

# Research on Social Work Practice

<http://rsw.sagepub.com/>

---

## **Adapting Parent–Child Interaction Therapy to Foster Care: Outcomes From a Randomized Trial**

Joshua P. Mersky, James Topitzes, Stacey D. Grant-Savelle, Michael J. Brondino and Cheryl B. McNeil

*Research on Social Work Practice* published online 18 July 2014

DOI: 10.1177/1049731514543023

The online version of this article can be found at:

<http://rsw.sagepub.com/content/early/2014/07/16/1049731514543023>

---

Published by:



<http://www.sagepublications.com>

**Additional services and information for *Research on Social Work Practice* can be found at:**

**Email Alerts:** <http://rsw.sagepub.com/cgi/alerts>

**Subscriptions:** <http://rsw.sagepub.com/subscriptions>

**Reprints:** <http://www.sagepub.com/journalsReprints.nav>


**Permissions:** <http://www.sagepub.com/journalsPermissions.nav>

**Citations:** <http://rsw.sagepub.com/content/early/2014/07/16/1049731514543023.refs.html>

>> [OnlineFirst Version of Record](#) - Jul 18, 2014

[What is This?](#)

# Adapting Parent–Child Interaction Therapy to Foster Care: Outcomes From a Randomized Trial

Research on Social Work Practice  
1-11  
© The Author(s) 2014  
Reprints and permission:  
sagepub.com/journalsPermissions.nav  
DOI: 10.1177/1049731514543023  
rsw.sagepub.com  


Joshua P. Mersky<sup>1</sup>, James Topitzes<sup>2</sup>, Stacey D. Grant-Savelle<sup>2</sup>,  
Michael J. Brondino<sup>2</sup>, and Cheryl B. McNeil<sup>3</sup>

## Abstract

**Objective:** This study presents outcomes from a randomized trial of a novel Parent–Child Interaction Therapy (PCIT) model for foster families. Differential effects of two intervention doses on child externalizing and internalizing symptoms are examined. **Method:** A sample of 102 foster children was assigned to one of three conditions—brief PCIT, extended PCIT, or wait-list control. The brief and extended groups received 2 days of PCIT training and 8 weeks of telephone consultation. The extended PCIT group received an additional booster training plus 6 more weeks of consultation. Wait-list controls received services as usual. Tests of change over time were estimated using mixed-model repeated measures analysis of covariance. **Results:** Compared to controls, children in both PCIT groups exhibited a greater reduction in externalizing and internalizing scores over time. Pairwise contrasts of the two PCIT conditions yielded mixed results. **Conclusion:** Results indicate that PCIT can be tailored efficaciously for foster families using alternative treatment modalities.

## Keywords

foster care, Parent–Child Interaction Therapy, mental health, intervention, translational research

## Introduction

Children placed in foster care are at a high risk of mental health problems due to their history of adverse experiences such as abuse, neglect, and separation from parents and other attachment figures. Although up to 80% of foster children exhibit emotional and behavioral difficulties, they seldom receive empirically validated mental health services (Garland et al., 2001; Horwitz et al., 2012; Keil & Price, 2006; Leslie et al., 2005). The mental health needs of young children in foster care are particularly likely to go unmet (Burns et al., 2004; Zeanah, Shauffer, & Dozier, 2011), despite the fact that untreated early disturbances forecast later disorders that tend to be more difficult and costly to remedy (Foster & Jones, 2005; Knapp, Scott, & Davies, 1999; Nock, Kazdin, Hiripi, & Kessler, 2007; Pihlakoski et al., 2006).

There are a number of well-validated mental health treatments from which young foster children could benefit. Some of the most successful approaches center on parent training, and those that include live parent coaching and interactive parent–child activities are especially efficacious (Eyberg, Nelson, & Boggs, 2008; Kaminski, Valle, Filene, & Boyle, 2008). While enhancing child mental health, parent training interventions are known to have lasting impacts on parenting attitudes and practices as well as parent–child interactions (Lundahl, Nimer, & Parsons, 2006; Maughan, Christiansen, Jenson,

Olympia, & Clark, 2005; Reyno & McGrath, 2006). Yet foster parents rarely receive experiential, applied parent training with their foster children; the trainings foster parents attend are typically didactic, adult-centered, and lacking empirical support (Barth et al., 2005; Festinger & Baker, 2013; Rork & McNeil, 2011).

Parent–Child Interaction Therapy (PCIT) is a particularly promising parent training intervention that has the potential to improve the mental health of foster children and the parenting of their substitute caregivers. An outgrowth of the parent management training model (Kazdin, 2005), PCIT targets coercive cycles of parent–child interaction that reinforce child behavior problems. According to Patterson’s coercion theory, children with externalizing problems elicit attention through aversive behavior, which caregivers reinforce with coercion

<sup>1</sup>Jane Addams College of Social Work, University of Illinois at Chicago, Chicago, IL, USA

<sup>2</sup>Helen Bader School of Social Welfare, University of Wisconsin-Milwaukee, Milwaukee, WI, USA

<sup>3</sup>Department of Psychology, West Virginia University, Morgantown, WV, USA

## Corresponding Author:

Joshua P. Mersky, University of Illinois at Chicago, Jane Addams College of Social Work, 1040 W. Harrison St., EPASW 4246, Chicago, IL 60607, USA.  
Email: mersky@uic.edu

or capitulation (Granic & Patterson, 2006). Drawing on attachment and social learning principles, PCIT helps caregivers to modify their attitudes toward parenting and develop behavior management skills that alter parent-child exchanges and shape child behaviors (Eyberg, 1988).

PCIT is structured according to the two-stage Hanf treatment model. In Stage 1, child-directed interaction (CDI), a parent and child interact as a clinician provides instruction to promote authoritative parenting and positive parent-child interactions (McNeil & Hembree-Kigin, 2010). The parent is asked to follow the child's lead in play activities while providing consistent attention, affection, and guidance (e.g., verbal reflection, imitation, and praise). The clinician facilitates this process through direct coaching, modeling, role play, and didactic instruction. By learning to reshape and reinforce interaction patterns with the child, the parent fosters prosocial child behaviors. In the second phase of treatment, parent-directed interaction (PDI), therapists use instructional techniques to help parents develop effective discipline and behavior management skills (McNeil & Hembree-Kigin, 2010). Building on the mastery of skills learned through CDI, this phase is designed to minimize coercive processes by establishing consistent contingencies for the child's behavior.

Research compiled over three decades has shown that PCIT is associated with significant and enduring impacts on externalizing problems among children ages 2–7 years (for review, see Thomas & Zimmer-Gembeck, 2007). Emerging evidence suggests that PCIT may reduce internalizing problems as well (Bagner, Sheinkopf, Vohr, & Lester, 2010; Brendel & Maynard, *In press*; Chase & Eyberg, 2008; Luby, Lenze, & Tillman, 2012). In addition, PCIT has been shown to enhance parenting attitudes and skills along with parent-child interactions while reducing caregiver stress and child abuse potential (Thomas & Zimmer-Gembeck, 2007, 2012). Multiple studies have replicated these results with child welfare service recipients (Chaffin et al., 2004, 2009; Timmer et al., 2011), including children in foster care (McNeil, Herschell, Gurwitch, & Clemens-Mowrer, 2005; Timmer, Urquiza, & Zebell, 2006).

