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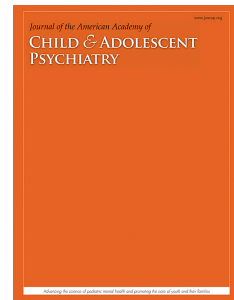
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Transported Versus Homegrown Parenting Interventions for Reducing Disruptive Child
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RH = Transported vs. Homegrown Interventions

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ABSTRACT

Introduction: Children's disruptive behavior problems put children at high risk for oppositional defiant disorder and conduct disorder and carry a high burden for individuals and society. Policy makers and service providers aiming to reduce children's disruptive behavior problems must often choose between importing an intervention developed abroad or developing or using a "homegrown" (i.e., local) intervention. No comprehensive comparison of these interventions exists.

Method: We performed a multilevel meta-regression of 129 randomized trials (374 effect sizes) of transported and homegrown parenting interventions. We identified trials by searching the included trials lists of systematic reviews, found through searches in six databases (e.g., MEDLINE, EMBASE). Trials that had not yet been reviewed were found by searching the same databases. Primary outcome was the mean difference in effectiveness between transported and homegrown interventions to reduce disruptive child behavior. We also compared this differential effectiveness for various intervention "brands" (e.g., Incredible Years and Triple P [Positive Parenting Program]) and geographical regions (e.g., North America and Europe).

Results: Transported and homegrown interventions did not differ in their effectiveness to reduce disruptive child behavior ($d = 0.10$, *n.s.*). Results were robust across intervention brands and geographical regions. Six trials on transported interventions in Hong Kong, Iran, and Panama suggest promising results for transporting interventions to "non-western" countries; one trial in Indonesia did not.

Conclusion: Parenting interventions based on the same principles lead to similar outcomes, whether transported or homegrown. This finding supports the selection of interventions based on their evidence base, rather than on cultural specificity.

Key words: disruptive behavior problems; parenting intervention; randomized controlled trial; multilevel meta-regression; transportability.

INTRODUCTION

There has been a substantial rise in policy recommendations and implementation of parenting interventions to prevent and treat disruptive child behavior problems.¹⁻⁵ Disruptive behavior problems, such as defiance and anger, put children at high risk for oppositional defiant disorder and conduct disorder and carry a high burden for individuals and society as a whole: they are common, persistent, and costly.⁶ Parenting interventions based on (social) learning theory are an effective, and cost effective, strategy to reduce disruptive child behavior across countries and cultures.⁷⁻¹⁰ Building on Patterson's theory of coercive cycles,¹¹ these interventions focus on increasing positive parent-child interactions (e.g., through parent-child play) and teach parents to reward positive child behavior (e.g., providing praise) and to use adequate disciplining techniques for misbehavior (e.g., providing a "time-out").

When deciding which parenting interventions to implement, service providers are faced with an often difficult choice: import interventions developed and evaluated in other countries or nurture "homegrown" interventions that are developed in the target families' own country? This question highlights a lack of our understanding of how intervening in parenting practices influences developmental pathways of disruptive child behavior across cultures, and the level of context dependency of interventions that is involved.

Transported and Homegrown Interventions

Importing parenting interventions has several advantages over developing new interventions. First, developing an intervention is time-consuming and costly. Second, if an intervention is proven effective in a certain context, this can be a promising sign for its effectiveness in another context. Third, and relatedly, if coercive parent-child interactions¹¹ are at the core of the development of disruptive child behavior across countries, similar techniques for breaking these cycles may work equally well across countries.^{7,12-14}

An alternative approach to importing parenting interventions is to develop interventions locally, based on the same underlying theory as established interventions. This has the advantage of specifically designing interventions to fit the needs of families within a certain country.^{15,16} Whereas transported interventions may restrain therapists from making adaptations, in order to protect program fidelity, homegrown interventions can be tailored to meet the cultural values and norms of target families.

Among the few meta-analyses that exist of transportability of parenting interventions, results are mixed. Gardner et al.¹⁰ showed that evidence-based parenting interventions were effective in countries other than their country of origin. Strikingly, parenting interventions seemed especially effective in countries that were culturally more distinct from the interventions' countries of origin. Hasson et al.¹⁷ compared the effectiveness of a wide range of psychosocial interventions (i.e., parenting and others) in Germany and Sweden that were either homegrown, transported and culturally adapted, or transported and not culturally adapted. Homegrown interventions and transported interventions that were culturally adapted were more effective than interventions that were not adapted. In contrast to the findings of Gardner et al.,¹⁰ the findings by Hasson et al. suggest that transported interventions, at least when no cultural adaptations are made, are less effective than homegrown interventions. However, their meta-analysis focused on a wide range of psychosocial interventions, both randomized and non-randomized designs, and included trials from only two European countries. To date, there has been no meta-analysis of evidence across continents, including the limited but increasing number of trials outside North America, Europe, or Australia, that directly tests the differential effects of transported and homegrown parenting interventions to reduce disruptive child behavior.

Informing Theory About Context Dependency of How Parenting Shapes Child Behavior

The extent to which parenting interventions are equally effective across countries is at least in part a question of the extent to which the translation of theory into parenting techniques affects families in less or more universal ways. Operant learning theory¹⁸ and social learning theory,¹⁹ which are at the core of most parenting interventions for reducing disruptive child behavior, are universal theories about behavior modification. However, does the way in which these theories have been translated into discrete parenting techniques in parenting interventions lead to equally universal effects on child behavior? Evidence suggests that this may not be the case. A parenting technique that may differentially affect children's disruptive behavior in different cultural groups is physical punishment.²⁰ While there are differing views and findings on this subject,^{21,22} some studies have found that parental corporal punishment is associated with disruptive child behavior, but that this varies by ethnic group.^{20,23} Similarly, strategies for paying compliments to children are known to vary between more direct praise in western countries and more indirect praise in eastern countries.²⁴ Country norms may vary in relation to parenting behavior that is appropriate, and effects of parenting techniques on children's behavior are likely to be influenced by the meaning applied to parental behavior.²⁵ Our meta-regression of the transportability of parenting interventions from one country to another aims to shed light on the level of context dependency of the effects of parenting techniques on children growing up in different countries. Based on promising findings for transported interventions in individual trials,^{7,26} we hypothesize that transported interventions are as effective for reducing disruptive child behavior as homegrown interventions.

Is Transportability Equally Effective for Different Programs and for Different Regions?

The transportability of parenting interventions may differ across different types of programs. Although the content of many programs based on social learning theory principles tends to be fairly similar, some programs are more fixed in the techniques they teach

parents,²⁷ whereas others more explicitly focus in therapist training and intervention delivery on flexibilities of the intervention to deal with individual differences in cultural norms and values.²⁸ This may impact program transportability. To explore whether some parenting intervention programs are more transportable than others, we compare the effectiveness of parenting interventions in their home country with the effectiveness of these same interventions in new countries for a range of parenting intervention “brands” (i.e., manualized interventions that are implemented under a particular name).

The transportability of parenting interventions may also differ across geographical regions. Cultural similarities between an intervention’s country of origin and a new country may impact transportability success. For example, even translation of program materials (e.g., for transportability to non-English-speaking countries in Europe) might have an impact on to what extent program fidelity is ensured. Gardner et al.¹⁰ found that transported parenting interventions were just as likely to be effective (and in some respects more so) in countries that were culturally more distinct from the interventions’ countries of origin. In this study, we explore for several different geographical regions whether importing interventions or nurturing homegrown interventions seems the better approach for reducing disruptive child behavior.

The Present Study

The present systematic review and multilevel meta-regression aims to inform theory on how parent–child interactions in different countries shape disruptive child behavior in children, and to better enable policy makers to decide which interventions to implement. We examine to what extent (1) transported parenting interventions for reducing disruptive child behavior lead to better (or worse) outcomes than homegrown parenting interventions, (2) different parenting intervention brands retain their effectiveness after transportation, and (3)

different geographical regions show superior effects of either transported or homegrown interventions.

