Parenting Programs to Reduce Young Children's Externalizing Behavior: A Meta-Analytic Review of their Behavioral or Cognitive Orientation

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Abstract

This meta-analytic review evaluates 35 parenting programs to analyze their effectiveness at reducing young children's externalizing behavior (EB). It looks at whether behavioral or cognitive orientation, informant or duration of these programs moderate their effect on such young children. It confirms that parenting interventions are effective at decreasing young children's EB but no moderation effect was found for specific orientation or duration, only for the informant. This illustrates the current difficulty in comparing programs on the basis of their theoretical background, which prevents the understanding of which are the most efficient parenting variables and change processes to manipulate.

Keywords: Meta-analysis; Parenting; Preschoolers; Young Children; Intervention; Externalizing Behavior.

Introductory note:

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Introduction

Externalizing Behavior in Young Children

Most young children exhibit Externalizing Behavior (EB) defined as aggressive, noncompliant, oppositional or agitation behaviors, at a low level (Brennan & Shaw, 2013). Five to 14% display a moderate to clinical level of EB (i.e., frequent and intense verbal or physical aggression, overt non-compliance to adults' requests or hyperactivity), raising concerns among parents and school or mental health professionals about their social and academic development (R.D.V Nixon, 2002; Reyno & McGrath, 2006). These concerns are confirmed by many longitudinal studies demonstrating the negative impact of the early onset of EB on child's development (Campbell, Shaw, & Gilliom, 2000). Behavior problems in children predict an increased risk of substance dependence, delinquency and criminal behavior in adulthood, poor psycho-social outcomes (in terms of work, financial and marital outcomes) as well as persistent antisocial behavior (Moffitt, Caspi, Harrington, & Milne, 2002).

The preschool period (3-7 years old) is a sensitive developmental time for children. Their executive functioning is progressively gaining complexity (Diamond, 2013), as well as their language skills (Gallagher, 1999) and their social competence (Deneault & Ricard, 2013). In the field of social cognition for instance, children gradually become able to recognize desires and emotional expressions, to predict emotions according to social situations and to adopt others' perspective. Children develop these various skills through their first experiences of being in a group, often in preschool. But at the same time, parenting remains their main source for understanding the world and adapting to it. Negative cycles of interaction between parents and children may contribute to the emergence of EB (G. R. Patterson, Forgatch, & DeGarmo, 2010; Smith, Dishion, Shaw, & Wilson, 2015). This is why preschool years are an important window for early effective parenting intervention.

To limit the potential negative outcomes of early EB and because of the importance of parenting at that age, clinical interventions have been developed for parents since the 1970s (Lundahl, Risser, & Lovejoy, 2006; Shelleby & Shaw, 2014). Parenting intervention here refers to interventions aiming at reducing young children's EB through individual or group support to parents to improve their parenting. These interventions share a common theoretical background (R. J. McMahon & Forehand, 2003; G. R. Patterson et al., 2010) that translates into a focus on parents as primary agents for change, because of their closeness to their children through their daily interaction. These complementary interventions differ in their theoretical orientations, ranging from behavioral to cognitive or offering a combination of cognitive and behavioral aspects. The parenting programs that are behavior-oriented consist of teaching parents how to manage their children's behavior, through positive reinforcement of appropriate behavior, in particular prosocial behavior, ignoring slightly maladaptive behavior and using appropriate discipline strategies like quiet time or time-out. The interventions that are cognitive-oriented aim to modify parental cognitions such as causal attributions, parental perceptions of their children (Renk, 2011), self-efficacy or emotional states related to parenting such as stress (Kazdin & Whitley, 2003; Mackler et al., 2015), all related to the management of children's behavior.

Despite differing in orientation, parenting interventions have been found to exhibit many commonalities in their implementation. At first, individual support was provided to families; group work then became popular in the 1990s; today, group-based programs are the most common form of parenting intervention (Wittkowski, Dowling, & Smith, 2016). Concerning the group parenting programs' organization, most are based on weekly group sessions of two hours taking place during from 1 to 24 weeks of treatment. A few of these parenting intervention programs have been standardized and widely implemented across the

world in several diverse cultural contexts such as Incredible Years (Webster-Stratton & Herman, 2010).

Effectiveness of Interventions

How effective are these parenting interventions? The term effectiveness is considered here along a continuum measured by effect size rather than distinct categories (effective versus ineffective) and relates to the reduction of child's EB (Menting, Orobio de Castro, & Matthys, 2013). Since the 2000s, meta-analyses and systematic reviews have reported small to moderate average effects of parenting programs (d=0.35- 0.53) (Furlong et al., 2012; Lundahl et al., 2006; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009). Some meta-analytic reviews looked exclusively at one specific program such as Incredible Years implemented in 50 studies (Menting et al., 2013) or Triple P in 55 studies (Nowak & Heinrichs, 2008) with effect size of respectively 0.27 and 0.35. This focus on one specific program limits the generalization of conclusions to other programs. Another drawback of existing meta-analyses is that they often cover a wide child age range and do not focus on young children, although early childhood is a critical period for EB. For instance, in the meta-analysis by Menting et al., the mean age of children ranged from 3 to 9.2 years (Menting et al., 2013).

Beyond efficacy measured by mean effect, a key issue is also to analyze for whom and at what dosage these programs are effective. Many studies tested the global effectiveness of parent programs, but the participants' and programs' characteristics vary greatly. Established for years in a global manner, this influence of factors on intervention effect has become the focus of recent studies looking at specific factors or methodological issues (La Greca, Silverman, & Lochman, 2009; Shelleby & Kolko, 2015). These factors that can be either moderators (conditions under which a treatment may be more or less effective, such as treatment characteristics - number of sessions, parents' involvement in the intervention or treatment fidelity), or predictors (preexisting variables not linked to the treatment and having

a main effect regardless of group, such as children's or parents' gender or temperament)and cover three aspects: participants' characteristics (i.e., child's EB level at baseline, child's gender and age); methods of evaluation (i.e., type and number of informants: parents, teachers or observer) and interventions' characteristics (i.e., programs' components and delivery methods).

Factors Influencing Effectiveness of Interventions

Participants' characteristics

Child's age or gender are not predictive of intervention effectiveness (Lundahl et al., 2006; Shelleby & Shaw, 2014). Concerning initial severity of child behavior, some reviews, such as the review of the Incredible Years program by Menting, de Castro and Matthys (2013), suggest that the level of children's EB at baseline is a main predictor of the intervention's effect on children. The more agitated, oppositional or aggressive children are, the more effective parenting interventions are on decreasing child's EB (P. Leijten, Raaijmakers, Orobio de Castro, & Matthys, 2013). But others have concluded that there is no systematic effect of initial severity (Shelleby & Shaw, 2014). Therefore, the predicting role of the level of children's EB at baseline is uncertain.

Methods of evaluation

Effects size also depends on who is describing the child's behavior (Scott, 2001). According to the informant (parent, observer or teacher) and the use of questionnaires or observation, effects of the intervention can vary (Nowak & Heinrichs, 2008).Teacher reports tend to show smaller effects than direct observation or parent reports. Teachers report on children behavior from a different setting from the family's or the lab and there is relatively little data to support the transfer of effects of parenting intervention to the school setting. Direct observation of parent-child interaction is often described as a more conservative approach to examining effects but several studies demonstrated that observed behavior was more sensitive to

intervention effects than parent ratings of behavior (Gardner, Burton, & Klimes, 2006; Menting et al., 2013). The meta-analytic study of variations across informants, in particular between the parent participating to the program and other informant - i.e., the other parent or the teacher-, remains an important topic with regard to methodological and clinical issues.

