Introduction to the Special Series on Booster Sessions and Long-Term Maintenance of Treatment Gains

David J. Kolko • Oliver Lindhiem

Published online: 12 January 2014
© Springer Science+Business Media New York 2014

In 1998, Eyberg and colleagues conducted a review of the literature of booster sessions and other maintenance strategies for enhancing the long-term maintenance of treatment effects for parent training programs. This timely review concluded with a call for more studies examining: 1) the long-term maintenance of treatment effects, and 2) the need to test the incremental benefit of booster sessions using randomized control group designs. Ten years later, an updated review by Eyberg and colleagues (2008) of treatments for disruptive behavior reported that most of the interventions included in that review had shown maintenance of treatment gains for at least a year after treatment had ended, but that many of the follow-up studies included designs that were only modestly rigorous. They suggested the need to explore alternative designs that would permit careful evaluation of disruptive behavior over time to document more rigorously maintenance effects. This special series is a step towards providing a response to this call.

All four papers in this special series address the first of these two recommendations (i.e. long-term maintenance of treatment effects) and three specifically test the utility of booster sessions using a randomized control group design. Dishion and colleagues (2013) report on the long-term maintenance of benefits from yearly Family Check-Ups (FCUs) in a multiethnic sample of high-risk families. Eyberg and colleagues (2014) examine a continuing care model of maintenance treatment following Parent–child Interaction Therapy (PCIT) for families of young children. Young children

diagnosed with oppositional defiant disorder (ODD) who completed the original treatment were then randomized to PCIT maintenance treatment (MT) or to an assessment-only follow-up condition (AO). Maintenance treatment consisted of monthly telephone contact to monitor progress and provide additional booster support. Lochman and colleagues (2013) report on a child-oriented booster intervention with children who had previously received an abbreviated version of the Coping Power program in the 5th grade. The booster sessions consisted of non-manualized, brief monthly individual contact. Finally, Kolko and colleagues (2013) examine the impact of a brief booster treatment that was delivered 3 years after an acute treatment for clinically referred boys and girls originally diagnosed with Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD). At the conclusion of the acute treatment and 3-year follow-up period (i.e., study month 42), the sample was re-randomized into Booster treatment or Enhanced Usual Care and then assessed through two years follow-up. Although these studies vary widely on specific parameters, all share a randomized design and empirical effort to examine the long-term maintenance of treatment/prevention effects and/or the incremental benefit of booster sessions for children with disruptive behavior problems and their families.

There are many parameters that are relevant to the evaluation of booster or sessions or maintenance treatment, many of which are represented in the studies described in this special issue. These include the timing of sessions (when to begin booster sessions), frequency of sessions, dose (both number and length of sessions), and modality (e.g. office visits versus phone check-ups). Another important consideration is whether booster sessions should be administered to all participants or a just a subgroup of participants (perhaps those who have failed to maintain their initial treatment gains). Other considerations include whether or not to introduce new treatment content and/or select new or revised treatment goals. For

D. J. Kolko (✉) • O. Lindhiem
Department of Psychiatry, University of Pittsburgh School of
Medicine, 3811 O'Hara Street, Pittsburgh, PA 15213, USA
e-mail: kolkodj@upmc.edu