METHOD

Data Sources, Study Selection, Inclusion Criteria

We identified randomized controlled trials of parenting interventions that were based on behavioral/social learning theory and aimed at reducing disruptive child behavior. Because this is a field that has been extensively reviewed,²⁹⁻³¹ we conducted searches in line with Cochrane guidance³² on systematic reviews of reviews. Relevant systematic reviews that were published from 2008 to 2015 were searched (see Supplement 1, available online). Included systematic reviews for identification of eligible trials are presented in Table S1, available online. No date limit was placed on included trials. We also searched for recent trials that may not yet have been systematically reviewed through searches of six online databases (see Supplement 2, available online) and for unpublished trials by contacting experts and searching trial registries. Neither reviews nor trials were excluded based on language, and efforts were made to identify trials published in any language, for example, by contacting colleagues and other experts working on parenting programs in many countries and regions. We applied our inclusion criteria to the list of trials based first on abstracts and then, if needed, the full text, to produce a list of included trials for this review. Please see Figure 1 for our preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow-chart. We acknowledge that although our search was systematic and thorough, we cannot fully exclude the possibility that there might be trials that we did not identify.

We included trials that compared a parenting intervention (comprised of techniques largely based on the principles of social learning theory) to a control condition. Other inclusion criteria were: (1) random assignment to treatment conditions, (2) more than 50

percent of sessions focused specifically on parenting, (3) children's mean age between 2 and 9 years, and (4) a control condition that was either no-treatment, wait-list, minimal intervention (e.g., telephone helpline), or care as usual. We excluded interventions directed at parents or carers of special child populations that were not defined by their behavioral problems, including (but not limited to) children in temporary foster care, children of the street, children with autism, and children with physical disabilities or very severe learning disabilities or mental illness. Because conduct problem symptoms and hyperactivity-impulsivity symptoms often co-occur in young children with disruptive behavior,³³ samples of children with attention-deficit/hyperactivity disorder (ADHD) that came up in our search were included as long as the study explicitly focused on reducing conduct problems. Importantly, only outcome measures of general disruptive behavior, not ADHD symptoms, were included in our study. Trials were excluded if they involved a wide range of services to children and families but did not isolate the effects of parenting intervention.

One author (W.K.) assessed abstracts and full text of studies that were likely to meet inclusion criteria; discrepancies and the final list of trials included in the review were assessed by two other authors (P.L. and F.G.). Final inclusion in the meta-regression was agreed by all authors.

Data Extraction

In addition to general trial characteristics, we coded whether the evaluated intervention was transported or homegrown. Unfortunately, trials on transported interventions hardly provided any information about the extent to which interventions were culturally adapted. This could therefore not be included in the analyses. Included outcome measures were all parent-reported measures of disruptive child behavior to ensure comparability across trials: observed and teacher-rated child behavior were available only for a subset of trials. Most outcome measures were symptom measures; only small minorities of the outcome

measures were impairment measures. Generally no information was available about measurement invariance of the outcome measures across countries.

Intervention Brand. For subgroup analysis, trials were coded in different intervention brand categories. Although the content of the different brands is fairly similar, the interventions meaningfully vary in their delivery methods (e.g., individual versus group-based), level of inbuilt flexibility to deal with cultural differences, and training and supervision procedures for new and overseas therapists. Coded brands were: Incredible Years (IY)³⁴; Triple P Positive Parenting Program (Triple P)³⁵; Parent–Child Interaction Therapy (PCIT)²⁷; and Parent Management Training–Oregon (PMTO).³⁶ Other intervention brands (e.g., 123 Magic³⁷) were evaluated only in one or a few trials and could therefore not be analyzed as a separate category. We used guidance from the *Cochrane Handbook for Systematic Reviews of Interventions*³² to decide that categories needed to include at least 9 trials. The remaining interventions (13%) were not branded and could therefore not be categorized. These interventions seemed designed mainly for research purposes and were based on various combinations of principles (e.g., the Hanf model³⁸) and books (e.g., *Helping the Noncompliant Child*³⁹). Examples of non-branded interventions include those evaluated by Bernal, Klinnert, and Schultz,⁴⁰ and by Hamilton and MacQuiddy.⁴¹

Geographical region. Trials were also coded in four different geographical regions. Regions were defined based on the continent, the number of trials available from each region, and on language similarities because transportability success may be affected by translation of intervention materials. This led to four categories: North America; Australia; UK and Ireland (i.e., English-speaking European countries), and other European countries (i.e., non-English-speaking European countries). Unfortunately, there were not enough trials from Asia, Africa, and Latin America to categorize into meaningful geographical regions.

Effect Size Calculation

Effect sizes were the standardized mean differences on disruptive child behavior between parenting intervention and control, represented as Cohen's d values,⁴² and were based on means and standard deviations reported at posttreatment. We preferred means and standard deviations that were analysis of covariance (ANCOVA)-adjusted for baseline, as is recommended in the analysis of randomized trials.³² Where appropriate, we used other summary statistics (e.g. p -values and sample sizes, or t -test statistics) to calculate d . Twenty-one trials did not provide relevant outcomes measures or sufficient information to compute effect sizes and were excluded from the analyses.

Two trials^{43,44} compared both transported and homegrown interventions to a control condition. We split these trials into the relevant transported vs. control and homegrown vs. control comparisons and treated these as separate studies. We avoided double-counting of control participants by estimating effect sizes with the size of the control group split between the two clusters resulting from each of these two trials. Twenty-one trials did not provide relevant outcomes measures or sufficient information to compute effect sizes and were excluded from the analyses (Table S2, available online).

Data Analyses

We used a three-level multilevel meta-analysis method with random effects to account for the clustering of outcomes within studies. Level 1 is implied and represents research and control participants in the studies. Level 2 is composed of each outcome measure for a treatment–control comparison (within-study level). Level 3 is composed of each study (between-study level). Multilevel meta-analysis is most appropriate when studies report multiple effect sizes corresponding to the same construct, i.e., unlike multivariate meta-analysis, where the variance–covariance matrix between different types of outcomes is required, multilevel meta-analysis can combine within studies multiple measures of the same outcome.⁴⁵

Our meta-regressor, whether an intervention was transported or homegrown, was a binary variable that was placed on Level 3, between studies. We first fit an overall model with the meta-regressor to test for overall differences between transported and homegrown interventions. We then stratified models first by brand of intervention and then by region. For each meta-regression model, we calculated I^2 at the between-study level by dividing the variance component for this level by the sum of the within-study and between-study variance components and the arithmetic mean of the variances attached to each effect size,⁴⁵ and we compared this residual I^2 to the I^2 for a model without a meta-regressor. The regression coefficient is thus the difference in intervention effectiveness between groups expressed in terms of Cohen's d . That is, how many more (or fewer) standard deviations do intervention groups improve relative to control groups in transported interventions as opposed to homegrown interventions?

We then estimated the size of the intervention effect for transported and homegrown interventions by refitting meta-analysis models without an intercept. Because several of the study groups we were examining contained small numbers of studies and because we used random effects models, estimating intervention effects in this way allowed for a more stable between-study variance parameter to be estimated.

Risk of Bias

We assessed risk of bias in included studies (as high, low, or unclear) using the Cochrane Collaboration tool (Table 1).³²

RESULTS

Transported Versus Homegrown Interventions

Tables S3a and S3b, available online, show the characteristics of the 129 included trials. There was no significant difference in effect sizes between transported and homegrown interventions ($d = 0.10$, 95% CI -0.08 to 0.29; Table 2). Transported and homegrown

interventions are thus not statistically different in their effectiveness in reducing disruptive child behavior.

Differential Effectiveness per Intervention Brand

IY, Triple P, and PCIT yielded significant effects on reduced disruptive child behavior in their country of origin and after transportation. PMTO did not yield significant effects. There was little evidence to suggest that IY and PCIT are differentially effective before and after transportation (Table 2). There was a trend suggesting that Triple P is less effective after transportation compared to in its home country, but this effect did not reach significance (95% CI 0.56 to -0.02). In all models, including transportation as a meta-regressor did not meaningfully reduce I^2 . In addition, there were no significant differences in effect sizes of transported and homegrown interventions for any of the intervention brands (Table 2). Because there were only two trials of PMTO in other countries, the transportability of PMTO cannot be interpreted.

