcohol, and tobacco use (Véronneau, Dishion, Connell, & Kavanagh, in press). In this study, both intention to treat (ITT) and complier average causal effect (CACE) modeling (Jo, 2002) were used. In the ITT framework, 12-year follow-ups showed reduced use of marijuana. When engagement in the FCU was incorporated into the prevention models, moderate effects were found for reductions in young adult alcohol, marijuana, and tobacco use.

Van Ryzin and Dishion (2012) examined the long-term effects of the FCU model on antisocial behavior by age 18–19 using youth report as the outcome. Like above, an ITT effect was found on the reduction of antisocial behavior from ages 11 to 18 (small effect size), and both self-reported and observed conflict mediated the long-term changes in adolescence.

Based on the initial positive results on parent monitoring and substance use, a new randomized trial was initiated in public middle schools to replicate and extend the findings. In this study, 593 ethnically diverse sixth-grade students were randomly assigned to the FCU or middle school as usual (see Stormshak, Fosco, & Dishion, 2010; Stormshak et al., 2011). In this study, the only intervention activity was the FCU, and the potential for follow-up parent training sessions and universal classroom-based family supports were not provided. In this trial, an effort was made to match the ethnicity of the parent consultant with that of the families to increase engagement. Engagement was increased from 25% to 38% (Stormshak et al., 2010). An analysis of FCU engagement using CACE modeling revealed statistically reliable reductions in antisocial behavior, deviant peer involvement, family conflict, and alcohol use (Stormshak et al., 2011; Van Ryzin & Dishion, 2012).

A study of the FCU model as implemented in a community mental health setting was studied by randomizing 40 therapists to being trained in the FCU model, and then following up with their clients and comparing those to therapists without such training. This study reports reductions in conduct problems among youth with therapists trained in the FCU (Smith, Stormshak, & Kavanagh, 2014).

Finally, in a randomized trial of motivational interviewing with 125 adolescents admitted to the ER for alcohol-related issues, youth were randomized to individual motivational interviewing, or individual motivation interviewing with an FCU (Spirito et al., 2011). The FCU condition was implemented in the home setting following the ER admission. Examining outcomes over three follow-up probes include 3, 6, and 1 year. Both conditions resulted in reductions in drinking, and the addition of the FCU was linked to reductions in "high volume" drinking at the 3-month follow-up probe, over and above motivational interviewing with the adolescent.

PARENT MANAGEMENT TRAINING–OREGON MODEL (PMTO)

PMTO is the core intervention underlying all of the Oregon models, originally summarized by Patterson and colleagues (Patterson & Reid, 1975) and tested using a randomized comparison sample (Patterson et al., 1982). This family of evidence-based programs ranges in focus from preventive interventions with at-risk samples to clinical treatment for serious behavior problems for youngsters from preschool through adolescence. In PMTO programs, parents serve as the primary agents of change; thus, therapists focus their efforts on parents rather than working directly with the children, although children are included in sessions as relevant. Programs focus on preventing or reducing outcomes related to youngsters' externalizing and internalizing behavior problems, including antisocial, academic, and conduct problems; delinquency; and depression. Children's mental health systems employ PMTO to address these issues. Because the programs intervene primarily with parents to decrease coercive parenting and increase positive parenting practices, PMTO interventions are also provided by the child welfare system for birth parents whose children have been removed for abuse/neglect (for reviews, see Forgatch & Domenech Rodríguez, 2015; Forgatch & Patterson, 2010; Forgatch, Patterson, & Gewirtz, 2013).

The iterative process employed by the OSLC group integrating theory has led to an expansion of the basic set of behavioral principles. The earliest programs focused on contingent positive reinforcement, negative sanctions for misbehavior, and careful tracking of specific behaviors. In the 21st century, the core components of PMTO programs comprise skill encouragement (also called contingent positive reinforcement), limit setting/discipline (also called negative sanctions), monitoring/supervision (an expansion of tracking), interpersonal problem solving, and positive involvement. An additional set of skills empowers these core components. These supporting skills include: clear directions, emotion identification and regulation, and communication skills. All intervention components are strength-based in that therapists help parents recognize and build on positive qualities already present in their families. For a more detailed description, see Forgatch and Domenech Rodríguez (2015).

PMTO can be delivered in a variety of formats: individual family treatment delivered in families' homes or in agency settings, parent groups in agency or community settings, and telehealth delivery by phone or video. The number of sessions averages 25 individual family sessions for clinical cases; parent groups and telehealth sessions range from 6 to 14 sessions. Typical procedures call for weekly meetings with a midweek call to troubleshoot issues with home practice assignments.

One aspect that may differentiate PMTO from other parent training approaches is an emphasis on clinical change skills of the therapist to reduce resistance to change. This emphasis grew out of a series of studies conducted during the 1980s in which video recordings of therapy sessions were scored using an observational system that coded exchanges between therapists and families (Patterson & Chamberlain, 1988; Patterson & Forgatch, 1985; Stoolmiller, Duncan, Bank, & Patterson, 1993). Findings indicated that both client characteristics and therapist behavior may evoke client resistance. For example, when therapists teach or confront parents, they increase the likelihood that the client's next response will be resistant; when they combine teach with confront, resistance increases sevenfold (Patterson & Forgatch, 1985). This finding led to efforts to shape clinical processes to provide more support and to replace didactic teaching by engaging parents in the teaching/learning process, consistent with motivational enhancement strategies applied to substance use treatment (Miller & Rollnick, 2002). In sessions we actively engage parents in the teaching-learning process through the use of role-play and interactive problem solving. For a brief review of the therapy process studies and their incorporation into the intervention, see Forgatch and Domenech Rodríguez (2015).

