What to Teach Parents to Reduce Disruptive Child Behavior: Two Meta-Analyses of Parenting Program Components

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Conflicts of Interest

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Abstract

Objective: Parenting programs are the recommended strategy for the prevention and treatment of disruptive child behavior. Similar to most psychosocial interventions, it is unknown which components of parenting programs (i.e., parenting techniques taught) actually contribute to program effects. Identifying what parents need to be taught to reduce disruptive child behavior can optimize intervention strategies, and refine theories on how parenting shapes disruptive child behavior. **Method:** In two meta-analyses, we updated the evidence-base for effectiveness of parenting programs delivered at various levels of prevention and treatment of disruptive behavior. We searched six databases (e.g., PsycINFO, MEDLINE) for randomized trials and coded the parenting techniques taught in each program. We identified the techniques associated with program effects in general, and for prevention versus treatment, and immediate versus longer-term effects, specifically. **Results:** Parenting program effects on disruptive behavior gradually increased per level of prevention (universal d=0.27, selective d=0.33, indicated d=0.65) and treatment (d=0.79) (Meta-Analysis 1: 154 trials, 398 effect sizes). Three out of 26 parenting techniques were associated with stronger program effects: positive reinforcement, praise in particular, and natural/logical consequences. Several additional techniques (e.g., relationship building and parental self-management) were associated with stronger effects in treatment, but weaker effects in prevention. No techniques were associated with stronger longer-term effects (Meta-Analysis 2: 42 trials, 157 effect sizes). **Conclusion:** Positive reinforcement and nonviolent disciplining techniques (e.g., natural/logical consequences) seem key parenting program techniques to reduce disruptive child behavior. Additional techniques (e.g., parental self-management skills) might improve program effects in treatment, but not in prevention.

What to Teach Parents to Reduce Disruptive Child Behavior: Two Meta-Analyses of Parenting Program Components

"There are hundreds of therapy techniques. To identify what needs to be activated to effect change […] requires a deeper understanding of therapies than we now have."
—Alan Kazdin[1(p692)]

Behavioral parenting programs have a robust evidence base for their ability to prevent and treat disruptive child behavior.[2] They comprise a multifaceted package of parenting knowledge, principles and skills. When competently delivered together, these components can lead to sustained reductions in disruptive child behavior.[3] Similar to most other psychosocial interventions, there is a dearth of knowledge about which of the often many techniques taught in parenting programs actually contribute to program effects.[4,5] Yet, this knowledge is vital for understanding why some programs are more effective than other, and for guiding program development and implementation processes. Moreover, if we understand the parenting techniques that yield the strongest effects on disruptive child behavior, this can refine our understanding of the aspects of parenting that matter most for shaping disruptive child behavior at various stages of its development.

Parenting programs for disruptive child behavior are among the most well-studied and exhaustively reviewed interventions for children's psychiatric problems. They have been evaluated in more than 200 randomized trials, and dozens of systematic reviews and meta-analyses.[6] Most meta-analyses have focused on the magnitude of program effects,[3,7] on their transportability across countries,[6] or on family characteristics associated with program effects.[8] Although there are some exceptions,[9-11] few attempts have been made to identify the specific techniques that contribute to parenting program effects.

It is well-documented that parenting programs yield meaningfully different effects in prevention versus treatment settings,[12] and that some programs show more sustained effects than other.[3] Yet, whether parenting programs should include different techniques in prevention settings, compared to treatment settings, and different techniques to obtain more sustained effects, has never been tested.

Techniques Taught in Parenting Programs

Most established parenting programs for disruptive child behavior in early and middle childhood share a theoretical background in Operant Learning Theory[13] and Social Learning Theory.[14,15] The translation of these theories into the actual behavior management skills taught differs across programs. While some programs mainly teach techniques to increase positive reinforcement (e.g., praise and rewards), other programs add non-violent disciplining techniques (e.g., ignore and time-out procedures). Besides, programs vary in the extent to which they add other techniques (e.g., parental problem solving or emotion regulation skills) to behavior management techniques (e.g., positive reinforcement and non-violent disciplining).

There is a strong rationale for teaching parents more than basic behavior management. It may be effective to target multiple family characteristics, such as marital conflict, that can contribute to the development and maintenance of disruptive child behavior.[16] Yet, there is also evidence to suggest that 'less is more,' i.e., that programs that teach parents fewer techniques outperform programs that teach more techniques,[17] and that including ancillary services compromises, rather than benefits, parenting program effects.[9] These seemingly counterintuitive findings raise the question of what specific parenting techniques should be taught to reduce disruptive child behavior.

Do We Need Different Parenting Techniques in Prevention and Treatment?