Even with its recognition as an empirically supported intervention for maltreated children (Chaffin & Friedrich, 2004; Thomas & Zimmer-Gembeck, 2012), PCIT has gained little traction in the foster care system. There are predictable barriers to assimilating clinical treatments like PCIT into services for foster children, including a lack of qualified mental health professionals (Burns et al., 2004; Horwitz, Chamberlain, Landsverk, & Mullican, 2010). Agencies may be dissuaded from investing in PCIT due to the initial costs and burden of training staff and reconfiguring services plus the ongoing costs of implementing a model that averages 12–14 weekly clinic sessions. Foster parents also may find it difficult to fulfill a treatment regimen of this intensity and duration, especially given that they often care for multiple children (Price, Chamberlain, Landsverk, & Reid, 2009).

This study presents initial results from an ongoing randomized trial of a PCIT model that was designed to improve the accessibility and convenience of services for foster families

and increase the probability of PCIT being integrated into standard care. Expanding on a small, nonexperimental study (McNeil et al., 2005), we adapted PCIT in such a way that it could be implemented in a group-based format that is conventional for foster parent training. Eligible foster families were randomly assigned to a wait-list control condition or to one of two treatment conditions: (1) brief PCIT comprised of two full-day trainings plus 8 weeks of telephone consultation and homework; (2) extended PCIT comprised of three full-day trainings and 14 weeks of phone consultation and homework. Because the two treatment conditions received the same services for different durations, we are able to estimate dosage effects. Consistent with the treatment goals of PCIT, child externalizing behaviors represent our primary outcomes of interest. We also extend research on PCIT by examining intervention effects on internalizing symptoms. Two research questions are investigated:

**Research Question 1:** Compared to wait-list controls that received services as usual, do children who received PCIT exhibit significantly reduced externalizing and internalizing symptoms over time?

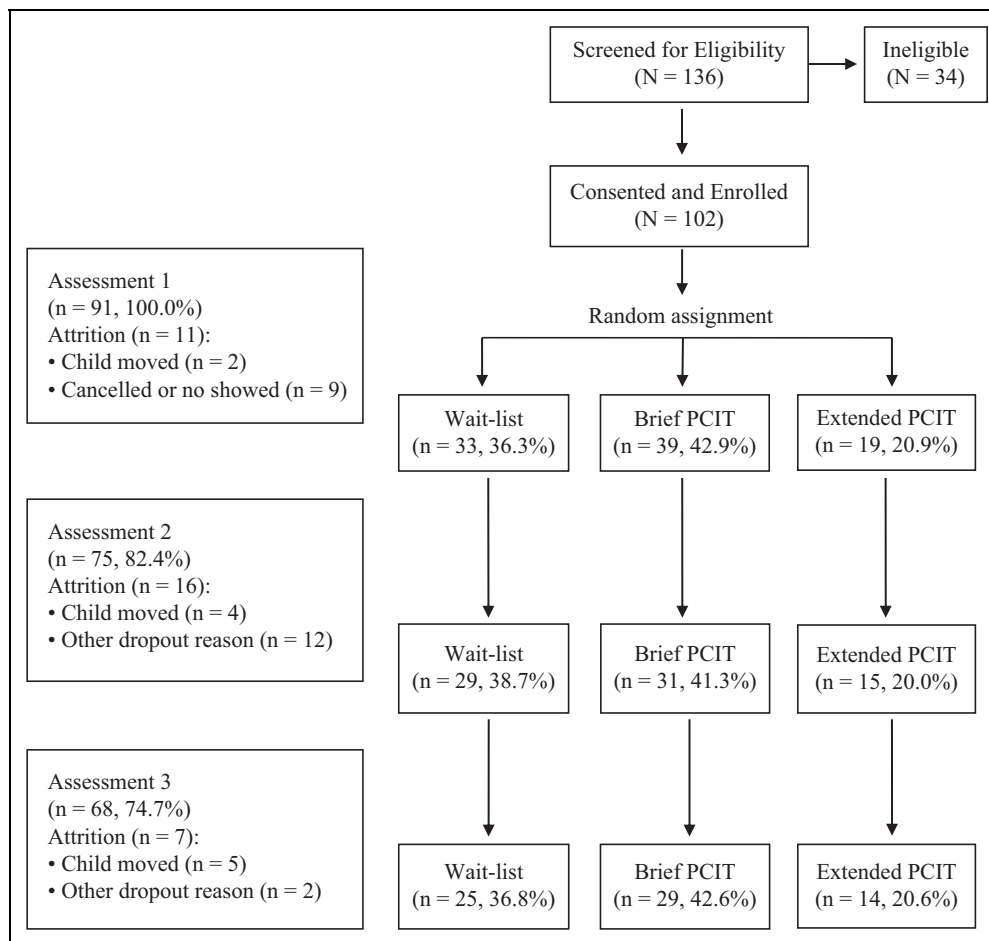
**Research Question 2:** Do the symptoms of children who received extended PCIT (i.e., three trainings plus 14 weeks of in-home services) differ significantly over time from children who received an abbreviated course of PCIT (i.e., two trainings plus 8 weeks of in-home services)?

## Method

### Participants

Study procedures were approved by the Institutional Review Board at the University of Wisconsin-Milwaukee (Federal Wide Assurance 00006171) prior to engaging human subjects. From September 2011 to March 2013, potentially eligible foster families were identified from child welfare case records along with referrals from agency personnel. Eligibility was confirmed through direct outreach initiated by the research team. Children qualified for the study if they were (a) between 3 and 6 years old, (b) placed in a licensed, nonrelative foster home, and (c) in the clinical range for externalizing problems on the Eyberg Child-Behavior Inventory (ECBI) according to foster parent ratings. Children with intellectual, physical, or pervasive developmental disabilities such as autism, deafness, or blindness were ineligible for the study. Cases nearing adoption or reunification were also excluded to reduce attrition due to predictable placement change. Only one eligible child per foster family was enrolled to reduce threats to group equivalence such as diffusion and burden. Children were not excluded for prior or current receipt of mental health and psychosocial services or psychotropic medication. No participants had received PCIT prior to enrollment.

As shown in Figure 1, recruitment and referrals produced a total of 136 children in the appropriate age range who resided with a licensed, nonrelative foster parent. Reflecting the demographics of the population served by the child welfare system in the metropolitan area, over 70% of children in the sample were



**Figure 1.** Enrollment, randomization, and attrition flowchart.

racial and ethnic minorities (61% African American). Sample children averaged 4.6 years of age, and 54% were female. The mean number of children per household was 2.96 (including nonfoster children). The vast majority of foster parents identified as the child's primary caregiver were female (89%). Roughly half of these caregivers were racial and ethnic minorities (51%) and were married (52%). Their median length of experience as a foster parent was 2 years (24.0 months).