Outcomes for PMTO prevention and treatment programs are based on randomized controlled trials, multiple-method and -agent assessment, and follow-up periods from 1 to 9 years (see Table 2 for a summary). Benefits have been reported for the youngsters and for the parents, mediated by observed changes in key family interaction dynamics. Positive outcomes for youngsters include the following: reductions in observed noncompliance, deviant behavior, family aggression, and playground aggression; fewer police reports of nonstatus offenses; reduction in early police arrests; less growth in number of police arrests and less time incarcerated; teacher ratings of improved adaptive functioning in school and reduction in delinquency; and reduced self-reported depression, deviant peer association, tobacco use, and illicit drug use. See Forgatch and Patterson (2010) for details of these studies.

Benefits for parents include the following: reductions in observed coercive parenting and ineffective discipline, increased or sustained positive parenting practices, improved marital interaction, self-reported rise out of poverty, increased per capita annual income, increased socioeconomic status (education, occupation, income), decreased maternal depression,

Table 2
Intervention Outcome Studies for Parent Management Training, Oregon

Authors	Targeted Population	Sample Size	Length of Follow-up	Randomized Comparison Group	Measurement Strategies	Analytic Framework	Mediating Variable	Effect Size on DV
Amlund Hagen et al., 2011 & Ogden & Amlund Hagen, 2008	Families in Norway with child ages 4-12 displaying at least onecf disruptive behavior disorder symptom, recruited to the study via existing child services agencies	112	12 months	Controls (treatment as usual)	Observed parental discipline, teacher ratings of social skills, parent ratings of externalizing behavior	ITT	Effective discipline, family cohesion	Small to medium
Kjøbli, Hukkelberg, & Ogden, 2013	Families in Norway with child ages 3-12 either at an early-stage / developed conduct problems, recruited from those who had contacted an agency for these issues	137	6 months	Controls (treatment as usual)	Self-reported parenting practices, parent and teacher ratings of social competence	ITT	N/A	Small to large
Kjøbli & Bjørnebekk, 2013	Families in Norway with child ages 3-12 either at an early-stage / developed conduct problems, recruited from those who had contacted an agency for these issues	216	6 months	Controls (treatment as usual)	Self-reported parenting practices, externalizing behavior	ITT	N/A	Small to medium
Bjorknes et al., 2012	Somali and Pakistani immigrant families in Norway with child ages 3-9 at risk for the development of conduct problems	96	Pre-Post	Controls (wait-list)	Self-reported parenting practices, externalizing behavior	ITT	Harsh discipline, positive parenting	Small to medium
Sigmarsdóttir, Thorlacius, Guðmundsdóttir, & DeGarmo, 2015	Families in Iceland with child ages 5-12 displaying current behavior problems at school or home	102	Pre-Post	Controls (treatment as usual)	Child adjustment construct using child, parent, and teacher reports	ITT	N/A	Small to medium
Sigmarsdóttir & Björnsdóttir, 2012	A community in Iceland	~930	10 years	N/A (quasi-experimental)	Referrals for services	N/A	N/A	Small to medium
Parra-Cardona et al., 2012	Two-parent families recruited from the community	24	Pre-Post	N/A (qualitative analysis)	Engagement, retention, satisfaction	N/A	N/A	N/A
Gewirtz & Taylor, 2009	Mothers and children residing in shelters or transitional housing	10	Pre-Post	N/A (feasibility trial)	Engagement, retention, satisfaction	N/A	N/A	N/A
Gewirtz et al., 2015	Formerly homeless families in supportive housing settings	161	2 years	Controls (treatment as usual)	Parent self-efficacy, observed parenting, child self-report of depression, teacher and parent report of child strengths	ITT	N/A	Medium to large
Wieling et al., 2015	Ugandan mothers drawn form a larger observational study and reporting significant difficulty parenting at least one child	14	5 months	N/A (feasibility trial)	Engagement, retention, satisfaction, observed positive parenting, self-reported discipline practices	N/A	N/A	Medium

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Table 2 (*continued*)

Authors	Targeted Population	Sample Size	Length of Follow-up	Randomized Comparison Group	Measurement Strategies	Analytic Framework	Mediating Variable	Effect Size on DV
Gewirtz et al., 2014	Families with a child ages 4-12 and at least one parent who had deployed recently (i.e., Iraq or Afghanistan)	42	Pre-Post	N/A (feasibility trial)	Participation, satisfaction	N/A		N/A
Forgatch et al., 2005	Recently married biological mother and stepfather families with child in grades K-3, recruited from community	110	24 months	Controls (no intervention)	Observed parenting practices, parent report of home behavior, teacher report of internalizing and externalizing behavior	ITT	Parenting practices, noncompliance, home behavior	Medium to large
DeGarmo & Forgatch, 2007	Recently married biological mother and stepfather families with child in grades K-3, recruited from community	111	25 months	Controls (no intervention)	Observed stepfather parenting	ITT	N/A	Medium
Bullard et al., 2010	Recently married biological mother and stepfather families with child in grades K-3, recruited from community	112	26 months	Controls (no intervention)	Observed parenting practices, observed marital relationship, self-reported marital satisfaction	ITT	Observed parenting practices	Medium
Wachlarowicz, Snyder, Low, Forgatch, & DeGarmo, 2012	Recently married biological mother and stepfather families with child in grades K-3, recruited from community	113	27 months	Controls (no intervention)	Coercive and positive parenting	ITT	N/A	Small to medium
Forgatch & DeGarmo, 2007	Recently separated single mothers and their sons in grades 1-3, recruited from the community	238	30 months	Controls (no intervention)	Rise out of poverty, financial stress, income-to-needs ratio	ITT	Income-to-needs ratio	Small to medium
Martinez & Forgatch, 2001	Recently separated single mothers and their sons in grades 1-3, recruited from the community	238	30 Months	Controls (no intervention)	Observed parenting practices, observed noncompliance	ITT	Positive parenting, coercive discipline	Small to medium
Forgatch et al., 2009	Recently separated single mothers and their sons in grades 1-3, recruited from the community	238	9 years	Controls (no intervention)	Observed parenting practices, teacher report of delinquency, self-reported deviant peer association, (early) arrests	ITT	Deviant peer association	Small to medium
DeGarmo et al., 2004	Recently separated single mothers and their sons in grades 1-3, recruited from the community	238	30 months	Controls (no intervention)	Observed parenting practices, teacher report of externalizing and internalizing behavior, maternal depression	ITT	Child externalizing and internalizing problems	Small to medium
Forgatch & DeGarmo, 1999	Recently separated single mothers and their sons in grades 1-3, recruited from the community	238	12 months	Controls (no intervention)	Observed parenting practices, teacher and child report of school adjustment	ITT	Effective parenting	Small to medium
Chamberlain et al., under review	Families served by private agencies in child welfare system	~2000	Pre-Post	N/A (quasi-experimental)	Reunification, placement stability	N/A	N/A	Small
Akin et al., 2014	Families swith a child with severe emotional disturbance in foster care	60	Pre-Post	Controls (treatment as usual)	Attrition, reunification	ITT	N/A	N/A