Differential Effectiveness per Geographical Region

There were no significant differences in effect sizes between transported and homegrown interventions for any of the geographical regions (Table 2). As above, including transportation in meta-regression models did not reduce I^2 , and differences between groups did not rise to statistical significance. The mean effect size for homegrown interventions, but not transported interventions, was significant in non-English-speaking European countries (UK and Ireland), but the difference between effect sizes of transported and homegrown trials was not significant. Because there were only two transported intervention trials in the US and Canada, the transportability of interventions to this region cannot be interpreted.

Unfortunately, numbers of trials from Asia, Africa, and Latin America were too small to meta-analyze. Transporting interventions to countries that are culturally more different from the country in which the intervention was developed may be especially challenging. We

therefore briefly summarize the findings from individual trials from Asia, Africa, and Latin America. Negative effect sizes indicate that reductions in disruptive child behavior were stronger in the intervention condition than in the control condition.

There were four trials in Hong Kong on transported interventions. The effects of these interventions on various measures of reduced disruptive child behavior ranged between $d = -0.26$, CI -0.79 to 0.26 and $d = -2.28$, CI -3.29 to -1.27. Indonesia, Iran, and Panama each had one trial on a transported intervention with multiple measures of reduced disruptive child behavior (Indonesia: $d = -0.23$, CI -0.56 to 0.10 and $d = -0.03$, CI -0.36 to 0.30; Iran: $d = -2.28$, CI -3.51 to -1.26 and $d = -2.72$, CI -3.91 to -1.52; Panama: $d = -0.51$, CI -0.92 to -0.10 and $d = -0.23$, CI -0.63 to 0.18). These findings suggest promising results for transporting interventions to Hong Kong, Iran, and Panama. Effects of the transported intervention to Indonesia on disruptive child behavior were not significant.

Hong Kong, Israel, and Liberia each had one trial on a homegrown intervention (Hong Kong: $d = -0.45$, CI -0.77 to 0.14 and $d = -0.55$, CI -0.86 to -0.24; Israel: $d = -0.75$, CI -1.04 to -0.45 and $d = -0.78$, CI -1.08 to -0.48; Liberia: $d = 0.09$, CI -0.15 to 0.33).

Post Hoc Analyses

First, we re-estimated our overall model without interventions that were not branded (i.e., did not have a formal name and manual). Second, we controlled for comparison arms that involved interventions that seemed more substantial than typical treatment as usual. None of these changed our findings about the overall lack of difference between transported and homegrown interventions.

DISCUSSION

We found no significant difference in effectiveness between transported and homegrown parenting interventions for reducing disruptive child behavior. The same underlying theoretical principles thus led to similar effects, regardless of whether translation

of these principles into an actual intervention was done abroad or locally. This is reassuring for policymakers, practitioners, and service commissioners, who can benefit from programs that have been designed and shown to work abroad, saving costs and money. Importantly, this finding held regardless of the region of the geographical region importing the intervention or the type (i.e., brand) of the intervention.

Thus, our findings support both the dissemination of evidence-based parenting interventions across countries and the use of locally developed and rigorously tested interventions based on the same theoretical principles. Our findings of the relative lack of difference between these strategies lead us to suggest that no preference should exist for either strategy. We do emphasize that, despite the strong intuitive appeal of homegrown programs, there is very little evidence to suggest they are superior in their effects to imported programs. This finding is of relevance to policymakers in countries without well-established evidence-based programs but who want to choose an intervention. Moreover, if it comes to implementing homegrown interventions that have not yet been tested in randomized trials (which represent the majority of parenting interventions in most countries, e.g., in the Netherlands⁴⁶), then arguably preference should be given to interventions that have been properly tested, even if this was done abroad.

Parenting across countries has both similarities and differences.⁴⁷ Our findings suggest that translations of social learning theory-based principles (e.g., positive reinforcement increases behavior) into actual parenting techniques (e.g., providing praise for compliance) leads to similar effects on children across countries. On a clinical and policy level, these findings add to the body of evidence that parenting interventions based on social learning theory can be effective for reducing disruptive child behavior across countries.¹⁰

Some limitations merit attention. First, our results pertain to parenting interventions that have a strong base in social learning theory, and transported interventions were mainly

branded interventions such as IY and Triple P. Although parenting interventions based on social learning theory form the majority of parenting interventions tested in randomized controlled trials (RCTs) in this age group, our findings cannot be generalized to parenting interventions with other theoretical bases. Second, the number of trials from other regions than North America, Europe, or Australia was limited ($k = 10$ studies). Although we included studies from around the world, the limited number of available studies from Asia, Africa, and Latin America limits the global scope of our findings. Findings of individual trials from Panama, Iran, Hong Kong, and Indonesia generally suggest promising results for transporting interventions to countries with relatively high income (e.g., Iran and Hong Kong), but different cultures from the countries in which the interventions were developed. Third, we were unable to describe variation in the extent to which transported interventions were culturally adapted as papers provided little information about this. Implicit and “intuitive” cultural adaptations tend to be made in the process of transportation, though they often remain undocumented. This makes it hard to evaluate the effects of cultural adaptations.⁴⁸ Moreover, some interventions may be little adapted but rather train therapists to adapt some of the content of the intervention flexibly to the needs of individual families. These inbuilt flexibilities in some manualized interventions further complicate the study of cultural adaptations.⁴⁹ Fourth, outcome measures generally lacked information about measurement invariance across trials and all were parent-reported and thus not blinded to the families’ condition. We chose to include parent-reported outcome measures to ensure comparability across trials: observed and teacher-rated child behavior were available only in a subset of trials.

Policymakers and mental health service providers across the world aim to reduce the burden of disruptive child behavior and prevent conduct disorders. They must often choose between implementing evidence-based interventions designed abroad or to develop or nurture

one locally. Our findings show that transported and homegrown parenting interventions based on the same underlying principles lead to similar outcomes across western countries. This finding supports the selection of interventions based on their evidence base, rather than on their cultural specificity. More research is needed outside North America, Europe, and Australia to enhance our understanding of the transportability of parenting interventions across more distinct countries and cultures.

Clinical Guidance

- Parenting interventions based on social learning theory principles are an effective strategy to reduce disruptive child behavior.
- Policy makers and clinicians must often choose between using transported interventions (i.e., developed abroad) or homegrown interventions (i.e., developed locally).
- Transported and homegrown parenting interventions do not differ in their effectiveness to reduce disruptive child behavior; this finding was robust across intervention brands and geographical regions of western countries.
- Interventions should be selected on their evidence base rather than on cultural specificity.

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Figure 1. Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow-chart.

RUNNING HEAD: SHOULD WE EACH DEVELOP OUR OWN?

Table 1: *Risk of Bias per Intervention Brand Category.*

Intervention brand category	Trial location (# trials)	Adequate sequence generation?	Allocation concealment?	Blinding of assessors?	Incomplete outcome data addressed?
Incredible Years	Transported (16)	+	+	+	+
	Homegrown (14)	+?	+	+	+
Triple P	Transported (13)	+	+?	?	+
	Homegrown (25)	+	?	?	+
PCIT	Transported (5)	+	?	+?	+
	Homegrown (6)	?	+?	?	?
Parent Management Training (Oregon)	Transported (2)	+	+	+	+
	Homegrown (7)	?	?	?	+?