Research staff administered the ECBI as a screener to determine if, based on foster parent ratings, foster children met the clinical threshold for externalizing problems. In total, 102 families consented to participate in the study; the majority of the 34 families who did not enroll had a foster child who fell below the clinical range on the ECBI Problem or Intensity subscales. The remaining parents declined to participate due to emerging schedule conflicts or loss of interest. Consenting families were randomly assigned to one of three study conditions (see Procedures subsection).

Eleven enrolled families dropped out of the study before completing a baseline assessment. Of the 91 families who completed a baseline assessment, 16 dropped out of the study before completing a post-baseline assessment. The most common reasons for dropout at this stage were change in child placement or loss of contact due to caregiver nonresponse.

Analyses for the present study included all subjects who completed a post-baseline assessment, resulting in an effective sample size of 75 and a retention rate of 73.5%. Seven families dropped out of the study after the second assessment, resulting in 68 completers of the third and final assessment. Rates of attrition were comparable across all groups (range = 24–26%).

### Procedures

After obtaining informed consent from their caregivers, foster children were randomly assigned to one of three study groups (see Interventions subsection): wait-list control (G0), brief PCIT (G1), or extended PCIT (G2). Assignment proceeded in waves (i.e., cohorts), and for each wave subjects were randomly allocated to either wait-list control or to one of the two treatment groups. This staggered approach to assignment was designed to populate each PCIT workshop with up to eight families, thereby maintaining an appropriate staff–client ratio. Despite alternating between brief and extended PCIT cohorts, there is an imbalanced allocation between treatment groups (see Figure 1) for two reasons: (1) the study began with a brief PCIT cohort and (2) two recently enrolled extended PCIT cohorts were excluded from this analysis because they had not yet completed the study.

Participating parent–child dyads then completed a baseline assessment comprised of parent self-report measures and an observational protocol to record parent–child interactions. At 8 weeks post-baseline, caregivers were asked to complete the same self-report measures by mail. After 14 weeks of study participation, parent–child dyads were scheduled to complete the self-report and observational assessments again. As compensation for their time and transportation, foster parents received gift cards of US\$10 to US\$20 in value depending on the duration of the assessment. Parents in the treatment groups also received US\$50 to US\$90 for completing PCIT workshops and in-home practice as well as for transportation. For completing PCIT trainings, parents also received credit toward their annual training requirements.

### Instruments

**Demographic questionnaire.** A foster parent questionnaire was developed to gather household demographic information, including age, sex, race/ethnicity, number of children and adults in the home, marital/relationship status, occupation, and education level.

**Eyberg Child Behavior Inventory (ECBI).** The ECBI (Eyberg & Pincus, 1999) is a 36-item instrument that measures children's (ages 2–16) problem behaviors and the extent to which caregivers find the behaviors difficult to manage. The ECBI yields an Intensity Scale that indicates the frequency of a child's problem behaviors, and a Problem Scale that indicates parent tolerance and distress associated with the behaviors. Among representative samples, the ECBI has been shown to have good properties of test–retest reliability ( $\alpha = .86-.88$ ), internal consistency ( $\alpha = .88-.95$ ), and concurrent validity with other validated measures (Boggs, Eyberg, & Reynolds, 1990; Rich & Eyberg, 2001). The ECBI also has demonstrated sound reliability and validity with African American and Latino samples (Gross et al., 2007).

**Child Behavior Checklist (CBCL).** The CBCL (Achenbach & Rescorla, 2001) is a widely used, standardized measure of child emotional and behavioral problems. Foster parents with a child less than age 6 at enrollment completed the CBCL for ages 1.5 to 5, and parents with a child aged 6 at enrollment completed the CBCL for ages 6 to 18. The CBCL/1.5-5 consists of 99 items allocated to seven subscales, and the CBCL/6-18 consists of 118 items allocated to eight subscales. Both versions of the CBCL produce two broadband scales—externalizing problems and internalizing problems—that have demonstrated strong psychometric properties in prior research with various domestic and international populations (Ivanova et al., 2010; Rescorla et al., 2011).

### Interventions

Replacing its traditional clinic-based format, PCIT was implemented using two novel modalities: group-based training and

telephone consultation. Foster parents who were assigned to treatment attended PCIT trainings at a child welfare agency with their foster children and other foster parent–child dyads. The principles and skills learned in the PCIT workshops were reinforced with periodic telephone consultation and daily homework exercises, activities that aimed to promote rapport between clinician and caregiver, increase treatment adherence, and generalize skills to the home environment.

Both the brief PCIT and extended PCIT groups (G1 and G2) initially received 14 hours of intensive training over 2 days. A typical workshop included 4–8 parent–child dyads. Day 1 commenced with didactic instruction provided by a lead PCIT clinician who introduced parents to Child-Directed Interaction (CDI), the first of two PCIT phases. At this time, children engaged in activities with child care providers in separate rooms. Afterward, children and caregivers were reunited in a group setting to practice CDI exercises facilitated by PCIT-trained graduate students enrolled in a Title IV-E child welfare training program. On a rotating basis, each parent–child dyad was directed to a private clinical room to engage in CDI with the lead clinician for 20 minutes. In keeping with standard PCIT, the clinician observed each dyad through a two-way mirror from an adjacent room and coached the foster parent using a bug-in-the-ear communication device. A parent from a different family also joined the clinician to watch the session, providing an occasion for observational learning. After completing the session, the observing parent moved to the clinical room to engage in active coaching with her foster child while the outgoing parent transitioned to the observation room to watch the session. This rotational process continued throughout the day, interspersed with respite periods, until all parent–child dyads completed at least two clinical coaching sessions. The training day then adjourned with a group discussion to consolidate knowledge and skills.

Day 2 of the workshop resembled the first day in structure, commencing with didactic instruction, followed by experiential exercises, and ending with group discussion. Day 2 focused on parent directed interaction (PDI), the second PCIT phase during which the caregiver learns behavior management and positive discipline skills. During the closing group discussion, parents were prepared for the next phase of the intervention involving in-home practice (i.e., homework) coupled with telephone consultation provided by PCIT clinicians.

After completing the 2-day workshop, caregivers from both experimental conditions were asked to complete daily homework exercises and engage in PCIT phone consultation for 8 weeks. Telephone contact was scheduled weekly for 4 weeks followed by biweekly contact for another 4 weeks. Along with ongoing monitoring and guidance, these 15–20 minute sessions were used to refresh parents' knowledge of PCIT principles, review progress, and prepare for PCIT homework activities. Following standard PCIT procedures, parents were asked to devote 5 minutes daily to practicing PCIT skills. Following usual PCIT protocol, homework was used to bolster group training, promote overlearning and mastery, and help to ensure that skills were applied in the home.