increased marital satisfaction, and fewer police reports of arrests (Bullard et al., 2010; DeGarmo, Patterson, & Forgatch, 2004; Forgatch & DeGarmo, 2007; Forgatch & Patterson, 2010; Patterson, Forgatch, & DeGarmo, 2010).

Several studies conducted ITT mediational modeling to test the theoretical perspective that the mechanisms of change are reduction in coercion and improved positive parenting practices. The findings have supported the hypothesis. Intervention benefits to parenting practices mediated intervention effects on youth and maternal police arrests, teacher-reported delinquency, children's reports of depression and drug and tobacco use, parents' reports of maternal improvements in SES, and observations of quality of marital interaction (Bullard et al., 2010; DeGarmo, Eddy, Reid, & Fetrow, 2009; DeGarmo & Forgatch, 2007; DeGarmo et al., 2004; Forgatch, DeGarmo, & Beldavs, 2005; Forgatch, Patterson, DeGarmo, & Beldavs, 2009; Patterson et al., 2010). An analysis of the divorce study with 9 years of data tested the model using longitudinal sequencing of the constructs and found that intervention effects on reducing coercive parenting from baseline to 1 year mediated the intervention effects on growth in positive parenting from 1 year to 3 years; growth in positive parenting served as the most proximal mediator for benefits to child outcomes (i.e., reduced number of police arrests and teacher ratings of delinquency) and benefits to socioeconomic status (Forgatch, Beldavs, Patterson, & DeGarmo, 2008).

The PMTO preventive approach has been adapted for a wide variety of contexts and cultures within the U.S., including mothers living in supportive housing (Gewirtz, DeGarmo, Lee, Morrell, & August, 2015) and shelters because of domestic violence or homelessness (Gewirtz, 2007; Gewirtz & Taylor, 2009), military staff reintegrating home from war (Gewirtz, Pinna, Hanson, & Brockberg, 2014), Latino immigrant families (Parra-Cardona et al., 2012), stepfamilies (Forgatch et al., 2005), single mothers (Forgatch & DeGarmo, 1999), and families living in high crime neighborhoods (Reid, Eddy, Fetrow, & Stoolmiller, 1998).

The late 1990s marked the beginning of wide-scale PMTO implementations. The first site, Norway, set the stage for the manner in which the PMTO purveyor group conducts implementations. The approach that was developed is full transfer to the adopting community, in which a fully trained implementation site becomes licensed to conduct the program independently within its site, training their own clinicians, coaches, trainers, and fidelity raters (see Forgatch et al., 2013). To ensure sustained fidelity to the model, each site maintains a team of fidelity raters who are trained to reliability on the Fidelity of Implementation Rating System (FIMP; Knutson, Forgatch, Rains, & Sigmarsdóttir, 2009). Reliability is maintained with monthly reliability checks within the site's team and an annual reliability test with scores provided by the purveyor fidelity team. This approach has resulted in extending the reach of the program within sites. A study of effect sizes across generations of PMTO practitioners in Norway following scale-up several years after the original implementation shows sustained fidelity to the model and maintenance of effect sizes in outcomes (Tømmeraas & Ogden, 2015). In the 15 years since the Norwegian implementation, they have tailored the program to extend its reach with adaptations for use within the health care system, ethnic minority groups, and other preventive applications. Each adaptation has been tested with an RCT (see Amlund Hagen, Ogden, & Bjørnebekk, 2011; Bjørknes, Kjøbli, Manger, & Jakobsen, 2012; Kjøbli & Bjørnebekk, 2013; Kjøbli, Hukkelberg, & Ogden, 2013; Kjøbli & Ogden, 2012; Ogden & Amlund Hagen, 2008).

Other wide-scale PMTO implementations include the following: statewide programs within the child mental health system in Michigan; a statewide program within child welfare in Kansas; city/county-wide programs in Detroit/Wayne County, Michigan; and nationwide in Iceland, The Netherlands, and Denmark. Mexico City conducted a small RCT, and a pilot program is under way in Northern Uganda. A program for birth parents in the child welfare system in New York City is ongoing in collaboration with KEEP for the foster parents (Chamberlain, Feldman, Wulczyn, Saldana, & Forgatch, 2015). See Forgatch and Domenech Rodríguez (2015) and Forgatch et al. (2013) for more information on implementations.