Most behavioral parenting programs were originally developed to treat disruptive child behavior.[18] When moved to prevention settings, programs are sometimes adapted in terms of intensity or delivery methods, but they tend to teach the same parenting techniques.[18,19] On the one hand, mechanisms underlying successful treatment of disruptive child behavior might be similar to mechanisms underlying successful prevention of disruptive child behavior. For example, rewarding positive child behavior with parental attention, and not rewarding disruptive behavior, might effectively reduce disruptive child behavior at various stages of its development.[20,21] On the other hand, parenting programs might need to teach different techniques to families whose children have significant conduct problems, compared to families considered to be at risk, based on for example young parenthood or socioeconomic deprivation. Families whose children have fully developed conduct problems may experience additional difficulties, such as parental exhaustion.[22] Parental self-management techniques such as emotion regulation may therefore be more important in treatment than in prevention settings. We therefore tested not only which parenting program techniques yield the strongest effects on child behavior, but also to what extent these techniques differ between treatment or prevention settings.

Do We Need Different Parenting Techniques to Obtain more Sustained Effects?

The overwhelming majority of trials that evaluate parenting programs focus on immediate or short-term effects of parenting programs only. Available evidence on longer-term effects suggests that the effects of parenting programs on disruptive child behavior on average sustain in the months and years after the program, but that there is substantial variation between programs in their longer-term effects.[7] This might in part be because different programs teach different parenting techniques. Some techniques, such as positive reinforcement, affect child behavior immediately,[20] while other techniques, such as parental teaching children emotional regulation skills and relationship building, might affect children

more gradually over time.[23,24] We therefore tested specifically which parenting techniques yield stronger longer-term, relative to immediate, program effects on disruptive child behavior.

The Present Studies

In two meta-analyses, we aimed to (1) update the evidence-base for parenting programs for reducing disruptive child behavior at various levels of prevention and treatment; (2) identify the parenting program techniques associated with stronger program effects; (3) test whether different parenting techniques are associated with program effects in prevention versus treatment settings; and (4) test whether different parenting techniques are associated with longer-term, relative to immediate, program effects.

Method

Meta-Analysis 1

In Meta-Analysis 1, we first estimated the effects of parenting programs on disruptive child behavior in universal prevention, selective prevention, indicated prevention, and treatment settings. Second, we identified the parenting techniques that, when taught in parenting programs, yield stronger or weaker effects. Third, we tested whether techniques yield different effects in prevention versus treatment settings.

Data sources, trial selection, inclusion criteria

We identified randomized controlled trials of behavioral parenting programs for reducing disruptive child behavior by updating the search from a previous meta-analysis.[5] We included trials that: (1) compared a parenting program based on social learning theory principles (i.e., the dominant theoretical approach in this field) to any type of control; (2) randomly allocated participants to conditions, to allow for causal inference about program effects; (3) evaluated programs where >50 per cent of the sessions focused on parenting,

because we focused on parenting techniques specifically; and (4) included children with a mean age between two and nine years, because different parenting techniques might be important for infants and adolescents. We excluded trials on special populations such as children in foster care, and children with autism or physical disabilities, because changing the behavior of these children might require different parenting techniques. We did not exclude trials on children with ADHD because conduct problems and hyperactivity-impulsivity often co-occur in young children.[25] One author assessed trials that were likely to meet inclusion criteria. Uncertainties and the final list of trials included in the review were checked with another author. The PRISMA flow diagram of Meta-Analysis 1 is presented in Figure S1, available online.

Data extraction and risk of bias

General trial characteristics. We coded several sample (e.g., age, percentage boys, ethnic background), intervention (e.g., individual or group-based), and design characteristics (e.g., following intention to treat principles).

Parenting techniques taught. We coded the techniques (Table 1) taught in each program based on information provided in the paper, online information about the program, or program manuals. For 15 trials information was requested from the authors, because available information was insufficient. For eight trials, authors reported sufficient information to include the trial in our analyses; seven trials had to be excluded due to insufficient information on included components. Because some parenting techniques share the same function (e.g., praise and rewards are both used as positive reinforcement techniques), we coded techniques on two levels: general techniques (e.g., positive reinforcement) and specific operationalizations of these general techniques (e.g., praise and rewards).

Level of prevention or treatment. We coded trials as (1) universal prevention if the program targeted general community samples. Universal prevention therefore reflected that no selection criteria were used; (2) selective prevention if the program targeted families at higher risk for disruptive child behavior. Selective prevention therefore reflected that families were selected based on known risk factors for the development of disruptive child behavior (e.g., parenting difficulties or socioeconomically deprivation); (3) indicated prevention if the program targeted families with emerging disruptive child behavior. Indicated prevention therefore reflected that children were screened for the study purposes, and included only when they showed subclinical or clinical levels of disruptive child behavior; and (4) treatment if the program targeted families who were referred or self-referred to outpatient clinics for children's mental health problems. Treatment therefore reflected that families received the parenting program in clinical settings.