Interventions' characteristics

Regarding interventions' characteristics, the length or number of sessions is generally not relevant to explain effect differences (Beauchaine, Webster-Stratton, & Reid, 2005; Serketich & Dumas, 1996). This has led some authors to conclude that lengthy interventions were not always necessary to produce higher effectiveness, considering that "less" can "be more" (Bakermans-Kranenburg, van Ijzendoorn, & Juffer, 2003). This is also true regarding the number of intervention components, for which reviews show that stacking intervention in a program does not always provide better outcomes (Beauchaine et al., 2005; Kaminski, Valle, Filene, & Boyle, 2008). Another meta-analytic review (Kaminski et al., 2008) tried to determine which program components and delivery methods were reliably associated with more successful outcomes in terms of parenting (skills, knowledge, self-efficacy, attitudes) and young children's behavior (externalizing and internalizing, as well as school and social outcomes). The authors looked at 18 key ingredients of the programs, but not their theoretical orientation. Some components were related to parenting behavioral skills (child development knowledge, care, use of time out, emotional communication), while others covered techniques to improve these skills (role play, modeling, parents practicing with their own child, etc.) as well as ancillary services (such as mental health or substance abuse services, social support or educational assistance). No cognitive components were included in their selection. This meta-analysis showed that four components of parental child-rearing behavior were associated with a greater effect size on child's EB: positive interactions with the child, time out, consistent responding to the child's behavior and parents practicing with their own child at home.

Authors concluded that actively including parents in creating positive interactions with their child and practicing new skills is more efficient than modeling or teaching, in which parents are less active. While this meta-analysis made an important contribution to the field, it listed exclusively behavioral components, leaving out cognitive or combined ones (cognitive and behavioral).

Actually, these past meta-analyses have not looked at what is actually at stake in parenting interventions. In behavior-oriented interventions, the main change process is based on parenting modeling. Trainers or practitioners leading the intervention show parents vignettes of "good parenting practice", use role playing techniques and provide practical exercises with instructions to implement at home with their children, in view of decreasing their non-compliance, opposition or aggressiveness. As explained by Serketich and Dumas (1996), these programs aim at establishing a shift in social contingencies, by using differential reinforcement, a shift towards prosocial behavior in children leading to positive parental reinforcement as opposed to aversive behavior that is punished or randomly ignored by parents.

Some programs also include an explicit cognitive orientation. They induce a modification in parents' perception of their children and their behavior, without any focus on parenting practices. Rather than modeling behaviors, they enhance parental self-efficacy by focusing parents' attention on positive experiences with their child, and modify expectations towards children or reduce parental stress (Kazdin & Whitley, 2003). Cedar and Levant (1990) examined 26 studies on a non-behavioral program called Parent Effectiveness Training focusing on positive communication, active listening and appropriate assertiveness. Authors found no effect on child behavior but positive changes in parental attitudes and communication with their child. But the narrow focus of this study on a single program

precluded a thorough analysis of the variety of treatment variables on child outcomes and generalization to other programs.

Parenting programs do not always stipulate clearly which specific parenting variables are manipulated, what is their orientation, whether they are of a behavioral or cognitive nature, and what change processes they intend to activate (Beauchaine et al., 2005; Kaminski et al., 2008). Consequently, meta-analytic reviews rarely differentiate parenting interventions according to their focus and orientation, as confirmed by Lundhal and colleagues (2006) who concluded that it was difficult to compare behavioral with non-behavioral interventions. This makes it difficult to understand which orientations are likely candidates for success. In order to do so, it could be helpful to clarify what these focuses and change processes are. Without such information, how can the program be replicated or adapted in a focused version concentrating on potentially effective focuses and to tailor it to the needs of families? The question is not only to document an isolated causal relation between a specific orientation and child EB but rather to investigate to what extent it is better to activate cognitive, behavioral or both theoretical mechanisms to reduce young children's EB (Eisenberg, Champion, & Ma, 2004).

Current Study

In view of these gaps, the main objective here was to compare the immediate effect of parenting programs on EB in young children (3-7 years old) according to their orientation, methods of evaluation and duration. The added value of this meta-analysis lies in the fact that the focus is on young children, by contrast with other meta-analyses that include studies covering a wider age range. This is important for two main reasons. First, the preschool period is a developmental stage characterized by plasticity. Second, the influence of parenting is key at this stage, which is less true later on when children become more autonomous. Because of these two elements, we expected a bigger effect size of parenting interventions

compared to other meta-analyses covering a wider age range. Even though parenting is the manipulated variable, it was decided to focus here on child's EB exclusively as the outcome, without analyzing interventions' effect on parenting, for several reasons. First, EB was the core issue of the selected studies. Second, EB's measurement is usually based on a limited number of instruments (i.e., CBCL or ECBI scales) and therefore easily comparable. This is less often the case for parenting which is measured through a wide variety of tools (various questionnaires, observational measures based on various paradigms). Therefore, we focused our analysis on child's EB in order to maintain a good level of homogeneity in our studies' sample.

In this meta-analytic review, we had a particular interest in identifying factors that influence the effectiveness of parenting programs. On the basis of the differences described above, we hypothesized that the following factors would influence programs' effectiveness on child's EB: 1/ the behavioral, behavioral-cognitive or cognitive orientation 2/ the informant; 3/ the duration of program. We had no hypothesis on the participants' characteristics because of divergent results in the literature.

Method

Inclusion and Exclusion Criteria

To fulfil our objective of analyzing the immediate effect of parenting programs on young children's EB, we included the following studies in our selection: randomized control trials studies published in French, English, German or Spanish for either children displaying a clinical level of EB or non-referred children and aged 3 to 7 years old. The included parenting interventions had to provide explicit information on the activities implemented so they could be categorized either as behavioral (e.g. praise or reward) or cognitive (e.g. self-efficacy beliefs or methods of dealing with stress). Concretely, they had to implement specific

activities to modify these behaviors or cognitions and not only aiming at these goals in a global manner. The included studies had to report the immediate change in children's EB after program attendance, using a pre-post-test research design and compare it to a control group (no-intervention, waiting-list or treatment-as-usual). Finally, the programs had to be attended exclusively by biological parents. We excluded programs designed for preschool teachers or siblings and studies with children or parents displaying mental health problems or neurobehavioral disorders such as autism, mental disability or depression. Studies with specific samples such as adoptees, foster care children or teenage mothers were excluded as well, in order to avoid other risk factors variables having an impact on children's EB.

Document Search, Review and Retrieval

Four independent investigators carried out the document search, review and retrieval. The search was conducted between September 2014 and February 2015 and limited to publications from 1990 onward. This year milestone was chosen because previous meta-analyses already covered the years before 1990, such as Serketich and Dumas' (1996), and in order to focus on recent studies that would differ the most on the selected factors. Several databases were used: Eric, Francis, Psycarticles, PsycINFO, Scopus, and Medline. The search terms used related to program descriptors, program targets, program outcomes, and beneficiaries' age. For the program descriptors, the keywords were *intervention*, *program*, *manipulation*, *training* and *treatment*. For program targets, the keywords were *parent* (or *parenting*) *behavior*, *childrearing*, *cognitions*, *skills* and *competence*. For the program outcomes, they were *externalizing* (or *externalized*) *behavior* (or *behavior*), *ADHD* (or *hyperactivity* or *agitation* or *arousal*), *conduct disorder* (or *disorders*), *opposition* and *aggressiveness* (or *aggressive*). For beneficiaries' age, they were *preschoolers* (or *children*) with a mean age ranging from *3.5 to 5.5 years*. The number of unduplicated studies was 1,172. After a first selection based on abstracts, 176 articles were retrieved. After the full

reading of the 176 articles, 59 were found to be eligible. A second in-depth reading led to 24 more studies being excluded because of multiple published reports (two or more publications included results from the same sample on the same measures), or comparison of two programs without a no-intervention or waiting list group, or lack of inclusion of the necessary statistics for meta-analytic computation. The final set encompassed 35 studies with a total of 3,201 participants (1,475 controls and 1,726 participants in a parenting program).