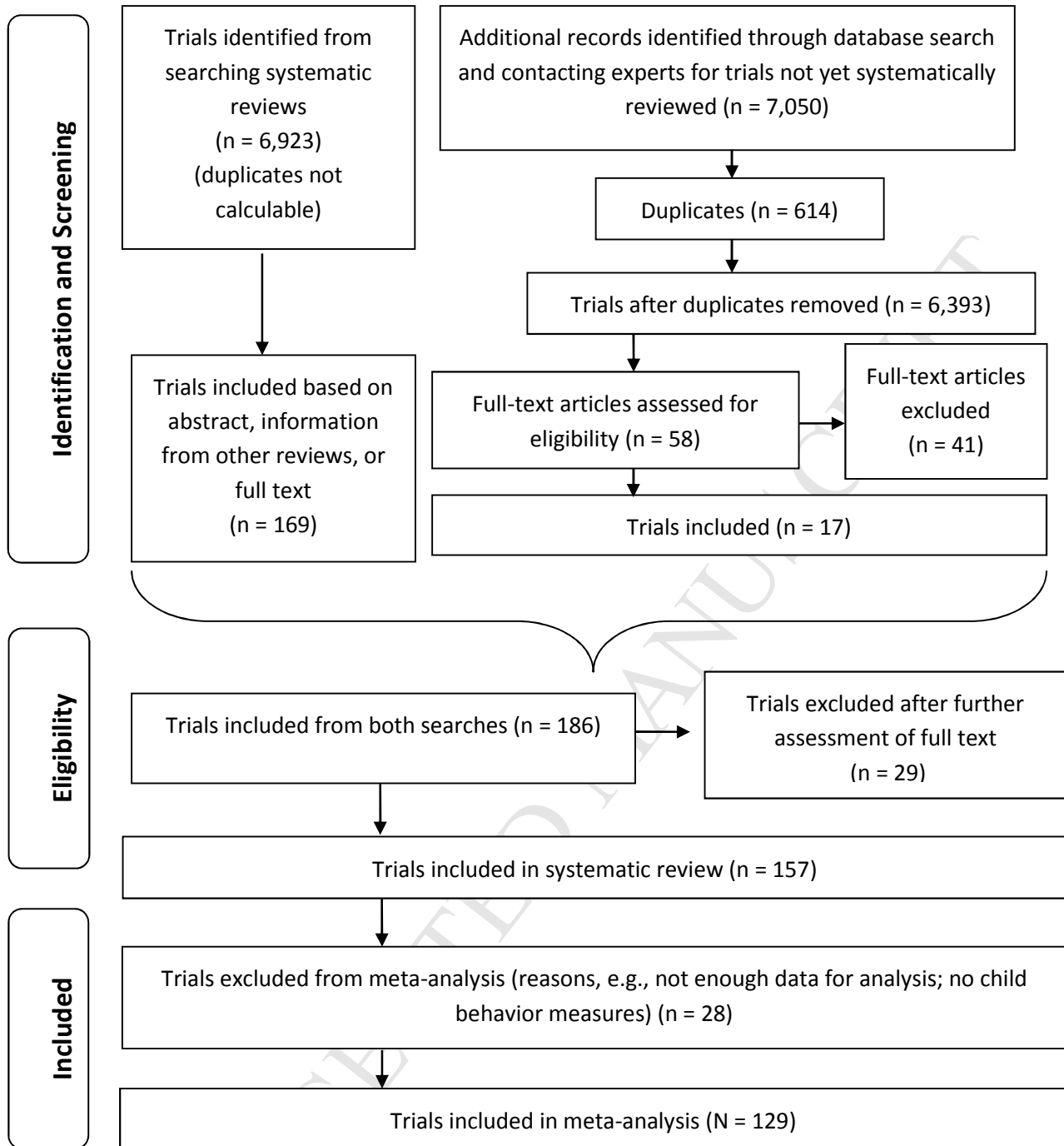
Note. PCIT = Parent–Child Interaction Therapy; Triple P = Positive Parenting Program. + = Low risk; ? = unclear risk; - high risk.

Table 2. Number of Trials (k), Number of Effect Sizes (n), Mean Effect Size (d), and Significance by Intervention Brand and Geographical Region.

	Homegrown		Transported		Mean difference	I ² (%)
	k (n)	d (95% CI)	k (n)	d (95% CI)	(95% CI)	(original, residual)
All models	91 (270)	-0.55*** (-0.65, -0.45)	38 (104)	-0.45*** (-0.60, -0.29)	0.10 (-0.08, 0.29)	66, 66
Intervention brand						
Incredible Years	14 (39)	-0.48*** (-0.69, -0.27)	17 (43)	-0.36*** (-0.53, -0.18)	0.12 (-0.15, 0.40)	58, 58
Triple P	26 (82)	-0.60*** (-0.76, -0.43)	13 (31)	-0.33** (-0.56, -0.09)	0.27 (-0.02, 0.56)	59, 55
PCIT	6 (30)	-1.37*** (-1.82, -0.92)	5 (21)	-0.97*** (-1.44, -0.49)	0.40 (-0.26, 1.05)	65, 64
Parent Management Training (Oregon)	7 (20)	-0.60 (-1.22, 0.03)	2 (4)	-0.21 (-1.37, 0.95)	0.39 (-0.93, 1.70)	84, 85
Geographical region						
US and Canada	49 (150)	-0.56*** (-0.71, -0.40)	2 (5)	-0.37 (-1.14, 0.41)	0.19 (-0.60, 0.98)	64, 64
Australia	26 (82)	-0.59*** (-0.75, -0.44)	4 (19)	-0.78*** (-1.20, -0.36)	-0.19 (-0.63, 0.26)	50, 51
Non-English-speaking European countries (Continental Europe and Iceland)	8 (23)	-0.61** (-0.99, -0.22)	14 (37)	-0.23 (-0.52, 0.06)	0.38 (-0.11, 0.86)	82, 81
English-speaking European countries (UK/Ireland)	5 (10)	-0.24 (-0.54, 0.06)	11 (28)	-0.31*** (-0.49, -0.13)	-0.07 (-0.42, 0.28)	53, 55

Note. PCIT = Parent–Child Interaction Therapy; Triple P = Positive Parenting Program.

*** $p < .001$, ** $p < .01$.



SUPPLEMENT 1. Search Strategy for Identifying Systematic Reviews and Meta-Analyses

We identified systematic reviews published from 2008 to 2011 in a previous review¹ using the search terms below, and updated the search for 2011–2014. (The search terms were also adapted for use in other databases, including CINAHL, *metaRegister* of Controlled Trials [mRCT] [<http://www.controlled-trials.com>], and the Cochrane Database of Systematic Reviews.)

Search terms used for PsycINFO (1967 to April 2014), MEDLINE (1948 to April 2014) and EMBASE (1980 to April 2014)

1. exp "literature review"/ or exp meta analysis/
2. systematic review.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
3. 1 or 2
4. exp Parents/ or exp Parent Training/ or exp Mothers/ or exp Childrearing Practices/ or exp Family Relations/ or exp Parenting Skills/
5. exp Parenting/
6. exp Parent Child Relations/
7. exp Conduct Disorder/
8. exp Antisocial Personality Disorder/
9. exp Juvenile Delinquency/
10. exp Child Abuse/
11. exp Child Neglect/
12. exp Mother Child Communication/ or exp Child Discipline/ or exp Child Psychology/ or exp Father Child Relations/ or exp Mother Child Relations/ or exp Parent Child Relations/ or exp Parent Child Communication/ or exp Father Child Communication/

13. Child.mp.
14. Preschool.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
15. exp Aggressiveness/ or exp Aggressive Behavior/ or exp Behavior Disorders/
16. exp Antisocial Personality Disorder/ or exp Antisocial Behavior/
17. Offending.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
18. (Behavio* and (change or therapy)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
19. 13 or 14
20. 15 or 16 or 17 or 18
21. 19 and 20
22. 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 21
23. 3 and 22

References

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SUPPLEMENT 2. Search Strategy for Identifying New Trials That Have not yet Been Systematically Reviewed

Search terms used for PsycINFO (2002 to January 2015), Ovid MEDLINE(R) (1946 to January 2015), Embase (1996 to January 2015) (Search terms were adapted for use in other databases, including CINAHL and the Cochrane Database of Systematic Reviews.)