Effect size calculation. We converted post-intervention means and standard deviations into Cohen's *d* values. We prioritized means and standard deviations that were ANCOVA-adjusted for baseline. When means and standard deviations were not reported, we used alternative summary statistics to calculate Cohen's *d* values (e.g., *p*-values and sample sizes, or *t*-test statistics). We included multiple effect sizes per trial if trials included multiple measures of parent-reported disruptive child behavior. For each effect size, we 'differenced' the parenting techniques to create a binary variable indicating that the technique was taught in the intervention condition and not in the control condition (coded as 1), or that the technique was taught in neither or both conditions (coded as 0).

Risk of bias. We assessed risk of bias in the included trials as high, low or unclear using the Cochrane Collaboration tool.[26] We followed the Cochrane Handbook's standardised guidance on how to rate trials on: random sequence generation, allocation concealment, blinding of assessors, blinding of providers and families (which is frequently impossible in

psychosocial interventions), incomplete outcome data, selective reporting, and other sources of bias.

Analytic strategy

We used a robust variance estimation approach where the multiple effect sizes in included trials are weighted using an approximate variance-covariance matrix. This results in valid point estimates and significance tests even when the exact variance-covariance matrix of effect sizes in included trials is unknown.[28] We estimated the model with only between-trial variables, because very few trials included multiple intervention conditions that varied in the parenting techniques they taught.

First, we first estimated overall program effects per level of prevention. Second, we tested for each technique whether inclusion was associated with program effects. The meta-regression coefficients of this model represent the difference in effect size between trials that compare a parenting program with the target technique against a control, and trials that compare a parenting program without the target technique against a control. Third, we tested for each technique whether inclusion (versus exclusion) interacted with whether the program was offered as prevention (versus treatment) in predicting program effects. In other words, we tested for each technique whether its merit depended on whether it was included in a program offered for either the prevention or treatment of disruptive behavior. Because we specifically tested components as moderators of intervention effects, we did not include covariates.

We did not test for publication bias. A standard assumption of tests for visualising and examining publication bias, including funnel plots, Egger's test and trim-and-fill tests, is the independence of effect sizes. Because a key feature of our analysis strategy was the inclusion of all relevant effect sizes from each study, the standard tests were not applicable.

Meta-Analysis 2

In Meta-Analysis 2, we aimed to identify the parenting techniques that are associated with more sustained (i.e., longer-term), relative to immediate, program effects.

Data sources, trial selection, inclusion criteria

We identified randomized controlled trials on longer-term effects of parenting programs by updating the search from a previous meta-analysis.[7] Inclusion criteria were the same as for Meta-Analysis 1, with the exception of a somewhat wider age range (children's mean age between 1 and 11 years) and including both behavioral and non-behavioral parenting programs. These wider inclusion criteria were necessary to include sufficient numbers of trials—randomized trials of longer-term effects of parenting programs are relatively scarce. One author assessed abstracts and full texts of trials that were likely to meet inclusion criteria. Uncertainties and the final list of trials included in the review were checked with another author. The PRISMA flow diagram of Meta-Analysis 2 is presented in Figure S2, available online.

Data extraction and risk of bias

We extracted the same data, effect sizes, and risk of bias indices as in Meta-Analysis 1. Meta-Analysis 2 included effect sizes based on multiple informants (i.e., parents and teachers) and methods (i.e., questionnaire and observation). In addition, we specified for each effect size when follow-up assessment took place, expressed in months after the end of the parenting program. Similar to Meta-Analysis 1, we 'differenced' the parenting techniques for each effect size to create a binary variable indicating that the technique was taught in the intervention condition and not in the control condition (coded as 1), or that the technique was taught in neither or both conditions (coded as 0). Agreement between researchers coding the parenting techniques for Meta-Analysis 1 and Meta-Analysis 2 was 89%.

Analytic strategy

We estimated a multilevel model in order to account for the multiple effect sizes, from different instruments and different assessment points, that cluster within trials. We estimated a random effects model with a compound symmetry correlation matrix within trials that assumes effect sizes from different measures of disruptive behavior to correlate $\rho = 0.80$. Time was a within-trial variable with intercept 0. One trial included multiple intervention conditions that differed in the techniques they taught parents. We treated intervention versus control comparisons in this trial as separate trials to prevent spurious within-trial inference arising from low variation on techniques within trials. We estimated cross-level interactions (i.e., technique × assessment time within trials) to test the added effect of each of the target techniques over time. We did not include covariates.