O. Lindhiem
e-mail: lindhiemoj@upmc.edu

Table 1 Summary of studies examining treatment maintenance or booster effects

	Outcome Measure(s)	Longest Follow-up Interval	Means	Summary of Maintenance Effects
Boggs et al. (2004)	ECBI (Intensity Scale)	Average of 19.59 months (SD=7.09) after pretreatment assessment	Tx Pre: 171.04 FU: 133.13 Dropout Pre: 179.83 FU: 170.61 Tx 1 Pre: 167.37 FU: 126 Tx 2 Pre: 156.5 FU: 122.65	52 % in of children treatment completion group and 13 % of children in drop-out group showed clinically significant gains
Bor, Sanders, and Markie-Dadds (2002)	ECBI (Intensity Scale)	1 year after program completion	Tx 1 Pre: 167.37 FU: 126 Tx 2 Pre: 156.5 FU: 122.65	Significant gains achieved at post-intervention were maintained by 80 % of children (significant decrease in mother-reported levels of inattentive behavior; however, slight (but not significant) increase in three out of four of the EBCI and PDR measures of disruptive behavior.
Chamberlain, Fisher, and Moore (2002)	Cumulative arrest rates	2–4 years after post-placement	Tx 2-year FU: 3.2 3-year FU: 5.4 4-year FU: 7.7 Control 2-year FU: 6.7 3-year FU: 8.5 4-year FU: 10.9 Tx: 56.2 weeks Control: 31.7 weeks	Treatment group had significantly fewer cumulative arrests than control group within this period (from 1 year prior to enrollment to 2–4 years after post-placement)
Henggeler et al. (1993)	Time to re-arrest	Average of 2.4 years post-referral	Tx: 56.2 weeks Control: 31.7 weeks	Treatment prolonged time to re-arrest of serious juvenile offenses compared to traditional community services
Horne and Van Dyke (1983)	Family Interaction Coding System (Aggressive Behavior Score)	1 year post-treatment	Pre: 0.65 Post: 0.36 FU: 0.38	Significant difference between baseline and 12-month follow-up; no significant difference between treatment termination and 12-month follow-up, however, child showed slight increase in aggressive behavior (baseline=0.65 to termination=0.36 to follow-up=0.38)
Kazdin, Bass, Siegel, and Thomas (1989)	CBCL (total behavior problems; social competence), SBCL (total disability)	1 year post-treatment	Proportion within nonclinical range for total behavioral problems Post: 12.5 %–42.9 % FU: 21.7 %–43.3 % Proportion within nonclinical range for social competence Post: 33.3 %–44 % FU: 28.6 %–37.5 % Proportion within nonclinical range for total disability Post: 29.6 %–66.7 % FU: 42.1 %–53.6 % CBCL ^a Pre: 78 Post: 66 FU: 68 SBCL ^a Pre: 75 Post: 62 FU: 64	Within treatment groups, from pretreatment to follow-up, children significantly improved on most CBCL and SBCL measures. No significant changes from post-treatments effects to follow-up.
Kazdin et al. (1987a)	CBCL, SBCL	1 year after treatment	CBCL ^a Pre: 78 Post: 66 FU: 68 SBCL ^a Pre: 75 Post: 62 FU: 64	For CBCL ratings, though follow-up measures remained significantly changed from baseline, the mean remained well above normative score. For SBCL ratings, follow-up measures were significantly different from pretreatment, and not significantly different from post-treatment. However, at post-treatment, mean was within normative range but at follow-up mean was back above normative score limit. Overall, even after treatment and follow-up, most children remained outside of normative range of behavior.

Table 1 (continued)