Data Abstraction

Coding forms were used to collect information about participants, intervention, outcomes, and results. In particular, information about participants included child's gender (percentage of boys), pathological level of EB (a score above a clinical cut-off point on a standardized EB scale), as well as participating parents' gender. Note that in the vast majority of studies, mothers participated in the program, sometimes a percentage was indicated. None was specifically dedicated to fathers only. When both mothers and fathers attended the program, the studies did not indicate whether they attended as couples or not, or what the percentage of mothers and fathers was. Therefore, this information was no longer kept in the analyses because of the difficulty of obtaining systematic and comparable information within the selected studies. A categorization of studies would have been necessary to analyze this information, with all the methodological limitations this involves (Shelleby & Shaw, 2014). Information about interventions included program duration (in weeks) and program delivery format (group sessions, individually or self-administered). Note that group sessions were combined with individual contact with participants through telephone calls or individual meetings in a majority of studies. Note also that in self-administered programs, the duration was calculated as the number of weeks between the pre- and the post-assessment. We also coded whether the program stimulated parenting behaviors only, cognitions only, or both. Information about programs was extracted from the studies' "treatment" or "intervention"

section of the published articles as well as from original manuals or official program websites. Those that reported explicitly to stimulate parents' discipline, management strategies, skills, practices, behaviors, instructions, or problem-solving techniques were coded as intervention on behaviors (B). Those that reported explicitly to stimulate parents' beliefs, confidence, attributions, thoughts, expectations, sense of responsibility, representations or methods of dealing with stress were coded as intervention on cognitions (C). Programs mentioning activities and processes belonging to both these categories were coded as behavioral and cognitive (CB).Programs that modified parenting behaviors and in which cognitions were only modified indirectly and not explicitly or when cognition modification was only implied were categorized as behavioral (B), not cognitive and behavioral (CB).

Our sample of studies is composed by a majority of studies implementing standardized intervention programs such as Triple P (n=12), Incredible Years (n=9), and to a lesser extend Parent Child Interaction Therapy (n=3), Tuning in to kids (n=2) and Parent Management Training (n=2). Seven studies evaluate parenting interventions, not yet replicated. For standardized interventions, several variants often exist, in particular for Triple P studies for which five levels of intervention exist. Most selected articles do not mention explicitly the level of Triple P implemented, reason why we decided not to report this information. These programs can vary on the setting (group versus individual), the number of sessions (short versus long version), the way they are administered (self-administered based on books, on line, television viewing or supervised by a professional) and their orientation (exclusively behavior- or with a cognitive-behavior oriented), which explains why some of the Triple P programs are behavioral and others cognitive-behavioral, as described in Table 1. A cross-coding was done by two different coders, with an intercoder score of 94.3%. After discussion, both coders agreed on the final code of the only two studies on which there was a disagreement.

Table 1 *Behavioral (B) and cognitive-behavioral (CB) orientation of the programs*

Citation	Name of programme	Parenting behaviors (B), cognitions (C) or both (CB) stimulated	Coding
(Axberg & Broberg, 2012)	Incredible Years	Interventions that foster a more secure child–parent relationship reduce harsh and inconsistent parenting and poor monitoring, decrease the child's association with deviant peers, and promote the child's positive bonding to school. (…) Principles for how the child can best be handled, based on the specific theme, are outlined. In role play sessions the parents practice how they can interact with their child in accordance with these principles, and in addition the parents get a weekly assignment to practice their newly acquired skills at home.	CB
(Bor, Sanders, & Markie-Dadds, 2002)	Triple P	Standard behavioral family intervention composed of 17 core child management strategies. Ten are designed to promote children's competence and development: quality time, talking with children, physical affection, praise, attention-engaging activities, setting a good example, ask, say, do, incidental teaching, behavior charts. Seven strategies help parents manage misbehavior: setting rules, directed discussion, planned ignoring, clear, direct instructions, logical consequences, quiet time, time-out. In addition, parents are taught a 6-step planned activities routine to enhance the generalization and maintenance of parenting skills.	B
(Connell, Sanders, & Markie-Dadds, 1997)	Triple P : self-directed behavioral family intervention	Behavioral family intervention in a self-directed format. Acquisition of skills known to influence children's development, including creating a safe and engaging environment providing opportunities to explore, discover and learn, creating a responsive environment including incidental teaching, using positive encouragement and attention to motivate children to learn new behaviors and skills, using consistent and assertive discipline encouraging children to accept limits and develop self-control, development of realistic, age-appropriate expectations and beliefs about children and their behaviors. Parents prompted to self-monitor their own and their child's behavior, to self-select goals and specific behaviors for change, to select strategies to use to identify their own and their child's strengths and areas for improvement.	CB
(Day, Michelson, Thomson, Penney, & Draper, 2012)	EPEC: Empowering parents, empowering communities	Improving parent-child relationships, reducing behavioral problems in the child, increasing participants' confidence in their parenting abilities.	CB
(Enebrink, Högström, Forster, & Ghaderi, 2012)	Parent management treatment internet-based	Positive parenting, communication, positive reinforcement, information and work about punishment of problematic child behavior	B
(Gardner et al., 2006)	Incredible Years	Parent-child play, praise, incentives, limit-setting, problem-solving and discipline	CB
(Griffin, Guerin, Sharry, & Drumm, 2010)	Parent Plus Early Years programme	Play, special time, encouragement, supporting children's learning and language, clear instructions, distractions, routines, consequence, assertive parenting, …	CB

(Hahlweg, Heinrichs, Kuschel, & Feldmann, 2008)	Triple P self-directed with therapist assistance	Encouraging the parents' own problem-solving skills (…) rather than relying on the therapist for solutions. … advice and support to promote responsibility for changing parents' own and their children's behavior. Discussions are restricted to behavior problems of the target children and elaboration of concepts nominated by the parent.	CB
(Hahlweg, Heinrichs, Kuschel, Bertram, & Naumann, 2010)	Triple P	4 sessions on 17 core child management strategies. 10 are designed to promote children's competence and development: quality time, talking with children, physical affection, praise, attention, engaging activities, setting a good example, ask, say, do, incidental teaching, behavior charts. Seven strategies help parents manage misbehavior: setting rules, directed discussion, planned ignoring, clear, direct instructions, logical consequences, quiet time, time-out.	B
(Hautmann, Hanisch, Mayer, Plück, & Döpfner, 2008)	Prevention Programme for Externalized Problems (PEP)	Parents and kindergarten teachers are taught to strengthen their positive relationship with problem children by engaging in positive child-directed play interactions and by paying special attention to the children's competencies and compliance. Further, parents and kindergarten teachers are trained to communicate commands effectively, to reinforce appropriate behavior, and to discipline inappropriate behavior. The treatment also aims to reduce parental stress by empowering parents, helping them to relax, strengthening their ability to anticipate difficult parenting situations, and to plan adequate solutions.	CB
(Havighurst, Wilson, Harley, Prior, & Kehoe, 2010)	Tuning in to Kids	Emphasis was placed on parents becoming aware of their own emotions as well as their children's emotions, including at a physiological level. In the first three sessions, parents were taught to attend to children's lower-intensity emotions, and how to reflect, label and empathize with children's emotions. The fourth session attended to anxiety and problem solving; and the last two focused on more intense emotions, particularly anger, and included emotion regulation. Strategies such as slow breathing, relaxation, self-control using the turtle technique from Promoting Alternative Thinking Strategies, and safe expression of anger. Parents were also taught skills in understanding and regulating their own emotions, and reflected on the influence of family of origin experiences on their beliefs and responses to emotions.	CB
(Joachim, Sanders, & Turner, 2010)	Triple P Brief discussion group (topic specific)	Specific child management strategies are taught that are alternatives to coercive and ineffective discipline practices, specific advice how to manage their child's behavior in the supermarket and how to prevent behavior problems in shopping trips.	B
(Jones, Daley, Hutchings, Bywater, & Eames, 2007)	Incredible Years	Skills taught on the program include (1) how parents can establish a positive relationship with their children through play and child-centered activities. Encouraging praise, reward and incentives for appropriate child behaviors; (3) guidance in the use of effective limit setting and clear instruction giving; and (4) strategies for managing noncompliance.	CB
(Kling, Forster, Sundell, & Melin, 2010)	Parent Management Training Practionner assisted	The program consists of eleven sessions with the following content: (1) self-directed play and positive interaction; (2 and 3) preparations before activities, effective commands, and praise; (4 and 5) tokens and rewards; (6) involving school teachers through home-notes; (7) stopping negative behavior; (8 and 9) behavioral contracts; (10) structured problem-solving; and (11) relapse prevention.	B