Results

Included Trials and Aggregate Effects

Meta-Analysis 1 included 154 trials and 398 effect sizes. The majority of the trials (k = 95; 62%) included children with subclinical or clinical levels of disruptive behavior (i.e., indicated prevention or treatment). Other trials included community sample children or children growing up in families at higher risk for the development of disruptive child behavior (i.e., universal or selective prevention; k = 58; 37%). The remaining trial[27] mixed selective prevention and treatment. On average across different levels of prevention and treatment, parenting programs reduced disruptive child behavior by almost half a standard deviation (Cohen's d = –0.47; 95% CI –0.55 to 0.40).

Meta-Analysis 2 included 42 trials and 157 effect sizes. All trials contributed effect sizes for at least two assessment points after the end of the program. More specifically, 81% of the trials contributed effect sizes for at least six months after the end of the program, and

40% of the trials contributed effect sizes for at least one year after the end of the program. On average across assessment points, parenting programs reduced disruptive child behavior by almost a third of a standard deviation (Cohen's d = –0.30; 95% CI –0.38 to 0.27), with stability between immediate effects (Cohen's d = –0.30 at 0 months after the program) and longer-term effects (Cohen's d = –0.31 at 12 months after the program). The largely similar, but somewhat wider inclusion criteria used for Meta-Analysis 2 led to a set of trials that partly overlapped with the set of trials in Meta-Analysis 1. Specifically, 52% of the trials in Meta-Analysis 2 was also included in Meta-Analysis 1.

With regard to risk of bias in both meta-analyses, older trials sometimes failed to describe how random sequences were generated and whether allocation was concealed. Participant blindness was not possible in any of the trials, because parents actively participated in the programs. Risk of bias was judged to be low on blinding of outcome assessors, addressing incomplete data, analyzing drop-outs, and selective outcome reporting.

Parenting Program Effects by Level of Prevention and Treatment (Meta-Analysis 1)

Parenting program effects in terms of reductions in disruptive behavior increased gradually per level of prevention and treatment (Figure 1). Universal prevention programs failed to yield significant effects (d = –0.21, 95% CI –0.52 to 0.10). Programs at all other levels of prevention and treatment yielded significant effects: selective prevention d = –0.27 (95% CI –0.36 to –0.17), indicated prevention d = –0.55 (95% CI –0.70 to –0.39), and treatment d = –0.69 (95% CI –0.84 to –0.54). Programs in universal and selective prevention were less effective than programs in indicated prevention and treatment ($\beta = 0.33$, $p < .001$). Differences between universal and selective prevention, and between indicated prevention and treatment, were not significant, as indicated by their overlapping 95% confidence intervals. For our analyses of interaction effects between parenting techniques and treatment setting, we therefore combined universal and selective prevention, and indicated prevention

and treatment, into one dichotomized variable (i.e., universal and selective prevention versus indicated prevention and treatment).

Parenting Techniques Associated with Stronger Overall Effects (Meta-Analysis 1)

Of the 26 techniques tested, three techniques were associated with stronger program effects (Table 2): positive reinforcement as a general technique (β = –0.28, 95% CI –0.61 to –0.15), praise as a specific operationalization of positive reinforcement (β = –0.22, 95% CI –0.43 to –0.02), and the use of natural or logical consequences as a disciplining technique (β = –0.21, 95% CI –0.38 to –0.05). Programs that included these techniques had stronger effects on reduced disruptive child behavior than programs that did not include these techniques. There were trends for three additional techniques to be associated with stronger effects (time-out, proactive parenting as a general technique, and monitoring as a specific operationalization of proactive parenting), and for one technique to be associated with weaker effects (parental self-management), but these effects did not reach significance (*p*s .062 to .094). Thus, while few techniques seemed to make a difference, children's disruptive behavior reduced more if programs taught parents to use reinforcements, and specifically praise, to increase positive child behavior, and to use natural or logical consequences to reduce disruptive behavior. Please note that betas in this context (Table 2) reflect the standardized additional reductions in disruptive child behavior in programs that include these techniques, compared to programs that do not include these techniques (e.g., Cohen's $d_{with\ positive\ reinforcement}$ = –0.50; Cohen's $d_{with\ out\ positive\ reinforcement}$ = –0.22).

Parenting Techniques Associated with Stronger Prevention versus Treatment Effects (Meta-Analysis 1)

Each of the three techniques associated with stronger overall effects turned out to be associated with stronger effects in indicated prevention and treatment only, as indicated by

significant technique × prevention versus treatment interaction effects (Table 3; interaction effect: βs = –0.34 to –0.51, *p*s <.023). We found similar interaction effects for four other techniques: relationship building as a general technique, parent-child play as a specific operationalization of relationship building, active listening, and parental self-management. These techniques were associated with stronger effects in indicated prevention and treatment only, and were either associated with weaker effects or not associated with effects in universal and selective prevention (interaction effect: βs = –0.30 to –0.42, *p*s <.042).