	Outcome Measure(s)	Longest Follow-up Interval	Means	Summary of Maintenance Effects
Kazdin et al. (1987b)	CBCL, SBCL	1 year after treatment	CBCL ^a Pre: 77 Post: 71 FU: 73 SBCL ^a Pre: 76 Post: 63 FU: 68	For CBCL ratings, though follow-up measures remained significantly changed from baseline, the mean remained well above normative score. For SBCL ratings, follow-up measures were significantly different from pretreatment, and not significantly different from post-treatment. However, at post-treatment, mean was within normative range but at follow-up mean was back above normative score limit. Overall, even after treatment and follow-up, most children remained outside of normative range of behavior.
Lochman (1992)	NYS, BOSPT	3 years after treatment		Aggressive boys in treatment group showed significant difference in substance abuse, general behavior defiance, self-esteem and classroom behavior compared to aggressive boys not in treatment. Aggressive boys in treatment group did not measure significantly differently in negative outcomes compared to boys in non-aggressive group. Additionally, some of aggressive-treated group had booster component; they showed significantly less passive off-task classroom behavior than non-booster aggressive-treated boys.
Reid, Webster-Stratton, and Hammond (2003)	ECBI	2 years after treatment	Parent-report 2-year FU: 35.5 %–81.8 % showed significant behavioral change Teacher report 2-year FU: 23.1 %–53.3 % showed significant change	75 % of children functioning in normal range (according to parent and teacher ECBI reports)
Webster-Stratton (1984)	ECBI	1 year after treatment	Pre: 67.7 FU (tx 1): 36.33 FU (tx 2): 34.44	Follow-up measures of behavior significantly different from pretreatment, but not significantly different from post-treatment for most measures. However, child noncompliance and deviancy behaviors showed continued decrease at 1-year follow-up.
Hood and Eyberg (2003)	ECBI (Intensity Scale)	3–6 years after treatment (<i>M</i> =55.43, <i>SD</i> =14.25 months)	Pre: 175.22 Post: 126.04 FU: 129.13 Tx 1	57 % showed clinically significant change on ECBI at follow-up
Larsson et al. (2009)	ECBI (Intensity Scale)	1 year after treatment	Pre: 157.1 Post: 116.5 FU: 121.3 Tx 2 Pre: 156.5 Post: 121.8 FU: 119.1 Control Pre: 159.7 Post: 137.3	At follow-up 79.6 % of children no longer had ODD diagnosis, but 15.7 % met criteria for sub-ODD threshold; 6 of 8 children who met criteria for CD at pretreatment, did not meet criteria at follow-up; only 8 of 22 children no longer met criteria for ADHD

ECBI eyberg child behavior inventory; CBCL child behavior checklist; SBCL school behavior checklist; NYS national youth survey questionnaire; BOSPT behavior observation schedule for pupils and teachers; Tx treatment; FU follow-up

^aNo means reported; values are rough estimates based on figures

purposes of providing some background on these and other parameters, we have included a description of the key parameters of several early and more recent studies reporting on the effects of treatment maintenance or booster treatment effects in Table 1. These few studies may provide a context for understanding some of the strengths and limitations of the research conducted in this area, as well as for appreciating the four studies included in this series.

Finally, the series includes a commentary by Patrick Tolan (2014), who has conducted one of the few studies designed to evaluate the incremental benefits of a booster intervention for school students that was conducted in the context of a prevention trial with high risk youth (Tolan et al., 2009). He provides an informed perspective on the role of booster or maintenance that incorporates his review of the four papers included in this series and his understanding of the long-term course of disruptive behavior disorders and juvenile delinquency.

We hope that this series provides the reader with a clear and comprehensive understanding of the description and evaluation of alternative applications of booster or maintenance interventions with children and adolescents. In addition, we hope that the series helps to frame some of the critical research and practice directions that should be addressed to enhance the careful study and successful incorporation of these conditions in routine clinical practice.

Acknowledgements This paper was supported, in part, by Grant 57727. We acknowledge the assistance of Jessica Laubach in the preparation of this paper.