1. exp Parents/ or exp Parent Training/ or exp Mothers/ or exp Childrearing Practices/ or exp Family Relations/ or exp Parenting Skills/
2. exp Parenting/
3. exp Parent Child Relations/
4. exp Conduct Disorder/
5. exp Juvenile Delinquency/
6. exp Child Abuse/
7. exp Child Neglect/
8. exp Mother Child Communication/ or exp Child Discipline/ or exp Child Psychology/ or exp Father Child Relations/ or exp Mother Child Relations/ or exp Parent Child Relations/ or exp Parent Child Communication/ or exp Father Child Communication/
9. Child.mp.
10. Preschool.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
11. exp Aggressiveness/ or exp Aggressive Behavior/ or exp Behavior Disorders/
12. exp Antisocial Personality Disorder/ or exp Antisocial Behavior/
13. Offending.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

14. (Behavio* and (change or therapy)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
15. 9 or 10
16. 11 or 12 or 13 or 14
17. 15 and 16
18. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 17
19. randomized controlled trial
20. limit 19 to yr="2011 - 2015"
21. limit 20 to ("preschool child (2 to 5 years)" or "child (6 to 12 years)")
22. limit 21 to humans
23. limit 22 to peer reviewed journal
24. limit 23 to treatment & prevention
25. limit 24 to ("core clinical journals (aim)" or communication disorders journals or consumer health journals or foreign journals or health technology assessment journals or nursing journals)

Table S1. Systematic Reviews and Reviews of Reviews Searched to Identify Relevant Trials

Citation
Barlow J, Smailagic N, Bennett C, Huband N, Jones H, Coren E. Individual and group based parenting programmes for improving psychosocial outcomes for teenage parents and their children. <i>Cochrane Database Syst Rev</i> . 2011;(3):CD002964.
Barlow J, Smailagic N, Huband N, Roloff V, Bennett C. Group-based parent training programmes for improving parental psychosocial health. <i>Cochrane Database Syst Rev</i> . 2012;6:CD002020.
Bayer J, Hiscock H, Scalzo K, et al. Systematic review of preventive interventions for children's mental health: what would work in Australian contexts? <i>Aust N Z J Psychiatry</i> . 2009;43:695-710.
Coates J, Taylor JA, Sayal K. Parenting Interventions for ADHD: A Systematic Literature Review and Meta-Analysis. <i>J Atten Disord</i> . 2015;19:831-43.
Cooley ME, Veldorale-Griffin A, Petren RE, Mullis AK. Parent–Child Interaction Therapy: A Meta-Analysis of Child Behavior Outcomes and Parent Stress. <i>J Fam Soc Work</i> . 2014;17:191-208.
de Graaf I, Speetjens P, Smit F, de Wolff M, Tavecchio L. Effectiveness of the Triple P Positive Parenting Program on behavioral problems in children: a meta-analysis. <i>Behavior Modification</i> . 2008;32:714-735.
Dekovic M, Slagt M, Asscher J, Boendermaker L, Eichelsheim V, Prinzie P. Effects of early prevention programs on adult criminal offending: A meta-analysis. <i>Clinical Psychology Review</i> . 2011;31:532-544.

- Dretzke J, Davenport C, Frew E, et al. The clinical effectiveness of different parenting programmes for children with conduct problems: A systematic review of randomised controlled trials. *Child Adolesc Psychiatry Ment Health*. 2009;3:7.
- Eyberg SM, Nelson MM, Boggs SR. Evidence-Based Psychosocial Treatments for Children and Adolescents With Disruptive Behavior. *J Clin Child Adolesc Psychol*. 2008;37:215-237.
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- Hodge DR, Jackson KF, Vaughn MG. Culturally sensitive interventions and health and behavioral health youth outcomes: a meta-analytic review. *Social Work in Health Care*. 2010;49:401-423.
- Huey SJ, Jr., Polo AJ. Evidence-based psychosocial treatments for ethnic minority youth. *J Clin Child Adolesc Psychol*. 2008;37:262-301.
- Knerr W, Gardner F, Cluver L. Improving Positive Parenting Skills and Reducing Harsh and

- Abusive Parenting in Low- and Middle-Income Countries: A Systematic Review. *Prev Sci.* 2013;14:352-363.
- Lee P-c, Niew W-i, Yang H-j, Chen VC-h, Lin K-c. A meta-analysis of behavioral parent training for children with attention deficit hyperactivity disorder. *Research in Developmental Disabilities.* 2012;33:2040-2049.
- Leijten P, Raaijmakers MAJ, Orobio de Castro B, Matthys W. Does socioeconomic status matter? A meta-analysis on parent training effectiveness for disruptive child behavior. *J Clin Child Adolesc Psychol.* 2013;42:384-392.
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- Matjasko JL, Vivolo-Kantor AM, Massetti GM, Holland KM, Holt MK, Dela Cruz J. A systematic meta-review of evaluations of youth violence prevention programs: Common and divergent findings from 25 years of meta-analyses and systematic reviews. *Aggression and Violent Behavior.* 2012;17:540-552.
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- Mikton C, Butchart A. Child maltreatment prevention: a systematic review of reviews. *Bulletin of the World Health Organization.* 2009;87:353-361.
- Miller S, Wampold B, Varhely K. Direct comparisons of treatment modalities for youth

- disorders: a meta-analysis. *Psychother.* 2008;18:5-14.
- Montoya A, Colom F, Ferrin M. Is psychoeducation for parents and teachers of children and adolescents with ADHD efficacious? A systematic literature review. *Eur Psychiatry.* 2011;26:166-175.
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- Piquero AR, Farrington D, Jennings WG, Tremblay R, Piquero A. Effects of early family/parent training programs on antisocial behavior and delinquency. *Campbell Systematic Reviews.* 2008.
- Shucksmith J, Jones S, Summerbell C. The role of parental involvement in school-based mental health interventions at primary (elementary) school level. *Adv Sch Ment Health Promot.* 2010;3:18-29.
- Smith TK, Duggan A, Bair-Merritt MH, Cox G. Systematic Review of Fathers' Involvement in Programmes for the Primary Prevention of Child Maltreatment. *Child Abuse Review.* 2012;21:237-254.
- Sonuga-Barke EJ, Brandeis D, Cortese S, et al. Nonpharmacological interventions for ADHD:

- systematic review and meta-analyses of randomized controlled trials of dietary and psychological treatments. *Am J Psychiatry*. 2013;170:275-289.
- von Sydow K, Retzlaff R, Beher S, Haun MW, Schweitzer J. The efficacy of systemic therapy for childhood and adolescent externalizing disorders: a systematic review of 47 RCT. *Family Process*. 2013;52:576-618.
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- Zwi M, Jones H, Thorgaard C, York A, Dennis JA. Parent training interventions for Attention Deficit Hyperactivity Disorder (ADHD) in children aged 5 to 18 years. *Cochrane Database of Systematic Reviews*. 2011;(12):CD003018.
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Table S2. *Trials Included in Systematic Review but Excluded From Meta-Analysis*

Citation	Reason for exclusion from analysis
Adesso V, Lipson JW. Group training of parents as therapists for their children. <i>Behav Ther.</i> 1981;12:625-633.	No relevant/comparable measures of child behaviour
Anastopoulos AD, Shelton TL, DuPaul GJ, Guevremont DC. Parent training for attention-deficit hyperactivity disorder: its impact on parent functioning. <i>J Abnorm Child Psychol.</i> 1993;21:581-596.	No relevant/comparable measures of child behaviour
Bradley SJ, Jadaa DA, Brody J, et al. Brief psychoeducational parenting program: an evaluation and 1-year follow-up. <i>J Am Acad Child Adolesc Psychiatry.</i> 2003;42:1171-1178.	No relevant/comparable measures of child behaviour
Christensen A, Johnson SM, Phillips S, Glasgow RE. Cost effectiveness in behavioral family therapy. <i>Behav Ther.</i> 1980;11:208-226.	Insufficient data reported
Dawe S, Harnett P. Reducing potential for child abuse among methadone-maintained parents: results from a randomized controlled trial. <i>J Subst Abuse Treat.</i> 2007;32:381-390.	Insufficient data reported
Diamant C, Colletti G. Evaluation of behavioral group counseling for parents of learning-disabled	Insufficient data reported; no relevant

children. <i>J Abnorm Child Psychol.</i> 1978;6:385-400.	measures of child behaviour
Hanisch C, Freund-Braier I, Hautmann C, et al. Detecting effects of the indicated prevention Programme for Externalizing Problem behaviour (PEP) on child symptoms, parenting, and parental quality of life in a randomized controlled trial. <i>Behav Cogn Psychother.</i> 2010;38:95-112.	No relevant/comparable measures of child behaviour
Helfenbaum-Kun ED, Ortiz C. Parent-Training Groups for Fathers of Head Start Children: A Pilot Study of Their Feasibility and Impact on Child Behavior and Intra-Familial Relationships. <i>Child Fam Behav Ther.</i> 2007;29:47-64.	Insufficient data reported
Hughes JR, Gottlieb LN. The effects of the Webster-Stratton parenting program on maltreating families: Fostering strengths. <i>Child Abuse Negl.</i> 2004;28:1081-1097.	No relevant/comparable measures of child behaviour
Jouriles EN, McDonald R, Rosenfield D, et al. Improving parenting in families referred for child maltreatment: A randomized controlled trial examining effects of project support. <i>J Fam Psychol.</i> 2010;24:328-338.	No child behaviour measures
Karoly P, Rosenthal M. Training parents in behavior modification: Effects on perceptions of family interaction and deviant child behavior. <i>Behav Ther.</i> 1977;8:406-410.	Insufficient data reported