TREATMENT FOSTER CARE–OREGON MODEL (TFCO)

The TFCO model (formerly Multidimensional Treatment Foster Care) was specifically designed to address the needs of families and youth with serious problem behavior and correlated family disruption and dissolution. Specifically, TFCO focuses on children and adolescents who have been removed or are slated to be removed from their family homes because of serious antisocial behavior (by juvenile justice), severe emotional problems (mental health systems), or because of having experienced severe child abuse and neglect (child welfare systems). Versions of TFCO have been developed for preschoolers in foster care (TFCO-P; Fisher, Stoolmiller, Mannering, & Chamberlain, 2011), latency age children (TFCO-C; Smith, Stormshak, Chamberlain, & Bridges Whaley, 2001), and adolescents (TFCO-A; Chamberlain, 2003). In addition, the model was

expanded to provide preventive services to regular state foster care homes in child welfare systems to stem the tide of foster care placement disruptions and increase child well-being outcomes. The preventive version of TFCO is called KEEP (keeping foster and kinship parents supported and trained). KEEP, described in detail elsewhere (Chamberlain, Price, Leve, Laurent, Landsverk, & Reid, 2008), contains the core elements of TFCO, yet is less intensive and costly to implement.

In TFCO, youth are placed singly in specially trained and supported foster homes as an alternative to congregate care settings. For adolescents, TFCO-A serves as an alternative to group homes, residential correctional settings, or inpatient residential treatment. For younger children, TFCO-C serves as an alternative to regular foster care for preschoolers with behavior/mental health problems (TFCO-P). Foster parents are intensively trained, supervised, and supported to provide positive adult support, nurturing and mentoring, close supervision, and consistent limit setting. TFCO placements typically last 6 to 9 months and involve coordinated interventions in the home, with peers, in educational settings, and with the youth's biological family members or other long-term placement resource. Close consultation, training, and support of the foster parents form the cornerstone of the TFCO model. Program supervisors with small caseloads (10 families each) maintain daily contact with TFCO parents to collect data on youth adjustment and to provide ongoing consultation, support, and crisis intervention. Many of the youth served have unfortunately developed advanced skills in undermining adult efforts to set healthy limits and monitor daily activities. In TFCO, daily consultations that are data-based and supportive provide a critical venue for problem- solving strategies to socialize youth into more healthy lifestyles (e.g., attending school, doing homework, chores, participating in family activities, and reducing unsupervised time with peers).

The basic components of the model include: (a) daily (M–F) telephone contact with foster parents using the Parent Daily Report checklist (PDR; Chamberlain & Reid, 1987); (b) weekly foster parent group meetings led by the program supervisor focused on supervision, training in parenting practices, and support; (c) an individualized behavior management program implemented daily in the home by the foster parent; (d) individual therapy for the youth, (e) individual skills training/coaching for the youth; (f) PMTO-informed family therapy (for biological/adoptive/relative family of the youth) focused on parent management strategies; (g) close monitoring of school attendance, performance, and homework completion; (h) case management to coordinate the TFCO family, peer, and school settings; (i) 24-hour on-call staff availability to foster and biological parents; and (j) psychiatric consultation as needed. Like the FCU and PMTO models, the TFCO intervention embodies a strong focus on strength-building and positive reinforcement, and specific intervention components are tailored to the child's age and developmental level. Additional information on the basic TFCO model is described in detail elsewhere (Chamberlain, 2003).

TFCO-A trials (see Table 3 for summary) in the U.S. have indicated its effectiveness in reducing arrest rates and deviant peer affiliations for boys and girls, placement disruption and parenting for boys, and pregnancy rates and school engagement for girls (Chamberlain & Reid, 1998; Kerr, Leve, & Chamberlain, 2009; Leve, Fisher, & Chamberlain, 2009). For example, between baseline and a 12-month follow-up, TFCO youth had spent 53 (boys) and 22 (girls) days in lockup (e.g., a detention facility), whereas control youth had spent 129 and 56 days, respectively; and in the 24 months following baseline, 26.9% of TFCO girls had a new pregnancy vs. 46.9% of control girls. International replication trials of TFCO have also shown positive results. A trial in Sweden indicated significant reductions in youth-reported externalizing and internalizing behavior relative to the treatment services-as-usual (TAU) control group (Westermark, Hansson, & Olsson, 2010). Depression scores were twice as high for TAU control youth as compared to TFCO-A youth at the 2-year follow-up. A recent 3-year follow-up in Sweden found that compared to youth assigned to TAU, those in TFCO-A spent two-thirds fewer days in locked settings and had significantly lower rates of violent crime (Bergström & Höjman, 2015).