**Table 1.** Mixed Model Analyses of Covariance (ANCOVAs) Comparing Mean Externalizing and Internalizing Scores.

Outcomes	Wait-List Control (G0)		Brief PCIT (G1)		Extended PCIT (G2)		Omnibus Test <sup>a</sup>	Pairwise Contrasts			
	M	SE	M	SE	M	SE		(G0 vs. G1 + G2) <sup>b</sup>		(G1 vs. G2) <sup>c</sup>	
								Linear	Quadratic	Linear	Quadratic
ECBI intensity											
Time 1	158.2	6.01	164.7	5.54	160.7	8.33					
Time 2	148.7	6.15	128.0	5.67	133.8	8.33	$p = .012$	$p = .060$	$p = .030$	$p = .536$	$p = .128$
Time 3	134.0	6.38	126.6	5.98	118.2	8.74	ES = .11	ES = .03	ES = .04	ES = .00	ES = .02
ECBI problem											
Time 1	23.6	1.35	23.4	1.24	22.3	1.86					
Time 2	20.2	1.51	11.9	1.35	10.8	1.97	$p < .001$	$p = .006$	$p = .004$	$p = .111$	$p = .363$
Time 3	14.3	1.50	10.6	1.38	5.4	2.03	ES = .18	ES = .06	ES = .07	ES = .02	ES = .01
CBCL externalizing											
Time 1	25.2	1.88	28.0	1.74	27.9	2.61					
Time 2	24.5	1.89	19.7	1.72	22.3	2.61	$p < .001$	$p < .001$	$p = .084$	$p = .216$	$p = .045$
Time 3	22.8	1.92	20.4	1.79	17.2	2.74	ES = .17	ES = .09	ES = .02	ES = .01	ES = .03
CBCL internalizing											
Time 1	17.3	2.01	20.3	1.84	20.9	2.83					
Time 2	16.1	2.02	11.5	1.83	19.8	2.78	$p < .001$	$p = .002$	$p = .735$	$p = .898$	$p < .001$
Time 3	15.0	2.05	11.8	1.90	12.1	2.92	ES = .21	ES = .08	ES = .00	ES = .00	ES = .10

Note. Coefficients are least squares means. *M* = mean; *SE* = standard error. *ES* = effect size reported as  $R^2$

<sup>a</sup>Omnibus interaction tests of study condition by time.

<sup>b</sup>Interaction contrasts comparing linear and quadratic trends of wait-list controls (G0) to the average of treatment conditions (G1 and G2).

<sup>c</sup>Interaction contrasts comparing linear and quadratic trends of the two treatment conditions (G1 vs. G2).

After receiving two full-day PCIT trainings and 8 weeks of in-home services, the intervention ceased for brief PCIT groups while extended PCIT groups continued to receive services. Parent-child dyads in G2 attended a 1-day booster training focused on PDI skills, which tend to be more difficult than CDI skills to master. G2 also completed 6 more weeks of homework and biweekly telephone consults. In total, G1 was asked to complete 2 days of group training and 8 weeks of in-home services, and G2 was asked to complete 3 days of group training and 14 weeks of in-home services.

Participants who were not assigned to treatment entered a wait-list control group (G0). Foster parents in the control condition continued to receive their usual services, including case management and standard parent training. Foster children in G0 also continued to receive standard care options designated by their case plan, including medication and other mental health services such as play therapy. After completing their final assessment at 14 weeks post-baseline, wait-list controls were eligible to attend PCIT workshops.

### Analysis Plan

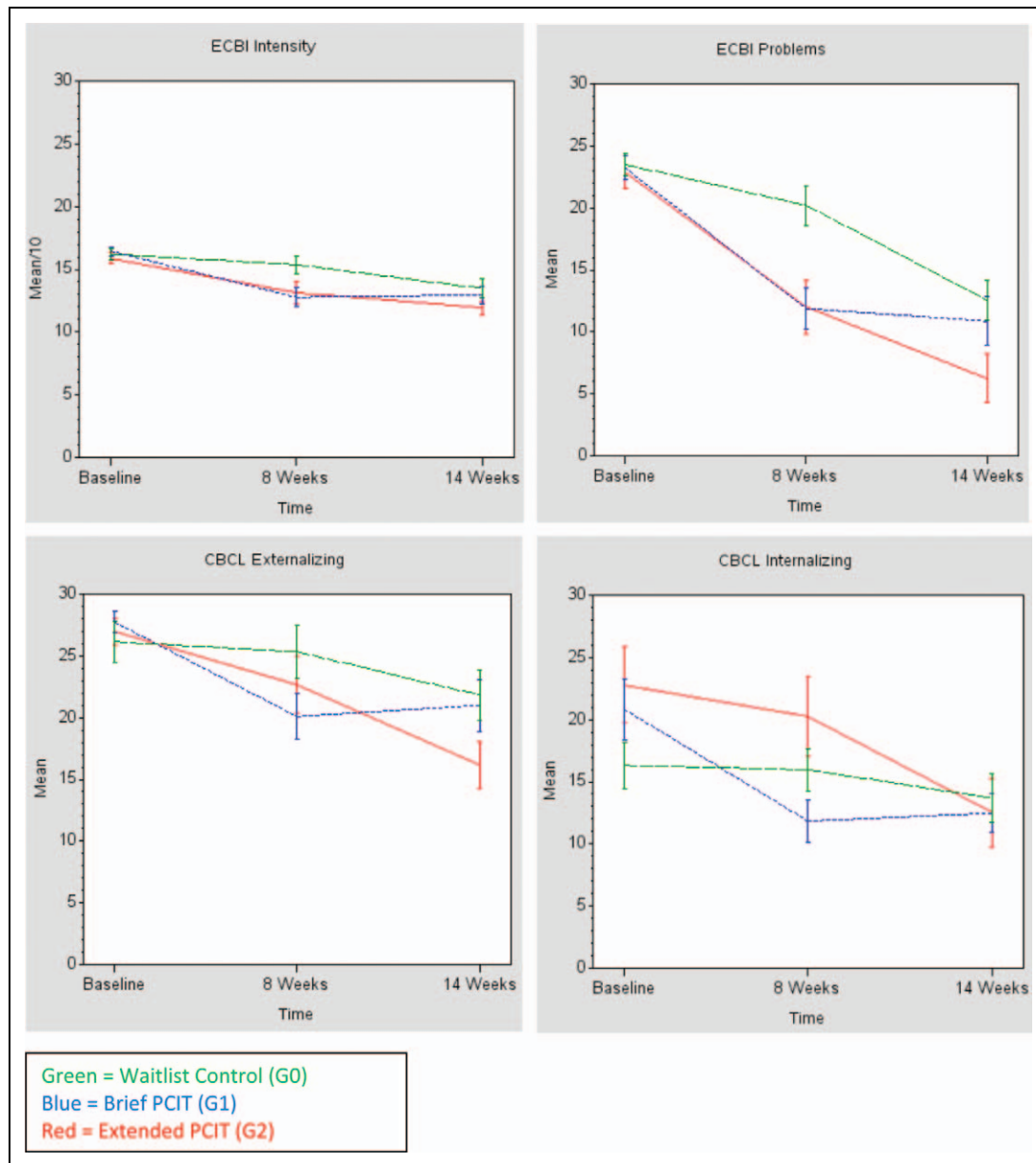
We compared subjects in the three study conditions demographically to assess whether randomization resulted in group equivalence. Analyses were performed using  $\chi^2$  or Fisher's exact tests for categorical variables and *t*-tests for continuous variables. Results indicated that the study groups were largely equivalent. No significant differences were found for child age, sex, race, and ethnicity, or length of time in out-of-home care. Study groups were also statistically equivalent in the number of children per household as well as foster parent age, sex,

education, and marital status. However, tests revealed two significant differences: Caregivers in the control group were more likely to be African American and they had been licensed as foster parents for a longer period of time. Therefore, in our analyses of intervention effects, we control for race/ethnicity and duration of foster parent experience.