Within subgroup analyses (i.e., within universal and selective prevention or, separately, within indicated prevention and treatment) further revealed that in indicated prevention and treatment, teaching time-out was associated with stronger effects (β = –0.26, 95% CI –0.50 to –0.02). In universal and selective prevention, teaching rule setting and parental problem solving skills were associated with weaker effects (β = 0.20, 95% CI 0.04 to 0.36 and β = 0.19, 95% CI 0.02 to 0.36, respectively). Please note that betas with a positive sign in this context in Table 3 reflect less reduction in disruptive child behavior, instead of an increase in disruptive child behavior. The other 16 techniques were associated with parenting program effects neither within prevention or treatment, nor did they interact with universal and selective prevention versus indicated prevention and treatment setting in predicting parenting program effects.

Parenting Techniques Associated with More Sustained Effects (Meta-Analysis 2)

None of the 26 techniques tested were associated with obtaining more sustained parenting program effects on disruptive child behavior. In other words, none of the technique × assessment point interaction terms significantly predicted parenting program effects (*p*s >.11).

Discussion

Parenting programs for disruptive child behavior are complex interventions—they teach parents a multifaceted package of knowledge, attitudes, and skills. Understanding the parenting techniques that contribute to parenting program success is vital to guide intervention selection, and for efficient and sustainable implementation processes. Moreover, this understanding can help refine theories on the aspects of parenting that matter most for modifying disruptive child behavior. We therefore tested in two meta-analyses of randomized evaluations of parenting programs which parenting techniques are associated with intervention success. In addition, we tested whether different techniques are associated with intervention success in treatment, relative to prevention, and whether different techniques are associated with longer-term, relative to short-term, effects.

Parenting programs reduced disruptive child behavior when implemented as selective prevention, indicated prevention, or treatment, but not when implemented as universal prevention. It is well-known that intervention effects tend to be stronger when children's disruptive behavior is more severe.[12,29] Our findings suggest that, on average, the threshold between ineffective and effective intervention lies between universal prevention and selective prevention: while universal prevention programs had no significant effects, selective prevention had small but significant effects. The immediate merit of universal prevention programs might lie in reducing risk factors for disruptive behavior (e.g., harsh parenting) or in improving other aspects of child development (e.g., cognitive development), rather than in reducing disruptive behavior. This might in part be because of floor effects of the level of disruptive behavior in universal prevention trials: when children hardly show any disruptive behavior, it is hard to further reduce this behavior. Also, the included trials varied substantially in the effect sizes they found for universal prevention, even when evaluating the same program (e.g., *d* around 0.10 for Triple P in Switzerland and Sweden, and *d* around 0.40 for Triple P in Hong Kong and Australia). These wide variations, and the fact that some large

trials had null effects, combined with the small number of trials (eight trials for universal prevention, compared to >40 trials for all other levels of prevention and treatment), meant there was an overall null effect. Although it was beyond the scope of our meta-analysis to test moderation effects, there seemed to be a trend that universal prevention programs were ineffective in European countries specifically.

Of the 26 techniques tested, three techniques were associated with stronger parenting program effects on disruptive child behavior: positive reinforcement as a general technique, praise as a specific operationalization of positive reinforcement, and the use of natural or logical consequences as a nonviolent disciplining technique. Programs that included these techniques more effectively reduced disruptive child behavior than programs that did not include these techniques. One previous meta-analysis identified various parenting techniques that were associated with parenting programs effects on disruptive child behavior.[9] In a meta-analytic sample twice as large, and by using state of the art methods that account for the multilevel structure of meta-analytic data, our findings are generally in line with this study. Importantly, however, our study showed for the first time that some techniques that are often assumed to be important for all parenting programs (e.g., time-out) seem important for parenting programs in indicated prevention and treatment specifically.

The general picture that emerged was that adding techniques (e.g., relationship building, active listening and time-out) yielded stronger effects in indicated prevention and treatment settings, while adding techniques (e.g., parental self-management) yielded weaker effects in universal and selective prevention settings. Although seemingly counterintuitive, it is well-established that less can be more in psychosocial intervention.[17] Our findings suggest that in the context of parenting programs for disruptive child behavior, this is the case for prevention programs specifically. Two differences between treatment and prevention settings may explain this. First, different parenting techniques may be important for changing

disruptive child behavior at various stages of its development. Techniques such as time-out may be effective to reduce problematic levels of disruptive child behavior, but may not be necessary to prevent disruptive child behavior. Second, and related to children's level of disruptive behavior, parents in treatment and prevention settings may have different motivations, expectations, and goals for participating.[30,31] Our findings highlight the importance of understanding of the specific parenting techniques that should be targeted in different settings.