For children experiencing abuse and neglect, there is a myriad of cascading effects, including attenuated attachment and trust of adults, stress reactivity, as well as the potential for repeated placements in caregiving environments. As discussed above, progression in mental health and problem behavior symptoms is a linear function of repeated changes and failures in the caregiving environment. TFCO-P has been shown to produce positive attachment outcomes: Children in the intervention condition showed increases in secure behavior and decreases in avoidant behavior relative to children in regular foster care services, with small effect sizes; children in TFCO-P had a 10% increase in rates of secure behavior over a 12-month period, whereas control children had a 6% decrease in secure behavior over the same time period (Fisher & Kim, 2007). In addition, TFCO-P outcomes include significant influences on stress response systems: the intervention effectively prevented TFCO-P children from

Table 3
Intervention Outcome Studies for Treatment Foster Care, Oregon

Authors	Targeted Population	Sample Size	Length of Follow-up	Randomized Comparison Group	Measurement Strategies	Analytic Framework	Mediating Variable	Effect Size on DV
Leve, Chamberlain, & Reid, 2005	Girls referred by juvenile court judges for out-of-home care due to chronic delinquency	81	12 months	Control (treatment-as-usual: group care setting)	Days in locked settings, recidivism and criminal activity	ITT	N/A	Small to medium
Leve & Chamberlain, 2005	Male and female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	153	12 months	Control (treatment-as-usual: group care setting)	Delinquent peer affiliations	ITT	Delinquent peer association during intervention	Small
Leve & Chamberlain, 2007	Female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	81	12 months	Control (treatment-as-usual: group care setting)	School attendance, homework completion	ITT	N/A	Small
Chamberlain, Leve, & DeGarmo, 2007	Female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	81	24 months	Control (treatment-as-usual: group care setting)	Delinquency, criminal referrals, days in locked settings	ITT	N/A	Small to medium
Kerr et al., 2009	Female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	166	24 months	Control (treatment-as-usual: group care setting)	Pregnancies	ITT	N/A	Medium
Harold et al., 2013	Female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	166	24 months	Control (treatment-as-usual: group care setting)	Depressive symptoms and diagnosis	ITT	N/A	Small to medium
Poulton et al., 2014	Female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	166	24 months	Control (treatment-as-usual: group care setting)	Psychotic symptoms	ITT	N/A	Medium

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Table 3 (*continued*)

Authors	Targeted Population	Sample Size	Length of Follow-up	Randomized Comparison Group	Measurement Strategies	Analytic Framework	Mediating Variable	Effect Size on DV
Fisher, Gunnar, Chamberlain, & Reid, 2000	Children referred for placement in foster home by child welfare system because of one or more placement disruptions and/or highly disruptive behavior	30	3 months	N/A (pilot study)	Parenting strategies, parent/foster stress, child behavior problems and salivary cortisol levels	N/A	N/A	Medium to large
Eddy & Chamberlain, 2000	Male adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	79	24 months	Control (treatment-as-usual: group care setting)	Antisocial behavior construct	ITT	Family management skills, deviant peer association	Medium
Chamberlain, Moreland, & Reid, 1992	Children placed in foster care for at least three months	72	24 months	Control (treatment-as-usual)	Retention of foster families, disruption in placements, child behavior problems, staff impression of parenting practices	ITT	N/A	Small to medium
Chamberlain & Reid, 1998	Male adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	79	12 months	Control (treatment-as-usual: group care setting)	Official records and self-report of criminal referrals, reunification with family members days in locked settings	ITT	N/A	Medium to large
Chamberlain et al., 2008	Children being placed in foster care for the first time, being moved due to disruptive behavior, or returning to foster care from another setting	700	5 months	Control (treatment-as-usual)	Child behavior problems, positive reinforcement practices by parents	ITT	N/A	Small
Rhoades, Leve, Harold, Kim, & Chamberlain, 2014	Female adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	166	9 years	Control (treatment-as-usual: group care setting)	Self-report of illicit drug use	ITT	N/A	Small to medium
Smith et al., 2012	Female adolescents referred by court for out-of-home care due to chronic delinquency, with at least one traumatic experience	30	12 months	Control (treatment-as-usual: group care setting)	Trauma-related mental health symptoms, delinquency, days spent in locked settings	ITT	N/A	Medium
Smith, Chamberlain, & Eddy, 2010	Male adolescents referred by juvenile court judges for out-of-home care due to chronic delinquency	79	18 months	Control (treatment-as-usual: group care setting)	Adolescent self-report of drug and alcohol use	ITT	N/A	Small to medium

having blunted diurnal HPA axis function, with medium effect sizes (Fisher, Stoolmiller, Gunnar, & Burraston, 2007) and produced reductions in caregiver stress (Fisher & Stoolmiller, 2008). Further, the intervention improved placement stability outcomes across a 2-year period and mitigated the risk of multiple prior foster care placements on children's subsequent placement failures (Fisher, Burraston, & Pears, 2006). Compared to TFCO-P children, children receiving regular foster care services were not only 3.6 times more likely to have a permanent placement failure, but children with three or more prior placement failures were at a heightened risk of a permanent placement failure. The probability of a failed permanent placement was approximately three times larger for children in the control condition.

Each of the interventions described here emphasizes the important role of caregiving adults in supervising, nurturing, and managing child and adolescent behavioral, emotional, and functional adjustment. In the case of TFCO, foster parents are in the critical role of providing this support and skill building. Mediational modeling studies have been conducted to verify the theoretical perspective underlying the TFCO model and to demonstrate that specific TFCO program elements act as drivers or mechanisms of change on major intervention targets. For example, Eddy and Chamberlain (2000) found that association with delinquent peers and the availability of parents as supports and mentors predicted subsequent levels of youth delinquent and antisocial behavior regardless of intervention condition (TFCO-A experimental or Group Care control). That is, those youth who were prevented from hanging out unsupervised with delinquent peers and who experienced positive parenting had significantly lower levels of delinquency in follow-up. Unsupervised time with peers occurred less frequently for the youth TFCO-A model than for those in the Group Care (control group) setting, and youth in TFCO-A spent higher quality and more time with mentoring adults. These components partially (and significantly) accounted for the positive treatment effects observed for youth placed in TFCO-A relative to those placed in Group Care settings.