Treatment effects on externalizing and internalizing problems were examined using three conditions (G0, G1, and G2)  $\times$  3 time (baseline, 8 weeks, and 14 weeks) mixed-model repeated measures analysis of covariance (ANCOVA) and maximum likelihood estimation. Our principal interest in these analyses lies with tests of interactions between contrast-coded vectors representing the hypothesized treatment comparisons and linear and quadratic orthogonal polynomial trend contrasts representing time. Assumptions for the statistical model were examined for all variables, but no violations were found. Effect size (ES) estimates are reported as  $r^2$  values where .01 is a small effect, .09 medium, and .25 a large ES. All analyses were run in SAS<sup>®</sup> 9.3 under intention-to-treat (ITT) assumptions, including the last observation carried forward (LOCF) method of replacing missing data for subjects that were noncompliant with treatment, dropped out of the study, or were missing data due to nonresponse.

### Results

Tests of simple main effects in the mixed-model ANCOVAs controlling for race/ethnicity and foster parent experience indicated that the three study conditions did not differ at baseline on any outcome measure. As shown in Table 1, least squares mean scores on the ECBI Intensity scale decreased during the



**Figure 2.** Group trajectories in externalizing and internalizing problems.

study period for all groups. At baseline, the raw means for each group were above the clinically significant cutoff ( $\geq 131$ ) for externalizing behaviors. By 14 weeks post-baseline, the mean scores for both treatment groups fell below the clinical threshold while scores for the control group were still in the clinically significant range. A significant condition-by-time interaction effect was observed ( $p = .012$ , composite  $ES = .11$ ), indicating an omnibus difference in responding across the three study conditions over time. Interaction contrasts also showed that the average trend of the combined treatment groups (G1 + G2) differed significantly from the trend of the wait-list control group (G0) when time was modeled as a quadratic function ( $p = .030$ ,  $ES = .04$ ), but not when time was modeled as a linear function ( $p = .060$ ,  $ES = .03$ ). As can be seen in Figure 2, both treatment groups decreased at a faster rate than the control group from

baseline to 8 weeks but then slowed in the rate of decrease (G2) or slightly increased (G1) from 8 to 14 weeks while the control group continued to decrease gradually over the same period.

Least squares mean scores on the ECBI Problem scale decreased for all groups from a clinically significant level at baseline to below the clinical threshold ( $\geq 15$ ) at 14 weeks post-baseline. However, omnibus tests revealed a significant condition-by-time interaction effect ( $p < .001$ , composite  $ES = .18$ ), signifying that the groups responded differently over time. Scores reported by caregivers in the control group decreased by nearly 40% from baseline to 14 weeks post-baseline, scores for the brief PCIT group decreased by nearly 55%, and scores for the extended PCIT group decreased by more than 75%. Interaction contrasts showed

that the average linear ( $p = .006$ ,  $ES = .06$ ) and quadratic ( $p = .004$ ,  $ES = .07$ ) trends of G1 and G2 combined differed significantly from the trend of G0. No significant differences were found between the linear and quadratic trends of the two treatment groups (G1 vs. G2) for either the ECBI Intensity or Problem scale.

Mean scores on the CBCL Externalizing Scale also decreased for all conditions during the study. Nevertheless, there was again a significant omnibus condition-by-time interaction effect ( $p < .001$ , composite  $ES = .17$ ). Scores for all groups fell in the clinical range at baseline, but only the treatment groups were in the normal range at post-baseline assessments. Interaction contrasts revealed that the average linear trend of G1 and G2 combined was significantly different than the linear trend of G0 ( $p < .001$ ,  $ES = .09$ ); differences in the quadratic trend were not statistically significant ( $p = .084$ ,  $ES = .02$ ). Tests comparing G1 and G2 indicated that their trajectories did not differ when time was modeled as a linear function ( $p = .216$ ,  $ES = .01$ ). Yet the trajectories of the two treatment groups differed significantly when time was modeled as a quadratic function ( $p = .045$ ,  $ES = .03$ ). From Figure 2 it can be seen that G1 made greater overall gains than G2 between the first and second time points but between the second and third time points G1 increased slightly in their average externalizing scores while G2 scores continued to decrease.

CBCL internalizing problems also declined for all groups over time, but only the PCIT conditions reached the normal symptom range by the end of the study. By 14 weeks post-baseline, internalizing scores for controls had decreased by about 13%, whereas scores for the brief and extended PCIT groups decreased by 42%. A significant condition-by-time interaction was detected ( $p < .001$ , composite  $ES = .21$ ), denoting an omnibus difference between groups over time. Comparing the composite average of G1 and G2 with the average of G0, a significant contrast was observed when time was modeled as a linear trend ( $p = .002$ ,  $ES = .08$ ) but not as quadratic trend ( $p = .735$ ,  $ES = .00$ ). Conversely, comparisons of the PCIT groups (G1 vs. G2) revealed a significant condition-by-time effect in the quadratic model ( $p < .001$ ,  $ES = .10$ ) but not in the linear model ( $p = .898$ ,  $ES = .00$ ). Figure 2 shows that there was a small, mostly linear decrease in scores for G0 from baseline to the 14-week follow-up. G2 also showed a mostly linear, albeit more acute, decrease in scores over this period. Scores for G1 dropped even more precipitously from baseline to 8 weeks, yet once again increased slightly from 8 to 14 weeks.

## Discussion and Applications to Social Work

Results from this randomized trial revealed that, compared to foster parents receiving usual services, foster parents who also received group-based PCIT training plus individual phone consultation reported a greater decrease in their foster children's externalizing and internalizing symptoms over time. On average, children in the PCIT conditions transitioned from clinically significant scores to a normal range of functioning while control children remained in the clinical or borderline

clinical range by the study's end. When time was modeled as a linear function, results showed that the composite trajectory of the PCIT groups differed from the trajectory of the control group for all outcomes except the ECBI Intensity scale ( $p = .06$ ). For both the ECBI Intensity and Problem Scales, quadratic models showed that the composite trajectory of the PCIT groups differed from trajectory of the control group. Omnibus estimates of  $ES$  were medium to large across outcomes, with  $r^2$  values ranging from .11 to .21, while pooled treatment  $ES$ s were generally small to medium, with  $r^2$  values of .09 or less.