References

- Boggs, S. R., Eyberg, S. M., Edwards, D., Rayfield, A., Jacobs, J., Bagner, D., & Hood, K. (2004). Outcomes of parent–child interaction therapy: a comparison of dropouts and treatment completers one to three years after treatment. *Child & Family Behavior Therapy*, 26(4), 1–22.
- Bor, W., Sanders, M. R., & Markie-Dadds, C. (2002). The effects of the triple P-positive parenting program on preschool children with disruptive behavior and attentional problems. *Journal of Abnormal Child Psychology*, 30(6), 571–587.
- Chamberlain, P., Fisher, P. A., & Moore, K. J. (2002). Multidimensional treatment foster care: applications of the OSLC intervention model to high-risk youth and their families. In J. B. Reid, G. R. Patterson, & J. Snyder (Eds.), *Antisocial behavior in children: developmental theories and models for intervention* (pp. 203–218). Washington, DC: American Psychological Association.
- Dishion, T. J., Brennan, L. M., Shaw, D. S., McEachern, A. D., Wilson, M. N., & Jo, B. (2013). Prevention of problem behavior through annual family check-ups in early childhood: intervention effects from home to early elementary school. *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-013-9768-2.
- Eyberg, S. M., Edwards, D., Boggs, S. R., & Foote, R. (1998). Maintaining the treatment effects of parental training: the role of booster sessions and other maintenance strategies. *Clinical Psychology-Science & Practice*, 5(4), 544–554.
- 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 and Adolescent Psychology*, 37, 215–237.
- Eyberg, S., Boggs, S., & Jaccard, J. (2014). Does maintenance treatment matter? *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-013-9842-9.
- Henggeler, S. W., Melton, G. B., Smith, L. A., Schoenwald, S. K., & Hanley, J. H. (1993). Family preservation using multisystemic treatment: long-term follow-up to a clinical trial with serious juvenile offenders. *Journal of Child and Family Studies*, 2, 283–293.
- Hood, K. K., & Eyberg, S. M. (2003). Outcomes of parent–child interaction therapy: mothers' reports on maintenance three to six years after treatment. *Journal of Clinical Child and Adolescent Psychology*, 32, 419–429.
- Horne, A. M., & Van Dyke, B. (1983). Treatment and maintenance of social learning family therapy. *Behavior Therapy*, 14(5), 606–613. doi:10.1016/S0005-7894(83)80053-7.
- Kazdin, A. E., Bass, D., Siegel, T., & Thomas, C. (1989). Cognitive-behavioral therapy and relationship therapy in the treatment of children referred for antisocial behavior. *Journal of Consulting and Clinical Psychology*, 57(4), 522–35.
- Kazdin, A. E., Esvelt-Dawson, K., French, N. H., & Unis, A. S. (1987a). Effects of parent management training and problem solving skills training combined in the treatment of antisocial child behavior. *Journal of the American Academy of Child and Adolescent Psychiatry*, 26, 416–424.
- Kazdin, A. E., Esvelt-Dawson, K., French, N. H., & Unis, A. S. (1987b). Problem-solving skills training and relationship therapy in the treatment of antisocial child behavior. *Journal of Consulting and Clinical Psychology*, 55, 76–85.
- Kolko, D. J., Lindhiem, O., Hart, J., & Bukstein, O. G. (2013). Evaluation of a booster intervention three years after acute treatment for early-onset disruptive behavior disorders. *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-013-9724-1.
- Larsson, B., Fossum, S., Clifford, G., Drugli, M. B., Handegård, B. H., & Mørch, W. T. (2009). Treatment of oppositional defiant and conduct problems in young Norwegian children: results of a randomized controlled trial. *European Child & Adolescent Psychiatry*, 18(1), 42–52. doi:10.1007/s00787-008-0702-z.
- Lochman, J. E. (1992). Cognitive-behavioral intervention with aggressive boys: three-year follow-up and preventive effects. *Journal of Consulting and Clinical Psychology*, 60, 426–32.
- Lochman, J. E., Baden, R. E., Boxmeyer, C. L., Powell, N. P., Qu, L., Salekin, K. L., et al. (2013). Does a booster intervention augment the preventive effects of an abbreviated version of the coping power program for aggressive children? *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-013-9727-y.
- Reid, M. J., Webster-Stratton, C., & Hammond, M. (2003). Follow-up of children who received the incredible years intervention for oppositional-defiant disorder: maintenance and prediction of 2-year outcome. *Behavior Therapy*, 34, 471–491.
- Tolan, P. H. (2014). More than afterthoughts and details: maintenance and booster effects as critical elements of intervention research. *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-013-9839-4.
- Tolan, P. H., Gorman-Smith, D., Henry, D., & Schoeny, M. (2009). The benefits of booster interventions: evidence from a family-focused prevention program. *Prevention Science*, 10, 287–297. doi:10.1007/s1121-009-0139-8.
- Webster-Stratton, C. (1984). A randomized trial of two parent-training programs for families with conduct-disordered children. *Journal of Consulting and Clinical Psychology*, 52, 666–678.