In another example, Leve and Chamberlain (2007) found that girls in TFCO-A spent more time doing homework than girls in Group Care during treatment and that this homework time and school engagement scores significantly predicted the number of days girls spent in locked settings 12 months postbaseline. In other words, keeping girls engaged in school prevented additional criminal behavior and therefore time incarcerated in follow-up

The TFCO began being implemented in the U.S. and in Europe in the early 1990s (see www.TFCO.com for a list of sites). Large-scale implementations with multiple TFCO sites have occurred in England, Sweden, and New York City. In 2000, we partnered with the California Institute for Mental Health (CIMH) to decrease the number of children and adolescents placed in group home settings in California. Group home placements had been shown to be expensive and to result in poor outcomes (Marsenich, 2002). CIMH obtained foundation funding to pay for 10 counties to receive training in TFCO as an alternative to placing youth in-group homes. Our experiences working with these counties, who were well resourced and experienced with innovation, encouraged us to think about how we could engage and motivate non–early adopting counties to implement. At the same time, CIMH was looking for ways to provide technical assistance and support to counties implementing EBPs with the goal of increasing the reach, fidelity, and sustainability of EBPs in California. To do this, they developed a peer-to-peer learning model called the Community Development Team (CDT). The CDT operates through multicounty development team meetings where a group of six to seven counties share experiences and engage in problem solving about implementation barriers together. Key stakeholders from each of the counties participate in CDT meetings. Stakeholders are drawn from multiple levels (system leaders, organization/agency directors, practitioners) to participate in the CDT meetings (Sosna & Marsenich, 2006). Next, with funding from NIMH, we tested the effectiveness of implementing TFCO using the CDT model compared to "implementation as usual" (with counties implementing TFCO singly) in 51 counties in California and Ohio. Counties were randomly assigned to implementation condition (CDT or implementing singly). We found that CDT had advantages in that it resulted in the eventual placements of more than double the number of youth in to TFCO programs (Brown et al., 2014).

An Integrative Public Health Framework

As the science of behavioral family interventions improved over the past four decades, there was a gradual increase in the demand for implementing in real-world service settings with a focus on reducing problem behavior. This transition from program development to real-world implementation, however, has been a serious challenge for the field in general. For example, it is estimated that about 10% of the providers in settings that serve children and families are adopted with the fidelity intended by the original program developers (O'Connell, Boat, & Warner, 2009; Biglan, 2015). Based on our research as well as that of the field, we suggest progress for large-scale

reductions in the prevalence of child and adolescent problem behavior (antisocial behavior, substance use, delinquency, and violence) will benefit from deep integration of family-based prevention and treatment strategies in the context of child welfare, juvenile justice, and the public education system. We suggest the application of three basic behavioral science principles that could be applied to this end.

The first is the *contagion principle*, which specifies that children and adolescents often escalate problem behaviors in the company of peers in settings without skillful adult leadership (Dishion & Tipsord, 2011, for review). Direct observations of children on the public school playground as early as age 5 (Snyder et al., 2006) as well as within adolescent friendships (Dishion & Patterson, 1996) revealed a process of deviancy training involving peer reinforcement for deviant talk that leads to escalations in problem behavior and violence (see Dishion, in press; Piehler, in press). A lack of awareness of the contagion principle can lead to the unfortunate outcome of spending resources on programs and intervention strategies that inadvertently increase the problem behaviors that potentially undermine youth development (see Dodge, Dishion, & Lansford, 2006, for a review).

The contagion principle is most compelling when considering conventional rehabilitation strategies within juvenile justice and child welfare. For example, in studies reviewed above, the effectiveness of TFCO-A in reducing repeat offending among multiple offenders was mediated by youths' exposure to unsupervised peer settings in group homes and residential treatment (see Leve & Chamberlain, 2005). This finding is consistent with early work on juvenile correction facilities, showing the ratio of positive reinforcement of peers compared to adults in the institution was 9 to 1 (Buehler, Patterson, & Furniss, 1966). It is challenging in many residential settings to adequately establish an environment where the good intentions of staff compete with the tendency of youth in peer groups to reinforce and learn new forms of problem behavior. Careful longitudinal studies that collected data on children before they committed offenses have confirmed suspicions that juvenile correction facilities (institutions, lock ups, group homes) do more harm than good. For example, research by Gatti, Tremblay, and Vitaro (2009) following youth in the Montreal prevention trial revealed that there was an iatrogenic effect of juvenile correction facilities, in that youth who spent time in juvenile corrections were more likely to reoffend with serious offenses in adulthood, controlling for their differences in their problem behavior in adolescence. Moreover, systematic studies of youth in Florida juvenile corrections revealed youth tended to reoffend with the same crime as their inmate peers after released, controlling for their behavior at entry (Bayer, Hjalmarsson, & Pozen, 2009). Clearly youth learn behaviors within institutions that contribute to the chronicity of their problem behavior, which further undermines opportunities for dropping out of criminal behavior as well as drug-using and selling lifestyles.

In this sense, larger units (e.g., states) are in a position of reducing and possibly eliminating expensive residential facilities that aggregate high-risk youth in public schools, child welfare, and juvenile justice. Correctional facilities would be needed far less if more effective family-centered prevention and intervention strategies like FCU, PMTO, and TFCO were adopted. In the context of randomized trials these interventions find decreases in arrests, changes in placements, and reduced time in locked-down facilities through adolescence. Reduction of time in juvenile corrections predicts reduced time in the very expensive adult prison system.