The study design also permitted tests of dosage effects. Results from pairwise contrasts of the two PCIT groups were mixed. Linear models uncovered no significant condition-by-time interaction effects, whereas quadratic models indicated that the CBCL externalizing and internalizing trends of the two PCIT groups differed. Figure 2 shows that, from baseline to 8 weeks, G1 made a greater degree of improvement than G2 on both measures. However, from 8 weeks to 14 weeks post-baseline, mean scores for G2 children decreased while scores for G1 children increased slightly. In other words, it appears that children who stopped receiving treatment at 8 weeks stopped making gains while children who remained in treatment beyond 8 weeks continued to improve. These results should be interpreted cautiously, however, due to the small sample size, brief duration of observation, and lack of corresponding results from analyses of the ECBI scales.

The fact that both treatment groups appeared to benefit from PCIT despite the gains of the control group yields multiple implications. To begin, it implies that even in the absence of PCIT, foster children who remain in a stable placement and receive usual services often improve over time. Corroborating this claim, and contrary to the common perception that foster care is frequently harmful, many well-designed studies have shown that children placed in out-of-home care have outcomes that are comparable to children who enter the child welfare system but are not placed in out-of-home care (for review, see McDonald, Allen, Westerfelt, & Piliavin, 1996; Mersky & Janczewski, 2013).

Nevertheless, we found that adding PCIT to standard care helped to accelerate reductions in externalizing symptoms and internalizing symptoms. In fact, estimates of the intervention's  $ES$  were larger for the latter than for the former. These findings support the conclusions of a meta-analysis by Kaminski and colleagues (2008), which showed that parent training programs have more sizable impacts on child internalizing symptoms than on externalizing symptoms. Although PCIT was originally conceived as a treatment for externalizing behaviors, other studies have also documented the effects of PCIT on internalizing symptoms (Bagner et al., 2010; Brendel & Maynard, *In press*; Chase & Eyberg, 2008; Luby et al., 2012). Thus, PCIT may be more aptly conceptualized as a broad-based mental health treatment than as a treatment for externalizing problems alone.

The results also imply that PCIT may be efficacious at less-than-typical levels of dosage, which bolsters prior evidence indicating that brief exposure to PCIT can produce significant impacts on child mental health symptoms (Berkovits, O'Brien,



Carter, & Eyberg, 2010; Hakman, Chaffin, Funderburk, & Silovsky, 2009; Nixon, Sweeney, Erickson, & Touyz, 2004). Pending replication, a short course of training and consultation may be recommended as a means of increasing access to PCIT while reducing client burden and agency costs. On the other hand, we discovered that children in the extended PCIT group tended to improve beyond the 8-week mark while children in the brief PCIT group did not. These results suggest that booster sessions or other mechanisms of advanced PCIT training may help some participants maintain or build on earlier gains. Additional research that assesses participants over a longer period, incorporates person- and variable-centered analyses, and measures costs relative to benefits is needed to draw more precise practice and policy implications regarding treatment dosage.

Inferences drawn from the study's results should be weighed against four limitations. First, results were derived from self-report measures, which have well-known shortcomings. Of chief concern is that parent raters were not blinded to study condition, which could introduce internal validity threats such as demand characteristics and social desirability bias. Second, as noted previously, the relatively brief observation period recommends longer follow-up to determine if extended treatment is associated with enduring effects over and above an abbreviated model. Third, although the detection of significant differences implies that the models were sufficiently powered, the study's small sample size overall, and in the booster group (G2) particularly, is reason for caution. This may have inflated the Type II error rate, limiting our capacity to detect dosage effects. Finally, generalizability may be restricted to children in stable placements with licensed, nonrelative foster parents; it is uncertain whether similar results would be obtained with children who experience greater placement instability or reside in other settings such as kinship homes or congregate care facilities. Likewise, because participation in the study was voluntary, there may have been unobservable differences (e.g., motivation) between foster parents who selected into the study and those who declined to participate.

The above limitations notwithstanding, several study features increase confidence in the findings, including the use of random assignment, repeated assessments, and psychometrically sound measures. To generate valid estimates of change over time, we used mixed effects modeling, which allows alternative structures for longitudinal covariance to be specified, covariates to be incorporated, and cases with incomplete data to be retained for ITT analyses. The relatively low rate of study attrition due to treatment dropout and survey nonresponse strengthens confidence in statistical conclusions, as does the consistency of findings across different measures and mental health indicators. Furthermore, because both treatments were compared to a usual services condition, instead of a no-treatment condition, the study's findings could be interpreted as conservative as well as more practically significant.

Owing partly to its methodological strengths, this investigation makes a meaningful contribution to a growing body of "T2" translational research aimed at integrating and testing evidence-based models in child welfare (Aarons & Palinkas,

2007; Woolf, 2008). Foster children seldom receive empirically validated mental health treatments, and the services they do receive are typically untested and unproven. Increasing the availability of efficacious therapies to children who enter the child welfare system should count as a high priority, given their high risk of mental health problems that, if left untreated, bear significant personal and public costs.

Yet there are prevailing barriers that hinder PCIT from gaining a foothold in child welfare. Systems of care that reliably link foster children to mental health services are scarce. When such systems are in place, few communities have the supply of clinicians to meet service demands (Hurlburt et al., 2004; Osofsky & Lieberman, 2011). In these circumstances, substantial investments of human and economic capital are required to build the capacity needed to implement PCIT in its standard clinical format. Yet chronic budgetary constraints may dissuade agencies from assuming these up-front costs, despite evidence indicating that PCIT is cost-effective in the long run (Goldfine, Wagner, Branstetter, & McNeil, 2008). In addition to these systemic challenges, foster parents, many of whom care for children with complex needs, may find it difficult to complete an average course of 12–14 weekly sessions in an outpatient clinic. Brief interventions hold all the more appeal for foster parents, given that they often care for foster children for an indeterminate length of time.

This study and other similar trials indicate that it is possible to negotiate the previously mentioned barriers while tailoring clinically validated interventions to the child welfare service sector (Horwitz et al., 2010; Webster-Stratton & Reid, 2010). Doing so successfully requires fidelity to features that function as the model's active ingredients. Distinguishing characteristics of PCIT include the following (a) joint treatment for children and caregivers, (b) live parent coaching, and (c) use of assessment to tailor treatment to the child's developmental level and parent's skill mastery (McNeil & Hembree-Kigin, 2010). We speculate that our adherence to these core components while adapting the model contributed to the apparent success of the intervention.

Translation from the clinic to the community also may be expedited by aligning PCIT with existing modes of service delivery in the child welfare system rather than modifying the system to fit the model. Therefore, grounded in evidence that parent training can be delivered effectively in groups (Brightman, Baker, Clark, & Ambrose, 1982; Ruma, Burke, & Thompson, 1996), we provided PCIT in a setting and format that is typical of foster parent training. In so doing, we aimed to reduce burden for caregivers and service agencies alike. This approach also may help to increase the portability of PCIT and contain the costs of mental health service utilization. Similar to group training, individual telephone consultation may help to increase treatment access and adherence while minimizing client burden. Phone consultation also may be a useful cost containment strategy because it is a brief, flexible, and widely used mode of client contact that can be employed without major structural changes to an agency or its services.