- Lavigne JV, Lebailly SA, Gouze KR, et al. Treating oppositional defiant disorder in primary care: a comparison of three models. *J Pediatr Psychol*. 2008;33:449-461. Insufficient data reported
- Martinez CR, Jr., Forgatch MS. Preventing problems with boys' noncompliance: effects of a parent training intervention for divorcing mothers. *J Consult Clin Psychol*. 2001;69:416-28. No relevant/comparable measures of child behaviour
- Nye CL, Zucker RA, Fitzgerald HE. Early intervention in the path to alcohol problems through conduct problems: treatment involvement and child behavior change. *J Consult Clin Psychol*. 1995;63:831-840. Insufficient data reported
- Nye CL, Zucker RA, Fitzgerald HE. Early family-based intervention in the path to alcohol problems: Rationale and relationship between treatment process characteristics and child and parenting outcomes. *J Stud Alcohol*. 1999;13:10-21. Insufficient data reported
- Olivares J, Rosa AI, Garcia-Lopez LJ. El papel del video en el entrenamiento a madres: Un estudio comparativo (Video training of mothers: A comparative study). *Psicologia Conductal*. 1997;5:237-254. No child behaviour measures
- Patterson GR, Chamberlain P, Reid JB. A comparative evaluation of a parent-training program. *Behav* No relevant/comparable measures of

<i>Ther.</i> 1982;13:638-650.	child behaviour
Pisterman S, Firestone P, McGrath P, et al. The effects of parent training on parenting stress and sense of competence. <i>Canadian Journal of Behavioural Science.</i> 1992;24:41-58.	Insufficient data reported
Pisterman S, McGrath P, Firestone P, Goodman JT, Webster I, Mallory R. Outcome of parent-mediated treatment of preschoolers with attention deficit disorder with hyperactivity. <i>J Consult Clin Psychol.</i> 1989;57:628-35.	Insufficient data reported
Sigmarsdottir M, Degarmo DS, Forgatch MS, Gumundsdottir EV. Treatment effectiveness of PMTO for children's behavior problems in Iceland: Assessing parenting practices in a randomized controlled trial. <i>Scand J Psychol.</i> 2013;54:468-476.	No relevant/comparable measures of child behaviour
Sim A, Annan J, Puffer E, Salhi C, Betancourt T. <i>Building happy families: Impact evaluation of a parenting and family skills intervention for migrant and displaced Burmese families in Thailand.</i> Bangkok: International Rescue Committee; 2014.	Relevant data not yet available
Spaccarelli S, Cotler S, Penman D. Problem-solving skills training as a supplement to behavioral parent training. <i>Cognit Ther Res.</i> 1992;16:1-17.	Insufficient data reported

Spijkers W, Jansen DE, Reijneveld SA. Effectiveness of Primary Care Triple P on child psychosocial problems in preventive child healthcare: a randomized controlled trial. <i>BMC Med.</i> 2013;11:240.	Insufficient data reported
Sutton C. Training Parents to Manage Difficult Children: A Comparison of Methods. <i>Behav Cogn Psychother.</i> 1992;20:115-139.	Insufficient data reported
Sutton C. Parent Training by Telephone: A Partial Replication! <i>Behav Cogn Psychother.</i> 1995;23:1-24.	Insufficient data reported
Szapocznik J, Rio A, Murray E, et al. Structural family versus psychodynamic child therapy for problematic Hispanic boys. <i>J Consult Clin Psychol.</i> 1989;57:571-578.	No relevant/comparable measures of child behaviour
Thompson MJ, Laver-Bradbury C, Ayres M, et al. A small-scale randomized controlled trial of the revised new forest parenting programme for preschoolers with attention deficit hyperactivity disorder. <i>Eur Child Adolesc Psychiatry.</i> 2009;18:605-616.	No relevant/comparable measures of child behaviour

Table S3a. *Characteristics of Included Trials of Transported Interventions.*

First author	Year	Trial country	Program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Au	2014	Hong Kong	Australia	Triple P	wait-list	5-10 [7.5]	17	6%	ECBI-I/P
Axberg	2012	Sweden	USA	IY	wait-list	4-8 [unclear]	62	8%	ECBI-I/P
Azevedo	2013	Portugal	USA	IY	wait-list	36 [4.7]	123	7%	SDQ-C, PACS
Bjorknes	2013	Norway	USA	PMTO	wait-list	3-9 [5.9]	96	18%	ECBI-P, Conduct Problem Composite (of ECBI and PDR)
Bodenmann	2008	Switzerland	Australia	Triple P	no intervention	2-12 [6.6]	100	12%	ECBI-I/P
Gardner	2006	UK	USA	IY	wait-list	2-9 [5.9]	76	7%	ECBI-I/P
Hahlweg	2008	Germany	Australia	Triple P	wait-list	3-6 [4.1]	69	9%	CBCL-Ext
Heinrichs (reported in Hahlweg 2010)	2010	Germany	Australia	Triple P	no intervention	3-6 [4.5]	280	1%	CBCL-Ext
Hutchings	2007	UK	USA	IY	wait-list	3-4.6 [4.2]	153	13%	ECBI-I/P, SDQ-C
Jalali	2009	Iran	Australia	Triple P	no intervention	7-10 [8.3]	24	13%	CBCL-ODD
Kleefman	2014	Netherlands	Australia	Triple P	TAU	5-12 [9]	209	24%	ECBI-I
Larsson	2008/9	Norway	USA	IY	wait-list	4-8 [6.6]	81	10%	ECBI-I/P, CBCL-Agg
Leijten	In press	Netherlands	USA	IY	wait-list	3-8 [5.6]	154	16%	ECBI-I/P, SDQ-C
Leung	2003	Hong Kong	Australia	Triple P	wait-list	3-7 [4.2]	88	22%	ECBI-I/P, SDQ-C, PDR
Leung	2012	Hong Kong	USA	PCIT	wait-list	2-7 [4.5]	111	0%	ECBI-I/P
Leung	2014a	Hong Kong	Australia	Triple P	wait-list	5-6 [5]	56	13%	ECBI-I/P
Leung	2014b	Hong Kong	USA	PCIT	wait-list	2-7 [4.5]	111	14%	ECBI-I/P
Little	2012a	UK	Australia	Triple P	wait-list	4-9 [6.8]	146	5%	ECBI-I/P, SDQ-C
Little	2012b	UK	USA	IY	wait-list	3-4 [3.7]	161	9%	ECBI-I/P, SDQ-C