(Larsson et al., 2009)	Incredible Years	This program teaches parents the use of positive disciplinary strategies, effective parenting skills, strategies for coping with stress, and ways to strengthen children's social skills.	CB
(Leung, Sanders, Leung, Mak, & Lau, 2003)	Triple P	The program introduces positive, nonviolent child management techniques to parents as an alternative to coercive parenting practices. It also emphasizes the importance of changing unrealistic or dysfunctional parental cognitions, specifically attributions and expectations in their child management, and helps parents to identify alternative explanations for their children's behaviors.	CB
(Markie-dadds & Sanders, 2006)	Triple P Self-directed	The program involved teaching parents 17 core child management strategies. 10 of the strategies are designed to promote children's competence and development (i.e. quality time; talking with children; physical affection; praise; attention; engaging activities; setting a good example; Ask, Say, Do; incidental teaching; and behavior charts) and seven strategies are designed to help parents manage misbehavior (i.e. setting rules; directed discussion; planned ignoring; clear direct instructions; logical consequences, quiet-time; and time-out). In addition, parents were taught a 6-step planned activities routine to enhance the generalization and maintenance of parenting skills (i.e. plan ahead; decide on rules; select engaging activities; decide on rewards and consequences; hold a follow-up discussion). Consequently, parents were taught to apply parenting skills to a broad range of target behavior in both home and community settings with the target child and all relevant siblings; Emphasis on parent-self regulation and promotion of parental self-sufficiency.	CB
(Matos, Bauermeister, & Bernal, 2009)	Parent Child Interaction Therapy (PCIT)	Parental coaching during dyadic play. Parents were taught how to direct their children's activity while being instructed in the use of clear, positively stated, direct commands and consistent consequences for behavior (e.g., praise for compliance, timeout in a chair for noncompliance). Parents learned to establish and enforce "house rules" and to manage their children's behavior both at home and in public places.	B
(McGilloway et al., 2012)	Incredible Years	Program topics include play, attention and involvement, listening, problem solving, praise, incentives, and limit setting and other non-aversive discipline strategies. The program promotes positive parenting techniques, such as child-directed play and encouragement, to foster child cooperation and strengthen parent-child relationships. Child problem behaviors are addressed by encouraging parents to reinforce positive prosocial behavior and to use non-aversive discipline strategies (e.g., time-out) to tackle aversive or inappropriate behaviors.	CB
(Morawska, Haslam, Milne & Sanders, 2011)	Triple P Brief intervention (discussion group)	The key points covered in the discussion group included reasons for disobedience, parenting traps, encouraging good behavior, and managing disobedience. To increase parenting skills in promoting social, emotional and behavioral competence in children. To reduce parents' use of coercive and punitive methods of discipline, to improve communication about parenting and reduce parental stress.	CB
(Reginald D. V. Nixon, Sweeney,	Parent Child Interaction Therapy (PCIT)	Parental coaching during dyadic play. PCIT has two major phases. First, there is a focus on improving the child–parent relationship by teaching parents to play with their children in a positive, nondirective manner and labeled *special playtime* (Sessions 1 to 5). During this	B

Erickson, & Touyz, 2003)		phase, parents are also taught basic skills (e.g., selective ignoring, labeled praise) to help modify unwanted behaviors of their child that would respond to such strategies. The focus of the second phase (labeled *discipline skills*, Sessions 6 to 12) was to teach parents skills and strategies in behavior management, using clear instructions in terms of commands to children and appropriate consequences for noncompliance (e.g., time-out and withdrawal of privileges).	
(J. Patterson et al., 2002)	Incredible Years	The techniques covered included play and positive interaction with the child, clear commands, limit setting, ignoring undesirable behavior, praising and rewarding desirable behavior, and following through on discipline.	CB
(Roskam, 2015)	Lou & us	'Lou & us' attempts to isolate metacognition as the core process that promotes positive parenting. It is based on a self-monitoring, relatively non-directive approach which can help parents to take control of their own development. The aim of 'Lou & us' is to offer an insight into how parents reason, thus making them more aware of how they parent and why they parent the way they do. It considers parents as agents who are self-examiners with a metacognitive capacity to reflect about both their thoughts and actions.	CB
(Sanders, Markie-Dadds, Tully, & Bor, 2000)	Triple P Self-directed	17 core child management strategies. Ten of the strategies are designed to promote children's competence and development (i.e. quality time; talking with children; physical affection; praise; attention; engaging activities; setting a good example; Ask, Say, Do; incidental teaching; and behavior charts) and seven strategies are designed to help parents manage misbehavior (i.e. setting rules; directed discussion; planned ignoring; clear direct instructions; logical consequences, quiet-time; and time-out). In addition, parents were taught a 6-step planned activities routine to enhance the generalization and maintenance of parenting skills (i.e. plan ahead; decide on rules; select engaging activities; decide on rewards and consequences; hold a follow-up discussion).	B
(Sanders, Montgomery, & Brechman-Toussaint, 2000)	Triple P Television viewing "Families" 12-episode TV program	Parenting strategies designed to address common behavioral problems (e.g., whining and tantrums), to prevent problems from occurring, and to teach children new skills and help them master difficult tasks (e.g., brushing teeth). Brief examples of the causes of child behavior problems from a social learning perspective, and information on how to keep track of child behavior problems by monitoring. Strategies of descriptive praise, positive attention, and providing engaging activities to encourage desirable behavior in children. Range of management strategies such as rule setting, directed discussion, planned ignoring, and the provision of clear instructions that are backed up by either logical consequences, quiet time, or time-out. Dealing with sleeping difficulties, whining, disobedience, and temper tantrums, respectively. How to promote children's creativity, and advice on how to encourage children's involvement in sport and physical activity and how to deal with inappropriate sporting behavior. Discussion on the topics of aggressive behavior and encouraging cooperative play;	B

		understanding and dealing with children's eating difficulties; and assisting children with homework, respectively.	
(Sanders, Baker, & Turner, 2012)	Triple P On line Self-directed intensive 8 module	The intervention provides instruction in the use of 17core positive parenting skills (e.g., descriptive praise, quiet time, time-out). The content is presented in sequenced modules: 1) What is positive parenting?; 2) Encouraging behavior you like; 3)Teaching new skills; 4) Managing misbehavior; 5) Dealing with disobedience; 6) Preventing problems by planning ahead; 7)Making shopping fun; and 8) Raising confident, capable kids. A distinctive feature of this online interactive program is its emphasis on promoting parental self-regulation. This is achieved through sound instructional design, dynamic and demonstration driven video content, teaching parents self-management skills (goal setting, self-evaluation). It focuses on increasing parental self-efficacy (beliefs about capacity to execute daily parenting tasks), personal agency (attributing change to one's own efforts) and self-sufficiency (independent problem solving). It also prompts parents' ongoing participation, without the need for personal contact with a clinician. Triple P Online incorporates elements designed to engage participants and improve knowledge acquisition, positive self-efficacy, and behavior activation.	CB
(Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998)	Parent Child Interaction Therapy (PCIT)	PCIT has two phases, labeled child-directed interaction (CDI) and parent-directed interaction (PDI). In CDI, which focuses on changing the quality of the parent-child relationship, parents learn nondirective play skills similar to those used by traditional play therapists. In PDI, which emphasizes child compliance, parents learn to direct the child's behavior with clear, age-appropriate instructions and consistent consequences: praise for compliance and time-out for noncompliance. Coaching with bug-in-the-ear microphone	B
(Sheeber & Johnson, 1994)	Temperament focused parent training	The initial focus of the program was on familiarizing parents with the nature of child temperament, describing its role in understanding child behavior, and exploring parental feelings and family difficulties related to parenting a difficult child. Techniques for managing temperament related behavior problem.	CB
(Somech & Elizur, 2012)	Hitkashrut	Strategies : 1/ Father involvement/cooperation 2/ Parental self-regulation (3/ Two-stage consequence 4/ Teacher involvement/cooperation Components: 1/ Interaction quality/ time 2/ Parent-child communication skills 3/ Behavior management 4/ Discipline skills 5/ Self-regulation capacity (imagery and relaxation; parental self-reflection; understanding intergenerational parental patterns) 6/ Couple communication skills.	CB
(Taylor, Schmidt, Pepler, & Hodgins, 1998)	Parents and Children series treatment (PACS)	Parents are introduced to a range of topics including how to play with young children, using praise and rewards effectively, setting appropriate limits, ignoring attention-seeking behavior, using time-out, establishing logical consequences, and focusing on preventive strategies.	B
(Turner & Sanders, 2006)	Triple P Brief 4 session	Advice on managing problem behaviors was provided to the parents. Session 1: history and nature of the presenting problems; Session 2: parents' perceptions of the child's	B