The second principle is *data-based monitoring and decision-making*, a cornerstone of behavioral approaches to treatment in general, but behavior family therapy in particular (Chamberlain & Reid, 1998; Kolko, 1996). At a larger scale, optimizing organizational and community strategies for improving youth lives and reducing problem behaviors benefits from data-driven decision-making with periodic monitoring (see also Fixsen, Blase, Metz & Van Dyke, 2013; Mrazek, Biglan, Hawkins, & Cody, 2007). In our collective work, well-intentioned implementations may fail if the appropriate leadership structure is not in place. In an implementation study of the FCU model in 41 public middle schools, engagement of high-risk families within the public middle school context was not supported at the district level. Therefore, the efforts of school principals to monitor and support the use of parenting supports in schools went unnoticed, and therefore, often languished. A monthly report of the proportion of high-risk students with each school with family behavior support would likely improve leadership support as well as student outcomes (Dishion et al., under review). Alternatively, the experiences described above in Norway, Sweden, Michigan, California, and New York had strong leadership support, periodic monitoring of implementation outcomes, and accordingly, have progressed with respect to increasing the number of providers using the evidence-based practices as well as child outcomes.

The third key principle is *shaping competent adherence* to the evidence-based practices. Shaping involves the differential reinforcement for successive approximations of a skill, commonly used with

clinical success in behavioral interventions. However, shaping is less often used in the context of professional development of advanced skill sets. The early work on client resistance described above suggested that the clinical skill of the provider is critical to the change process. Direct observations of therapists' competent adherence in sessions predicts changes in parenting practices, which in turn predicts improvement in youth outcomes in both FCU and PMTO (Forgatch et al., 2013; Forgatch & DeGarmo, 2011; Smith et al., 2014). This finding has two implications. The first is that competent adherence requires motivation and effort of the provider, and as such, shaping successive approximations when coaching this skill set is critical to therapists becoming fluid in a behavioral model. If clinician competence is assumed or neglected through lack of training and support, effect sizes will suffer, especially working with families with children showing problem behavior (Ogden, Forgatch, Askeland, Patterson, & Bullock, 2005; Weiss, Catron, Harris, & Phung, 1999). Second, therapists and supervisors who use evidence-based practices benefit from professional support in terms of acknowledgement and salary for mastering a skill-set that is conducive to family change. Most evidence-based practices require more than a modicum of patience and skill to effectively deliver, as well as study, practice, role-play and openness to supervisory feedback. It is likely that the supervisory context is one among several pillars that support the implementation of evidence-based practices for children and families (Dishion & Stormshak, 2007) and these support systems need to be in place to deliver and sustain effective prevention and treatment services that are scientifically derived.

INTEGRATED FAMILY SUPPORT WITHIN PUBLIC SCHOOLS

So far we have reviewed a history of divergent development since the publication of Patterson, Chamberlain, and Reid (1982). Although the FCU, PMTO, and TFC-O arose within the Oregon group, the intervention models were tested and refined independently. At this juncture, it is beneficial to consider the benefits of integrating the models within one service system within a community to reduce the prevalence of problem behavior and to promote healthy development. The public school system is a promising venue for integration, as all children are ostensibly served and educated, despite their involvement in child welfare, juvenile justice, community mental health, and foster care.

At present, school district leadership typically adopt evidence-based intervention programs for high-risk children and families in an *uncoordinated* approach, and depending on the structure of the school district, each school can shop for the program that best fits the needs of the staff as well as the perceived needs of the students and parents. Often schools have multiple programs running at the same time. Therefore, school staff have difficulty tracking the procedures and processes of each evidence-based program. Staff meetings are often held in the "program graveyard," including stacks of previously adopted and abandoned intervention programs, many of which are evidence based. The problem is not the availability of interventions that are evidence based, it is one of coordination of intervention strategies in such a way as to not disrupt the workflow of the educational environment.

To scaffold decisions on evidence-based adoption, training, and implementation, some alternative approaches have emerged. Exemplary is the PROSPER diffusion model for EBI's for children and families (see Spoth, Redmond, Shin, & Azevedo, 2004). Within the PROSPER framework, the Cooperation Extension System (CES) serves as a venue for seed-funding initial efforts to initiate program adoption, training, and implementation over time, resulting in sustainable efforts to promote evidence-based family-centered prevention programs within schools. For example, the Strengthening Families parent groups were disseminated within schools within the CES venue and found to be a cost-effective prevention strategy (Crowley, Jones, Greenberg, Feinberg, & Spoth, 2012). However, this approach focuses purely on primary prevention within the context of public schools. Thus, universal support for parents is provided in parent groups that meet after school, often involving a select group of families willing to attend regularly. Despite the limited reach, this approach has been found to produce robust prevention effects on multiple forms of substance use (e.g., Spoth, Redmond, Hockaday, & Shin, 1996).

The focus on family support within school systems is synergistic to effective school practices such as Positive Behavior Intervention Support (Crone & Horner, 2003) or the Good Behavior Game (Poduska et al., 2008). Effective family support, however, requires engagement of families of high-risk students as well as integration into other student support services (Dishion, 2011). It is noteworthy that about 50% of the juvenile offences are committed by 5% of the youth and families (Farrington, Loeber, & Van Kammen, 1990). Similarly, the vast majority of the discipline contacts in schools involve only 5% to 10% of the student population (Crone & Horner, 2003). Invitations to parent groups are unlikely to engage the families most in need of services (Szapocznik et al., 1988). For example, in one community sample of youth, less than half of the persistent juvenile offenders

had sought help by age 18 for the problem behavior, despite the long history of juvenile justice offenses and behavior problems in school and in the community (Stouthamer-Loeber & Loeber, 2002). By extension based on the prevalence of community service settings using EBIs (O'Connell, Boat, & Warner, 2009), less than 5% of the persistent juvenile offenders likely had exposure to an evidence-based family intervention. In this sense, the failure to coordinate and track youth within a public school venue means a lost opportunity for prevention and treatment. In this sense, it is precisely the highest risk youth who may slip through the cracks, eventually cascading to more serious levels of problem behavior.