In Meta-analysis 2, we found no evidence that some parenting techniques are more important than others for obtaining more sustained (i.e., longer-term) reductions in disruptive child behavior. Although some parenting techniques may contribute to processes that need more time to evolve (e.g., relationship building and teaching children emotional regulation skills),[22,23] programs that teach these techniques did not yield stronger longer-term effects than programs that did not teach these techniques. Because longer-term randomized comparisons of parenting programs with control conditions are still relatively scarce, Meta-analysis 2 (42 RCTs; 157 effect sizes) was less well-powered than Meta-analysis 1 (154 RCTs; 398 effect sizes). We therefore recommend replication of our findings in a few years, when the evidence-base for longer-term effects of parenting programs has hopefully expanded.

Several study limitations merit attention. First, we tested associations between parenting techniques and program effects. With associations, we can never rule out the possibility that other program characteristics that are confounded with these techniques are responsible for the superiority of some programs over others. A causal test of true additive effects of techniques requires randomized, within-study differences between families in the techniques taught, rather than between-study differences in techniques taught. Designs that achieve this, through multi-arm additive or disentangling trials,[32] or factorial designs,[33] are

unfortunately rare in parenting program research. Second, Meta-Analysis 1 relied on parent-reported outcomes of disruptive child behavior. A recent meta-analysis, however, reassuringly shows that parenting program effects on disruptive child behavior tend to be of similar magnitude when based on independent observations.[12] Third, while Meta-Analysis 1 included 398 effect sizes and was generally well powered, the fact that some techniques were taught in almost all programs (e.g., positive reinforcement), and other techniques were taught in only a few programs (e.g., empathy and monitoring), made our analyses better powered for some techniques than for other techniques. Fourth, and related to this, we only tested associations between individual techniques and program effects. Although empirically understudied, the merit of certain parenting techniques might depend on the presence or absence of other parenting techniques, or on the order in which techniques are taught (e.g., teaching positive parenting practices before disciplining techniques[34]). Testing hypotheses about interaction effects between techniques on program effects requires more power than currently allowed for by the meta-analytic data available in this field.

Future research should invest in designing studies that allow for causal conclusions about the parenting techniques that increase program effects when added to a program, or that comprise program effects when left out. In addition, we need a roadmap for meaningfully defining and classifying the parenting techniques taught in parenting programs for disruptive child behavior. We distinguished between higher-level techniques (e.g., positive reinforcement, reflecting the function of a technique), and lower level-techniques (e.g., praise, reflecting the form of a technique). A better understanding of how well lower level techniques fulfill their expected function (e.g., whether praise indeed acts as a positive reinforcement) is needed to improve our understanding of *why* some techniques lead to stronger reductions in disruptive child behavior.

In clinical practice, most prevention programs for disruptive child behavior are clones of treatment programs. Our findings highlight the need to reconsider this approach. Although the evidence-base for parenting programs is well-documented (e.g., Blueprints in the US, NICE guidelines in the UK), clearinghouses tend to focus on general labels for programs as "evidence-based" or "promising." These general labels mask meaningful differences between settings where programs are less or more effective. Our findings show that families in universal and selective prevention, compared to families in indicated prevention and treatment, may benefit from different program content. We therefore encourage guidelines to include information on differential effectiveness in addition to overall labels of effectiveness.

Conclusion

Parenting programs yield the strongest effects on disruptive child behavior in indicated prevention and treatment settings, and are not generally effective in universal prevention settings. Our findings further suggest that programs that teach positive reinforcement (specifically praise) to increase positive child behavior, and those that teach the use of natural and logical consequences to reduce disruptive child behavior, are more successful than programs that do not teach these techniques. In indicated prevention and treatment, adding techniques (e.g., parent-child play, active listening) yielded stronger program effects, while we found no evidence for this in universal and selective prevention settings. Our findings call for more differentiation in the content of parenting programs implemented to either prevent or treat disruptive child behavior.

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Table 1. *Definitions of Parenting Techniques*.

General technique	Specific operationalization	Definition
Psychoeducation		Parents are informed about general child development and parent-child interactions.
	Explaining child development	Parents are informed about typical and atypical child development.
	Explaining parent-child interactions	Parents are informed about how parents and children shape each other's behavior in everyday interactions.
Positive reinforcement		React to positive child behavior with praise and/or rewards.
	Praise	Verbally praise positive child behavior.
	Rewards	Reward positive child behavior with social and/or tangible rewards.
Nonviolent disciplining		React to disruptive child behavior with a nonviolent consequence that is intended to reduce the behavior (time-out, ignore, and/or natural or logical consequences).
	Time-out	React to disruptive child behavior with a time-out procedure.
	Ignore	Ignore disruptive attention seeking or demanding child behavior.