		behavior; sharing conclusions about the nature of the problem; Session 3: reviewing family's progress, skill rehearsal or introduction of additional parenting strategies; Session 4: progress review, positive feedback and encouragement.	
(Webster-Stratton & Hammond, 1997)	Incredible Years	Sessions emphasize the importance of play, ways to help children learn, effective praise, use of incentives, limit setting and ways to deal effectively with misbehavior.	CB
(Webster-Stratton, 1990)	Incredible Years self-administered videotapes	The content of the videotapes included a modification of the interactional model focusing on play skills, praise, and tangible rewards. The last half of the program focused on teaching parents non punitive discipline approaches and a specific set of operant techniques and problem-solving approaches.	CB
(Webster-Stratton, 1992)	Incredible Years	The content included teaching parents play and reinforcement skills, effective limit setting and nonviolent discipline techniques, and problem-solving approaches. In addition to the behavioral aspects of the content of the program, the process of the intervention had some cognitive components. (…) These questions (in the parents' manual) focused on helping parents examine their beliefs about children's behaviors and emotional reactions as well as their own responses.	CB
(K. Wilson, Havighurst, & Harley, 2012)	Tuning in to Kids	Parents are taught five steps of emotion coaching: (a) become aware of the child's emotion, especially if it is at lower intensity, (b) become aware of the child's emotion as an opportunity for intimacy and teaching, (c) communicate understanding and acceptance of the emotion, (d) help the child to use words to describe how they feel, (e) if necessary, assist them with problem-solving	CB

With regard to information about outcomes, children's EB was the primary outcome of interest. In all 35 selected studies, the main outcome was reported by the participating parent. In addition, in a subsample of studies (n=16), children's EB was also reported by another informant (the other parent, a preschool teacher or investigator's observation). Finally, information about the results provided the necessary statistical information for meta-analysis statistics, in particular the number of subjects attending the parent program, the immediate post-test mean and standard deviations in control and treatment groups. Variables coded for program participants, intervention type and outcomes are described in Table 2.

Table 2 *Descriptive information on participants, programs and outcomes*

Citation	Child gender (% boys)	EB pathological level treatment (T) or prevention (P)	Program duration (in weeks)	Group sessions (G) or individual program only (I)	Parenting behaviors (B), cognitions (C) or both (CB) stimulated	EB measure by participating parent	EB measure by other informant
(Axberg & Broberg, 2012)	83.87	T	13	G	CB	ECBI	ECBI (teacher)
(Bor et al., 2002)	68.00	T	16	I	B	ECBI	Observation
(Connell et al., 1997)	43.47	T	10	I	CB	ECBI	
(Day et al., 2012)	50.00	P	8	G	CB	ECBI	
(Enebrink et al., 2012)	57.70	T	7	I	B	ECBI	
(Gardner et al., 2006)	73.68	T	14	G	CB	ECBI	Observation
(Griffin et al., 2010)	86	T	12	G+I	CB	SDQ	
(Hahlweg et al., 2008)	51.00	P	10	I	CB	CBCL	CBCL (other parent)
(Hahlweg et al., 2010)	51.00	P	4	G	B	CBCL	CBCL (teacher)
(Hautmann et al., 2008)	78.80	T	12	G	CB	CBCL	
(Havighurst et al., 2010)	51.13	P	6	G	CB	ECBI	ECBI (teacher)
(Joachim et al., 2010)	54.34	P	1	G	B	ECBI	
(Jones et al., 2007)	68.00	T	12	G	CB	Conners	
(Kling et al., 2010)	60.00	P	11	G	B	ECBI	Observation
(Larsson et al., 2009)	80.00	T	13	G	CB	ECBI	ECBI (other parent)
(Leung et al., 2003)	63.77	T	8	G	CB	ECBI	
(Markie-dadds & Sanders, 2006)	63.49	T	10	I	CB	ECBI	
(Matos et al., 2009)	NR	T	17	I	B	ECBI	
(McGilloway et al., 2012)	61.07	T	24	G	CB	ECBI	
(Morawska et al., 2011)	55.20	P	1	G	CB	ECBI	
(Reginald D. V. Nixon et al., 2003)	70.00	T	12	G	B	ECBI	PSA (other parent)
(J. Patterson et al., 2002)	NR	T	10	G	CB	ECBI	
(Roskam, 2015)	36.30	P	3	I	CB	PSA	
(Sanders, Markie-Dadds, et al., 2000)	69	T	15	I	B	ECBI	Observation
(Sanders, Montgomery, et al., 2000)	58.92	P	24	I	B	ECBI	Observation
(Sanders et al., 2012)	67.24	T	12	I	CB	ECBI	Observation
(Schuhmann et al., 1998)	59.37	T	13	I	B	ECBI	ECBI (other parent)
(Sheeber & Johnson, 1994)	60.00	T	9	G	CB	CBCL	CBCL (other parent)
(Somech & Elizur, 2012)	77.51	T	14	G	CB	ECBI	
(Taylor et al., 1998)	67.18	T	16	G	B	ECBI	
(Turner & Sanders, 2006)	53.33	T	4	I	B	ECBI	
(Webster-Stratton & Hammond, 1997)	74.50	T	24	G	CB	ECBI	PBQ (teacher)
(Webster-Stratton, 1990)	79.06	T	10	I	CB	ECBI	
(Webster-Stratton, 1992)	72.00	T	10	I	CB	ECBI	ECBI (other parent)
(K. Wilson et al., 2012)	52.00	P	8	G	CB	ECBI	

NR Not reported

CBCL, Child Behavior Checklist-Externalizing Behavior scale; ECBI, Eyberg Child Behavior Inventory-Intensity scale; PSA, Profil Psycho-Affectif-Problèmes externalisés; SDQ, Strengths and Difficulties Questionnaire-Total Problems; PBQ, Problem Behavior Questionnaire; Conners, Abbreviated Parent/Teacher Rating Scale.

Effect Size Computation

The standardized mean difference statistic (Hedges & Olkin, 1985) is the conventional effect size for treatment outcome investigations. The StatsDirect software was used(Freemantle, 2000). The post-test mean of the comparison group was subtracted from the post-test mean of the treatment group. The result was divided by the pooled standard deviation as in the following formula: d=g[J(N-2)],where $g = \frac{u_e - u_a}{\sigma\ pooled}$, $\sigma\ pooled = \frac{\sqrt{\sigma^2{}_e(n_e-1)+\sigma^2{}_a(n_a-1)}}{N-2}$, and $J(m) = \frac{\Gamma(m-2)}{\Gamma[\frac{m-1}{2}]\sqrt{(\frac{m}{2})}}$.