THE AIM FAMILY SUPPORT SYSTEM

There is clear and dire need for an integrated approach to prevention and treatment of student problem behavior as well as emotional stress with family support in public schools. There are three functions that need to be addressed to provide effective support to the children and families on the risk continuum. The first is systematic and cost-effective assessment and screening. It is relatively simple to screen for antisocial behavior and emotional distress in children and adolescents. Several researchers have built on the multistage assessment strategies originally formulated by Cronbach and Gleser (1965). A multiple gating strategy was suggested (Loeber, Dishion & Patterson, 1984) and later refined for elementary school (Walker & Severson, 1990). In these multistage approaches, teachers and parents are administered brief screens to identify youth at low risk for problem behavior or persistent emotional distress (depression, anxiety). The remaining group is then reassessed by another agent (parent or teacher) and again, youth at low risk are screened out. This procedure of systematically ruling out low-risk youth is often referred to as multiple gating, and has shown to be quite effective in identifying a very small subgroup with high rates of problem behavior and substance use (Dishion & Patterson, 1993).

The second function of a family support system is to provide the appropriate level of intervention support for the youth and families. Although assessment protocols can be useful to identify those most in need of intervention support, it is often the case that the risk status of a family may change quickly. Thus a team of intervention staff is needed to navigate multiple risk needs of families (see Figure 2) and minimize the need for seeking referrals with agencies. In the most severe form of family disruption, treatment foster care may be necessary, providing youth with a safe and effective treatment context while also providing parenting support with the family caregivers. Rather than hope that there is an evidence-based treatment foster care service available, the integrated service team can respond without outside referrals.

The third function of an integrated service system is monitoring intervention progress and decreasing or increasing support based on response to the intervention (Fuchs & Fuchs, 2006). In our early work, we used parents' daily telephone reports as a tool for monitoring intervention progress (Chamberlain & Reid, 1991). The three functions—assessment, intervention and monitoring—can be coordinated with the AIM Family Support System, combining FCU, PMTO, and TFC-O, as shown in Figure 3. Seamless integration of the FCU, PMTO, and TFC-O within a school district potentiates substantial benefits over deploying the three models independently. The following are the list of potential benefits:

1) Redundancy in the behavior support strategies at all tiers of the family service.
2) Accurate and rapid assorting of families into the appropriate level of support, making it less likely that parents are receiving too brief or too intensive an intervention.
3) Continuity of educational engagement and school retention, by minimizing the need for disruptions due to residential treatment.
4) Reduce the likelihood of placement into programs or school settings that aggregate high-risk students, which, under some

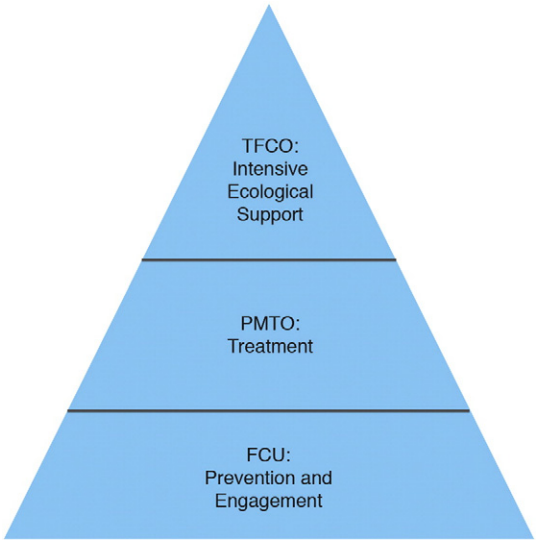

FIGURE 3 Towards a cost-effective, coordinated, comprehensive community support system for children and families.

conditions, may lead to problem behavior contagion.
5) Reduce need to change schools due to temporary treatment foster care reduces disruption of educational progress.
6) Parents would be less likely to fall out of contact with services during the referral process (e.g., from PMTO to TFC-O). For example, completers of TFC-O that may still need support at a lower level could be seamlessly transitioned to continuing PMTO, and completers of PMTO could be transitioned to annual FCUs to monitor for possible deterioration in skills.
7) The development of parenting skills across different levels of need and support services could be seamlessly tracked to refine intervention strategies and promote data-based monitoring and decision-making.
8) Substantially reduced implementation costs due to training, quality of implementation oversight, training and retraining as well as a unified tracking and billing.

In summary, efforts to systemically link effective behavioral interventions within service settings that serve an entire school district are likely to be more effective, less costly, and more sustainable than any single intervention delivered individually (Chamberlain, Wolf-Feldman, Wulczyn, Saldana & Forgatch, under review). In this sense, we are perhaps ready to move beyond our previous focus on clinical outcomes to a broader focus on community well-being (Biglan, 2015). The AIM Family Support System is an example of a service system that is accountable for improving outcomes but also provides efficient coordination of behavioral interventions for families most likely to succeed. The progress in behavioral family therapy over the past three decades is remarkable. A clinically effective but narrowly defined intervention for outpatient clinics serving families with children with manifest problem behavior has evolved into a range of complementary interventions that can be embedded in service systems that reach thousands of youth and families. Early models for the development of problem behavior served as a useful guide to intervention design and testing. What is now needed are models for implementation that can bring about systemic change to reduce the prevalence of child and adolescent problem behavior and eliminate ineffective, expensive, or iatrogenic prevention and treatment services.

Conflict of Interest Statement

Dr. Chamberlain is a partner in TFC Consultants, which disseminates TFCO.

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