Implementing PCIT via group workshops and phone consults also offers some distinct clinical advantages. Group trainings introduce opportunities for in vivo coaching and parent-child interaction that are usually absent from foster parent training. A group-based format also may enhance outcomes through social learning and social support, mechanisms of effect that are not present in traditional PCIT. Phone consults can be used as an auxiliary service to assess client progress, reinforce gains that emerged during training, and generalize effects to the home environment. Prior work has shown that telephone-based interventions can foster therapeutic alliances between parents and practitioners and that they are even efficacious as stand-alone treatments for child mental health problems (Leach & Christensen, 2006; McGrath et al., 2011). Taken together, group training and phone consultation are complementary modalities that may facilitate the integration of PCIT into usual services, thereby enhancing the care provided by foster parents and ultimately promoting the well-being of foster children.

### Acknowledgments

The authors gratefully acknowledge the support of the Bureau of Milwaukee Child Welfare and its partner agencies: Saint A and the Children's Hospital of Wisconsin Community Services. We also thank the foster families that graciously devoted their time and effort to this project.

### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Support for this research was provided by the National Institutes of Health, National Institute of Child Health and Human Development, Award No. 1R15HD067829-01A1.

### References

- Aarons, G. A., & Palinkas, L. A. (2007). Implementation of evidence-based practice in child welfare: Service provider perspectives. *Administration and Policy in Mental Health and Mental Health Services Research, 34*, 411-419.
- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Bagner, D. M., Sheinkopf, S. J., Vohr, B. R., & Lester, B. M. (2010). Parenting intervention for externalizing behavior problems in children born premature: An initial examination. *Journal of Developmental and Behavioral Pediatrics, 31*, 209-216.
- Barth, R. P., Landsverk, J., Chamberlain, P., Reid, J. B., Rolls, J. A., Hurlburt, M. S., . . . Kohl, P. L. (2005). Parent-training programs in child welfare services: Planning for a more evidence-based approach to serving biological parents. *Research on Social Work Practice, 15*, 353-371.
- Berkovits, M. D., O'Brien, K. A., Carter, C. G., & Eyberg, S. M. (2010). Early identification and intervention for behavior problems in primary care: A comparison of two abbreviated versions of Parent-Child Interaction Therapy. *Behavior Therapy, 41*, 375-387.
- Boggs, S. R., Eyberg, S., & Reynolds, L. A. (1990). Concurrent validity of the Eyberg child behavior inventory. *Journal of Clinical Child Psychology, 19*, 75-78.
- Brendel, K. E., & Maynard, B. R. (In Press). Child-parent interventions for childhood anxiety disorders: A systematic review and meta-analysis. *Research on Social Work Practice*.
- Brightman, R. P., Baker, B. L., Clark, D. B., & Ambrose, S. A. (1982). Effectiveness of alternative parent training formats. *Journal of Behavior Therapy and Experimental Psychiatry, 13*, 113-117.
- Burns, B. J., Phillips, S. D., Wagner, H. R., Barth, R. P., Kolko, D. J., Campbell, Y., & Landsverk, J. (2004). Mental health need and access to mental health services by youths involved with child welfare: A national survey. *Journal of the American Academy of Child and Adolescent Psychiatry, 43*, 960-970.
- Chaffin, M., & Friedrich, B. (2004). Evidence-based treatments in child abuse and neglect. *Children and Youth Services Review, 26*, 1097-1113.
- Chaffin, M., Silovsky, J. F., Funderburk, B., Valle, L. A., Brestan, E. V., Balachova, T., . . . Bonner, B. L. (2004). Parent-Child Interaction Therapy with physically abusive parents: Efficacy for reducing future abuse reports. *Journal of Consulting and Clinical Psychology, 72*, 500-510.
- Chaffin, M., Valle, L. A., Funderburk, B., Gurwitch, R., Silovsky, J., Bard, D., . . . Kees, M. (2009). A motivational intervention can improve retention in PCIT for low-motivation child welfare clients. *Child Maltreatment, 14*, 356-368.
- Chase, R. M., & Eyberg, S. M. (2008). Clinical presentation and treatment outcome for children with comorbid externalizing and internalizing symptoms. *Journal of Anxiety Disorders, 22*, 273-282.
- Eyberg, S. (1988). Parent-Child Interaction Therapy: Integration of traditional and behavioral concerns. *Child & Family Behavior Therapy, 10*, 33-46.
- Eyberg, S. M., Nelson, M. M., & Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal of Clinical Child & Adolescent Psychology, 37*, 215-237.
- Eyberg, S. M., & Pincus, D. (1999). *Eyberg Child Behavior Inventory and Sutter-Eyberg Student Behavior Inventory-Revised Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Festinger, T., & Baker, A. J. (2013). The quality of evaluations of foster parent training: An empirical review. *Children and Youth Services Review, 35*, 2147-2153.
- Foster, E. M., & Jones, D. E. (2005). The high costs of aggression: Public expenditures resulting from conduct disorder. *American Journal of Public Health, 95*, 1767-1772.
- Garland, A. F., Hough, R. L., McCabe, K. M., Yeh, M., Wood, P. A., & Aarons, G. A. (2001). Prevalence of psychiatric disorders in youths across five sectors of care. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*, 409-418.
- Goldfine, M. E., Wagner, S. M., Branstetter, S. A., & McNeil, C. B. (2008). Parent-Child Interaction Therapy: An examination of cost-effectiveness. *Journal of Early and Intensive Behavior Intervention, 5*, 119-141.