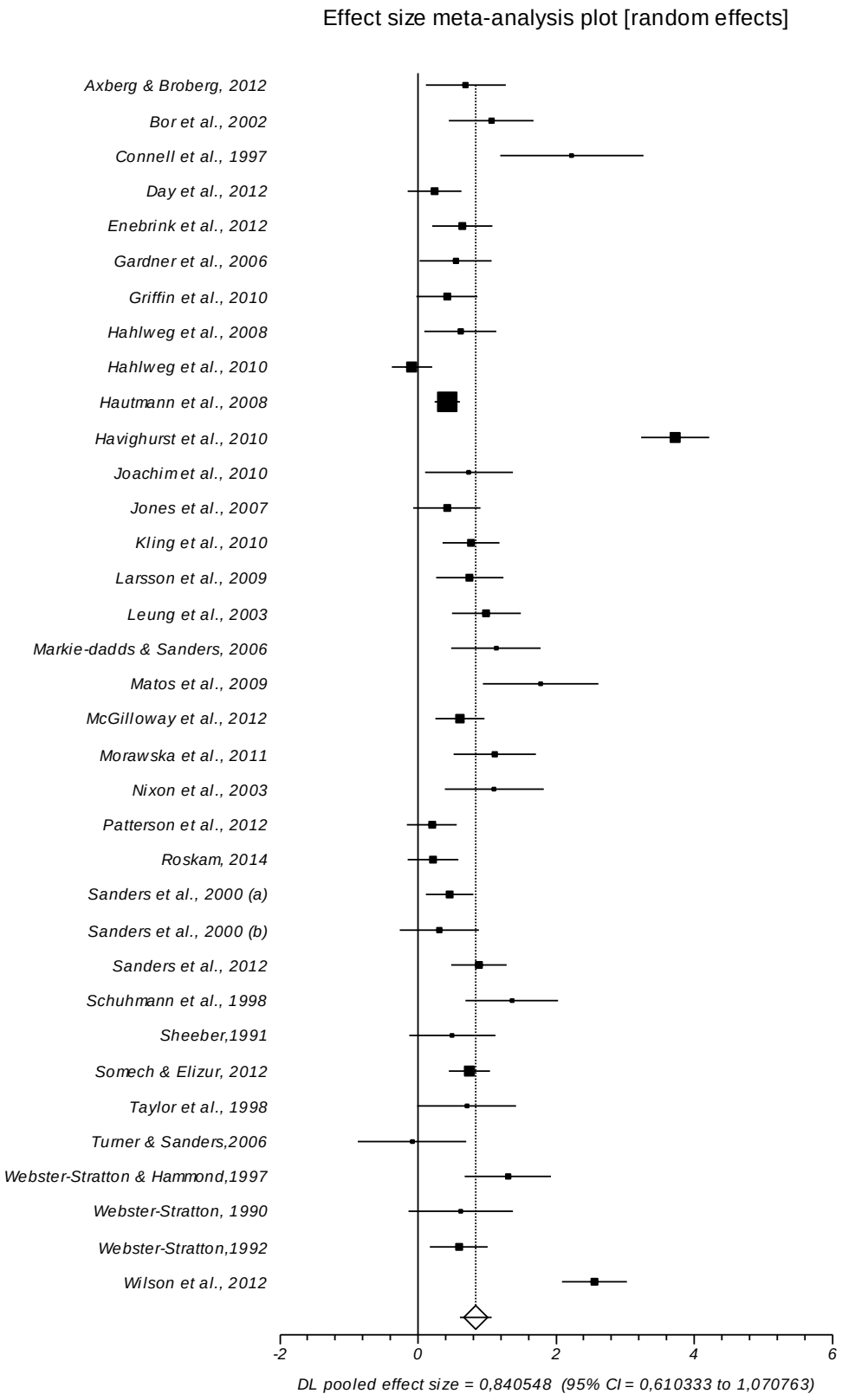
When multiple EB outcomes or multiple treatment conditions had been reported within the same study, only one effect size per study was computed and included in the analysis in order to respect the statistical independence assumption. Following Wilson and Lipsey's recommendation(2001), we selected the most appropriate results information according to our inclusion criteria and the main objective of the meta-analysis. For the purposes of cross-informant analysis, a second effect size was calculated for studies giving an assessment of children's EB by parties other than the participating parents.

Results

Both fixed and random effects models were generated. Random effects models assume that treatment effects may differ between studies, allowing generalization of results. Only random effects are therefore reported here. The mean effect size of the final set of 35 studies was 0.84 (95% CI = 0.61 to 1.07), meaning that the true size of effect was at least 0.61 greater for the group receiving the parenting program compared with the control group that did not. Individual effect sizes ranged from -.08 to 3.72. Examination of the set of effect sizes suggested the presence of an outlier. The question of whether the extreme value influenced

the results was tested by running all analyses with and without the potential outlier (effect size without outlier is .77). None of the results patterns changed. Therefore, for clarity of presentation, all results presented in the current section are based on the full set of effect sizes. The effect size meta-analysis plot is presented in Figure 1, with the size of the square being proportional to the precision of the study (sample size).

Figure 1 *Effect size meta-analysis plot*



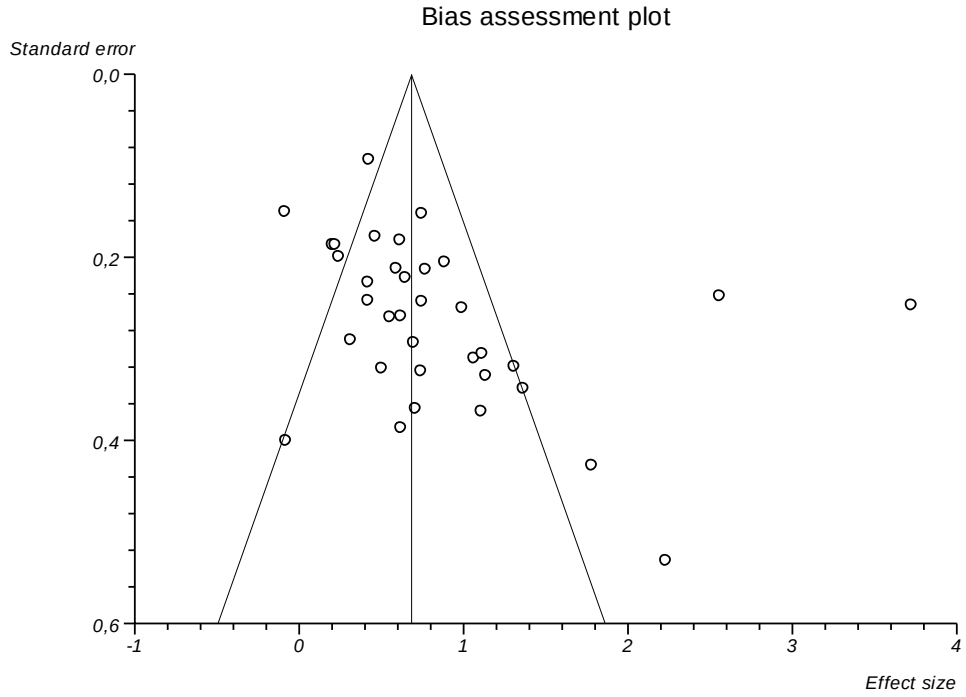
Homogeneity of Results

The Cochran Q test of homogeneity of effect sizes was shown to be significant (Q[34] =300.53, p<.001) revealing variability in reported effect size across studies. This result pointed to the need to examine potential moderators of effect size. In addition, variation in standardized mean differences attributable to heterogeneity was assessed with the I^2 statistic, corresponding to the percentage of between-study heterogeneity attributable to variability in the true treatment effect rather than sampling variation. There was evidence for heterogeneity, with I^2=88.7% (95% CI = 85.7% to 90.8%). Such a level of heterogeneity suggests that there are significant differences between studies that cannot be explained by random variations.

Publication Bias

Publication bias was assessed with a funnel plot illustrating the relation between sample size and effect sizes. The results are shown in Figure 2. Egger's statistic was computed in order to test if small studies tended to have larger effect sizes than would be expected. The estimated bias coefficient was 3.07, p=0.023, yielding evidence of small-study effects, as is the case in other meta-analyses (P. Wilson et al., 2012).