First author	Year	Trial country	Program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Malti	2011	Switzerland	Australia	Triple P	no intervention	6-7 [7.5]	695	4%	SBQ-Agg (teacher)/Non-aggressive externalizing (conduct; teacher)/Agg (parent)
McGilloway	2012	Ireland	USA	IY	wait-list	3-7 [5]	149	8%	ECBI-I/P
McGilloway	2013	Ireland	USA	IY	wait-list	3-7 [4.8]	33	0%	SDQ-C, Conners-Opp
Mejia	2015	Panama	Australia	Triple P	no intervention	3-12 [8.5]	108	13%	ECBI-I/P
Menting	2013	Netherlands	USA	IY	no intervention	2-10 years	113	33%	ECBI-I/P
Nicholson	1999	USA	Australia	Triple P	wait-list	7-12 [9.6]	39	23%	PDR
Nixon	2001	Australia	USA	PCIT	wait-list	3-5 [3.9]	34	0%	ECBI-I
Nixon	2003	Australia	USA	PCIT	wait-list	3-5 [3.9]	35	17%	ECBI-I, CBCL-Ext, ODD Sx, HSQ-M
Ogden	2008	Norway	USA	PMTO	TAU	4-13 [8.4]	112	13%	CBCL-Ext, PDR
Patterson	2002	UK	USA	IY	no intervention	2-8 [unclear]	116	19%	ECBI-I/P, SDQ-C
Schappin	2013	Netherlands	Australia	Triple P	wait-list	2-5 [3.7]	67	4%	ECBI-I
Scott	2001	UK	USA	IY	wait-list	2-9 [5.8]	141	22%	SDQ-C, PACS-C
Scott	2010a	UK	USA	IY	no intervention	5-6 [5.7]	174	13%	PACS, SDQ-C
Scott	2010b	UK	USA	IY	minimal intervention	5-6 [5.2]	112	3%	ECBI-Opp, PACS-A
Stattin	2015	Sweden	Canada	COPE	wait-list	3-12 [7]	361	10%	ECBI-I/P, SNAP IV-ODD
Stattin	2015	Sweden	USA	IY	wait-list	3-12 [7]	122	39%	ECBI-I/P, SNAP IV-ODD
Sumargi	2015	Indonesia	Australia	Triple P	wait-list	2-12 [6.3]	143	6%	CAPES-behavior
Swift	2009	Australia	USA	Defiant Children	wait-list	2-12 [7]	29	14%	ECBI-I/P
Taylor	1998	Canada	USA	Eclectic Treatment	wait-list	3-8 [5.6]	64	0%	ECBI-I/P, PDR
Taylor	1998	Canada	USA	IY	wait-list	3-8 [5.6]	64	0%	ECBI-I/P, PDR
Thomas	2011	Australia	USA	PCIT	wait-list	2-8 [5]	150	0%	ECBI-I/P, CBCL-Ext

Note. A = antisocial; Agg = aggression; C = conduct; CAPES-behavior = behaviour problems scale of the Child Adjustment and Parent Efficacy Scale; CBCL = Child Behavior Checklist; Conners = Conners Behavior Rating Scale; COPE = Community Parent Education; ECBI = Eyberg Child Behavior Inventory; Ext = externalizing; HSQ = Home Situations Questionnaire; I = intensity; IY = Incredible Years; M = modified; ODD = oppositional defiant disorder; OPP = oppositional; P = problem; PACS = Parent Account of

Childhood Symptoms; PCIT = Parent-Child Interaction Therapy; PDR = Parent Daily Report; PMTO = Parent Management Training-Oregon; SBQ = Social Behavior Questionnaire; SDQ = Strengths and Difficulties Questionnaire; SNAP IV = SNAP IV Teacher and Parent Rating Scale; Sx = intensity of oppositional defiant disorder symptoms from Structured *DSM-IV* Interview; TAU = treatment as usual; Triple P = Triple P Positive Parenting Program.

^a Control condition: TAU.

Table S3b. *Characteristics of Included Trials of Homegrown Interventions.*

First author	Year	Trial and program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Adams	1992	USA	Time-out/overcorrection intervention	no intervention	1-12 [5.7]	20	0%	Home Report Card Daily Aggression
Adamson	2013	Australia	Triple P	wait-list	1.5-6 [3.1]	96	20%	ECBI-I/P
Bagner	2010	USA	PCIT	wait-list	1.5-5 [3.2]	28	11%	ECBI-I/P, CBCL-Agg/Ext
Barkley	2000	USA	Barkley Parent Training	no intervention	4-6 [4.8]	81	17%	CBCL-Agg/Del
Behan	2001	Ireland	Parents Plus Program	wait-list	3-12 [7.2]	50	20%	CBCL-Agg/Ext, SDQ-C
Bernal	1980	USA	Behavioral parent training	wait-list	5-12 [8.4]	36	14%	Tailored checklist (5 parent-identified problem behaviours), BACS
Braet	2009	Belgium	PMTO	wait-list	4-7 [5.6]	64	23%	CBCL-Agg/Del/Ext
Brestan	1997	USA	PCIT	wait-list	3-6 [4.5]	30	0%	ECBI-I/P
Chacko	2009	USA	Strategies to Enhance Positive Parenting (STEP)	wait-list	5-12 [7.7]	80	Unclear	DBD-ODD
Chao	2006	USA	PMTO	no intervention	3-5 [4.2]	41	0%	ECBI-I/P
Coard	2007	USA	Black Parenting Strengths and Strategies (BPSS) Program	wait-list	5-6 [5]	30	7%	BASC
Connell	1997	Australia	Triple P	wait-list	2-6 [4.3]	24	4%	ECBI-I/P, PDR-P/T

First author	Year	Trial and program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Cowan	2009	USA	Supporting Father Involvement	minimal intervention	0-7 [2.3]	269	28%	CABI-Agg
Day	2012	UK	Empowering Parents, Empowering Communities	wait-list	2-11 [5]	116	10%	ECBI-I/P, SDQ-C
Dishion	2008	USA	Family Check-Up	no intervention	2-3 [2.4]	731	9%	ECBI-I/P, CBCL-Agg/Ext/ODD
Enebrink	2012	Sweden	COMET	wait-list	3-12 [6.8]	104	17%	ECBI-I/P, SDQ-C
Eyberg	1995	USA	PCIT	wait-list	3-6 [4.5]	50	28%	ECBI-I/P
Fabiano	2012	USA	Coaching Our Acting-out Children: Heightening Essential Skills (COACHES)	wait-list	6-12 [8.5]	55	11%	ECBI-I/P
Forehand	2011	USA	Group Curriculum	wait-list	3-6 [4.5]	39	5%	ECBI-I/P, PRB
Forgatch	1999	USA	Parenting Through Change	no intervention	6-10 [7.8]	238	18%	CBCL-Ext
Fung	2014	USA	Early Pathways/Parenting Young Children	wait-list	0-6 [3.9]	137	28%	ECBS-Challenging
Gallart	2005	Australia	Triple P	wait-list	2-8 [5.4]	32	16%	ECBI-I
Gottfredson	2006	USA	Strengthening Washington DC Families Project	minimal intervention	7-11 [unclear]	351	Unclear	Hyperactivity/impulsivity and antisocial behavior (based on Parent Observation of Children's Activities and SSRS)
Gross	1995	USA	IY	unclear	2-3 [2.5]	24	29%	ECBI-I/P
Gross	2003	USA	IY	wait-list	2-3 [unclear]	134	25%	ECBI-I/P/C/Opp
Gross	2009	USA	IY	wait-list	2-4 [2.9]	292	10%	ECBI-I/P
Hamilton	1984	USA	Parent-Administered Treatment	wait-list	2-7 [3.7]	27	unclear	ECBI-I/P, BACS, Daily Checklist-Compliance

First author	Year	Trial and program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Haslam	2013	Australia	Triple P	wait-list	2-12 [7.4]	107	20%	ECBI-I/P
Herbert	2013	USA	Parenting Your Hyperactive Preschooler	wait-list	3-6 [4.6]	31	3%	BASC, DBRS-ODD
Hoath	2002	Australia	Triple P	wait-list	5-10 [7.75]	21	5%	ECBI-I/P
Joachim	2010	Australia	Triple P	wait-list	2-6 [3.2]	46	13%	ECBI-I/P
Jouriles	2001	USA	Project Support	TAU	4-9 [5.7]	36	0%	CBCL-Ext
Jouriles	2009	USA	Project Support	TAU	4-9 [unclear]	66	15%	ECBI-P, CBCL-Ext
Kim	2008	USA	IY	no intervention	3-8 [5.7]	33	12%	ECBI-I/P, CSCS
Kirby	2014	Australia	Triple P	TAU	2-9 [4.42]	54	4%	ECBI-I/P
Kjøbli	2013	Norway	PMTO	TAU	3-12 [7.3]	216	13%	ECBI-I/P, SBS
Kling	2010	Sweden	Comet	wait-list	3-10 [6]	159	4%	ECBI-I/P, PDR
Landy	2006	Canada	Helping Encourage Affect Regulation (HEAR)	wait-list	3-6 [4.5]	35	23%	ECBI-I, CBCL-Agg
Lau	2011	USA	IY	wait-list	5-12 [8.4]	54	17%	CBCL-Ext
Leung	2013	Australia	Triple P	wait-list	2-5 [4.2]	81	9%	ECBI-I/P
Leung	2015	Hong Kong	HOPE	wait-list	2 [2]	173	6%	ECBI-I/P
Long	1993	USA	Bibliotherapy protocol	TAU	6-11 [8.13]	32	31%	ECBI-I/P, HSQ-I/P
MacKenzie	2000	USA	Computer-Assisted Parenting Program	no intervention	3-5 [4.3]	32	19%	CBCL-Ext
Magen	1994	USA	Behavioral skills training and general problem-solving skills training	wait-list	5-11 [7]	38	unclear	RBPC-C/Agg