- Granic, I., & Patterson, G. R. (2006). Toward a comprehensive model of antisocial development: A dynamic systems approach. *Psychological Review*, *113*, 101.
- Gross, D., Fogg, L., Young, M., Ridge, A., Cowell, J., Sivan, A., & Richardson, R. (2007). Reliability and validity of the Eyberg Child Behavior Inventory with African-American and Latino parents of young children. *Research in Nursing & Health*, *30*, 213–223.
- Hakman, M., Chaffin, M., Funderburk, B., & Silovsky, J. F. (2009). Change trajectories for parent-child interaction sequences during Parent-Child Interaction Therapy for child physical abuse. *Child Abuse & Neglect*, *33*, 461–470.
- Horwitz, S. M., Chamberlain, P., Landsverk, J., & Mullican, C. (2010). Improving the mental health of children in child welfare through the implementation of evidence-based parenting interventions. *Administration and Policy in Mental Health and Mental Health Services Research*, *37*, 27–39.
- Horwitz, S. M., Hurlburt, M. S., Heneghan, A., Zhang, J., Rolls-Reutz, J., Fisher, E., . . . Stein, R. E. (2012). Mental health problems in young children investigated by US child welfare agencies. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*, 572–581.
- Hurlburt, M. S., Leslie, L. K., Landsverk, J., Barth, R. P., Burns, B. J., Gibbons, R. D., . . . Zhang, J. (2004). Contextual predictors of mental health service use among children open to child welfare. *Archives of General Psychiatry*, *61*, 1217–1224.
- Ivanova, M. Y., Achenbach, T. M., Rescorla, L. A., Harder, V. S., Ang, R. P., Bilenberg, N., . . . Verhulst, F. C. (2010). Preschool psychopathology reported by parents in 23 societies: Testing the seven-syndrome model of the child behavior checklist for ages 1.5–5. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*, 1215–1224.
- Kaminski, J. W., Valle, L. A., Filene, J. H., & Boyle, C. L. (2008). A meta-analytic review of components associated with parent training program effectiveness. *Journal of Abnormal Child Psychology*, *36*, 567–589.
- Kazdin, A. E. (2005). *Parent Management Training: Treatment for oppositional, aggressive, and antisocial behavior in children and adolescents*. New York, NY: Oxford University Press.
- Keil, V., & Price, J. M. (2006). Externalizing behavior disorders in child welfare settings: Definition, prevalence, and implications for assessment and treatment. *Children and Youth Services Review*, *28*, 761–779.
- Knapp, M., Scott, S., & Davies, J. (1999). The cost of antisocial behaviour in younger children. *Clinical Child Psychology and Psychiatry*, *4*, 457–473.
- Leach, L. S., & Christensen, H. (2006). A systematic review of telephone-based interventions for mental disorders. *Journal of Telemedicine and Telecare*, *12*, 122–129.
- Leslie, L. K., Gordon, J. N., Lambros, K., Premji, K., Peoples, J., & Gist, K. (2005). Addressing the developmental and mental health needs of young children in foster care. *Journal of Developmental and Behavioral Pediatrics*, *26*, 140–151.
- Luby, J., Lenze, S., & Tillman, R. (2012). A novel early intervention for preschool depression: Findings from a pilot randomized controlled trial. *Journal of Child Psychology and Psychiatry*, *53*, 313–322.
- Lundahl, B. W., Nimer, J., & Parsons, B. (2006). Preventing child abuse: A meta-analysis of parent training programs. *Research on Social Work Practice*, *16*, 251–262.
- Maughan, D. R., Christiansen, E., Jenson, W. R., Olympia, D., & Clark, E. (2005). Behavioral parent training as a treatment for externalizing behaviors and disruptive behavior disorders: A meta-analysis. *School Psychology Review*, *34*, 267–286.
- McDonald, T. P., Allen, R. I., Westerfelt, A., & Piliavan, I. (1996). *Assessing the long-term effects of foster care*. Washington, DC: Child Welfare League of America.
- McGrath, P. J., Lingley-Pottie, P., Thurston, C., MacLean, C., Cunningham, C., Waschbusch, D. A., . . . Chaplin, W. (2011). Telephone-based mental health interventions for child disruptive behavior or anxiety disorders: Randomized trials and overall analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*, 1162–1172.
- McNeil, C. B., & Hembree-Kigin, T. (2010). *Parent-Child Interaction Therapy* (2nd ed.). New York, NY: Springer.
- McNeil, C. B., Herschell, A. D., Gurwitch, R. H., & Clemens-Mowrer, L. (2005). Training foster parents in Parent-Child Interaction Therapy. *Education and Treatment of Children*, *28*, 182–196.
- Mersky, J. P., & Janczewski, C. (2013). Adult well-being of foster care alumni: Comparisons to other child welfare recipients and a non-child welfare sample in a high-risk, urban setting. *Children and Youth Services Review*, *35*, 367–376.
- Nixon, R. D., Sweeney, L., Erickson, D. B., & Touyz, S. W. (2004). Parent-Child Interaction Therapy: One-and two-year follow-up of standard and abbreviated treatments for oppositional preschoolers. *Journal of Abnormal Child Psychology*, *32*, 263–271.
- Nock, M. K., Kazdin, A. E., Hiripi, E., & Kessler, R. C. (2007). Lifetime prevalence, correlates, and persistence of oppositional defiant disorder: Results from the National comorbidity survey replication. *Journal of Child Psychology and Psychiatry*, *48*, 703–713.
- Osofsky, J. D., & Lieberman, A. F. (2011). A call for integrating a mental health perspective into systems of care for abused and neglected infants and young children. *American Psychologist*, *66*, 120–128.
- Pihlakoski, L., Sourander, A., Aromaa, M., Rautava, P., Helenius, H., & Sillanpää, M. (2006). The continuity of psychopathology from early childhood to preadolescence. *European Child & Adolescent Psychiatry*, *15*, 409–417.
- Price, J. M., Chamberlain, P., Landsverk, J., & Reid, J. (2009). KEEP foster-parent training intervention: Model description and effectiveness. *Child & Family Social Work*, *14*, 233–242.
- Rescorla, L. A., Achenbach, T. M., Ivanova, M. Y., Harder, V. S., Otten, L., Bilenberg, N., . . . Verhulst, F. C. (2011). International comparisons of behavioral and emotional problems in preschool children: Parents' reports from 24 societies. *Journal of Clinical Child & Adolescent Psychology*, *40*, 456–467.
- Reyno, S. M., & McGrath, P. J. (2006). Predictors of parent training efficacy for child externalizing behavior problems—a meta-analytic review. *Journal of Child Psychology and Psychiatry*, *47*, 99–111.
- Rich, B. A., & Eyberg, S. M. (2001). Accuracy of assessment: The discriminative and predictive power of the Eyberg Child Behavior Inventory. *Ambulatory Child Health*, *7*, 249–257.

- Rork, K. E., & McNeil, C. B. (2011). Evaluation of foster parent training programs: A critical review. *Child & Family Behavior Therapy, 33*, 139–170.
- Ruma, P. R., Burke, R. V., & Thompson, R. W. (1996). Group parent training: Is it effective for children of all ages? *Behavior Therapy, 27*, 159–169.
- Thomas, R., & Zimmer-Gembeck, M. J. (2007). Behavioral outcomes of parent-child interaction therapy and Triple P—Positive Parenting Program: A review and meta-analysis. *Journal of Abnormal Child Psychology, 35*, 475–495.
- Thomas, R., & Zimmer-Gembeck, M. J. (2012). Parent-Child Interaction Therapy: An evidence-based treatment for child maltreatment. *Child Maltreatment, 17*, 253–266.
- Timmer, S. G., Ho, L. K., Urquiza, A. J., Zebell, N. M., Y Garcia, E. F., & Boys, D. (2011). The effectiveness of parent-child interaction therapy with depressive mothers: The changing relationship as the agent of individual change. *Child Psychiatry & Human Development, 42*, 406–423.
- Timmer, S. G., Urquiza, A. J., & Zebell, N. (2006). Challenging foster caregiver-maltreated child relationships: The effectiveness of Parent-Child Interaction Therapy. *Children and Youth Services Review, 28*, 1–19.
- Webster-Stratton, C., & Reid, M. (2010). Adapting the Incredible Years, an evidence-based parenting programme, for families involved in the child welfare system. *Journal of Children's Services, 5*, 25–42.
- Wolf, S. H. (2008). The meaning of translational research and why it matters. *JAMA: The Journal of the American Medical Association, 299*, 211–213.
- Zeanah, C. H., Shaffer, C., & Dozier, M. (2011). Foster care for young children: Why it must be developmentally informed. *Journal of the American Academy of Child and Adolescent Psychiatry, 50*, 1199–1201.