Figure 2 *Bias assessment plot*



Factors Influencing Effect Size

In a first set of factors, we examined if and to what extent the interventions' orientation was related to effect sizes. Information about the programs orientation indicated that parents' behavior was stimulated exclusively in 12 studies. In the other 23 studies, stimulation addressed both parental behavior and cognition. None of the parenting programs stimulated cognition only. Therefore, we compared behavioral versus cognitive-behavioral programs and found no significant difference ($F(1,33)=.254$, $p>.05$).

Program duration and delivery format were also analyzed. The correlation between program duration in weeks and effect size was $r=-.01$, $p>.05$, suggesting that there was no higher effect size related to longer program duration. T-tests were computed also on effect sizes with delivery variables on group vs. individual or self-administered programs. Parenting programs were individual or self-administered programs in 14 studies and delivered in a group in the other 21. No significant difference in effect sizes was found between the two

types, $F(1,33)=.02$, $p>.05$, suggesting that the two types of intervention had similar effect sizes.

Then, we examined if and to what extent participants' characteristics predicted effect size. Concerning gender, the correlation between the percentage of boys and effect size was not significant ($r=-.20$, $p>.05$). Therefore, interventions could be expected to be equally beneficial for boys and girls, which is consistent with the findings of a recent review by Brennan and Shaw (2013). Concerning age, there was insufficient variance to suggest that children's age had a predicting effect, which is probably due to the focus of this study on young children, with a limited age range (3-7 years old with a mean age between 3.5 and 5.5). Concerning child behavior initial severity, F-tests were computed on effect sizes with children displaying EB, first using dichotomous variable (normal vs. clinical). Children recruited in 11 studies were in the normal EB range, while in the other 24 they were recruited for their pathological level of EB. No significant difference in effect sizes was found between the two groups, $F(1,33)=.57$, $p>.05$. This suggests that parenting programs have the same effect on typically developing children as on children displaying a clinical level of EB. Second, using continuous variable, we analyzed the children's EB baseline level in a sub-sample of 28 studies reporting child EB at baseline using the Eyberg Child Behavior Inventory (ECBI)-Intensity scale by correlating it with the effect size. The coefficient was $r=-.21$, $p>.05$, showing no significant relation with baseline EB severity, like for the dichotomous variable. In conclusion, participants' characteristics (gender, age and EB initial severity) seemed to be unable to explain variations in the effect sizes.

In another subsample of 16 studies reporting a post- assessment of children's EB by informants other than the participating parents, a second set of moderators was analyzed. The other parent (father) was the other informant in 6 studies. Observations with investigator's coding were conducted in 6 other studies. Preschool teachers were the informant in the other

4. T-tests for repeated measures were computed on the two effect sizes. A significant difference was revealed, t (15)=3.04, p<.01, with effect sizes reported for the participating parent being higher (M=.81, SD=.86) than those for the other informant (M=.42, SD=.60). This suggests that the parent taking part in the intervention perceived more positive change in the child than the other informers (father, observer, or teacher).

In conclusion, the interventions' orientation (behavioral vs combination of cognitive and behavioral stimulation) seemed to be unable to explain variations in effect size, contrary to our hypothesis. The only influencing factor is the informant.

Discussion

The aim of this meta-analytical review was to compare parenting interventions for young children's EB according to their orientation and other influencing factors. Meta-analyses have the advantage that they embrace heterogeneity in effect size in a larger sample. The 35 selected studies concerned more than 3,200 parents and children and covered a good scope of existing parenting interventions.

Mean Effectiveness

Results show that parenting interventions are effective at decreasing children's EB, as expected. The mean effect size (0.84) was consistent with earlier meta-analyses looking at this outcome (0.73- 0.85 in Serketich and Dumas(1996), 0.67 in Dretzke, Davenport et al.(2009), 0.53 in Furlong, McGilloway et al. (2012), 0.35 in Piquero, Farrington et al. (2009), and 0.30 in Kaminski, Valle et al. (2008). The slightly higher effect size found here is in line with our main expectation of finding a bigger effect size of parenting programs on EB in young children compared to other meta-analyses covering a wider age range. This may be due to higher plasticity and to the key influence of parenting at this stage. This main result underlines the importance of early interventions. The slightly higher effect size found here

could also be explained by the fact that the 35 selected studies had to provide data on their orientation (behavioral vs cognitive-behavioral), which was not the case in the aforementioned meta-analyses. Furthermore, the sample includes smaller interventions and not only standardized multimodal programs, which usually show lower effect size (Menting et al., 2013). Partly because of the publication bias, smaller studies were found to have a bigger effect size than larger ones, which is usual in the parenting field (B. McMahon, Holly, Harrington, Roberts, & Green, 2008). Larger sample studies tend to find smaller effect sizes because they tend to be undertaken on larger scale population. This could be also due to small studies with smaller samples usually failing to report outcomes for participants who drop out before completing the intervention (Serketich & Dumas, 1996). Also, other meta-analytic reviews suggest larger effects for studies conducted by developers-as-evaluators than for independent trials, notably due to better implementation quality in developer-led studies (Menting et al., 2013). Finally, there might be a selective publishing bias of small studies with positive results, while larger studies are more likely to be published regardless of their effect size.

No Influence of Programs' Orientation

We postulated that according to which specific parenting variables were addressed, effect size would be different. Our results indicated that there was no difference in effect size between behavioral and cognitive-behavioral programs. This could be interpreted as meaning that parenting interventions have a similar positive impact on children's behavior regardless of their orientation (in terms of behavioral vs. behavioral and cognitive). It might even be taken to imply that focusing on behavior only rather than combining it with cognitive orientation could be sufficient to help limit children's EB. This could be explained by the fact that parenting programs produce secondary benefits. For example is is conceivable that any behavioral program would enhance parental self-efficacy beliefs even when none of the

activities directly targeted such cognitions. Such secondary benefits, also referred to as "widespread effects" in parenting research, have been studied in a recent publication describing how a program based on stimulating verbal responsiveness resulted in higher self-efficacy beliefs (Roskam, Brassart, Loop, Mouton, & Schelstraete, 2016). Such widespread effects in parenting programs are potentially unlimited. In this respect, we found it very interesting to look at processes, either behavioral or cognitive, that had been explicitly stimulated by the programs. It is thus conceivable that thanks to widespread effects, it would be unnecessary to explicitly activate both cognitive and behavioral processes in order to obtain a large effect size. Such a result adds to the still limited but growing literature about the best cost-benefit ratio in parenting interventions (Roskam et al., 2016). However, this conclusion may be misleading and clearly needs to be nuanced for several reasons. First, it has been difficult to identify specific parenting variables beyond the behavioral ones responsible for EB reduction. Most parenting programs are global and multimodal, which creates methodological difficulties in isolating specific orientations. They stimulate numerous parenting variables simultaneously but do not document on each of them separately. This is partly because, as Burke and Loeber explain (page 2), "efforts to identify mechanisms of treatment for children with behavioral problems are complicated" (Burke & Loeber, 2015). These problems are heterogeneous (opposition, aggressiveness, attention-seeking for instance) and there may be many ways out of EB as there are many ways in, according to the developmental principle of multifinality (Cicchetti & Rogosch, 1996). There is also some comorbidity with internalized behavior (anxiety and depression). Another difficulty lies in the fact that probably no single mechanism will be sufficient to explain the outcomes. "There remains a great level of need regarding evidence as to how these interventions affect outcomes, and whether there are general treatment effects across outcomes, or specific treatment effects on particular mechanisms, which in turn influence particular outcomes",

(page 2) (Burke & Loeber, 2015). Another difficulty was that information on orientation was not made explicit in articles or even official manuals or websites on programs, with the assumption that most programs aiming at similar objectives manipulate the same variables and induce the same change processes through similar activities. The way parenting intervention efficacy is reported does not provide sufficient information yet for accurate comparison on orientation. Emerging parenting research based on micro-trials designed to enhance specific protective mechanisms will probably highlight the potential effect of cognitive, behavioral and cognitive-behavioral orientations alike (Patty Leijten et al., 2015; Loop & Roskam, 2016; Mouton & Roskam, 2015).