	Natural/logical consequences	React to disruptive child behavior with natural and/or logical consequences (e.g., take a toy away when the child plays too rough with it).
Proactive parenting		Proactively prevent the occurrence of disruptive child behavior.
	Direct and positive commands	Give children direct and positive commands (e.g., instruct rather than ask or beg, and tell children to "do" something rather than "not to do" something).
	Rule setting	Set rules about appropriate and inappropriate behavior.
	Monitoring	Invest in knowing what the child does and whom s/he plays with.
Relationship enhancement		Invest in building a positive parent-child relationship, though play and empathy.
	Parent-child play	Have daily play sessions with the child.
	Empathy	Understand what the child feels in different situations.
Active Listening		Concentrate on what the child says, and show that s/he is listened to.
Skills for parents themselves		Techniques to improve parental their own well-being.
	Emotion regulation skills	Recognize and regulate your own feelings as a parent (e.g., relaxation).

	Problem solving skills	Generate and implement solutions to difficult parenting situations.
	Partner support	Improve partner relationships and co-parenting.
Skills parents teach their children		Teach the child skills to improve her/his socioemotional development.
	Emotion regulation skills	Teaching the child how to have words for emotions and how to regulate them.
	Problem solving skills	Teaching the child how to solve everyday problems.
	Social skills	Teaching the child how to interact with other children.

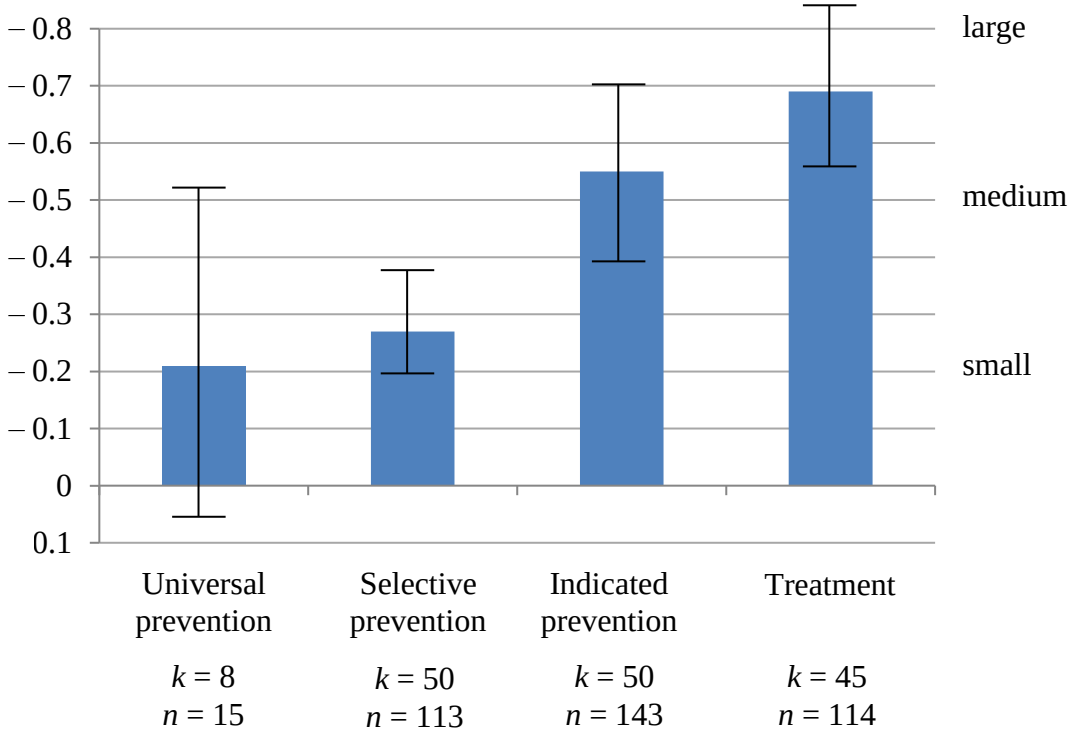

Figure 1. Parenting program effects (Cohen's *d*) on reduced disruptive child behavior increase per level of prevention and treatment. *k* = number of trials; *n* = number of effect sizes.

Table 2 *Techniques Associated with Stronger or Weaker Parenting Program Effects on Disruptive Child Behavior*.