First author	Year	Trial and program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Maguin	1994	USA	Michigan State University protocol with alcoholic fathers	no intervention	3-5 [4.4]	81	4%	Composite negative behaviour
Markie-Dadds	2006a	Australia	Triple P	wait-list	2-6 [3.6]	26	4%	ECBI-I/P, PDR-P/T
Markie-Dadds	2006b	Australia	Triple P	wait-list	2-5 [3.9]	63	25%	ECBI-I/P, PDR-P/T
Martin	2003	Australia	Triple P	wait-list	2-9 [5.8]	45	40%	ECBI-I/P
Matos	2009	Puerto Rico (USA)	PCIT	wait-list	4-6 [unclear]	32	3%	ECBI-I/P, DBRS-Agg/ODD
Matsumoto	2007	Australia	Triple P	wait-list	2-10 [4.9]	50	0%	ECBI-I/P
Matsumoto	2010	Australia	Triple P	wait-list	2-10 [5.8]	54	6%	ECBI-I/P, SDQ-C
McCabe	2009	USA	PCIT	TAU	3-7 [4.4]	39	49%	ECBI-I/P, CBCL-Ext, ECI-ODD/C
Morawska	2006	Australia	Triple P	wait-list	1.5-3 [2.2]	83	14%	ECBI-I/P
Morawska	2009	Australia	Triple P	wait-list	3-10 [unclear]	75	7%	ECBI-I/P, SDQ-C
Morawska	2011	Australia	Triple P	wait-list	2-5 [3.6]	67	18%	ECBI-I/P
Morawska	2014	Australia	Triple P	wait-list	2-10 [6]	139	28%	ECBI-I/P
Mullin	1994	Ireland	Eastern Health Board parenting programme	wait-list	1-6 [unclear]	79	0%	ECBI-I/P
Nicholson	2002	USA	STAR parenting programme	wait-list	1-5 [unclear]	26	0%	ECBI-I/P
Parras	in press	USA	PMT	wait-list	4-12 [9]	68	0%	CBCL-Ext
Perrin	2014	USA	IY	wait-list	2-4 [2.8]	150	19%	ECBI-I/P
Plant	2007	Australia	Triple P	wait-list	0-6 [4.7]	48	0%	Care-giving Problem Checklist-Difficult Child Behavior: Developmental Behavior Checklist-Disruptive Subscale
Sanders	2000a	Australia	Triple P	wait-list	3-4 [3]	153	16%	ECBI-I, PDR

First author	Year	Trial and program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Sanders	2000b	Australia	Triple P	wait-list	2-8 [4.6]	56	0%	ECBI-I/P
Sanders	2011	Australia	Triple P	wait-list	1-16 [6.6]	121	17%	ECBI-I/P
Sanders	2012	Australia	Triple P	no intervention	2-9 [4.7]	116	8%	ECBI-I/P
Sayger	1988	USA	Family Therapy Research Project	wait-list	7-12 [unclear]	43	14%	CBCL-Agg/Del/Ext, PDR
Schuhmann	1998	USA	PCIT	wait-list	3-6 [4.9]	64	34%	ECBI-I/P
Shaw	2006	USA	Family Check-Up	no intervention	1-2 [2]	120	7%	CBCL-Agg/Destr/Phys
Sheeber	1994	USA	Temperament-focused psycho-educational intervention	wait-list	3-5 [4]	40	3%	CBCL-Ext, PDR
Sim	2014a	Liberia	Parents Make the Difference	wait-list	3-7 [5]	270	7%	SDQ-C
Somech	2012	Israel	Hitkashrut	minimal intervention	3-5 [4]	209	13%	ECBI-I, Callous/Unemotional Traits
Sonuga-Barke	2001	UK	New Forest Parenting Programme	wait-list	3 [3]	50	0%	PACS-C
Sonuga-Barke	2004	UK	New Forest Parenting Programme	wait-list	3 [3]	89	0%	BCL
Stattin	2015	Sweden	Comet	wait-list	3-12 [7]	366	15%	ECBI-I/P, SNAP IV-ODD
Stolk_MP	2008	Netherlands	VIPP-SD	minimal intervention	1-3 [2.3]	107	Unclear	CBCL-Agg/Opp
Stolk_PP	2008	Netherlands	VIPP-SD	minimal intervention	1-3 [2.3]	130	Unclear	CBCL-Agg/Opp
Turner	2006	Australia	Triple P	wait-list	2-5 [3.3]	30	17%	ECBI-I/P, PDR
Turner	2007	Australia	Triple P	wait-list	1-13 [6]	51	25%	ECBI-I/P
van den Hoofdakker	2007	Netherlands	Behavioral parent training	TAU	4-12 [7.4]	96	2%	CBCL-Ext
Webster-Stratton	1982	USA	IY	wait-list	3-5 [3.9]	35	0%	ECBI-I/P

First author	Year	Trial and program origin country	Program	Control condition ^a	Child age range [mean] (years)	N	% dropouts	Measures included in meta-analysis
Webster-Stratton	1984	USA	IY	wait-list	4-6 [4.8]	24	4%	ECBI-I/P, PDR-Neg
Webster-Stratton	1988	USA	IY	wait-list	3-8 [4.6]	114	4%	ECBI-I/P
Webster-Stratton	1990	USA	IY	wait-list	3-8 [5]	31	6%	ECBI-I, PDR-Neg
Webster-Stratton	1992	USA	IY	wait-list	3-8 [5]	100	4%	ECBI-I
Webster-Stratton	1997	USA	IY	wait-list	4-8 [5.7]	48	0%	ECBI-I
Webster-Stratton	2004	USA	IY	wait-list	4-7 [5.9]	57	7%	Composite score: conduct problems-home
Wiggins	2009	Australia	Triple P	wait-list	4-10 [6.2]	60	18%	CBCL-Ext
Zangwill	1983	USA	Child-/Parent-Directed Interaction	wait-list	2-8 [3]	15	27%	ECBI-I/P

Note. A = antisocial; Agg = aggression; BACS = Becker Adjective Checklist; BASC = Behavioral Assessment System for Children–Parent Report; BCL = Behavior Checklist; C = conduct; CABI = Child Adaptive Behaviour Inventory; CBCL = Child Behavior Checklist; Composite negative behaviour=4 negative behavior constructs (anger arousal, aggression, hyper, and defiant; Conners = Conners Behavior Rating Scale; COPE = Community Parent Education; CSCS = Children’s Social Competence Scale; DBD = Disruptive Behaviour Disorders; DBRS = Distrutive Behavior Rating Scale; Del = delinquent; Destr = destructive; ECBI = Eyberg Child Behavior Inventory; ECBS = Early Childhood Behaviour Screen-Challenging; ECI = Early Childhood Inventory; Ext = externalizing; HSQ = Home Situations Questionnaire; I = intensity; IY = Incredible Years; M = modified; Neg = negative behaviors; ODD = oppositional defiant disorder; OPP = oppositional; P = problem; PACS = Parent Account of Childhood Symptoms; PCIT = Parent-Child Interaction Therapy; PDR = Parent Daily Report; Phys = physical aggression; PMTO = Parent Management Training-Oregon; PRB = Parent-Recorded Behaviour; RBPC = Revised Behavior Problem Checklist; SBQ = Social Behavior Questionnaire; SBS = Merrell Social Behaviour Scales-Externalizing; SDQ = Strengths and Difficulties Questionnaire; SNAP IV = SNAP IV Teacher and Parent Rating Scale; SSRS = Social Skills Rating System; Sx = intensity of oppositional defiant disorder symptoms from Structured *DSM–IV* Interview; T = target; TAU = treatment as usual; Triple P = Triple P Positive Parenting Program.

^aControl condition: TAU.