Influence of Other Factors

The differences in effect size were not explained by children's gender or EB severity at baseline. This would suggest that parenting intervention has a positive impact on both girls and boys and regardless of the severity of their EB when the program starts. These programs are apparently similarly effective both as prevention and treatment for young children, which is consistent with several recent meta-analytic reviews (Menting et al., 2013; Shelleby & Shaw, 2014). This could also be due to the higher presence of clinical samples (24) compared with non-clinical ones (11) in this review. But, it is interesting to note that other studies that included children rated within the clinical range also found non-significant moderation by baseline child behavior severity (Gardner, Hutchings, Bywater, & Whitaker, 2010; Lavigne et al., 2008; B. McMahon et al., 2008).

The absence of a moderation effect of program duration is also worth underlining. It confirms conclusions drawn from previous studies showing that less can be more in terms of parenting interventions (Bakermans-Kranenburg et al., 2003), the length of the intervention does not guarantee better effect size. This is also discussed in the recent review on effects of parenting intervention on parental self-efficacy by Wittkowski et al. (2016) who showed that

a single session had already significant and lasting effect on parental self-efficacy. However, it must be recognized that an accurate estimation of the duration of the programs is difficult. In the current meta-analysis, we considered that the duration of the program was the number of weeks between the pre- and the post-test since this information is reported in all publications. Actually, it is impossible to know how much time participants really spent training. Some of them probably thought about the activities in between group or self-administered sessions they attended, while others attended these sessions without thinking about parenting matters at any other time. Also, in several programs, group or self-administered sessions were combined with phone calls or individual meetings, the duration of which is impossible to estimate on the basis of the information given by the authors.

The absence of any effect of several of the factors analyzed here could also be explained by the focus on young children. The choice of these factors is based on previous meta-analyses in which older children were included. These factors may not be as pertinent for younger children whose neurological maturity or language development is not as advanced. Interindividual variability may be higher in younger children, but this information is not available in publications. Also, in terms of children's initial EB severity for instance, focusing on young children implies that they have not yet been diagnosed with ADHD or Conduct Disorder. They are recruited on the basis of a questionnaire completed by the parent (ECBI, CBCL, etc.) and their EB severity could be less acute than in other studies with older children. Concerning the orientation of the interventions (cognitive-behavioral versus behavioral), we could also explain the absence of effect by this focus on younger children. The content of interventions may moderate their effects at other developmental stages, but not at preschool age. For instance, during adolescence, the combined cognitive-behavioral interventions could be more efficacious than behavioral interventions because this is a period

during which parents must adapt their cognitions intensively, in particular their representations of their child, and not only their behaviors.

Finally, the only factor identified here as making a difference in effect size between programs is the informant reporting the outcome. The parents participating in the intervention perceived more change in the children than teachers or non-participating parents, as found in other meta-analytic reviews (Menting et al., 2013). This informant effect could be explained by the change in parents' overall representation of their children, induced by the intervention influencing the way these parents actually rate their children's behavior. This may suggest that participating parents overestimate the degree of change that occurs. However, the questionnaires that have been used for parent reports, i.e. ECBI, SDQ, CBCL, PSA and Conners, are empirically validated assessment methods that cannot be described as only yielding subjective information. Therefore, it is also possible that change occurs particularly when children interact with participating parents, because they have a more positive parenting style than the non-participating parents. The participating parents may also have improved their ability to observe their child by fine tuning their perception, getting away from a negative systematic bias focusing on difficult behavior. No generalization to other relationships or settings immediately after the program was observed in the compiled studies. The moderating effect of the informant is therefore interesting to analyze since it informs us about both the benefits and limitations of parenting interventions. Further information would be gained from multi-informant ratings of effectiveness. However, in our sample, only 16 studies reported EB using informants other than the participating parent; 6 of these studies used direct observation of the child, with an investigator's coding.

In conclusion, the results illustrate both the need to disentangle programs' orientation and the current difficulty in doing so. One point raised by this micro meta-analytic review is the predominance of cognitive-behavioral parenting programs over programs focusing

exclusively on behaviors, and the non-existence of cognitive parenting programs. However, if we had limited our classification to what was explicitly documented in the method or intervention section of articles, several programs would have been categorized as behavioral although they were in fact behaviorally and cognitively oriented. By looking at manuals and websites, we were able to gain a clearer view of their orientation. For publication purposes, these articles may have been written in such a way as to facilitate evidence-based intervention reporting, putting forward their behavioral dimension. In the case of a few of the programs which stimulated cognitive processes, this was not reported in the article, but was mentioned in their wider official documentation.

Another intriguing result of this review is the under-representation of focused cognitive programs, which is not consistent with recent research showing that stimulating process of change such as meta-cognition (Roskam, 2015) or parental cognitive variables such as self-efficacy does in fact impact children's behavior. The latter was documented in a recent randomized controlled micro-trial by Mouton et al. (2014) who showed that a change in children's positive behavior could be induced by a cognitive process induced in mothers. Enhancing the cognition of self-efficacy had a positive effect on the children's positive behavior during interaction with their mothers, with an effect size of 0.64. It also had an impact on their mothers' behavior, with an effect size of 0.63.

Limitations

The main limitation of this review is the difficulty to discriminate parenting programs according to their orientation, on the basis of programs' articles and official manuals and websites. Another limitation of this review lies in a possible bias due to treatment fidelity that has not been accounted for here. Unfortunately, not all studies reported such information and the decision was made to not include it in our analysis for homogeneity reasons. Another information not included in this review is the assessment of study quality, recommended by

the APA Meta-Analysis Reporting Standards (MARS), but which was not a central research question for this review. All of the 35 selected studies were published in peer-reviewed publications that check for study quality.

Other moderators probably involved here were not captured by this meta-analytic review. Parents' gender could not be categorized in a methodologically satisfactory way. Change processes (modeling, reinforcement, instruction, metacognition, etc.) were rarely documented in the literature and were often combined in interventions to increase efficacy (Roskam, 2015). Other moderators explaining differences in intervention effectiveness could be the children's language or cognitive profile, in particular in terms of inhibition (Roskam, Meunier, Stievenart, & Noël, 2013) or temperament (Martel, Gremillion, & Roberts, 2012; Rowe & Plomin, 1977), which are known to have an influence on children's EB. It is most likely that these variables contribute to explain why parenting interventions are effective or not. If children have language or cognitive impairments, an intervention on their parents may have a limited effect on the children's behavior.

Future Research

Analyzing mediation of treatment outcome by parenting behaviors would also add to the understanding of changes in child behavior (Hinshaw, 2002). Young children's development and functioning are strongly influenced by their environment, in particular their relationship with their parents. This meta-analytic review did not analyze this mediation effect of parenting improvement on child behavior, as in other reviews as well, and left it open for further research. This would contribute to throw light on how treatment change is produced, along with the orientation analysis. "Answering not just whether treatment change is produced, but how it is produced, is the cornerstone of advancing theoretical understanding about mechanisms of change" (La Greca et al., 2009), p.377). Such a move towards tailored

parenting interventions would also provide clinicians with the flexibility to adapt to variations in patients' problems, strengths, contexts or conditions.

Moreover, it could be interesting for further research to explore factors related to the participating parent. Parenting interventions can only have an effect on children if parents are impacted themselves. We could imagine that according to their temperament for instance, parents may benefit differently from programs. So far, studies have taken account of parenting variables (parenting behaviors, parental stress etc.), but these measures have differed from one study to another. We could recommend that future studies like randomized controlled trials systematically measure parent temperament or personality in order to test their moderating effects in future meta-analyses.

In sum, this meta-analytic review confirms that parenting interventions are effective at decreasing young children's EB, as expected, but it also highlights the current difficulty in comparing interventions on the basis of their specific orientation, preventing a thorough understanding of what is actually at stake for parents and their children in these programs. This could be overcome by a more systematic inclusion of this information in parenting program studies and the development of micro-trial experiments.

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