	Technique present in intervention (*n*)	Technique absent in intervention (*n)*	Effect size (*d*) with this technique	Effect size (*d*) without this technique
Psychoeducation	130	256	–0.43	–0.51
Explaining child developmental stages	117	269	–0.40	–0.51
Explaining parent-child interactions	106	280	–0.47	–0.48
Positive reinforcement techniques	359	27	**–0.50****	**–0.22**
Praise	344	42	**–0.21**	**–0.29***
Rewards	259	127	–0.44	–0.55
Disciplining techniques	366	20	–0.48	–0.44
Time-out	336	50	–0.49†	–0.35
Ignore	397	89	–0.50	–0.40
Natural/logical consequences	301	85	**–0.52****	**–0.32**
Proactive parenting techniques	313	73	*–0.50*†	*–0.37*
Direct and positive commands	299	87	–0.49	–0.44
Rule setting	210	176	–0.44	–0.53
Monitoring	88	298	*–0.70*†	*–0.43*
Relationship enhancement techniques	176	210	–0.52	–0.44

Parent-child play	176	210	–0.52	–0.44
Empathy	9	377	–0.34	–0.48
Active Listening	139	247	–0.57	–0.43
Skills for parents themselves	289	97	*–0.38*	*–0.53*†
Emotion regulation skills	150	236	–0.44	–0.51
Problem solving skills	200	186	–0.46	–0.50
Partner support	25	361	–0.58	–0.47
Skills parents teach their children	106	274	–0.41	–0.50
Emotion regulation skills	92	294	–0.46	–0.48
Problem solving skills	95	291	–0.41	–0.50
Social skills	92	294	–0.43	–0.49

Note. Differences in effect sizes between programs *with* or *without* the parenting technique were significant at the level of † p <.10, * p <.05, ** p <.01. Effect sizes in **bold** differ significantly (p <.05); effect sizes in *italic* show a non-significant trend (p <.10).

Table 3. *Techniques Differentially Associated with Stronger or Weaker Parenting Program Effects in Prevention versus Treatment Settings.*

	Prevention (k = 58) (n = 128)		Treatment (k = 95) (n = 167)		
	Effect size (d) with this technique	Effect size (d) without this technique	Effect size (d) with this technique	Effect size (d) without this technique	p
Psychoeducation	–0.27	–0.29	–0.53	–0.63	.534
Explaining child developmental stages	–0.20	–0.32	–0.53	–0.63	.124
Explaining parent-child interactions	–0.29	–0.28	–0.57	–0.61	.746
Positive reinforcement techniques	–0.28	–0.28	**–0.63**	**–0.18**	.022*
Praise	–0.28	–0.31	**–0.64**	**–0.27**	.020*
Rewards	–0.31	–0.18	–0.55	–0.71	.057†
Disciplining techniques	–0.34	–0.31	–0.60	–0.53	.656
Time-out	–0.29	–0.24	**–0.64**	**–0.38**	.182
Ignore	–0.28	–0.29	–0.65	–0.45	.231
Natural/logical consequences	–0.28	–0.26	**–0.68**	**–0.34**	.022*
Proactive parenting techniques	–0.28	–0.28	–0.63	–0.44	.205
Direct and positive commands	–0.29	–0.26	–0.61	–0.56	.969

Rule setting	**–0.20**	**–0.40**	–0.59	–0.60	.164
Monitoring	–0.28	–0.28	–0.83	–0.53	.467
Relationship enhancement techniques	*–0.14*	*–0.33*	–0.65	–0.54	.041*
Parent-child play	*–0.17*	*–0.34*	–0.66	–0.53	.032*
Empathy	–0.17	–0.28	–0.31	–0.61	.540
Active listening	–0.20	–0.32	–0.80	–0.49	.011*
Skills for parents themselves	*–0.23*	*–0.38*	–0.63	–0.44	.027*
Emotion regulation skills	–0.28	–0.29	–0.51	–0.68	.252
Problem solving skills	**–0.20**	**–0.39**	–0.61	–0.57	.098†
Partner support	–0.60	–0.25	–0.55	–0.60	.133
Skills parents teach their children	–0.20	–0.29	–0.52	–0.63	.549
Emotion regulation skills	–0.27	–0.29	–0.55	–0.61	.839
Problem solving skills	–0.22	–0.30	–0.50	–0.63	.737
Social skills	–0.17	–0.32	–0.56	–0.61	.489

Note. prevention versus treatment × technique interaction effects: † p <.10, * p <.05, ** p <.01. Effect sizes in **bold** differ significantly (p <.05) within prevention and/or within treatment settings; effect sizes in *italic* show a non-significant trend (p <.10) towards significant difference within prevention and/or within treatment settings.